Oil Pollution Emergency Plan and Operational and Scientific Monitoring Plan

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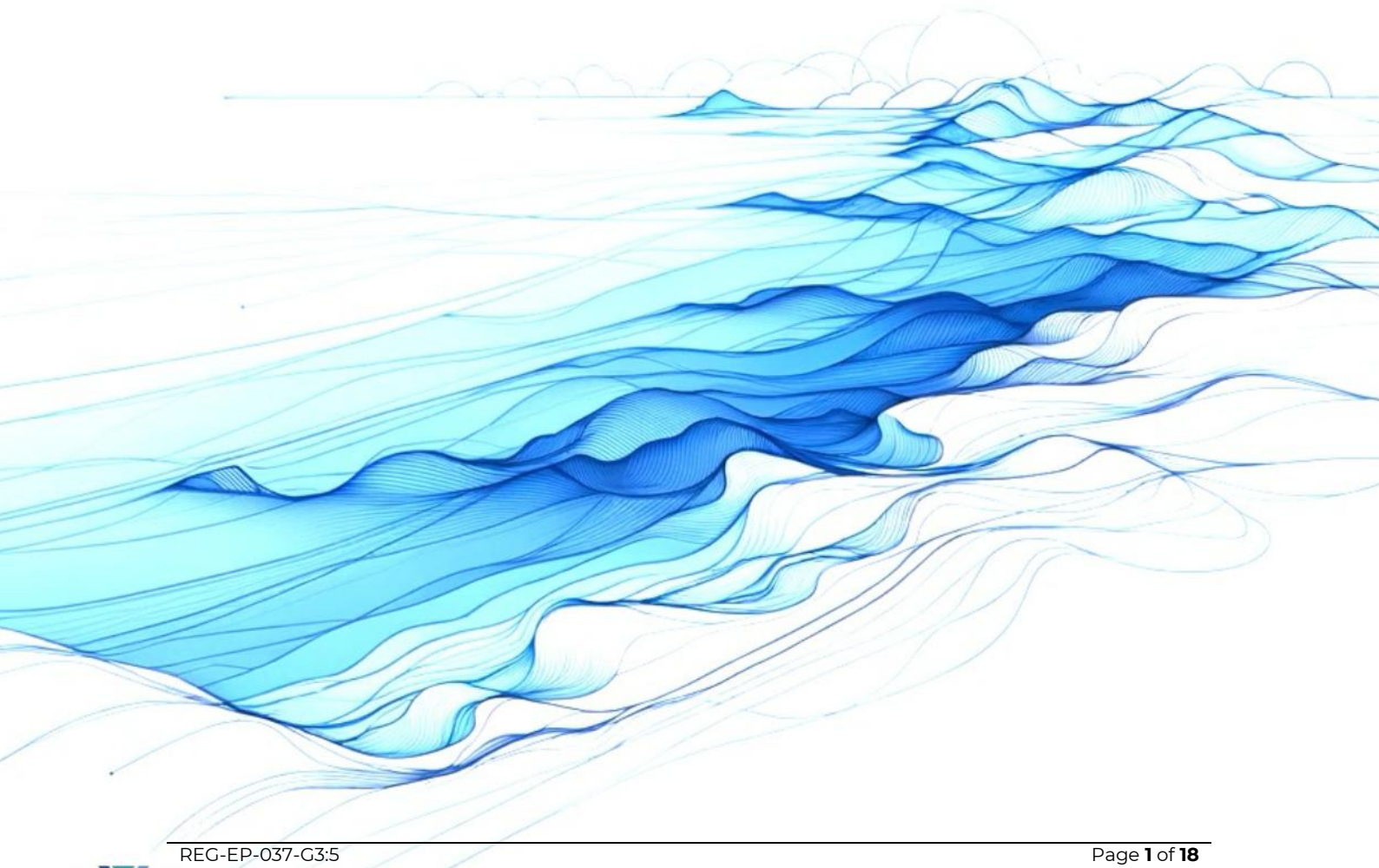


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First Response Actions

In the event of a hydrocarbon release, first call the AMSA Rescue Co-ordination Centre Australia (JRCC Australia) via:

Phone: 02 6230 6811, 1800 641 792 (24 hours)
Fax: 02 6230 6868
Telex: 62349
AFTN: YSARYCYX

The following information should be provided wherever possible:

- ☐ Name and contact details.
- ☐ Where and when the spill occurred.
- ☐ A description of the pollutant.
- ☐ The size of the area where the oil is visible.
- ☐ The source of the spill including vessel registration numbers if known.
- ☐ Any photographs of the incident.

Victoria
If the spill is in, or is likely to move into Victorian State waters, the spill must be reported using the contact details below. If the spill occurs outside port jurisdictions, relevant port authorities will be notified as defined in the relevant State response plan. In the case of a Level 1 release within or close to State waters Portland Port will be the Control Agency. Contact the Port of Portland via:

Reporting (24-hour) Port of Portland +61 3 5525 2450.

For a Level 2 or 3 spill, or where a spill originates in Commonwealth waters and is likely to enter State waters (and where AMSA hand over Control Agency role), DJSIR will be the Control Agency.

Contact DJSIR via: DJSIR State Duty Officer on 0428 863 564.

In the event of a spill in one of the Victorian ports to be used by the Regia MSS seismic vessels, the relevant Port Authority must be notified immediately.

Tasmania
If the spill is in, or is likely to move into Tasmanian State waters, the spill must be reported using the contact details below.

