APPENDIX E: OIL POLLUTION EMERGENCY PLAN

Eureka 3D Marine Seismic Survey

Revision	Date	Reason for issue	Reviewers	Approvers
A	13/03/2023	Internal Review		
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Terms

Term/Acronym	Definition
3D	Three dimensional
ADIOS2	Automated Data Inquiry for Oil Spills 2.0
AFMA	Australian Fisheries Management Authority
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Marine Safety Authority
BAOAC	Bonn Agreement Oil Appearance Codes
CEO	Chief Executive Officer
CMT	Crisis Management Team
DBCA	WA Department of Biodiversity Conservation and Attractions
DCCEEW	Cwth Department of Climate Change, Energy, the Environment and Water
DWER	WA Department of Water and Environmental Regulation
DFAT	Cwth Department of Foreign Affairs and Trade
DISR	Cwth Department of Industry, Science And Resources
DMIRS	WA Department of Mines, Industry Regulation and Safety
DoT	WA Department of Transport
DPIRD	WA Department of Primary Industries and Resource Development
EMBA	Environment that May Be Affected
EMSA	European Maritime Safety Authority
EP	Environment Plan
ERT	Emergency Response Team
ESC	Environmental Scientific Coordinator
FOB	Forward Operating Base
GIS	Geographic Information System
GPS	Global Positioning System
HMA	Hazard Management Authority
IAP	Incident Action Planning
ICC	Incident Command Centre
IMT	Incident Management Team
IPIECA-IOGP	International Petroleum Industry Environmental Conservation Association - International Association of Oil & Gas Producers
ITOPF	International Tanker Owners Pollution Federation
JSA	Job Safety Analysis
MARPOL	International Convention for the Prevention of Pollution from Ships
MDO	Marine Diesel Oil
MEE	Maritime Environmental Emergencies
MEECC	Maritime Environmental Emergency Coordination Centre (DoT)
MEER	Maritime Environmental Emergency Response (unit) (DoT)
MGO	Marine Gas Oil

Term/Acronym	Definition
MNES	Matters of National Environmental Significance
MSS	Marine Seismic Survey
NEBA	Net Environmental Benefit Analysis
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
OMP	Operational Monitoring Plan
OPEP	Oil Pollution Emergency Plan
OPGGS (Env)	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (Env) Regulations)
OPGGS Act	*Offshore Petroleum and Greenhouse Gas Storage Act 2006*
OPICC	Offshore Petroleum Incident Coordination Committee
OSC	On Scene Commander
OSCP	Oil Spill Contingency Plan
OSM-BIP	Operational and Scientific Monitoring – Bridging Implementation Plan
OSTM	Oil Spill Trajectory Modelling
OWR	Oiled Wildlife Response
POLREP	Pollution Report
PPE	Personal Protective Equipment
RCC	Rescue Coordination Centre (AMSA)
SEMC	State Emergency Management Committee
SHP-MEE	Western Australian State Hazard Plan for Maritime Environmental Emergencies
SIMA	Spill Impact Mitigation Assessment
SIMAP	Spill Impact Mapping and Analysis Program
SMP	Scientific Monitoring Plan
SMPC	State Marine Pollution Coordinator (DoT)
SMPEP	Shipboard Marine Pollution Emergency Plan
SOPEP	Shipboard Oil Pollution Emergency Plan
WA	Western Australia
WAOWRP	Western Australian Oiled Wildlife Response Plan

First strike activations

The initial response to an oil spill incident will be undertaken by the Vessel Master. For vessel oil spill incidents, the Vessel Master will act in accordance with the relevant Shipboard Oil Pollution Emergency Plan (SOPEP) where applicable, which will include notification to the relevant Control Agency (refer to Section 2.2 and 2.3).

Table A-1 outlines the first strike response actions that need to be followed in the event of a spill.

Table A-1: First strike actions

Responsibility	Actions
Observer	❑ Provide details of the incident to the Vessel Master.
Vessel Master/On-Scene Commander (OSC)[1]	❑ Monitor the safety of all personnel. ❑ Take immediate actions to control the source of the spill, in accordance with the vessel-specific SOPEP. ❑ If source control is not possible, ensure vessel safety by clearing the immediate vicinity of the spill, if possible. ❑ Conduct risk assessment and assess safe approach routes. ❑ Contact relevant Jurisdictional Authority and Control Agency, as soon as practicable, to inform them of the incident, providing as much information as possible via POLREP (Refer to Table 2-2 for a description of Jurisdictional Authorities and Control Agencies). ❑ Notify Pilot Energy Survey Representative of the spill.
Pilot Energy Survey Representative on vessel	❑ Notify the Pilot Energy Duty Manager of the incident and ensure source control measures being implemented. ❑ Aid the Vessel Master/OSC in preparing the POLREP[2] and provide as much information[3] to the Incident Management Team (IMT) as soon as practicable, including: – Name and details of vessel – Location and coordinates – Date and time the release occurred or was first reported – How it was detected – Names of any witnesses – Hydrocarbon type (e.g. Marine Diesel Oil (MDO)), any Material Safety Data Sheets – Vessel's Oil Record Book (contains information on volumes and contents in each tank) – Cause of the spill (e.g. collision) – Source of spill (e.g. fuel tank) – Approximate volume of spill (better to overestimate) – If the spill is controlled or continuous – Weather, tide and current details – Trajectory of the spill (what direction is the slick spreading) – If any fauna has been observed nearby (e.g. whales, dolphins, seabirds)

1 The Vessel Master may act as the OSC or nominate a delegate for this role.

2 This information will also be required when completing incident reports and reports to external agencies.

3 Some details may be limited in the initial POLREP. Aim to get the initial report submitted as soon as possible and follow up with more detail as it becomes available.

Responsibility	Actions
	– Notifications undertaken. ❑ Provide updated POLREPs to the IMT as required. ❑ Use personal Incident Log to record events. ❑ Take photos and send to the IMT, if possible.
Duty Manager/ IMT Operations Section Chief Note: Duty Manager may take on the role of IMT Operations Section Chief or handover command to the IMT Operations Section Chief	❑ Notify Incident Commander as soon as practicable that an incident has occurred and determine if IMT activation is required. ❑ Ensure IMT has been activated (if required). ❑ Confirm incident report and capture key details relating to the incident (obtain POLREP). ❑ Undertake external notifications and reporting (Refer to Section 4). ❑ Remain as the sole liaison and communication interface between the IMT Incident Commander and the Pilot Energy Survey Representative on the vessel.
IMT Incident Commander	❑ Evaluate initial incident report. ❑ Maintain contact with Control Agency to confirm actions (Australian Marine Safety Authority (AMSA) or Western Australian Department of Transport (WA DoT) IMT) (see Section 2.2). ❑ Confirm level of the incident in consultation with Control Agency. ❑ Activate IMT in consultation with Duty Manager/Operations Section Chief. ❑ Notify Crisis Duty Manager Leader of incident (if level 2 or 3). ❑ Remain as the decision-making interface between the IMT and the Crisis Management Team (CMT) Leader.

Once first strike actions are completed and initial notifications to the Control Agency are made, Pilot Energy shall maintain direct contact with the Control Agency and act as a Supporting Agency throughout the response. This includes providing essential services, personnel, material or advice in support of the Control Agency. In addition, Pilot Energy will implement monitoring activities as outlined in the Eureka 3D Marine Seismic Survey Operational and Scientific Monitoring Bridging Implementation Plan (OSM-BIP) (Appendix H).

1. Introduction

1.1 Purpose

This Oil Pollution Emergency Plan (OPEP) outlines oil spill response arrangements for spill scenarios that may occur from a three dimensional (3D) seismic survey undertaken within the Operational Area for the Eureka 3D Marine Seismic Survey (MSS) Environment Plan (EP) (**Error! Reference source not found.**). It describes the spill response management arrangements, protection priorities and the process for selecting suitable oil spill response strategies.

This OPEP addresses the requirements of the Offshore Petroleum and Greenhouse Gas Storage (OPGGS) (Environment) Regulations 2009 and forms a supporting document to the Eureka 3D MSS EP. It is also consistent with the National Plan for Maritime Environmental Emergencies (National Plan) (AMSA, 2020) managed by AMSA and the Western Australian (WA) State Hazard Plan for Maritime Environmental Emergencies (SHP-MEE) (DoT, 2021).

1.2 Scope

This OPEP only applies to acquisition of the proposed Eureka 3D MSS. It excludes all other petroleum related activities. It also excludes marine hydrocarbon spills originating from vessels outside of the Eureka 3D MSS EP Operational Area, which will be addressed by the vessel's SOPEP or Shipboard Marine Pollution Emergency Plan (SMPEP), as applicable to vessel class.

Refer to Section 3 of the Eureka 3D MSS EP for further details on the activity.

1.3 Location

This OPEP applies to a hydrocarbon spill originating within the Eureka 3D MSS Operational Area, which is located within Commonwealth waters off the mid-west coast of Western Australia (WA) (**Error! Reference source not found.**), within the northern Perth Basin, in exploration permit area WA-481-P and associated AA and SPA areas.

1.4 Objectives

The objectives of this OPEP are to:

- Meet the requirements of the OPGGS (E) Regulations.
- Provide alignment with arrangements in the WA State Emergency Management Plan (SEMC, 2022), specifically the WA SHP-MEE and the National Plan.
- Define the oil spill response arrangements that are in place for the credible spill scenarios.
- Provide guidance to the IMT in relation to spill response selection and response implementation.
- Provide procedures for identifying appropriate resources to support a marine hydrocarbon spill response associated with a seismic survey.

1.5 Interface with internal documents

In addition to this OPEP, a number of other Pilot Energy documents provide guidance and instruction relevant to the spill response, including:

- Pilot Energy Emergency Response Procedure (PE-05-PRO-003)
- Pilot Energy Incident Management Procedure (PE-07-PRO-001)
- Eureka 3D MSS OSM-BIP (Appendix H).

Other documents, including an emergency contact form, will be generated to meet the specific requirements of the survey. These will be finalised in the pre-mobilisation phase for up to date information.

1.6 Document review

This OPEP is required to be reviewed, and if applicable updated, to ensure that all relevant information is accurate, and that new information or improved technology is evaluated and used to adapt and improve the management of spills.

Reviews and revisions to this OPEP will be undertaken as per the Eureka 3D MSS EP review and revision process detailed in Section 10 of the Eureka 3D MSS EP.

This could include changes required in response to one or more of the following:

- When major changes have occurred, which affect oil spill response coordination or capabilities.
- Changes to the Eureka 3D MSS EP that affect oil spill response coordination or capabilities (e.g. a significant increase in spill risk, inclusion of new activity).
- Following routine testing of the OPEP if improvements are identified.
- After a Level 2/3 spill incident.