In the case of any spill within State waters the Environment Protection Authority Tasmania is the Control Agency. TasPorts is the control agency for oil spills within Port waters.

For a Level 2 or 3 spill, or where a spill originates in Commonwealth waters and is likely to enter State waters (and where AMSA hand over Control Agency role), the Tasmanian Environment Protection Authority (EPA) is the Control Agency.

Ship's masters, owners, charterers, and agents must provide notification in accordance with statutory requirements (under Marine-related Incidents (MARPOL Implementation) Act 2020).

Telephone: Control Officer (SOPCA): +61 (0)3 6165 4599 or 1800 005 171 (within Tasmania only)
Radio: TasPorts Vessel Traffic Services

VHF radio channel 16/14/12, Call sign “relevant port name VTS" (e.g. Grassy VTS)

Email: incidentresponse@epa.tas.gov.au
EPA: Pollution Incidents: 1800 005 171
General enquiries: +61 3 6165 4599 enquiries@epa.tas.gov.au

The name, IMO number and radio call sign of the vessel must be provided, along with a written report commencing with the code letters “POLREP”. The report must include key basic information, including location, nature and scale of the spill, and contact details. A detailed written report may

also be required. Notify the relevant party when injured/oiled wildlife is confirmed or could potentially occur.

1 Introduction

Welcome to the Regia MSS Oil Pollution Emergency Plan (OPEP). The Regia MSS OPEP serves as a blueprint for responding effectively to potential oil and chemical spill emergencies that may arise during our operations at sea.

The development of an Oil Pollution Emergency Plan (OPEP) is required by Section 14(8) of the OPGGS(E) Regulations. This OPEP for the Regia MSS comprises relevant components of the CGG seismic vessel or contractor's Shipboard Oil Pollution Emergency Plan (SOPEP) and the National Plan for Maritime Environmental Emergencies (NATPLAN) (AMSA 2014).

2 Purpose of the Document

The primary purpose of the Regia MSS OPEP is to establish a clear and systematic framework for preventing, managing, and mitigating oil pollution incidents on the vessels deployed during the Regia MSS. By outlining specific procedures and responsibilities, this document can be followed to ensure that our crews address environmental emergencies swiftly and efficiently.

3 OPEP Objectives

The Regia MSS OPEP strives to achieve the following objectives:

Environmental Protection: Our commitment to safeguarding the marine environment is paramount. This document is designed to prevent and minimize the impact of oil and chemical spills on aquatic ecosystems, marine life, and coastal regions.

Compliance: The Regia MSS OPEP is developed in accordance with the Offshore Petroleum and Greenhouse Gas (Environment) Regulations. It is also designed to be consistent with the Australian national system for oil spill preparedness and response.

Safety: The safety of our crew members and the vessels themselves is of paramount importance. This plan outlines measures to protect our personnel while responding to pollution emergencies and prevent accidents that could lead to such incidents.

Reputation Management: Recognizing that environmental responsibility is a core value of CGG, this OPEP reinforces our commitment to stakeholders, partners, and the broader community. Effective pollution response measures help safeguard our reputation as a responsible and conscientious maritime operator.

4 Scope of the OPEP

The Regia MSS OPEP applies to all vessels and operations under the jurisdiction of the Australian Maritime Safety Authority (AMSA). The scope of this document encompasses:

Response Protocols: Clear and decisive steps to be followed in the event of a pollution incident, including containment, clean-up, and notification procedures.

Personnel Responsibilities: Allocation of roles and responsibilities to crew members, ensuring a coordinated and effective response to emergencies.

Documentation and Reporting: Requirements for maintaining records, reporting incidents, and cooperating with relevant authorities and organizations.

This document does not include the testing arrangements for this OPEP which can be found in the Regia MSS Implementation Strategy and are not part of this document.

The Regia MSS OPEP is a dynamic and evolving document, subject to periodic reviews and updates to reflect changes in technology, regulations, and best practices. It is our collective responsibility to implement and uphold the principles outlined in this plan, ensuring the continued success of our operations while preserving the integrity of our oceans and marine ecosystems.

This document is not a Shipboard Oil Pollution Emergency Plan (SOPEP). The SOPEP is part of the response arrangements for the Regia MSS as it is a critical document and preparedness measure required for vessels operating at sea. Each SOPEP is designed to outline the procedures and responsibilities that the crew of a vessel must follow in the event of an oil spill to minimize environmental damage and respond effectively to such emergencies. SOPEPs are a mandatory requirement under the International Maritime Organization's (IMO) International Convention for the Prevention of Pollution from Ships (MARPOL).

5 The National System for Preparedness and Response

NATPLAN is the framework that integrates Commonwealth and State Government(s) response, facilitating an effective response to marine pollution incidents via Australian Emergency Management Arrangements. AMSA manages NATPLAN and is the control agency for vessel spills in Commonwealth waters. As such, AMSA works with State Governments, emergency services and relevant industries (shipping, oil and gas, exploration, and chemical industries) to maximise Australia's response capability.

NATPLAN applies to all spills from vessels in Commonwealth waters. The SOPEP recognises the divisions of responsibility to provide effective response to marine pollution incidents, as defined under NATPLAN. The SOPEP is the principal response document that will be implemented in the event of a marine oil spill, which provides specifics and provision for guiding management response to mitigate oil spills from vessels.

NATPLAN applies to Commonwealth waters seaward of the boundary of State Waters (3 NM offshore) and integrates with State response plans. NATPLAN identifies several of the roles that are fulfilled by State agencies as defined in the relevant State contingency plan.

5.1 Jurisdictional Authority (JA)

A JA is a statutory responsibility required to ensure that an adequate spill response plan has been prepared. In the event of a spill, the JA also ensures that a satisfactory response can be implemented by the Control Agency. In Commonwealth waters, the JA for petroleum activities is NOPSEMA, and AMSA for vessel spills.

5.2 Control Agency (CA)

The CA is responsible for operational control and response to an oil spill in the marine environment. The Commonwealth waters CA for the Regia MSS is AMSA. AMSA may request that State CAs assume the lead CA role, even where the spill has occurred in Commonwealth waters (but where there is a likelihood that spill hydrocarbons may impact State resources/shorelines).

National Plan response equipment and resources are managed and controlled by AMSA's Marine Environment Protection (MEP) Division, and include:

- Maritime Emergency Response Commander (MERCOM)
- Oil spill response equipment managed via the Marine Oil Spill Equipment System (MOSES)
- Oil Spill Response Atlas (OSRA) which identified sensitive receptors (e.g. marine and shoreline ecosystems and biological resources)
- Oil Spill Trajectory Modelling (OSTM).

In addition, the Australian Marine Oil Spill Centre (AMOSC) is an oil spill response organization funded by industry membership fees that can be contracted as an oil spill response agent.

5.3 State Waters

If a hydrocarbon release occurs in state waters (or if it is likely to move into State waters), the following relevant state oil spill contingency plans will apply:

The Victoria state plan is the State Maritime Emergencies (non-search and rescue) Plan (Emergency Management Victoria 2016). The State Jurisdictional Authority (JA) and Control Agency (CA) is the Department of Economic Development, Jobs, Transport and Resources (DEDJTR).

The Tasmania state plan is the Tasmanian Marine Oil Spill Contingency Plan (TASPLAN) (EPA Tasmania January 2022). The State JA is the Environmental Protection Authority Tasmania, and the State CA is the Tasmanian Environment Protection Authority (EPA).

The deployment of state resources in Commonwealth waters will be requested and coordinated by AMSA.

5.4 Roles and Responsibilities

AMSA is the Control Agency and hence responsible for managing response to all oil spills in Commonwealth waters under NATPLAN. Both MARPOL 73/78 and the vessel's SOPEP require the vessel master to report to the nearest State whenever there is an incident involving actual or probably discharge. The vessel SOPEP is implemented to initiate clean up resources and control discharges.

The following roles will also provide key support:

Prior to commencement of the survey **the Survey Vessel Master will ensure that all relevant personnel have undergone relevant inductions and are familiar with the SOPEP** (and oil spill response arrangements therein) and are appropriately trained to undertake their responsibilities under the SOPEP.

The Seismic Survey Vessel Master will be responsible for notifications and reporting all spills to the sea to the AMSA JRCC, via a POLREP form included in the vessel SOPEP. Further reports will be sent at regular intervals to inform AMSA, NOPSEMA, CGG, survey contractors, State Control Agencies).

The Survey Vessel Master will continue to provide situation reports (SITREPs) throughout the response activity, at the direction of AMSA. AMSA will maintain the response until relevant termination criteria are achieved.

The Survey Vessel Master will make the area safe (protect human life) and to make reasonable efforts to stop the leak to prevent further spillage, for example by transferring fuel to another tank.

The Survey Vessel Master will be responsible for ensuring that the spill containment and recovery kits are serviced and in-date (where relevant), and appropriately always stocked.

The CGG Client Site Representative on board the vessel is responsible for reporting directly to CGG. The CGG Technical Operations Manager (shore-based) is then responsible for notifying NOPSEMA of any spills in Commonwealth waters.

AMSA will appoint the MERCOM, who is supported by statutory powers under the Protection of the Sea (Powers of Intervention) Act 1981. The responsibilities of the MERCOM include the management of emergency intervention issues during a response to maritime casualty incidents where there is a real (or even potential) risk of significant pollution.

6 Assessment Of Spill Scenarios

The level of hydrocarbon release is used to identify the level of resources required to respond to the spill. This approach allows scaling of response in line with the evolving nature and scale of the incident. Incident classification (Levels 1 to 3) are defined in NATPLAN as follows:

Level 1 incidents with a release of 0 to 10 m³, and where sensitive species or habitats are not at risk. These incidents are generally resolved through a First Strike response (i.e., local, or initial resources only).

Level 2 incidents with a release of 10 to 1000 m³ may require deployment of jurisdictional resources supplementary to the initial response due to the more complex size/duration/resource management/risks involved. A Level 1 release may be escalated to a Level 2 where sensitive environmental/socio-economic receptors may be at risk.

Level 3 incidents with a release of greater than 1,000 m³ may require national and international resources, and where the incident controller must delegate all management functions and focus on strategic leadership and response coordination. A Level 2 release may

be escalated to a Level 3 where sensitive environmental/socio- economic receptors may be at risk.

The following spill scenarios have been identified for the Regia MSS:

Level 1 (<10 m^3): The complete loss of hydrocarbons from a transfer hose during refuelling operations.

Level 2 (>10 m^3 of Marine Diesel Oil (MDO)): The complete loss of inventory from the largest fuel tank of an example wide-tow capable survey vessel resulting from collision or grounding. Note that should a release of this volume pose a significant risk to key sensitive receptors, then escalation to Level 3 may be triggered.