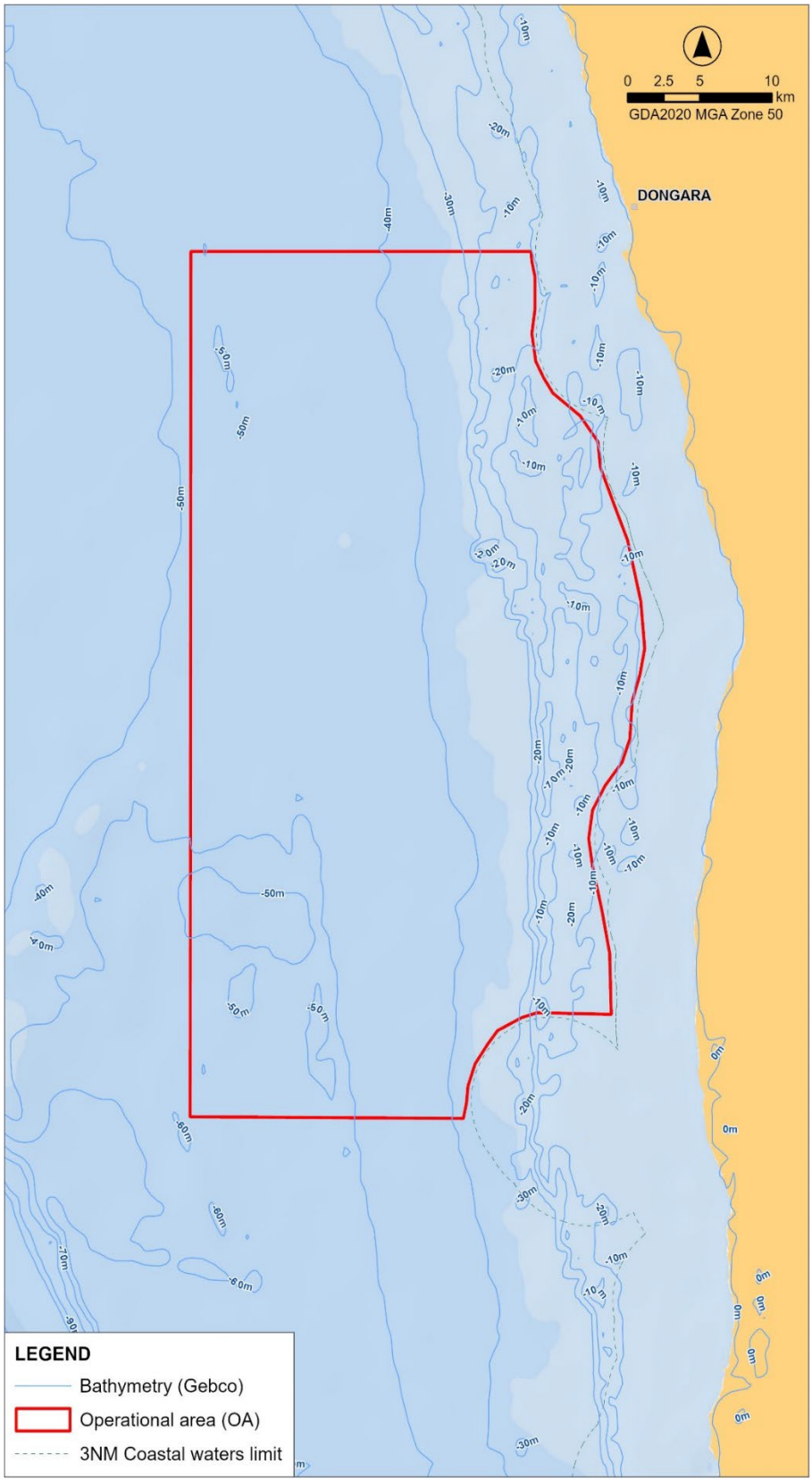


Figure 1-1: Eureka 3D MSS Operational Area

2. Spill Management Arrangements

2.1 Response levels and escalation criteria

The National Plan and the WA SHP-MEE identify three levels of incidents, which are consistently applied by Pilot Energy.

An incident level (also referred to as 'tier') will determine where the resources will be drawn from to respond to the spill and the level of incident management that is required to manage the response effort.

In the event of a spill occurring where effective response is considered beyond the capabilities within a level, the response will be escalated immediately to the next level. The decision to escalate a response to a higher level (as defined in Table 2-1) will be made by the responsible Control Agency.

If the response level is undetermined, then a worst-case scenario should be assumed when activating resources, as it is always possible to scale down the response effort.

Table 2-1: Pilot Energy Incident Level Guidance

	Incident management response level		
Characteristic	**Level 1**	**Level 2**	**Level 3**
General description and escalation criteria	An incident that has not caused severe injury to personnel or damage to assets or the environment Incident does not threaten the safety of a vessel/facility and can be managed by the local response team and its resources	An incident that exceeds Level 1 capability and requires the assistance of the IMT and external support services/agencies If no external support is required, an incident may be classified in a higher tier if there is potential for escalation or damaging public image or government relations	An incident that exceeds Level 2 capabilities and resources and requires the assistance of the CMT Incident may attract media coverage or create public outrage and has the potential to cause, or does cause, a major impact
AMSA National Plan Levels and escalation criteria	Level 1 Generally able to be resolved by Responsible Party through the application of local or initial response resources (first strike response)	Level 2 Typically, more complex in size, duration, resource management and risk than Level 1 incidents. May require deployment of resources beyond the first strike response	Level 3 Characterised by a high degree of complexity, require strategic leadership and response coordination. May require national and international response resources
IMT activation	Vessel or Facility's local response team activated	IMT activated	IMT activated
Resources at risk			
Human	Potential for serious injuries	Potential for loss of life	Potential for multiple loss of life
Environment	Isolated impacts or with natural recovery expected within weeks.	Significant impacts and recovery may take months. Monitoring and remediation may be required.	Significant area and recovery may take months or years. Monitoring and remediation will be required.

	Incident management response level		
Characteristic	**Level 1**	**Level 2**	**Level 3**
Wildlife	Individuals of a small number of fauna species affected	Groups of fauna species or multiple numbers of individuals affected	Large numbers of fauna (individuals and species) affected
Economy	Business level disruption	Business failure	Disruption to a sector
Social	Reduced services	Ongoing reduced services	Reduced quality of life
Infrastructure	Short term failure Non-safety/operational critical failure	Medium term failure Potentially safety/operational critical failure	Severe impairment Safety/operational critical system failure
Public affairs	Local and regional media coverage	National media coverage	International media coverage

2.2 Control agencies and jurisdictional authorities

The responsibility for responding to an oil spill is dependent on location and spill origin. The National Plan sets out the divisions of responsibility for an oil spill response. Definitions of Jurisdictional Authority and Control Agency are as follows:

- Control Agencies: the organisation assigned by legislation, administrative arrangements or within the relevant contingency plan, to control response activities to a maritime environmental emergency. Control Agencies have the operational responsibility of response activities but may have arrangements in place with other parties to provide response assistance under their direction.
- Jurisdictional Authority: the agency which has responsibility to verify that an adequate spill response plan is prepared and, in the event of an incident, that a satisfactory response is implemented. The Jurisdictional Authority is also responsible for initiating prosecutions and the recovery of clean-up costs on behalf of all participating agencies.

Table 2-2 provides guidance on the designated Control Agency and Jurisdictional Authority for Commonwealth and State waters and for vessel and petroleum activity spills.

It should be noted that in Commonwealth waters, vessels involved in seismic surveys are considered to be ‘vessels’ and not ‘petroleum activities’. However, in WA waters marine seismic surveys are a petroleum activity where they are associated with exploration for hydrocarbon reservoirs or evaluation of these resources.

2.3 Seismic survey spills in Commonwealth waters

AMSA manages the National Plan and is the Control Agency for all vessel-based spills in the Commonwealth jurisdiction. This includes vessels undertaking seismic surveys and associated supply or support vessels.

The Vessel Master is responsible for implementing source control arrangements detailed in the vessel specific SOPEP. Once initial notifications to the Control Agency are made, Pilot Energy shall maintain direct contact with the Control Agency and act as a Supporting Agency throughout the response. This includes providing essential services, personnel, material or advice in support of the Control Agency. In addition, Pilot Energy will implement monitoring activities as outlined in the Eureka 3D MSS OSM-BIP.

2.4 Seismic survey spills in WA waters

Although the National Plan defines seismic survey spills to be 'vessel-based' spills, this definition does not apply to WA waters, or to cross jurisdictional arrangements involving WA. As seismic survey spills are petroleum activity spills in WA waters, if a Marine Oil Pollution incident occurs enters, or has the potential to enter, State waters, the DoT is the Hazard Management Agency (HMA) (DoT CEO or proxy). The Assistant Executive Director (or proxy) has been nominated by the HMA to perform the role of State Marine Pollution Coordinator (SMPC) (as prescribed in Section 1.3 of the SHP–MEE) and DoT will take on the role as a Control Agency. The role of the SMPC is to provide strategic management of the incident response on behalf of the HMA.

Where DoT has assumed the role of Control Agency, Pilot Energy will provide all necessary resources to assist DoT.

2.5 Cross jurisdiction vessel spills

If a Level 2/3 vessel spill crosses jurisdictions between Commonwealth and State waters, two Jurisdictional Authorities will exist (AMSA for Commonwealth waters and DoT for WA State waters). The Control Agency will remain with the original nominated agency or organisation unless otherwise appointed through agreement between the HMA / Jurisdictional Authority of both waters. Pilot Energy will continue to provide all necessary resources (including personnel and equipment) as a Supporting Agency.

AMSA may request that DoT manage a vessel incident in Australian Commonwealth waters (DoT, 2021).

2.6 Pilot Energy Incident Management

For the period of a seismic survey Pilot Energy will maintain an IMT that is commensurate to the response level (Section 2.1) for the survey oil spill risk and impacts. The IMT structure, roles and responsibilities are outlined in Section 10 of the Eureka 3D MSS EP. IMT competencies and training schedule is outlined in Section 10 of the Eureka 3D MSS EP.

Table 2-2: Jurisdictional and Control Agencies for Hydrocarbon Spills

Jurisdictional boundary	Spill source	Jurisdictional authority	Control agency		Relevant documentation
			Level 1	Level 2/3	
Commonwealth waters (three to 200 nautical miles from Territorial/State sea baseline)	Vessel [4]	AMSA	AMSA		Vessel SOPEP National Plan Eureka 3D MSS OPEP (this document)
	Petroleum activities[5]	National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA)	Titleholder		Activity OPEP
Western Australian (WA) State waters (State waters to three nautical miles and some areas around offshore atolls and islands)	Vessel	WA Department of Transport (DoT)	DoT	DoT	Vessel SOPEP SHP-MEE Incident Management Plan – Marine Pollution (DoT, 2023)
	Petroleum activities	DoT	Titleholder	DoT	Eureka 3D MSS OPEP (this document) SHP-MEE

[4] Vessels are defined by Australian Government Coordination Arrangements for Maritime Environmental Emergencies (AMSA, 2017a) as a seismic vessel, supply or support vessel, or offtake tanker. Note: this definition does not apply to WA State waters.

[5] Includes a 'Facility', such as a fixed platform, FPSO/FSO, MODU, subsea infrastructure, or a construction, decommissioning and pipelay vessel. As defined by Schedule 3, Part 1, Clause 4 of the OPGGS Act.

2.7 Integration with other organisations

2.7.1 Western Australia – Department of Transport

Pilot Energy will notify the DoT Maritime Environmental Emergency Response (MEER) unit as soon as reasonably practicable (within 2 hours of spill occurring) if an actual or impending spill may impact WA State waters. On notification, the SMPC will activate their Maritime Environmental Emergency Coordination Centre (MEECC) and the DoT IMT. Titleholders will work in partnership with DoT during such instances, as outlined within the DoT's Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (DoT, 2020).

Pilot Energy will conduct initial response actions in State waters as necessary in accordance with this OPEP and the Eureka 3D MSS OSMP-BIP and continue to manage those operations until formal handover of incident control is completed. Appendix 1 in the Offshore Petroleum Industry Guidance Note provides a checklist for formal handover. Beyond formal handover, Pilot Energy will continue to provide all necessary resources, including personnel and equipment, to assist the DoT in performing duties as the Control Agency.

For a cross-jurisdictional response, there will be a Lead IMT (DoT or AMSA) for each spill response activity, with DoT's control resting primarily for State waters activities. Appendix 2 in the Offshore Petroleum Industry Guidance Note provides guidance on the allocation of a Lead IMT to response activities for a cross-jurisdictional spill.

To facilitate coordination between DoT and AMSA during a cross-jurisdictional response, a Joint Strategic Coordination Committee will be established. The Joint Strategic Coordination Committee will be jointly chaired between the SMPC and a nominated representative of AMSA and will ensure alignment of objectives and provide a mechanism for de-conflicting priorities and resourcing requests.

For a cross-jurisdictional response, Pilot Energy will be responsible for ensuring adequate resources are provided to DoT as Control Agency, initially 11 personnel to fill roles in the DoT IMT or Forward Operating Base (FOB) (DoT, 2020) and operational personnel to assist with those response strategies where DoT is the Lead IMT. Concurrently, DoT will also provide two of their personnel to the Pilot Energy IMT as described in the Offshore Petroleum Industry Guidance Note. Pilot Energy's Representative is to attend the DoT Fremantle Incident Command Centre (ICC) as soon as possible after the formal request has been made by the SMPC. It is an expectation that the remaining initial cohort will attend the DoT Fremantle ICC no later than 8 am on the day following the request being formally made to Pilot Energy by the SMPC. Pilot Energy delegated personnel designated to serve in DoT's FOB will arrive no later than 24 hours after receipt of formal request from the SMPC.