7 Environment That May Be Affected (EMBA)

The Environment That May Be Affected (EMBA) is the sea surface area, water column, seabed and any relevant shorelines that could be impacted by oil spilled from a petroleum activity. The EMBA for a Level 1 bunkering incident is expected to be limited to the immediate vicinity of the release point due to rapid spreading, evaporation, and dilution of the spilled MDO and the actions taken under the vessel SOPEP.

The EMBA for a Level 2 spill is based on the outcomes of extensive SIMAPs modelling for various scenarios ranging from 200m^3 to 373m^3 (Appendix B11).

7.1 Protection priorities within the EMBA

The NATPLAN protection priority hierarchy has been used to define protection priorities and response objectives within the EMBA:

PRIORITY 1: protection of human health and safety remove marine users and any potential casualties from areas considered to be a safety hazard.

PRIORITY 2: protection of habitat and cultural resources.

PRIORITY 3: protection of rare and/or endangered fauna prevention of oil exposure to threatened fauna that are or may be present in (or near) the operational area.

PRIORITY 4: protection of commercial resources prevent exposure to commercial fisheries in (or near) the operational area.

8 Spill Response Preparedness

8.1 Oil Spill Resources

Typical oil spill resources expected to be carried onboard the survey vessel are listed in the vessel's SOPEP. The vessel will carry spill containment and recovery kits with sufficient absorbent booms and materials to contain small to medium-scale deck spills. Minor spills will be managed through good housekeeping practices and the use of absorbent materials. Deck spills will not be discharged into the ocean. Spill clean-up materials will be retained on board the survey vessel and stored in covered containers for subsequent disposal at an appropriate onshore facility.

8.2 Proposed Spill Response Strategies

Spill response strategies for the credible scenarios identified (<125 L and 268 m3 MDO) are presented in Table G3-1. In the unlikely event of a spill, the potential use of each spill response strategy would be assessed for feasibility with the recommended responses subject to a Net Environmental Benefit Analysis (NEBA) or Spill Impact Mitigation Assessment (SIMA) by the CA (e.g., AMSA in Commonwealth waters). Any rejected response strategy may be adopted if directed by the CA.

Table G3-1 - Assessment of Spill Response Strategies.

Response Strategy	Assessment	Recommendation	Termination Criteria
Monitor and evaluate	Vessel observation is the easiest and most available option available in all spills. Information gathering for spills is critical for situational awareness and supporting a coordinated spill response. Visual operations of surface hydrocarbons are limited to daylight. Understanding of entrained or dissolved hydrocarbons distribution is limited to spot-point water column sampling using suitable equipment (e.g., fluorometer).	Adopt	No visible surface sheen, slick, or floating oil remains in the affected area, as confirmed by systematic visual surveys over multiple tidal cycles.
Mechanical dispersion	Undamaged vessels in the area can be used to breakup surface slicks if safe to do so. This strategy may be effective in sheltered/near shore areas and is unlikely to be effective in open ocean conditions where wind and wave energy will naturally disperse the slick.	Reject	Not required.
Containment and recovery	The wind and wave conditions are likely to breakup any surface slicks and limit the operational window of this strategy to port or nearshore areas. The relative thickness and spreading of MDO renders this strategy ineffective.	Reject	Not required.
Shoreline protections and shoreline clean-up	The spreading and relative thickness of MDO slicks on shorelines would mostly be below the 10 g/m^2 impact threshold. This along with the exposed and high energy shorelines of the Otway coast make this strategy ineffective.	Reject	Not required.
Chemical dispersion	Due to the spreading and relative thickness of MDO slicks on water, chemical dispersants would not be used as they are unlikely to be effective on an MDO spill (CSIRO 2016). This along with the exposed and high energy shorelines of the Otway coast make this strategy ineffective.	Reject	Not required.

8.3 Oil Spill Response Run-sheet

Given the location of the proposed Regia MSS, the preferred strategy for MDO spills will be to allow small spills to disperse and evaporate naturally, and to monitor and evaluate the position and trajectory of any surface slicks. This passive response and reliance on natural processes greatly reduces the potential for impacts associated with spill response activities.

For Level 1 fuel spills in Commonwealth waters, initial actions will be undertaken by the survey vessel in accordance with the vessel SOPEP (See Page 1), with subsequent actions determined in consultation with AMSA (under NATPLAN). In such situations, the Survey Vessel Master (or delegate) will monitor the spill and notify AMSA of the situation status. AMSA will monitor and continue to assess this level of spill.

For Level 2 spills, AMSA is the responsible CA for oil spills from vessels within the Commonwealth jurisdiction and will respond in accordance with its Marine Pollution Response Plan, as approved by the AMSA Executive. Upon notification of an incident, AMSA will assume control of the incident (AMSA 2014). CGG and the vessel contractors will support the response as required.

After ensuring the safety of the crew and fire prevention (and notifying AMSA), the Survey Vessel Master will implement the SOPEP and consider relevant actions (e.g., tank lightering) to reduce the oil volume released to the environment. AMSA will determine the appropriate response strategies depending upon the protection priorities at risk within the EMBA.

AMSA will determine the potential need for oil spill trajectory modelling (OSTM) and possible sea/aerial surveillance to confirm/inform trajectory predictions, depending on the location, prevailing weather conditions, available vessel responses and volume released.

Recognising that there is potential for impacts associated with spill response activities, these risks would be assessed as part of any NEBA/SIMA coordinated by AMSA, to which CGG would contribute if requested by AMSA.

The NEBA/SIMA process requires several data and information inputs to allow a robust and transparent assessment. AMSA will require CGG to provide this information in a timely manner. Information requirements will likely include:

- The oil spill risk assessment in the accepted EP.
- Vessel observations obtained immediately prior to and following the spill.
- On water capability information to support spill response.
- Any available baseline data.

Where hydrocarbons from the spill are likely to cross from Commonwealth to State waters, AMSA will undertake the NEBA/SIMA in conjunction with representatives from the relevant State CAs.

8.3.1 Oiled Wildlife Response

If AMSA identify that an oiled wildlife response is required in Commonwealth waters, this will be based on the Oiled Wildlife Response Plan (AMSA 2017). Responses in State waters will be implemented by or under the direction of State CAs and align with current State oiled wildlife response plans. The accumulation of hydrocarbons on shorelines is considered unlikely based on the credible scenarios; however, to allow for an adaptable response, consideration will be given to migratory shorebird feeding and roosting sites/nesting colonies and any seal colonies in and adjacent to the EMBA (e.g., on the northern coast of King Island). In addition, species protected under Part 3 of the EPBC Act will be given particular attention, with consideration of information provided in relevant plans, guidelines, and policies (e.g., NOPSEMA 2016a).

8.3.2 Communication with Other Marine Users

Commercial and recreational fishers and other users that operate in the area would be advised of any spill and associated response activities within 2 hours of the incident, and every 24 hours for the duration of the incident. This would minimise the potential for interaction with their activities or unnecessary risks to personnel or property.

Subsequent actions will be determined in consultation with the Control Agency and regulatory authorities (AMSA and NOPSEMA) under NATPLAN, with regards to the low potential for impacts posed by the spill. AMSA has indicated that it does not require titleholders to directly consult on OPEPs for seismic surveys or those addressing the operations of offshore supply vessels (AMSA 2014). Such operations are already covered by existing NATPLAN arrangements.

Any reportable fuel or oil spills will be reported using CGG's Event Reporting Management Procedure (GRP_HSE_GEI_17E).

8.3.3 Communication with other relevant interested persons or organisations

There is no specific commitment for CGG to communicate the details of the spill to relevant persons consulted in the preparation of the EP, or to other relevant interested persons or organisations as part of ongoing consultation. This position is justified because the Control Agency under the National Plan would be responsible for such communication. CGG will issue updates to relevant persons if requested to do so by the Control Agency and prior approval of the content.

9 Operational And Scientific Monitoring Plan (OSMP)

The specific operational and scientific monitoring program undertaken following an oil spill would be developed based on the following information:

- location of the spill
- nature and scale of the spill, and likely evolution
- types of values and assets within the EMBA
- potential for impact upon sensitive resources
- review of available baseline data.

An assessment of gaps in available baseline data and potential/requirements for post-spill/pre-exposure baseline data collection will be considerations in the monitoring design. AMSA will direct and lead any monitoring requirements in the event of an oil spill, supported by CGG.

All monitoring personnel will be suitably experienced and qualified for their role. A pre-mobilisation assessment of experience and certifications will be used to allocate specific roles to personnel. Multiple personnel will be allocated to monitoring roles to allow for shift rotations (where multiple shifts per day are required) or survey rotations (where staff are rotated from the field as part of effective fatigue management planning). The availability of personnel with in-date certificates (e.g., offshore medical, TBOSIET and MSIC) will then identify which personnel will support immediate mobilisation or comprise the second rotation.

9.1 Operational Monitoring

In the event of a hydrocarbon release, CGG would implement Operational (Type I) Monitoring in consultation with AMSA, and where appropriate, relevant State agencies. This monitoring will be implemented to;

- determine the extent and character of a spill.
- track the movement and trajectory of surface MDO slicks.
- identify areas/ resources potentially affected by surface slicks.
- determine sea conditions/ other constraints.
- identify the efficacy and potential impacts of spill response strategies and tactics (to inform any remediation activities and any subsequent NEBA assessments).

Oil Spill Trajectory Modelling (OSTM), used in conjunction with water quality monitoring, will help determine the potential extent and direction of travel of the plume of entrained MDO, and to determine the risk of hydrocarbon toxicity impacts to sensitive receptor locations.

This monitoring will be instigated by AMSA and will enable CGG to provide the necessary information to AMSA, to assist in planning appropriate response actions under NATPLAN. Specific monitoring and data collection would include aspects of the following, as agreed with AMSA:

- immediate monitoring (approximately 0 to 6 hours):
- estimate of sea state
- estimates of wind direction and speed
- characteristics of the surface MDO slicks (thickness and areal extent)
- GIS mapping
- OSTM triggered for a Level 2 spill or greater.

Modelling, if triggered, will be used in conjunction with other field observation/monitoring data to identify the likely direction, spread and potential speed of the slick. This will be used as a guide to support the planning for other operational monitoring scopes (e.g., water quality, sampling and fluorometry). This information will allow initial identification sites for sampling, which may also provide information on the subsurface distribution of hydrocarbons via vertical profiling of the water column (should sufficiently levels of hydrocarbons remain to be detectable).

Water column profiling data will be used to identify the sites and depths at which water samples will then be taken for laboratory analysis. Water sampling for hydrocarbons should be undertaken using suitable equipment by personnel trained in the relevant procedures. “Improvised” approaches will not be used as the samples obtained may result in inaccurate results or a failure or a delay in confirming the credible source of the spill (as described in NOPSEMA 2017c).