Figure 2-1 shows the overall cross-jurisdictional organisational structure referenced from the SHP-MEE.

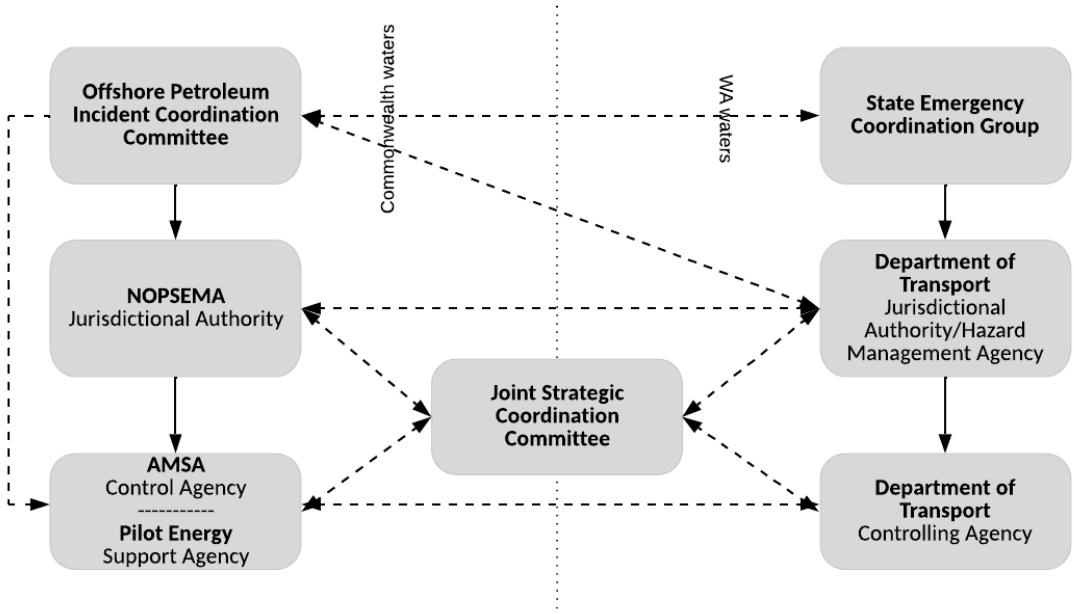


Figure 2-1: Cross-Jurisdictional Organisational Structure

2.7.2 AMSA

AMSA is the designated Control Agency for vessel spills in Commonwealth waters. Therefore, should a vessel spill enter Commonwealth waters, AMSA may also become a (or the) Control Agency. Arrangements for coordination and potential transfer of Control Agency status are outlined in AMSA Guidance Note NP-GUI-023: Coordination of Cross-Border Incidents (AMSA, 2017b).

AMSA is to be notified immediately of all ship-source incidents through the AMSA Rescue Coordination Centre (RCC) Australia (refer to project emergency contacts register).

AMSA manages the National Plan, Australia's key maritime emergency contingency and response plan (AMSA, 2020). AMSA also has a range of National Plan supporting documents containing related policies, guidance and advisory information.

2.7.3 Western Australian Department of Biodiversity, Conservation and Attractions

The Western Australian Department of Biodiversity, Conservation and Attractions (DBCA) has responsibilities associated with wildlife and activities in national parks, reserves and State marine parks. The *Biodiversity Conservation Act 2016* (WA) is the legislation that provides DBCA with the responsibility and Statutory Authority to treat, protect, and destroy wildlife. In State waters, DBCA is the Jurisdictional Authority for Oiled Wildlife Response (OWR), providing advice to the Control Agency (DoT). The role of DBCA in an OWR is outlined in the Western Australian Oiled Wildlife Response Plan (WAOWRP) (DBCA, 2022a).

For a Level 2/3 petroleum spill that originates within or moves into State waters, DoT will be the Control Agency responsible for overall command of an oiled wildlife response. Pilot Energy will provide all necessary resources (equipment and personnel) to DoT to facilitate this response.

For matters relating to environmental sensitivities and scientific advice in State waters DBCA may provide an Environmental Scientific Coordinator (ESC) to support the SMPC and/or DoT Incident Controller.

This may include advice on priorities for environmental protection, appropriateness of proposed response strategies and the planning and coordination of scientific monitoring for impact and recovery assessment.

2.7.4 Department of Industry, Science and Resources

The Commonwealth Department of Industry, Science and Resources (DISR) will be the lead Commonwealth Agency for the provision of strategic oversight and Commonwealth government support to a significant offshore petroleum incident (including oil spill incidents). DISR will be notified by NOPSEMA of a significant oil pollution incident and under the Offshore Petroleum Incident Coordination Framework will stand up the Offshore Petroleum Incident Coordination Committee (OPICC) as the mechanism to provide Commonwealth strategic advice and support to the incident. To facilitate information between the petroleum titleholder IMT and Offshore Petroleum Incident Coordination Committee, Liaison Officer/s will be deployed from DISR to the Pilot Energy IMT.

For incidents that are classified at a greater level than level 3 (See section 2.1), a whole of government crisis committee will be formed under the Australian Government Crisis Management Framework to provide strategic advice and support and the Offshore Petroleum Incident Coordination Committee will not be convened, although DISR will remain as the lead agency.

2.8 Incident Action Planning

The incident action planning (IAP) process is built on the following phases:

1. Understand the situation.
2. Establish incident objectives.
3. Develop the plan.
4. Prepare and disseminate the plan.
5. Execute, evaluate and revise the plan.

The Control Agency will use the IAP process to determine and document the appropriate strategies as more information becomes available during an incident response. The Control Agency IMT will use an IAP for each operational period following the initial first-strike assessments, notifications, and activations undertaken by the Pilot Energy.

As Support Agency, Pilot Energy may be requested by the Control Agency to develop, or support the development of an IAP to help guide the incident response.

The DoT have a suite of Incident Management System templates to assist with the preparation of an IAP. These can be found under the Incident Management System drop down list here

3. Response Strategy Selection

3.1 Strategic spill impact mitigation assessment

Titleholders typically use a Spill Impact Mitigation Assessment (SIMA) or Net Environmental Benefit Analysis (NEBA) as their decision support tool to consider available information that helps them select the most suitable response strategies or combination of strategies that would minimise impacts to ecological, cultural, economic and social values (hereafter referred to as receptors). Different response strategies provide varying levels of effectiveness and protection under different environmental conditions, depending on the individual spill (Coelho et al., 2014).

Conducting a SIMA is an important step in the oil spill planning and preparedness process and is often called a Strategic SIMA. An overview of this assessment process is provided in Figure 3-1. To complete a Strategic SIMA, all available information on a potential spill is considered (e.g. oil type, volume, duration of release), together with any vector mapping or spill trajectory modelling to consider potential impacts to sensitive receptors.

A list of possible response strategies are considered from a 'response toolbox', as detailed in Section 3.3.1.

A detailed assessment of the benefits and drawbacks of each response strategy is completed to help determine the combination of strategies that would be most suited to each maximum credible spill scenario. This includes 'primary response strategies' and 'secondary response strategies', with the former typically being more reliable and effective in reducing impacts from an individual spill.

Table 3-6 details the Strategic SIMA for the Eureka 3D MSS spill scenario of an MGO spill from a vessel collision. It details the response strategies applicable or not applicable for an MGO spill.

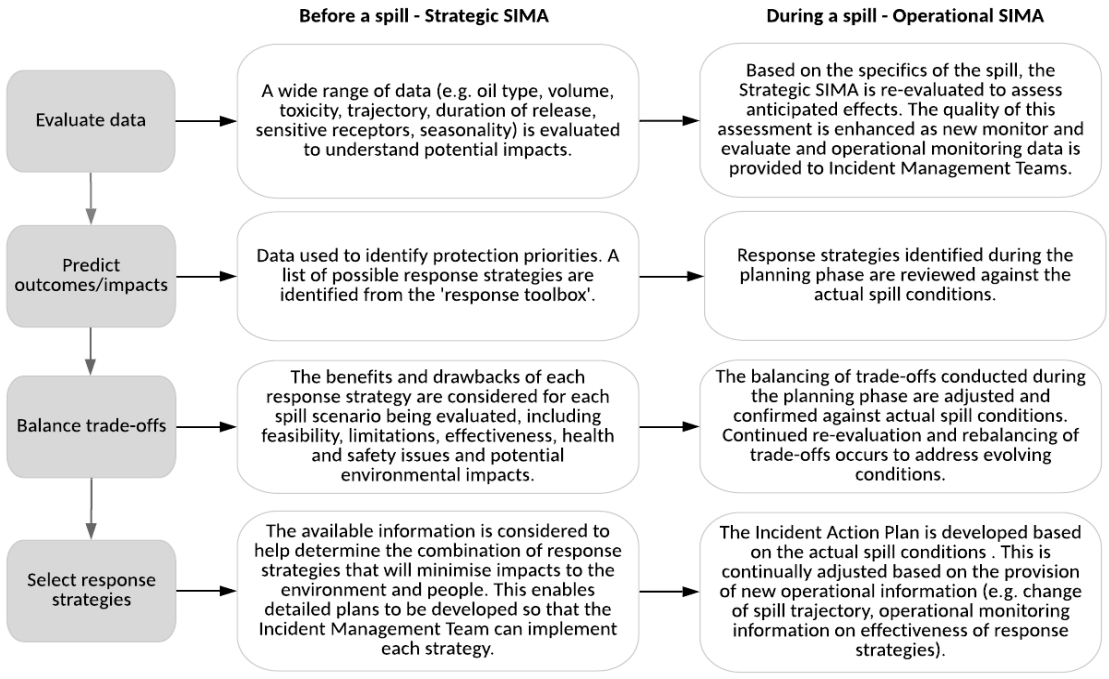


Figure 3-1: Spill Impact Mitigation Assessment Overview

3.2 Evaluate data

3.2.1 Spill scenario

The worst-case spill scenario in the Eureka 3D MSS EP (as presented in Table 3-1) is an MGO spill from a vessel collision in the south-east corner of the Operational Area, at a location that is approximately 12 km from the mainland coastline and approximately 5 km from the Beagle Islands.

Table 3-1: Worst-Case Credible Spill Scenario – Eureka 3D MSS

Spill scenario	Hydrocarbon type	Maximum credible volume released (m^3)	Release duration
Vessel collision	MGO	320	6 hours

3.2.2 Hydrocarbon properties

MGO is a product that contain a mixture of volatile and persistent hydrocarbons. Table 3-2 shows the approximate physical properties and boiling point range of MGO.

When released to the marine environment, MGO will spread quickly and thin out to low thickness levels, thereby increasing the rate of evaporation. Due to its chemical composition, up to 65% will generally evaporate over the first two days depending upon the prevailing conditions and spill volume.

MGO has a strong tendency to entrain into the upper water column (0 m–10 m) (and consequently reduce evaporative loss) in the presence of moderate winds (> 10 knots) and breaking waves. However, MGO can re-surface when the conditions calm.

Table 3-2: MGO Representative Characteristics

Hydrocarbon type	Density (kg/m^3)	Viscosity (cP)	Component	Volatile (%)	Semi-volatile (%)	Low volatility (%)	Residual (%)
			BP (ºC)	<180	180–265	265–380	>380
MGO	820–860 (at 15 °C)	2–4.5 (at 40 °C)	% of total	16.4	49	31.9	2.7

3.2.3 Spill Modelling Results

The worst-case credible spill scenario shown in Table 3-1 was used as the basis for modelling, which was performed using a three-dimensional spill trajectory and weathering model, SIMAP (Spill Impact Mapping and Analysis Program). The SIMAP model calculates the transport, spreading, entrainment, evaporation and decay of surface hydrocarbon slicks as well as the entrained and dissolved oil components in the water column.

A total of 100 spill trajectories were simulated for the time of year that the survey might be conducted (February and March) using a number of unique environmental conditions sampled from historical metocean data. The scenario was tracked for 28 days.

The modelling outputs do not represent the potential behaviour of a single spill (which would have a much smaller area of influence) but provides an indication of the probability of any given area of the sea surface being contacted by hydrocarbons above impact thresholds. For the purpose of spill response preparedness, outputs relating to floating oil and oil accumulated on the shoreline are most

relevant (i.e. oil that can be diverted, contained, collected or dispersed through the use of spill response strategies) for the allocation and mobilisation of spill response resources.