The following operational monitoring techniques must be mobilised once immediate response actions have concluded:

- aerial surveillance for Level 2+ spills (if aircraft available offshore).
- GPS tracking using satellite drifter buoys (if available).
- measuring concentrations of entrained hydrocarbons through the water column (e.g., from water samples or using fluorometers calibrated to an appropriate hydrocarbon type).
- stochastic modelling predictions for Level 2+ spills (requires up to two weeks to receive results).

Field-based operational monitoring will be restricted to daylight hours only when surface slicks will be visible from either vessels or via aerial surveillance. Where available and practicable, remote sensing (e.g., using satellite-mounted optical imagery and Synthetic Aperture Radar (SAR)) may be used to provide situational awareness of the spatial distribution of the surface slick(s) during daylight, at night, or during overcast days.

The information gathered from this monitoring will be passed on to AMSA is it becomes available and via ongoing SITREP reports. Where GPS tracking using satellite drifter buoys, real-time spill modelling, aerial surveillance, water quality sampling and/or visual slick estimation is required, CGG can engage RPS under existing contractual arrangements to provide urgent specialist response services.

Should there be the need to implement field response activities using external parties, a response logistics plan would be developed and initiated immediately on notification of the spill. The plan would detail logistics, equipment personnel and detailed OSMP plans. CGG will implement, assist with, or contribute to (including funding if required) any other operational or scientific monitoring as directed by AMSA.

9.2 Scientific Monitoring

Scientific (Type II) Monitoring would be triggered and implemented if there is a reasonable expectation that there may be adverse impacts to marine biota or habitats in the area. The scientific monitoring likely to be implemented includes the programs listed in the sections below. The key receptors for which scientific monitoring studies would be considered are:

- benthic sediments (particularly soft sediments able to retain hydrocarbons, infauna)
- subtidal marine benthos (filter-feeders, macroalgae)
- seabird populations (foraging individuals)
- non-avian marine wildlife (cetaceans, marine reptiles, and fish).
- intertidal sediments and habitats.
- fisheries and aquaculture operations.

9.2.1 Scientific Monitoring Program 1

SMP1 is about monitoring for hydrocarbons in benthic sediments. The aims of SMP1 are to understand the characteristics, persistence, and fate of hydrocarbons in sediments to provide data for the assessment of potential impacts on seabed sediments and to understand the effect of hydrocarbon concentrations on infaunal macrobiota.

The objectives of SMP1 are to:

- Quantify hydrocarbon concentrations at locations within the EMBA.
- Quantify change in sediment hydrocarbon concentrations at sampling locations over time (considering seasonal and inter-annual change).
- Provide sediment hydrocarbon data to support determination of potential cause-effect relationships between spill hydrocarbons and changes in benthic communities.
- Identify potential areas of benthic impact based on sediment hydrocarbon concentrations and impacts to benthic macroinfaunal assemblages.

SMP1 will start in the event of a Level 2 or 3 spill and where modelling and/or operational monitoring (e.g., water quality) indicates likely exposure to benthic sediments.

SMP1 will end when sediment contamination results showed recovery to a point where hydrocarbon concentrations are no longer demonstrated to be a primary driver of infauna assemblage composition.

9.2.2 Scientific Monitoring Program 2

SMP2 is about monitoring and surveys of shoreline and intertidal benthos to determine impacts of oil spill and recovery. The aim of SMP2 is to determine and monitor the impact of the spill, dispersants or response activities and potential subsequent recovery for intertidal benthos at both individual (species) and community (habitat) levels.

- The objectives of SMP2 are to:
- Monitor the spill and spill management operations on intertidal marine coastal habitats (like tidal seagrass, tidal mud flats, mangroves, intertidal saltmarsh, and saltpans).
- Monitoring associated organisms (like fishes, crustaceans, arboreal mangrove biota, microphytobenthos, macroalgae, mangrove/saltmarsh plants, seagrass)
- Establish necessary responses.
- Quantify the biological and ecological effects of the spill and response activities.

SMP2 will start in the event of a Level 2 or 3 spill and if modelling predicts possible shoreline/intertidal contact or there are any reports of shoreline/intertidal contact.

SMP2 will end when all reasonable and practical measures have been taken to assess the impact of the spill on intertidal benthos and affected intertidal benthos has returned to baseline (or reference site) conditions or oil pollution impacts on critical intertidal benthos species and taxa are no longer identifiable.

9.2.3 Scientific Monitoring Program 3

SMP3 is about monitoring of subtidal marine benthos to determine impacts of oil spill and recovery. It aims to enable assessment of impacts and potential for subsequent recovery of benthic marine habitats (soft and hard substrate habitats) and associated macro-epibenthic organisms (e.g., macroalgae, seagrass, sponges and other filter feeders, motile invertebrates, and associated fishes) in response to a spill event and associated response activities. It also aims to document recovery of affected biota and habitats.

The objectives of SMP3 are to:

- characterise and quantify habitat composition and coverage/abundance of macro-epibenthic organisms and site-associated demersal fish.
- allow comparison with historical (baseline) data and seasonal/interannual surveys.
- define recovery in macro-benthic and demersal populations and recovery/change in habitat type.

SMP3 will start in the event of a Level 2 or 3 spill and where modelling and/or operational monitoring (e.g., water quality) indicates likely exposure to benthic habitats or if there are any reports of subtidal contact.

SMP 3 will end when reasonable and practicable scientifically robust measures have been taken to assess the effects or impact of the spill on benthic habitats / communities and oil pollution effects / impacts on benthos are no longer detectable, or impacts shown to be within accepted protection limits (to be defined in Sampling and Analysis Plan) and when a trend towards post-impact recovery or alternate developmental trajectory has been demonstrated (in comparison with control/reference sites) at sites that were exposed to elevated concentrations of hydrocarbons.

9.2.4 Scientific Monitoring Program 4

SMP4 is about undertaking wildlife surveys to determine impact of oil spill on seabird and shorebird populations and recovery. It aims to assess any short-term or longer-term environmental effects on seabird and shorebird populations within the study area that may have resulted from the oil spill (i.e., damage extent and recovery). It also aims to document recovery of affected biota and habitats.

The objectives of SMP4 are to:

- Quantify foraging seabird and shorebird populations.
- Quantify foraging, nesting or breeding shorebird populations.
- Quantify records of oiled birds and bird mortalities.
- Allow comparison of changes in populations over time (seasonal and inter-annual).

SMP4 will start in the event of a Level 2 or 3 spill and where post-spill observations indicate possible contact with foraging seabird populations and/or any reports of oiled or dead seabirds and/or shoreline oil indicates possible contact with shoreline bird habitats or populations.

SMP4 will end when the extent of damage and rate of recovery of key seabird/shorebird behaviour and breeding activities has been quantified using scientifically robust methods and the affected environment or natural resource has returned to baseline conditions (taking into account natural variability) in terms of breeding population (for seabirds) or counts (for shorebirds), with regard to reference sites and/or baseline data and oil pollution effects/impacts on critical species and taxa are no longer detectable.

9.2.5 Scientific Monitoring Program 5

SMP5 is a desktop study and survey about occurrences of oiled/mortalities of non-avian marine wildlife to determine impacts of oil spill and recovery. SMP5 aims to assess any short-term or longer-term environmental effects on non-avian marine wildlife that may have resulted from the oil spill (i.e., damage extent and recovery). It also aims to document recovery of affected biota and habitats.

The objectives of SMP5 are to:

- quantify records of sightings of dead or oiled marine wildlife.
- allow seasonal or inter-annual comparison of records of dead or oiled wildlife.

SMP5 will start in the event of a Level 2 or 3 spill and where modelling indicates possible contact with populations and/or any reports of oiled or dead non-avian marine wildlife.

SMP5 will end when reasonable and practical measures have been taken to assess the effects or impact of the spill on non-avian marine wildlife and restoration or resumption of key biological processes (e.g., abundance, distribution, breeding) necessary to ensure post-impact recovery have been identified and oil pollution impacts on non-avian marine wildlife are no longer detectable.

9.2.6 Scientific Monitoring Program 6

SMP6 is about monitoring of intertidal receptors to determine impacts of spill hydrocarbons and recovery. SMP6 aims to understand the behaviour, persistence, and fate of hydrocarbons in intertidal sediments, and enable assessment of potential impacts and recovery to intertidal habitats. It also aims to identify the potential implications of changes in intertidal communities to other biota (e.g. shorebirds).

The objectives of SMP6 are to:

- Quantify hydrocarbon concentrations at locations within the EMBA.
- Characterise and quantify habitat composition and coverage/abundance of epibenthic and infaunal organisms.
- Quantify change at sampling locations over time (considering seasonal and inter-annual change).
- Define recovery/change in habitat type and epibenthic and infaunal organisms.
- Provide sediment hydrocarbon data to support determination of potential cause-effect relationships between spill hydrocarbons and changes in benthic communities.

SMP6 will start in the event of a Level 2 or 3 spill and where modelling or operational monitoring indicates likely exposure to intertidal habitats.

SMP6 will end when the results of the monitoring tasks achieved the objectives and appropriate, meaningful, and defensible scientific monitoring results have been achieved and sediment contamination results have shown recovery to a point where hydrocarbon concentrations are no longer demonstrated to be a primary driver of habitat composition.

9.2.7 Scientific Monitoring Program 7

SMP7 is about impacts to fisheries and aquaculture. SMP7 aims to understand the potential short and long-term impacts and recovery of fisheries (should they be closed), and aquaculture facility/operation that have been exposed to spill hydrocarbons.

The objectives of SMP7 are to:

- quantify hydrocarbons in tissue of organisms targeted by fisheries or aquaculture.

- determine potential effects on population size/structure.
- identify potential impacts to organism health.
- determine potential risks to human health.

SMP7 will start in the event of a Level 2 or 3 spill and where fisheries have been closed in response to a hydrocarbon spill and/or where modelling or operational monitoring indicates likely exposure to aquaculture operations or key brood stock collection locations.

SMP7 will end when the results of the monitoring tasks achieved the objectives and appropriate, meaningful, and defensible scientific monitoring results have been achieved and sediment contamination results have shown recovery to a point where risks to human health are understood and data on population structure have shown that recovery is possible through retention of sexually mature adults and demonstrated recruitment of juveniles.

9.3 Initiation Of Scientific Monitoring

CGG will implement scientific monitoring in the event of a Level 2 spill (or greater), in accordance with initiation criteria described in Table G3-2. A detailed OSMP Implementation Plan based on commonly used, scientifically robust and easily accessible methods would be developed to ensure an efficient and technically defensible response. This approach builds time efficiencies into development of the OSMP as existing RPS documentation (e.g., Health and Safety Plans) can be adapted to meet the requirements of the OSMP. Potential suppliers of available survey equipment would be identified as a priority, with a preference for those with existing contracts.

Relevant permit applications (e.g., for sediment/biota sampling) will be identified and submitted as soon as reasonably practicable. This approach does not work from the base assumption that permit requirements will be waived by relevant authorities to minimise potential delays in mobilisation and permit approval should permit requirements not be waived.