Table 3-3 presents the stochastic modelling results for floating concentrations and shoreline accumulation volumes for the vessel collision spill for February to March. Oil spill modelling did not predict any shoreline accumulation above the moderate exposure thresholds above 10% probability for either season.

Modelling results for dissolved and entrained oil for the worst-case scenario have not been included given there are limited response strategies that will reduce subsurface impacts. However, Pilot Energy uses the modelling results for entrained oil from the worst-case scenario for the purposes of identifying scientific monitoring priority areas as outlined in the Eureka 3D MSS OSM-BIP.

Table 3-3: Stochastic Modelling Results – Scenario 1 (February to March) - MGO spill (RPS, 2023)

Location	Probability (%) of floating oil exposure ≥10 g/m^2	Minimum time before floating oil exposure (hours) ≥10 g/m^2	Maximum probability (%) of shoreline loading ≥10 g/m^2	Minimum time before shoreline accumulation ≥10 g/m^2 (hours)	Maximum probability (%) of shoreline loading ≥100 g/m^2	Minimum time before shoreline accumulation ≥100 g/m^2 (hours)	Peak volume ashore (m^3) ≥100 g/m^2	Maximum length of shoreline contacted (km) ≥100 g/m^2
Bowes River – Broken Anchor Bay (B)	<1	NC	1	472	<1	NC	NC	NC
Glenfield Beach – Bowes River (C)	<1	NC	1	234	<1	NC	NC	NC
Green Head - Leeman	<1	NC	1	54	1	60	<1	<1
Illawong – Cliff Head	6	3	<1	NC	<1	NC	NC	NC
Leeman Coolimba	<1	NC	1	56	<1	NC	NC	NC
Thirsty Point – Booker Valley	<1	NC	1	491	<1	NC	NC	NC
Abrolhos Islands	<1	NC	1	234	<1	NC	NC	NC
Pelsaert Group	<1	NC	1	234	<1	NC	NC	NC
Wallabi Group	<1	NC	1	472	<1	NC	NC	NC
NC= No contact								

3.2.4 Sensitive Receptors and Protection Priorities

For any oil spill entering or within WA State waters/shorelines, the WA DoT is the Control Agency and ultimate decision-maker regarding identification and selection of protection priorities.

Spill modelling results were used to predict the Environment that may be Affected (EMBA) for Eureka 3D MSS (refer to section 8). The EMBA is the area in which activities associated with Eureka 3D MSS may result in environmental impacts – defined as the area potentially impacted by hydrocarbons from a spill event above impact concentration thresholds. Within the EMBA, priority protection areas have been identified. Priority protection areas are emergent features (i.e. coastal areas and islands) that are predicted to be contacted above moderate exposure values and would be targeted by nearshore spill response operations such as protection and deflection and shoreline clean-up.

Table 3-4 lists the priority protection areas for this activity.

Table 3-4: Priority Protection Area – Eureka 3D MSS

Protection Priority Areas	Key sensitivities	DoT Ranking (Floating oil)[6]	DoT Ranking (Dissolved oil)
Green Head – Leeman (DoT shoreline cell #193)	• Extensive meadows of seagrass that grow in shallow lagoons which provide an important nursery habitat for juvenile fish and western rock lobster (CALM, 2000) • Macroalgal communities • Abalone occur on intertidal reefs • Humpback whale and bottlenose dolphins (*Tursiops truncatus*) regularly seen in the area (CALM, 2000) • White shark foraging • Inshore islands between Cliff Head and Grey are important breeding areas for seabirds (Dunlop and Wooller, 1990; CALM, 2004) • Seabird foraging • Only breeding area for Australian sea lions on the west coast of Australia: – Reside and breed on Buller Island, North Fisherman Island, East Island, Beagle Island (CALM, 2004) – Approximately 800 sea lions – Isolated genetically distinct sub-population • Sea lion foraging • Boullanger Island dunnart is only found on Boullanger Island (CALM, 2004) • Dibblers are found on Boullanger and Whitlock islands (CALM, 2004) • Cultural heritage- mainland areas have been identified as a significant area for Noongar people • The coast area between Green Head and Jurien has the largest number of midden deposits in the south-west of WA (CALM, 2004) • Coast dunes in the Jurien Bay region were used as burial sites (CALM, 2004) • Several shipwrecks have been recorded between Cliff Head and Grey (CALM, 2004)	4	3

[6] Provision of Western Australian Marine Oil Pollution Risk Assessment – Protection Priorities: Assessment for Zone 3: Midwest (Advisian, 2018).

3.3 Predict Outcomes

3.3.1 Response 'Toolbox'

Possible response strategies for a surface oil spill include:

- Monitor and evaluate
- Source control
- Containment and recovery
- (Mechanical) physical dispersion
- Chemical dispersion – surface application
- Shoreline protection
- Shoreline clean-up
- In-situ burning
- Oiled wildlife response

Support functions:

- Waste management
- Scientific monitoring

3.3.2 Response Planning Thresholds

In addition to the impact assessment thresholds described in the Eureka 3D MSS EP Section 8.6.3, response thresholds have been developed for response planning to determine the conditions that response strategies would be effective. These thresholds are provided as a guide for response planning based on case studies that have demonstrated some response strategies (e.g. chemical dispersant application) require certain oil spill thicknesses and conditions to be effective.

The thresholds assist with understanding worst-case spill scenario response strategy capability requirements when used in conjunction with oil spill trajectory modelling results. Modelling informs the predicted spatial extent of the spill at certain response thresholds, which in turn can inform response strategy capability.

Response planning thresholds are provided in Table 3-5.

Table 3-5: Surface and Shoreline Hydrocarbon Thresholds for Response Planning

Hydrocarbon (g/m^2)	Description	Justification
≥ 1	Estimated minimum threshold for commencing some monitoring components (e.g. water quality monitoring) and monitoring and evaluation tactics (e.g. aerial surveillance)	This thickness approximates the range of socio-economic effects and helps to establish the spatial extent for scientific monitoring (NOPSEMA, 2019).
≥ 10	Estimated minimum threshold for commencing all triggered monitoring components	This approximates the lower limit for harmful exposures to birds and marine mammals (NOPSEMA, 2019) so assists with planning for related scientific monitoring components.
≥ 50	Estimated minimum floating hydrocarbon threshold for on water response strategies	Surface chemical dispersants are most effective on hydrocarbons that are at a thickness of 50–100 g/m^2 on the sea surface. EMSA (2010) recommends thin layers of spilled hydrocarbons should not be treated with dispersant. This includes Bonn Agreement Oil Appearance Codes (BAOAC) 1–3 (EMSA, 2010). However, this may not always be practical in the field, as the actual thickness of a slick can vary greatly over even short distances (IPIECA-IOPG, 2015). Hence, this threshold is applied for planning purposes but should be judged according to real-time conditions in the event of a spill. McKinney and Caplis (2017) tested the effectiveness of various oil skimmers at different oil thicknesses. Their results showed that the oil recovery rate of skimmers dropped significantly when oil thickness was less than 50 g/m2.
≥ 100	Estimated floating hydrocarbon threshold for on water response strategies Estimated minimum shoreline accumulation threshold for shoreline clean-up (if required) and subsequent waste management	This threshold is often used as the minimum thickness for effective shoreline clean-up (Owens and Sergy, 2000; French-McCay, 2009).

3.4 Balance trade-offs and select response strategies

Selecting which response strategies to use often involves making trade-offs (e.g. risk, feasibility, flexibility, effectiveness), based on which environmental receptors should receive priority for protection. A Strategic SIMA is presented in Table 3-6 and indicates the applicability of each possible response strategy (Section 3.3.1) for the worst case spill scenario of a MGO spill from a vessel collision (Section 3.2.1).

Table 3-6: Strategic SIMA for Eureka 3D MSS vessel collision MGO spill

Response strategy	Evaluation	Recommendation
Source control	In the event of a vessel spill, the Vessel Master would revert to the Ship Oil Pollution Emergency Plan (SOPEP), which is a MARPOL requirement for applicable vessels and not addressed by this SIMA.	n/a
Monitor and evaluate	The requirement for situational awareness is critical to implement a coordinated, focussed and effective spill response. This strategy has several tactics (e.g. tracking buoys, aerial surveillance) and is scalable according to the nature and scale of the spill. SIMA will always support the implementation of 'Monitor and Evaluate' given the clear benefits in maintaining situational awareness throughout the duration of a spill event and little or no environmental impact associated with its implementation. Therefore, the benefits of undertaking this response are considered to significantly outweigh the potential environmental risks/impacts.	Primary response strategy
Natural recovery	Natural recovery is often the most effective response for light hydrocarbons (Group 1-3), including MGO. MGO products lose a large percentage of their volume via natural weathering and fate processes in the first 24 hours following a spill. It is unlikely that significant response resources would be able to be deployed within this time, so much of the spill volume will weather and evaporate prior to the arrival of additional response resources. Allowing the product to weather naturally can often create less overall impact than intrusive methods of clean-up and response (e.g. the net impact of allowing small volumes of product to naturally degrade on sensitive offshore islands may be less than sending in shoreline clean-up teams and equipment, which may damage nesting locations, disturb fauna and create significant waste volumes).	Primary response strategy
Containment and recovery	Unlikely to be effective as MGO products will rapidly degrade in the open ocean environment. For containment and recovery to be effective, a sufficient oil thickness is required be achieved by the containment booms (minimum of 50 g/m^2). This strategy is often limited to heavier and more persistent Group 3 and 4 (ITOPF) hydrocarbons.	Not recommended
In-situ burning	To conduct in-situ burning, meteorological conditions and sea-state must allow the deployment of especially designed fire-retardant booms, which are required to corral hydrocarbons to a sufficient thickness to permit ignition and ongoing combustion. MGO is a rapidly evaporating and spreading hydrocarbon and is not expected to be available at sufficient thicknesses for ignition.	Not recommended
(Mechanical) physical dispersion	The benefits of undertaking this response are not considered to significantly outweigh the potential risk to human health due to the volatility of the hydrocarbon products. Mechanical dispersion is not considered a suitable response strategy for MGO scenarios.	Not recommended
Chemical dispersion – surface application	MGO has high natural spreading, dispersion and evaporation rates in the marine environment and would be too thin to enable effective use of chemical dispersants. Chemical dispersants have a window of opportunity, after which effectiveness decreases. This includes a workable area for dispersant application, adequate surface thickness and presence of dispersible components of oil. These characteristics typically exist in the initial hours following a release. Dispersant use is not considered to be effective	Not recommended

Response strategy	Evaluation	Recommendation
	on the spill scenarios given they are not continuous releases and slick characteristics amenable to dispersant operations will unlikely be present by the time dispersant operations are mobilised. Adding chemical dispersants would introduce more chemicals into the marine environment, for little to no benefit.	
Shoreline protection and deflection	Shoreline protection and deflection activities involve mobilising personnel and equipment to remote coastal environments, which can result in physical disturbance to intertidal and shoreline habitats. It would also require small inshore vessels and calm weather to be effective and temporary staging areas for waste that would be generated from the recovery of floating oil. The effectiveness of this response will be dependent on local bathymetry, sea state, currents, tidal variations and wind conditions at the time of implementation. It is typically more effective in areas with low to moderate tidal ranges on low energy coastline types such as sandy beaches. Moderate to high tidal ranges generally include stronger currents and larger/longer intertidal areas that make it less effective and more difficult to keep booms in place. Activities would focus on areas of high protection value in low energy environments based upon real-time operational surveillance, provided the environmental and metocean conditions are favourable for an effective implementation. An Operational SIMA should demonstrate that protection would result in an overall benefit to receptors. Consequently, this option may not be applicable across all areas or receptors identified as having priority for protection.	Secondary response strategy – to be deployed if operational SIMA indicates it would result in a net benefit.
Shoreline clean-up	Shoreline clean-up activities involve mobilising personnel and equipment to remote coastal environments, which can result in physical disturbance to intertidal and shoreline habitats. This may cause more impacts than leaving the hydrocarbon to degrade naturally, especially if the oiling is light. Intrusive activities such as physical removal of waste using manual labour or mechanical aids requires careful site-specific planning to reduce secondary impacts of habitat disturbance, erosion and spreading oil beyond shorelines. Secondary impacts can be minimised using trained personnel to lead operations. Logistically, clean-up operations will require site access, decontamination, waste storage, PPE, catering and transport services to support personnel working on shorelines. Given the relatively small volumes predicted to come ashore for most locations, and the high rates of natural biodegradation of diesel, it would be better to focus on high priority areas for clean-up. This strategy is considered to be a secondary response strategy where it is safe and practical to implement and where an Operational SIMA demonstrates that clean-up would result in an overall benefit to receptors.	Secondary response strategy - to be deployed if operational SIMA indicates it would result in a net benefit.
Oiled wildlife response	Oiled wildlife response (OWR) includes wildlife surveillance/reconnaissance, wildlife hazing, pre-emptive capture and the capture, cleaning, treatment, and rehabilitation of animals that have been oiled. In addition, it includes the collection, post-mortem examination, and disposal of deceased animals that have succumbed to the effects of oiling.	Primary response strategy

Response strategy	Evaluation	Recommendation
	Wildlife surveillance/reconnaissance will likely form the main component of an OWR associated with the MGO scenarios.	