The OSMP Implementation Plan will detail the equipment required for each study, travel and freight arrangements, notifications, vessel support, HSE planning, and the sampling and analysis plan. Within 12 hours of RPS being notified, a teleconference will be held between the CGG, AMSA, the nominated scientific personnel, and the Vessel Master to finalise the requirements for implementation. Scientific teams can be on site within 48 to 72 hours of the implementation plan and budget being approved (and where permits are not required or have been approved). It is recognised that MDO is only likely to remain measurable on the water surface for a few days, and that realistically a response team would not be on site until it had dispersed.

Given the extremely low probability of a catastrophic spill and MDO subsequently contacting sensitive biota, and the rapid weathering and likely dispersal of spill hydrocarbons before a response team could be mobilised, CGG considers the costs associated with pre-emptive development of the Implementation Plan and full assembly and preparation of the response team to be grossly disproportionate to the benefit of a more rapid response.

The area of potential impact to be targeted in the scientific monitoring plan would be based on observations of the slick trajectory, water quality data collected during the operational phase, and available modelling. Due to the nature of the spill, potential for spread/dispersion, constrained spatial area of the EMBA, and likely field team mobilisation period, it is considered that post-spill pre-impact baseline data collection will likely not be feasible (but will remain a consideration for planning purposes).

Scientific monitoring would focus on determining potential short and long-term environmental impacts of the spill and response actions, and subsequent recovery). Scientific monitoring may continue for some time following the termination of the operational monitoring response (NOPSEMA 2016c).

9.4 Scientific Monitoring Team

In the event of the requirement to undertake scientific monitoring, CGG would engage a specialist subcontractor such as RPS to rapidly finalise response plans and to deploy the required resources to undertake the monitoring activities. Primary scientific monitoring studies could include some, or all, of the elements described in Table G3-2 depending on the size, timing, and location of the spill.

An adaptable scientific monitoring response must allow for the potential for operational monitoring or situational awareness obtained during a spill to indicate exposure to additional sensitive receptor types, depending on the nature and scale of the actual release. Where such an occurrence is identified, additional optional SMPs may be implemented, following agreement with AMSA.

9.5 Study Template

For each SMP described above, a detailed study template would be developed following implementation. This is summarised in Table G3-2.

Table G3-2 - Scientific Monitoring Studies Template

Study Heading	Description
Monitoring objective and rationale	Details the monitoring objectives for the study to focus sampling design.
Natural resource description and/or importance	Provides background information relevant to the context of the study; distribution, temporal patterns, life-stages present, critical habitats, and processes.
Activation trigger for monitoring tasks	Criteria to initiate the scientific monitoring study, based on likely exposure to harmful concentrations (acute and/or chronic)
Potential sensitivity to spilled MDO at exposure levels	General context of possible impacts associated with the spill, exposure pathways and effects concentrations. Range of measurable responses.
Spatial awareness	Outcomes of operational monitoring that support survey design
Monitoring methods / sampling and analysis plan	
Overview of the monitoring method	Provides a scientific and practical context for the monitoring methods to be used. Includes consideration of statistical methods and sampling effort required to achieve the monitoring objectives.
Details of the survey design, methods, standards and techniques to be utilised	Provides the information required to collect samples in a defined geographic area (based on operational monitoring data) as part of a robust scientific study program. Includes relevant specifications, standards, and requirements of the study.
Permits	Details any permit requirements and/or exemptions.
Data collection, analysis, and reporting requirements	Provides details on the necessary data requirements including baseline information, analytical parameters and detection limits, and metadata. Details the deliverables from the study.
Personnel resourcing requirements, qualifications, and skills	Provides minimum skill/experience, qualifications/certifications, and resourcing requirements to deliver the study safely and robustly. Considers shifts and survey rotations for effective fatigue management. Includes contingency resource planning.
Field equipment, survey platforms and logistics	Details equipment and logistics requirements to fulfil the study requirements.
Recommended procedures for data collection, sampling, storage, transport, and analysis	Provides the necessary sampling and analytical techniques, and standards to ensure data quality and ensure consistency throughout the study (including Chain of Custody (CoC) forms).

Study Heading	Description
Risk assessment, occupational health, and safety considerations	Describes the risks and mitigation controls associated with undertaking the study.
Data management, QA/QC, transmittal, and archiving	Provides QA / QC requirements for all data obtained as part of the study.
Supporting documents, standards, and references	Identifies the relevant guidelines and high-level references required to implement the study.
Reporting requirements	Provides description of reporting of the scientific outcomes of the survey(s), including identification and qualification/quantification of potential impacts and subsequent recovery. Each survey report identifies the need for any further scientific monitoring based on the survey outcomes.
Termination criteria	
Criteria for the terminating the monitoring activity	Completion criteria to be met to demonstrate that study objectives have been achieved to terminate the study.

10 Document Control

Version	Date of Revision	Author/Reviewer	Summary of Changes
0.0	21 September 2023	MS	Document started.
0.1	27 September 2023	MS	Sent to Tasmanian and Victorian Control Agencies for review.
1.0	28 September 2023	MS	PDF published online.
1.1	4 December 2023	MS	Updated following review from Tasmanian EPA.
2.0	6 December 2023	MS	Update published online.
3.0	8 November 2024	MS/EOR	Updated following NOPSEMA's assessment.
4.0	16 April 2025	AH	Updated following NOPSEMA's OMR 1 letter
5.0	9 December 2025	EOR	Updated following NOPSEMA's OMR 2 letter