3.5 Operational SIMA

An Operational SIMA is an iterative process that is used to help guide an IMT during a response. An outline of an Operational SIMA process is provided in Figure 3-1 and considerations to help refine the Operational SIMA are provided in Table 3-7. Real-time data from monitor and evaluate and operational monitoring activities should be incorporated into the Operational SIMA, so that the IMT can adjust the response according to the effectiveness of tactics during each operational period.

Following implementation of the initial (first strike) response, the Strategic SIMA (Table 3-6) will form the basis for the initial Operational SIMA.

The initial Operational SIMA should be a priority action for the Planning Section once they are activated but may be based on limited information. However, the overall response effort should not be delayed due to a lack of some information. The Operational SIMA can always be revised when more information is available.

The Planning Section is responsible for completing the Operational SIMA and to determine if outputs from the Strategic SIMA are still appropriate. The Operational SIMA should be revised during each new Operational Period and should incorporate post-spill trajectory modelling data, surveillance data, operational monitoring data and should be incorporated into the IAP.

Table 3-7: Operational SIMA Considerations

Response strategy	Considerations
Monitor and evaluate	• Which monitor and evaluate tactics will provide reliable and accurate data for the individual spill? • What sensitive receptors are in the current or anticipated trajectory? • What is the assessed volume and size of the spill? • Is the product weathering as anticipated? • What data is being returned from operational monitoring and how can this be used to aid decision making? • How do the response options and tactics seem to be influencing the spill? Shoreline assessment (only): • Will access to remote shorelines be safe and feasible? • Will assessment teams disturb sensitive seasonal nesting species?
Protection and deflection	• Have the protection priorities been ground-truthed and are there seasonal receptors that should be prioritised for protection? • Are conditions (e.g. tides, current, sea state) favourable for this strategy to be effective in open ocean environments immediately surrounding the emergent sensitivities (reefs)? • Can tactics be deployed in time? • Will access to the shallow intertidal areas on top of emergent sensitivities be safe and feasible? • Can the IMT access suitable shallow draft vessels to safely establish booming arrangements (e.g. does vessel have ability to transfer anchors and booms; does it have adequate tie-points?). • Is there potential that reefs could be damaged from anchor drag?
Shoreline clean-up	• What volumes and/or concentrations of hydrocarbons are present or expected on the shoreline and what would be the impact to leave the product to weather naturally (taking into consideration the effects of MGO as a lighter hydrocarbon type – high evaporation rates but more toxic and greater ability to penetrate sediments)? • Have the protection priorities been ground-truthed and are there seasonal receptors that should be prioritised for protection?

Response strategy	Considerations
	• Will access to remote shorelines be safe and feasible? • Will responders disturb sensitive seasonal nesting species? • Would it reduce overall impacts to send small teams of clean-up personnel?
Oiled wildlife response	• Is there adequate monitoring for wildlife, taking into consideration temporal and spatial species-specific considerations? • Are known species breeding or nesting? • What level of wildlife impact has occurred or is expected to occur? • What wildlife response strategies are feasible and safe?

4. External Notifications and Reporting Requirements

Pilot Energy is responsible for making external notifications and reporting. Table 4-1 outlines external notification and reporting requirements required for Level 2-3 incidents, noting that regulatory reporting may apply to smaller Level 1 spills.

Contact details for the regulatory agencies outlined in Table 4-1 are provided with the project emergency contacts register.

Table 4-1: External Notifications and Reporting

Agency or Authority	Type of Notification / Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
AMSA **(Rescue Coordination Centre)**	Verbal notification without delay to include: • name of ship/s involved • time, type and location of incident • quantity and type of harmful substance • assistance and salvage measures • any other relevant information Written POLREP form, within 24 hours of request from AMSA	National Plan for Maritime Environmental Emergencies MARPOL	All slicks trailing from a vessel All spills to the marine environment (notwithstanding the size or amount of oil or sheen) All spills where National Plan equipment is used in a response	Vessel Master	Incident reporting requirements: https://www.amsa.gov.au/marine-environment/marine-pollution/mandatory-marpol-pollution-reporting Online POLREP – https://amsa-forms.nogginoca.com/public/
NOPSEMA **(Incident Notification Office)**	Verbal notification within 2 hours after Pilot Energy becomes aware of the incident Written report as soon as practicable, but no later than 3 days	*Offshore Petroleum and Greenhouse Gas Storage Act 2006* Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009 (as amended 2014)	A spill associated with the activity that has caused, or has the potential to cause, moderate to significant environmental damage: Vessel loss of containment (MDO/MGO)	Notification by Pilot Energy IMT	Incident reporting requirements: https://www.nopsema.gov.au/environmental-management/notification-and-reporting/
National Offshore Petroleum Titles	Written report to NOPTA within 7 days of the initial	Guidance Note (N-03000-GN0926) Notification and Reporting of Environmental	Spill in Commonwealth waters that is	Notification by Pilot Energy IMT	Provide same written report as provided to NOPSEMA

Agency or Authority	Type of Notification / Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
Administrator (NOPTA) **(Titles Administrator)**	report being submitted to NOPSEMA	Incidents - https://www.nopsema.gov.au/assets/Guidance-notes/A198752.pdf	reportable to NOPSEMA		
Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) **(Director of monitoring and audit section)**	Email notification as soon as practicable	*Environment Protection and Biodiversity Conservation Act 1999*	If Matters of National Environmental Significance (MNES) are considered at risk from a spill or response strategy, or where there is death or injury to a protected species	Notification by Pilot Energy IMT	Not applicable
Parks Australia **(24-hour Marine Compliance Duty Officer)**	Verbal notification as soon as practicable	*Environment Protection and Biodiversity Conservation Act 1999*	All actual or impending spills which occur within a marine park or are likely to impact on an Australian marine park	Notification by Pilot Energy IMT	No forms, but the following information should be provided: • Pilot Energy's details • Time and location of the incident (including name of marine park likely to be affected) • Proposed response arrangements as per the OPEP • Details of the relevant contact person in the IMT
Australian Fisheries Management Authority (AFMA)	Verbal phone call notification as soon as practicable (within 24 hours)		Fisheries within the environment that may be affected (EMBA) Consider a courtesy call if not in exposure zone	Notification by Pilot Energy IMT	Not applicable

Agency or Authority	Type of Notification / Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
If spill is heading towards WA waters					
WA DoT **(WA Maritime Environmental Emergency Response (MEER) unit)**	Immediate notification to the MEER Duty Officer Follow up with written POLREP, as soon as practicable Written Situation Report (SITREP) submitted within 24 hours of being directed by DoT	State Hazard Plan – Maritime Environmental Emergencies	All actual or impending spills in WA waters, regardless of source or quantity	Immediate notification by Pilot Energy IMT POLREP to be submitted by Pilot Energy IMT SITREP to be submitted by Pilot Energy IMT	DoT POLREP: http://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-PollutionReport.pdf SITREP: http://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-SituationReport.pdf
Department of Mines, Industry Regulation and Safety (DMIRS) **(Petroleum Environment Duty Officer)**	Verbal notification within 2 hours Notification report within 3 days	Guidance Note on Environmental Non-compliances and Incidents	All actual or impending spills in WA waters	Notification by Pilot Energy IMT	Environmental and Reportable Incident/ Non-compliance Reporting Form http://www.dmp.wa.gov.au/Documents/Environment/ENV-PEB-189.docx
Department of Biodiversity Conservation and Attractions (DBCA) **(State Duty Officer)**	Verbal notification as soon as practicable	WA Oiled Wildlife Response Plan	Notify if spill has the potential to impact or has impacted wildlife in State waters (to activate the Oiled Wildlife Advisor)	Notification by Pilot Energy IMT	Not applicable
Department of Water and Environmental Regulation (DWER)	Initial verbal or electronic notification of the discharge as soon as practicable Written notification of the incident to the CEO of the DWER, copied to the local DWER Industry Regulation Office, as soon as practicable	*Environmental Protection Act 1986* (Section 72) Environmental Protection (Unauthorised Discharge) Regulations 2004	Call DWER 24 hour Pollution Watch hotline *Environmental Protection Act 1986* (WA): Spill or discharge of hydrocarbons to the environment	Notification by Pilot Energy IMT	Reporting requirements: https://www.dwer.wa.gov.au/your-environment/51-reporting-pollution/110-reporting-a-life-threatening-incident-or-pollution-emergency

Agency or Authority	Type of Notification / Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
			that has caused, or is likely to cause pollution, or material or serious environmental harm (Level 2 / 3 spills) Environmental Protection (Unauthorised Discharge) Regs.: Unauthorised discharge (where there is potential for significant impact or public interest) to environment of Schedule 1 material		
Department of Primary Industries and Resource Development (DPIRD) **Fisheries**	Verbal notification as soon as practicable (within 24 hours)	Agreed consultation	Notify if spill has the potential to impact or has impacted fisheries in State waters	Notification by Pilot Energy IMT	Not applicable
If spill is heading towards international waters					
Department of Foreign Affairs and Trade (DFAT) **(24-hour consular emergency centre)**	Verbal phone call notification within 8 hours, if the spill is likely to extend into international waters	Not applicable	Notify DFAT that a spill has occurred and is likely to extend into international waters Inform DFAT of the measures	Notification by Pilot Energy IMT	Not applicable

Agency or Authority	Type of Notification / Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
			being undertaken to manage the spill		

5. Source Control

Source control involves stopping the discharge of hydrocarbons from the source of the spill. If the source of the spill is a vessel, then the vessel owner is responsible for undertaking source control, although the titleholder may be requested to provide support.

Vessel based source control includes measures that can be undertaken aboard the vessel (e.g. shutoff valves, diversion to unaffected tanks) and support from other vessels (e.g. magnetic patches, salvage, transfer of hydrocarbons to alternate vessel) to control the source, reduce the loss of hydrocarbons and prevent escalation of the incident. This information is detailed in the relevant Ship Oil Pollution Emergency Plan (SOPEP).

6. Monitor and Evaluate

Monitor and evaluate involves the collection and evaluation of information to provide and maintain situational awareness in the event of a spill. Monitor and evaluate activities should be conducted throughout the spill response, as it provides the IMT with ongoing information on sensitive receptors at risk of impact from the spill and the effectiveness of spill response operations. This information should be used by the IMT when updating response (operational) SIMAs and in the development of IAPs.

The monitor and evaluate response strategy includes a range of tactics which may be suitable for the spill scenarios covered by this OPEP. The relevance and suitability of individual tactics will need to be considered when preparing the Operational SIMA for individual spills. Initiation of suitable tactics (with the exception of tracking buoys and fate/weathering modelling) will need to be confirmed by the Control Agency, prior to deployment.

- Deployment of tracking buoy(s) – requires a buoy to be deployed to the water at the leading edge of the spill to track the movement of the spill.
- Fate and weathering modelling – uses computer modelling (e.g.ADIOS2) to estimate the weathering of an oil spill.
- Oil spill trajectory modelling – uses computer modelling (e.g. SIMAP) to estimate the movement, fate and weathering of spills.
- Visual observation (via aerial and/or vessel surveillance) – requires trained observers to identify and characterise spills. Survey platforms typically include aircraft and/or vessels. Is also used to ground truth oil spill trajectory modelling and monitor the effectiveness of response options.
- Satellite surveillance and data capture – uses satellite technology to identify and track oil spills.

6.1 Initiation and termination criteria

Tactic	Initiation criteria	Termination criteria
Tracking buoy	Notification of a Level 2/3 spill	Tracking buoy deployment will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Fate and weathering modelling (e.g. ADIOS2)	Notification of a Level 2/3 spill - may be deployed in a Level-1 incident (to be determined by On-Scene Commander)	Spill fate and weathering modelling will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Oil Spill Trajectory Modelling (OSTM)	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	OSTM will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Vessel surveillance	Notification of a Level 2/3 spill - may be deployed in a Level-1 incident (to be determined by On-Scene Commander); and Requested by the relevant Control Agency	Vessel surveillance will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Aerial surveillance	Notification of a Level 2/3 spill; and	Aerial surveillance will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or

Tactic	Initiation criteria	Termination criteria
	Requested by the relevant Control Agency	As directed by the relevant Control Agency
Satellite surveillance and data capture	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	Satellite surveillance will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or Satellite surveillance is no longer required to provide situational awareness; or Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the tactic

6.2 Implementation guide

Table 6-1 provides guidance on tasks and responsibilities that the IMT should consider to support the Control Agency if they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken or should be reassigned.

Table 6-1: Monitor and evaluate implementation guide

Responsibility		Task	Consideration	Complete
Tracking buoy (if selected)				
Initial Actions	Pilot Energy Representative/Operations Section	Request onsite vessel to deploy tracking buoy		❑
	Vessel Master	Direct personnel to deploy buoy from the vessel: • Remove buoy from packaging; • Remove On/Off magnet and place in safe location (back in the box); and • Deploy buoy into the water from height not greater than 10 m unless the buoy design is robust to do so from a greater height'	Buoy should be deployed as close as possible to the leading edge of the spill (personnel and vessel safety is priority and must be considered by Vessel Master prior to selecting this tactic)	❑
	Pilot Energy Representative	Inform IMT that buoy has been deployed and provide IMT with current weather conditions	Note deployment details in incident log	❑
	Planning Section	Verify deployment of tracking buoy using tracking buoy login details	Tracking buoy login details located in the Project Emergency Contacts Directory	❑
Ongoing Actions	Planning Section	Use tracking buoy data to regularly update Common Operating Picture/Situation Boards in IMT		❑
	Planning Section	Provide tracking buoy data to Control Agency as soon as possible	Control Agency could provide data to spill trajectory provider improve the accuracy of spill model	❑
	Planning Section	Liaise with Control Agency to seek direction regarding any additional deployments of tracking buoys		❑
Trajectory and fate/weathering modelling (if selected)				
Initial Actions	Planning Section	Conduct hydrocarbon distribution, fate and weathering assessment using Automated Data Inquiry for Oil Spills (ADIOS2) using information available on oil type and provide information to Control Agency		❑

Responsibility		Task	Consideration	Complete
	Planning Section	Use information to regularly update Common Operating Picture/Situation Boards in IMT		❑
	Planning Section	Provide tracking buoy data to Control Agency as soon as possible		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Initial Actions	Planning Section	Contact Control Agency to request modelling through AMSA National Plan arrangements Complete Spill Trajectory Modelling Request form and provide to Control Agency	Complete Spill Trajectory Modelling Request form can be found here - https://www.amsa.gov.au/forms/national-plan-spill-trajectory-modelling-request Modelling should be undertaken within 4 hours of the request being sent to OSTM Service Provider, then every operational day during the spill response. Note all actions in incident log	❑
Ongoing Actions	Planning Section	Request trajectory modelling be provided daily throughout the duration of the response and integrate data into Common Operating Picture/Situation Boards		❑
	Planning Section	Use results from monitor and evaluate activities, and/or operational monitoring data (where available) to improve spill trajectory model accuracy	Provide available data to OSTM Service Provider at the end of each operational period	❑
Vessel surveillance (if selected)				
Initial Actions	Pilot Energy Representative/Operations Section	Determine if there are any nearby vessels available to follow spills and aid surveillance activities	Support vessels may be able to provide surveillance	❑
	Operations Section	Obtain approval from Control Agency to commence vessel surveillance in the vicinity		❑
	Vessel Master	Provide IMT initial report on estimated spill volumes and movement based on visual observation (if possible)	Preliminary observations are intended to provide initial projections of spill trajectory and scale prior to more detailed modelling and surveillance. These observations should be immediately verified by more detailed surveillance A Vessel Surveillance Observation Log is provided in Visual Surveillance Logs.	❑

Responsibility		Task	Consideration	Complete
Ongoing Actions	Planning Section	If vessel surveillance is feasible, ensure surveillance data is regularly incorporated into the Common Operating Picture/Situation Boards		❑
Aerial surveillance (if selected)				
Initial Actions	Operations Section	Contact AMSA to initiate aerial surveillance (via National Plan arrangements)	Trained observers should be familiar with the Bonn Agreement Aerial Operations Handbook (Part III) (Bonn Agreement, 2016). An Aerial Surveillance Observation Log is provided in Visual Surveillance Logs. Trained aerial observers are available from AMSA National Response Team (via the National Plan)	❑
	Operations Section	Once approval obtained, confirm availability of aerial surveillance platform to conduct initial surveillance flight	If aviation asset available near spill location, utilise where possible to gather as much information about the spill. If aviation asset not available at spill location, IMT is to seek available resources. It is possible that the initial surveillance flight will not include a trained aerial surveillance observer. Initial flights can be conducted using a standard crew and initial surveillance should not be delayed waiting for trained personnel. Ensure all safety requirements are met prior to deployment. There should be an attempt to obtain the following data during initial surveillance: • name of observer, date, time, aircraft type, speed and altitude of aircraft • location of slick or plume (GPS positions, if possible) • spill source • size of the spill, including approximate length and width of the slick or plume • visual appearance of the slick (e.g. colour) • edge description (clear or blurred) • general description (windrows, patches etc.) • wildlife, habitat or other sensitive receptors observed	❑

Responsibility		Task	Consideration	Complete
			• basic metocean conditions (e.g. sea state, wind, current) • photographic/video images	
	Operations Section	Obtain approval from Control Agency to commence surveillance flights in the vicinity of the spill	Operations Section is to assume primary coordination for all flights if approved by Control Agency	❑
	Operations Section	Once initial flight is complete, IMT in consultation with the Control Agency to determine if additional flights are required		❑
	Operations Section	In addition to arranging initial flight, mobilise aircraft and trained observers to the spill location to undertake surveillance activities if approved by the Control Agency (these can be cancelled if initial flight determines no additional surveillance is required)	Aerial platform should be capable of providing the following: • immediate accessibility from a designated airport • capability to fly at 150 feet • provision of aircraft crew for 1 x aircraft and space for at least one trained aerial observer	❑
	Operations Section	All records to be relayed to IMT and Control Agency when aircraft returns from observation flight	Visual observations from aircraft have inherent subjectivity due to the effect of the angle of insolation on the surface of the ocean. Optical techniques are also dependent on cloud cover and daylight. Where possible, a verbal report via radio/telephone en-route providing relevant information should be considered if the aircraft has long transits from the spill location to base	❑
Ongoing Actions	Operations Section	In consultation with the Control Agency, develop a flight schedule for ongoing aerial surveillance	Frequency of flights should consider information needs of IMT to help maintain the Common Operating Picture and determine ongoing response operations	❑
Satellite imagery (if selected)				
Initial Actions	Intelligence/Planning Section	Contact AMSA to initiate satellite services		❑
	Intelligence/Planning Section	Combine satellite data with other optical imagery (aerial surveillance, vessel-based observations) to mitigate issues of angle of insolation, thick cloud cover and night	Satellite derived data can be used to broaden aerial survey data in terms of both spatial and temporal scale and provide images	❑

Responsibility		Task	Consideration	Complete
Ongoing Actions	Intelligence/Planning Section	Request satellite imagery be provided every 48 hours throughout the duration of the response and integrate data into Common Operating Picture/Situation Boards		❑
General Actions (to be coordinated between Pilot Energy IMT and Control Agency)				
Surveillance Team		Record relevant data e.g. equipment used, time deployed, weather conditions, Job Safety Analysis (JSA) for all tasks		❑
Surveillance Team		Hold pre-mobilisation survey team meeting, including communication of field survey schedules (provision for field personnel rotation)		❑
IMT		Obtain weather and tidal information from the Bureau of Metrology and on-scene observers		❑
IMT		Assemble competent field team(s) (if required), including required personal protective equipment (PPE). Arrange any required inductions and/or permits		❑
IMT		Arrange transportation (e.g. flights, vehicles), accommodation and food/equipment for field teams		❑
IMT		Activate Geographic Information Systems (GIS) personnel to develop maps that can overlay surveillance data to enhance situational awareness of the spill		❑
IMT		Review fate and weathering, tracking buoy, oil spill modelling data and satellite data with field surveillance data (aerial and vessel surveillance) to validate spill fate and trajectory	Use available data to conduct Operational SIMA and confirm that pre-identified response options are still appropriate	❑
IMT		Use monitor and evaluate data to periodically reassess the spill and modify the response (through the IAP), as required		❑

6.4 Monitor and evaluate - environmental performance

Table 6-2 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of monitor and evaluate tactics in order to provide situational awareness to inform Control Agency decision making.

Table 6-2: Environmental Performance – Monitor and Evaluate

Performance Standard	Measurement Criteria
Response Preparedness	
Tracking buoy available on seismic vessel and maintained according to manufacturer specifications for duration of the titleholder survey	Records demonstrate that tracking buoys are available on vessels and maintained according to manufacturer specifications for the duration of the seismic survey
Response Implementation	
Offer support to the Control Agency in the selection and initiation of suitable monitor and evaluate tactics within 2 hours of notifying Control Agency of spill	Records demonstrate that IMT offered support to Control Agency in the selection and initiation of monitor and evaluate tactics within 2 hours of notifying Control Agency of spill
Deploy tracking buoys close to leading edge of spill (providing it is safe to do so) within 2 hours of Vessel Master being made aware of the spill	Records indicate that tracking buoys deployed close to leading edge of spill within 2 hours of Vessel Master being made aware of the spill
Initiate hydrocarbon distribution, fate and weathering assessment using ADIOS2 within 2 hours of IMT being made aware of the spill	Records indicate IMT initiated hydrocarbon distribution, fate and weathering assessment within 2 hours of spill notification
Provide available data from monitor and evaluate activities to modelling provider at the end of each operational period to help improve spill model accuracy	Records indicate that at the end of each operational period available data from monitor and evaluate activities was submitted to service provider to help improve spill model accuracy
Provide available monitoring data to Control Agency at the end of each operational period for inclusion into the Common Operating Picture and Operational SIMA to aid in response decision making	Incident Log shows available monitoring data provided to Control Agency at the end of each operational period

7. Natural Recovery

Natural recovery is a no impact response. There are no initiation or termination criteria, nor capability required to implement it apart from supporting strategies such as monitor and evaluate and oil spill monitoring.

Natural recovery is the process of letting hydrocarbons degrade naturally in the environment, either offshore or onshore. This section addresses offshore natural recovery, including degradation on or in the water column.

Oil on the ocean disperses and breaks up via several processes. Natural processes acting on the oil such as evaporation, dissolution, dispersion into the water column, biodegradation and photo oxidisation reduce the volume of oil over time. Evaporation can be the most important mechanism to reduce the volume of oil, especially in the short term. Approximately 65-80% of an MGO spill will generally evaporate over the first two days, depending upon the prevailing conditions and spill volume.

Whilst offshore natural recovery involves no direct response activities to mitigate the spill, it may be an appropriate response strategy to complement other intervention-based response strategies; or as a primary response strategy if other strategies are likely to cause a greater impact than leaving the oil to degrade naturally. It may also be the only viable response strategy during inclement weather (e.g. tropical cyclones), as responding could place personnel at risk.

Table 7-1 provides guidance on when natural recovery may be a suitable response option.

There is no implementation guide provided for this response option, as no direct tasks are required. However, if natural recovery is selected as a suitable response strategy, the Operational SIMA would need to confirm that natural recovery remains a suitable response strategy throughout the spill response.

Table 7-1: Natural Recovery Application Guidance

Recommended	Not Recommended
• For light, non-persistent hydrocarbons, such as ITOPF Group 1-2 hydrocarbons (e.g. MGO, condensate, hydraulic oil) • Product is weathering rapidly due to environmental conditions (e.g. high energy coastline, wave action) • Product is too thin for effective use of dispersants or containment and recovery • If responding during inclement weather conditions would place response personnel at risk	• For persistent hydrocarbons, such as ITOPF Group 3-4 hydrocarbons (Crude oil, Intermediate Fuel Oil, Heavy Fuel Oil) • Environmental conditions are not favourable for rapid degradation (e.g. calm seas) • Slick is continuous enough and thick enough to treat with dispersants or via containment and recovery methods

8. Shoreline Protection and Deflection

Spill modelling predicts if a worst-case vessel collision spill (refer to Section 3.2.1) were to occur during Eureka 3D MSS activities, there is a low probability of minimal shoreline contact (<1 m^3). Shoreline protection and deflection has been included as a secondary response strategy for the worst-case scenario, and would only be implemented if an operational SIMA demonstrated it would result in an overall benefit to receptors.

Protection and deflection tactics are utilised to divert hydrocarbons away from sensitive shoreline receptors and are more effective if they are deployed ahead of spill contact. They are typically used to protect smaller, high priority sections of shoreline. The relevant Control Agency has operational responsibility for the implementation of shoreline protection activities. Protection priorities are identified in

Table 3-4 but will need to be confirmed by the relevant Control Agency when the Operational SIMA is prepared.

The relevance and suitability of individual tactics (or combination of tactics) will need to be considered when preparing the Operational SIMA for individual spills. Initiation of suitable tactics will need to be confirmed by the Control Agency, prior to deployment.

- Shoreline booming – involves the use of a variety of booming techniques to exclude oil (exclusion booming), divert oil to a collection point where it can be removed from the environment (diversion booming) and redirecting flow of oil away from a priority area (deflection booming).
- Berms, dams and dikes – uses sandbags or embankments to exclude oil from sensitive areas
- Shoreside recovery – uses nearshore skimmers to collect oil corralled by nearshore booms (also used during shoreline clean-up).
- Passive recovery - uses sorbent booms or pads to collect oil and remove it from the environment. This can be used as a pre-impact tactic where sorbents are laid ahead of the spill making contact with the shoreline.
- Non-oiled debris removal – involves the removal of debris (e.g. seaweed) from the shoreline to prevent it being oiled, which in turn reduces impacts to wildlife and the volumes of waste produced during shoreline clean-up activities.

The effectiveness of shoreline protection and deflection tactics will be dependent upon metocean and wind conditions. Protection booms should only be installed in areas where tidal currents are below 0.75 knots.

8.1 Initiation and termination criteria

Initiation criteria	Termination criteria
Level 2 or 3 spills where shorelines with protection priorities will potentially be impacted; or SIMA demonstrates that the response strategy and selected tactics are likely to result in a net environmental benefit; and Requested by the relevant Control Agency	SIMA has determined that this strategy is unlikely to result in an overall benefit to the affected shoreline/s; and Control Agency decides to terminate the response strategy

8.2 Implementation guide

The locations for nearshore protection and deflection operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data and the protection priorities. In addition, the information obtained from monitor and evaluate activities will be used by the IMT in the development of the Operational SIMA to inform the most effective protection tactics (if any) to apply to individual sites. This will also consider the feasibility and effectiveness of selected tactics.

Deployment of equipment and personnel is to be at the direction of the WA DoT as the Control Agency in State waters.

Table 8-1 provides guidance to the IMT on the actions and responsibilities that should be considered to support the Control Agency if they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken or should be reassigned.

Table 8-1: Shoreline Protection and Deflection Implementation Guide

Responsibility		Task	Consideration	Complete
Initial Actions	Planning Section	Notify relevant authorities if there are likely to be any impacts on shorelines. See Table 4-1 for details on notifications. See Table 2-2 for details on Control Agency responsibilities.		❑
	Planning Section	Collect and provide spill trajectory modelling, other operational monitoring data and existing sensitivity information/mapping to Control Agency for confirmation of priority protection areas and Operational SIMA.		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Initial Actions	Planning Section	In conjunction with Control Agency conduct Operational SIMA to determine if protection and deflection is likely to result in a net environmental benefit using information from shoreline assessments and any tactical response plans for the area. See Section 3.5 for guidance on Operational SIMA.	Shoreline Clean-up Assessment Teams are responsible for preparing field maps and forms detailing the area surveyed and making specific clean-up recommendations (Refer to the Pilot Energy OSM-BIP for information on OMP: Shoreline Clean-up Assessment). The condition of affected shorelines will be constantly changing. Results of shoreline surveys should be reported as quickly as possible to the IMT and Control Agency to help inform real-time decision making. In consultation with Control Agency, engage a Heritage Advisor if spill response activities overlap with potential areas of cultural significance.	❑
Initial Actions	Planning Section	If Operational SIMA indicates that there is an overall environmental benefit, support Control Agency in the development of a Shoreline Protection Plan (IAP sub-plan) for each deployment area.	Shoreline Protection Plan may include (but not be limited to): • Priority nearshore and shoreline areas for protection • Locations to deploy protection and deflection equipment • Permits required (if applicable)	❑

Responsibility		Task	Consideration	Complete
			• Protection and deflection tactics to be employed for each location • List of resources (personnel and equipment) required • Logistical arrangements (e.g. staging areas, accommodation, transport of personnel) • Timeframes to undertake deployment • Access locations from land or sea • Frequency of equipment inspections and maintenance (noting tidal cycles) • Waste management information, including logistical information on temporary storage areas, segregation, decontamination zones and disposal routes • No access and demarcation zones for vehicle and personnel movement considering sensitive vegetation, bird nesting/roosting areas and turtle nesting habitat (utilise existing roads and tracks first).	
Ongoing Actions	Planning Section	In conjunction with Control Agency conduct regular Operational SIMA to confirm effectiveness of tactics and demonstrate benefit of continuing to implement shoreline protection and deflection activities.		❑
General (to be coordinated by Control Agency and Pilot Energy IMT to provide support)				
Emergency Response Team (ERT)		Record relevant data e.g. equipment used, time deployed, weather conditions, JSA for all tasks.		❑
ERT		Hold pre-mobilisation survey team meeting, including communication of field survey schedules (provision for field personnel rotation).		❑
IMT		Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑

Responsibility	Task	Consideration	Complete
IMT	Assemble competent field team(s) (if required), including required PPE. Arrange any required inductions and/or permits.		❑
IMT	Arrange transportation (e.g. flights, vehicles), accommodation and food/equipment for field teams.		❑
IMT	Establish staging areas.		❑
IMT	Establish decontamination facilities (as required) for all equipment, vessels and personnel.		❑
IMT	Prepare a communications plan for field personnel.		❑

8.3 Shoreline protection and deflection – environmental performance

Table 8-2 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of shoreline protection and deflection tactics to protect prioritised receptors from contact with hydrocarbons.

Table 8-2: Environmental Performance – Shoreline Protection and Deflection

Performance Standard	Measurement Criteria
Response Implementation	
Support Control Agency in the preparation of the Operational SIMA to determine if shoreline protection is likely to result in a net environmental benefit.	Records demonstrate that support offered to Control Agency in the preparation of an Operational SIMA.
Locations for nearshore protect and deflect operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data and protection priorities.	Incident log.
If Operational SIMA indicates that there is an overall environmental benefit, support Control Agency in the development of a Shoreline Protection Plan (IAP sub-plan).	Shoreline Protection Plan (IAP sub-plan) is dated and indicates preparation done in conjunction with Control Agency and prior to shoreline protection operations commencing.

Performance Standard	Measurement Criteria
Shoreline protection activities will be implemented under the direction of the Control Agency.	Records demonstrate that shoreline protection activities implemented under the direction of the Control Agency.

9. Shoreline Clean-up

Spill modelling predicts if a worst-case vessel collision spill were to occur during Eureka 3D MSS activities (refer to Section 3.2.1), there is a low probability of minimal shoreline contact. Out of 100 simulations only one simulation predicted shoreline accumulation above 100 g/m^2 which was at Green Head – Leeman, with a volume of less than 1 m^3 predicted over less than 1 km of shoreline (refer to Table 3-3). Shoreline clean-up has been included as a secondary response strategy for the worst-case scenario, and would only be implemented if an operational SIMA demonstrated it would result in an overall benefit to receptors.

The relevant Control Agency has operational responsibility for the implementation of shoreline clean-up activities. Protection priorities are identified in

Table 3-4 but will need to be confirmed by the relevant Control Agency when the Operational SIMA is prepared.

Shoreline clean-up aims to remove hydrocarbons from shorelines and intertidal habitat to achieve a net environmental benefit. Removal of these hydrocarbons helps reduce remobilisation and contamination of wildlife, habitat and other sensitive receptors. Shoreline clean-up is often a lengthy and cyclical process, requiring regular surveys (via OMP: Shoreline Clean-up Assessment) to monitor the effectiveness of clean-up activities and assess if they are resulting in any adverse impacts.

The locations for shoreline clean-up operations will continue to be evaluated by the relevant Control Agency throughout the incident response and will take into account monitor and evaluate data, operational monitoring data and the protection priorities identified.

The relevance and suitability of individual tactics (or tactics used in combination) will need to be considered when preparing the Operational SIMA for individual spills. Initiation of suitable tactics will need to be confirmed by the Control Agency, prior to deployment.

- Natural recovery – involves leaving the oil on the shoreline and allowing it to degrade naturally over time
- Manual and mechanical removal – requires the use of machinery, hand tools (or a combination) to remove hydrocarbons and oiled materials
- Washing, flooding and flushing – involves using water, steam, or sand to flush hydrocarbons from impacted shoreline areas
- Sediment reworking and surf washing – uses various methods to move oiled material into the intertidal zone where the hydrocarbons are washed out by wave action.

The information obtained from Shoreline Clean-up Assessment Teams should be used by the IMT and Control Agency in the development of the Operational SIMA to inform the most effective clean-up tactics (if any) to apply to individual sites. A minimum threshold of 100 g/m^2 (concentration of accumulated hydrocarbons on shorelines) is used to determine the lower limit for commencing clean-up operations (Table 3-5).

9.1 Initiation and termination criteria

Initiation criteria	Termination criteria
Level 2 or 3 spills where shorelines with protection priorities will potentially be impacted; or SIMA demonstrates that the response strategy and individual tactics are likely to result in a net environmental benefit; and Requested by the relevant Control Agency	SIMA has determined that this strategy is unlikely to result in an overall benefit to the affected shoreline/s; and Control Agency decides to terminate the response strategy

9.2 Operational considerations

Large scale operations involving large numbers of personnel may cause adverse environmental impacts at sensitive shoreline locations. The constant removal of hydrocarbons mixed with sand and debris, even via manual removal can result in a removal of large volumes of substrate (e.g. sand, pebbles). If intrusive clean-up is conducted frequently, over a long period of time and along contiguous lengths of coastline, this may result in geomorphological changes to the shoreline profile and adverse impacts to shoreline invertebrate communities which provide an array of ecosystem services (Michel et al., 2017).

An Operational SIMA should consider the safety constraints and ecological sensitivities of these shorelines (Refer to considerations presented in Table 3-7). If an Operational SIMA deems clean-up is likely to result in a net environmental benefit, it may be beneficial for operations to be conducted by smaller teams (max 10 people/team) over a longer period. Intermittent manual treatment (<20

visits/month) and use of passive recovery booms is likely to be more effective than intrusive methods (e.g. intrusive manual removal >20 visits/month). Although this may take longer to undertake the clean-up, the benefits often outweigh the impacts as smaller teams are more targeted, recover more hydrocarbons and less sand and debris, reducing trampling of hydrocarbons into the shore profile and will minimise ecological impacts on the shorelines and their sensitive species.

Clean-up endpoints should be established in consultation with key stakeholders (e.g. Parks Australia, WA DBCA) early in the clean-up process.

9.3 Implementation guide

The locations for shoreline clean-up operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data and the protection priorities. In addition, the information obtained from monitor and evaluate activities will be used by the IMT in the development of the Operational SIMA to inform the most effective protection tactics (if any) to apply to individual sites. This will also consider the feasibility and effectiveness of selected tactics.

Table 9-1 provides guidance on tasks and responsibilities that Pilot Energy will undertake to support the Control Agency should they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken or should be reassigned.

Table 9-1: Shoreline clean-up implementation guide

Responsibility		Task	Consideration	Complete
Initial Actions	Planning Section	Notify relevant authorities if there are likely to be any impacts on shorelines. Refer to Table 4-1 for details on notifications. Refer to Table 2-2 for details on Control Agency responsibilities.		❑
	Planning Section	Collect and provide spill trajectory modelling, other operational monitoring data and existing sensitivity information/mapping to Control Agency for confirmation of priority protection areas and Operational SIMA.		❑
	Planning Section	In conjunction with Control Agency, consult with Director of National Parks whilst preparing Operational SIMA for Designated Marine Parks.		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Natural recovery (if selected)				
Initial Actions	Planning Section	If Operational SIMA supports natural recovery, use monitor and evaluate data to periodically reassess the condition of the shoreline/s and modify tactics, if required by the Control Agency.		❑
Manual and mechanical removal; washing, flooding and flushing; and/or sediment reworking and surf washing (if selected)				
Initial Actions	Planning Section	If Operational SIMA supports shoreline clean-up, support Control Agency in the development of a Shoreline Clean-up Plan (IAP sub-plan) for inclusion in the IAP.	Shoreline Clean-up plan may include (but not be limited to): • Clean-up objectives • Clean-up end points • Clean-up priorities • Assessment and location of staging areas and worksites (including health and safety constraints, zoning) • Permits required (if applicable) • Chain of command for onsite personnel	❑

Responsibility		Task	Consideration	Complete
			• List of resources (personnel, equipment, PPE) • Details of accommodation and transport • Waste management information, including logistical information on temporary storage areas, segregation, decontamination zones and disposal routes • No access zones (to minimise disturbance to sensitive receptors) Refer to IPEICA-IOGP (2016) for additional guidance on shoreline clean-up planning and implementation.	
Ongoing Actions	Operations Section	Support Control Agency in monitoring the effectiveness of shoreline clean-up operations by continual implementation of Shoreline Clean-up Assessment.	Where possible, maintain same composition of Shoreline Clean-up Assessment Teams. If the same personnel are able to recommend clean-up techniques and then monitor their implementation, they will be better placed to adapt their recommendations as the clean-up progresses and judge when the agreed end-points have been met.	❑
General (to be coordinated by Control Agency and Pilot Energy IMT to provide support)				
IMT		Record relevant data e.g. equipment used, time deployed, weather conditions, JSA for all tasks.		❑
IMT		Hold pre-mobilisation survey team meeting, including communication of field survey schedules (provision for field personnel rotation).		❑
IMT		Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑
IMT		Assemble competent field team(s) (if required), including required PPE. Arrange any required inductions and/or permits.		❑
IMT		Arrange transportation (e.g. flights, vehicles), accommodation and food/equipment for field teams.		❑

Responsibility	Task	Consideration	Complete
IMT	Establish decontamination facilities (as required) for all equipment, vessels and personnel.		❑
IMT	Prepare a communications plan for field personnel.		❑
IMT	Consult with key stakeholders to develop clean-up end points for shorelines.		❑

9.4 Shoreline clean-up – environmental performance

Table 9-2 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of shoreline clean-up tactics to remove stranded hydrocarbons from shorelines in order to reduce impact on coastal protection priorities and facilitate habitat recovery.

Table 9-2: Environmental Performance – Shoreline Clean-up

Performance Standard	Measurement Criteria
Response Implementation	
Support Control Agency in the preparation of the Operational SIMA to determine if shoreline clean-up is likely to result in a net environmental benefit.	Records demonstrate that support offered to Control Agency in the preparation of an Operational SIMA.
Control Agency and IMT consult with Director of National Parks whilst preparing Operational SIMA for Designated Marine Parks.	Records demonstrate that Director of National Parks consulted when preparing Operational SIMA for Designated Marine Parks.
Shoreline clean-up activities will be implemented under the direction of the Control Agency.	Records demonstrate that shoreline clean-up activities implemented under the direction of the Control Agency.
Locations for clean-up operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data, operational monitoring data and protection priorities.	Incident log.
If Operational SIMA indicates that there is an overall environmental benefit, support Control Agency in the development of a Shoreline Protection Plan (IAP sub-plan).	Shoreline Protection Plan (IAP sub-plan) is dated and indicates preparation done in conjunction with Control Agency and prior to shoreline protection operations commencing.

10. Oiled Wildlife Response

The short-term effects of hydrocarbons on wildlife may be direct such as the external impacts from coating or internal effects from ingestion and inhalation. Oiled wildlife response (OWR) includes wildlife surveillance/reconnaissance, wildlife hazing, pre-emptive capture and the capture, cleaning, treatment, and rehabilitation of animals that have been oiled. In addition, it includes the collection, post-mortem examination, and disposal of deceased animals that have succumbed to the effects of oiling.

Long-term effects of a spill on wildlife may be associated with loss/degradation of habitat, impacts to food sources, and impacts to reproduction. An assessment of such impacts is covered under scientific monitoring.

The relevant Control Agency has operational responsibility for the implementation of an OWR as outlined in Sections 10.1 and 10.2. It is however also an expectation that Pilot Energy will conduct the initial first-strike response actions for wildlife and continue to manage those operations until the Control Agency takes over. Once the Control Agency takes over, the Pilot Energy will function as a Support Agency, and continue to provide planning and resourcing support.

10.1 Commonwealth waters

The Commonwealth of Climate Change, Energy, the Environment and Water (DCCEEW) is the Jurisdictional Authority for oiled wildlife in Commonwealth waters, although for vessel-based spills, the Control Agency function remains with AMSA. If an oiled wildlife response is required then this would be initiated through AMSA, who can access Australian Marine Oil Spill Centre (AMOSC) oiled wildlife resources.

10.2 Western Australian waters

If an OWR is required in WA State waters, the Department of Biodiversity, Conservation and Attractions (DBCA) will lead the OWR under the control of the WA DoT (as Control Agency). The key plan for OWR in WA is the WA Oiled Wildlife Response Plan (WAOWRP) (DBCA, 2022a) and the WA Oiled Wildlife Response Manual (WA OWR Manual) (DBCA, 2022b).

10.3 Magnitude of wildlife impact

Given the distribution and behaviour of wildlife in the marine environment, a spill which only impacts offshore waters is likely to result in limited opportunities to rescue wildlife. In such instances, continued wildlife reconnaissance, carcass recovery, sampling of carcasses that cannot be retrieved and scientific monitoring are more likely to be the focus of response efforts. In contrast, a spill which results in shoreline accumulation is likely to result in far greater wildlife impacts and opportunities to rescue wildlife.

Spill modelling predicts if a worst-case vessel collision spill (refer to Section 3.2.1) were to occur during Eureka 3D MSS activities, there is a low probability of minimal shoreline contact. Using the WAOWRP (DBCA, 2022a) *Guide for Rating the Wildlife Impact of an Oil Spill* (

Table 10-1) it is predicted that low wildlife impacts are likely associated with this scenario.

Table 10-1: WAOWRP Guide for rating the wildlife impact of an oil spill (DBCA, 2022a)

Wildlife Impact Rating	Low	Medium	High
What is the likely duration of the wildlife response?	< 3 days	3 – 10 days	> 10 days
What is the likely total intake of animals?	< 10	11 - 25	> 25
What is the likely daily intake of animals?	0 -2	2 – 5	> 5
Are threatened species, or species protected by treaty, likely to be impacted, either directly or by pollution of habitat or breeding areas?	No	Yes – possible	Yes - likely
Is there likely to be a requirement for building primary care facility for treatment, cleaning and rehabilitation?	No	Yes - possible	Yes - likely

10.4 Wildlife priority protection areas

For planning purposes, determination of wildlife priority protection areas is based on stochastic modelling of the worst-case spill scenario, the known presence of wildlife, and in consideration of the following:

- presence of high densities of wildlife, threatened species, and/or endemic species with high site fidelity
- greatest probability and level of contact from floating oil and/or shoreline accumulation
- shortest timeframe to contact.

The wildlife priority protection areas for a spill associated with Eureka 3D MSS activities are outlined in Table 10-2.

Depending on the timing of a potential hydrocarbon spill, certain species could be more impacted because of key seasonal biological activities such as breeding, mating, nesting, hatching or migrating.

Table 10-2: Wildlife priority protection areas

Wildlife priority protection area	Wildlife
Illawong – Cliff Head (DoT shoreline cell # 191)	• Inshore islands are important breeding areas for seabirds • Australian sea lion • Humpback whales and other inshore cetaceans
Green Head – Leeman (DoT shoreline cell # 193)	• Inshore islands are important breeding areas for seabirds • Australian sea lion • Humpback whales and other inshore cetaceans • Dunnart and dibbler found on Boullanger Island

10.5 Initiation criteria

Initiation criteria	Termination criteria
Notification of a Level 2/3 spill	When the SIMA for oiled wildlife response activities indicates no further action required; and Control Agency decides to terminate the response strategy

10.6 Implementation guide

Table 10-3 provides guidance to the IMT on the actions and responsibilities that should be considered when implementing an oiled wildlife first-strike plan. In State waters, Pilot Energy will conduct the initial first-strike response actions for wildlife and continue to manage these operations until DBCA is activated as the lead agency for wildlife response and formal handover occurs. Following formal hand over, Pilot Energy will function as a support organisation for the OWR and will be expected to continue to provide planning and resources as required.

Wildlife surveillance/reconnaissance is a critical component of an oiled wildlife first-strike. Wildlife reconnaissance should be undertaken in close consultation with personnel undertaking relevant operational monitoring activities. The information gathered from wildlife reconnaissance and all relevant pre-existing wildlife data/information should be used to inform decisions and aid the on-going development of the OWR portion of the IAP.

Table 10-3: OWR implementation guide

Responsibility		Task	Consideration	Complete
Initial Actions	Surveillance personnel	Personnel conducting monitor and evaluate activities shall report wildlife sightings in or near the spill trajectory (including those contacted with hydrocarbons or at risk of contact) and report them to the IMT within two hours of detection.	Record all reports of wildlife potentially impacted and impacted by spill. Record reports on: • Time / date • Location / GPS coordinates • Access to location • Numbers of individuals (estimate) • Species (if known) • Condition of implanted animals (if available) • Take phots of the affected wildlife and / or affected surrounds, if possible	❑
	Environment Unit Lead	If wildlife is sighted and are at risk of contact or have been contacted: In Commonwealth waters notify AMSA who can access AMOSC oiled wildlife resources In State waters notify DoT and DCBA State Duty Officer	Refer to Table 4-1 for reporting requirements.	❑
	Environment Unit Lead	Notify Department of Agriculture, Water and the Environment if there is a risk of death or injury to a protected species (including Matters of National Environmental Significance [MNES]).	Refer to Table 4-1 for reporting requirements.	❑
	Environment Unit Lead	Review all wildlife reports from surveillance or opportunistic activities and contact personnel who made the reports (if possible) to confirm information collected.		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Initial Actions	Planning Section	Support Control Agency in the development of an OWR Plan (IAP sub-plan) for inclusion in the IAP.	Targeted wildlife surveillance/reconnaissance needs to consider species known to occur in the impacted area, life-cycle stages, behaviour, and key risk periods. Wildlife reconnaissance should be undertaken in close consultation with personnel	❑

Responsibility		Task	Consideration	Complete
			undertaking relevant operational monitoring activities. Confirm best reconnaissance platform (e.g. vessel, aerial, shoreline). Consider ability to share resources (e.g. Monitor and Evaluate activities, Scientific Monitoring). Refer to the WA OWR Manual (DBCA, 2022b) for further information: • P1 OWR Procedure: Phase 1 Wildlife Reconnaissance • G-1: OWR Strategies by Fauna Group	
Ongoing Actions	Planning and Operations Section	Support Control Agency with any on-going OWR planning and resourcing support.		❑
General (to be coordinated by Control Agency and Pilot Energy IMT to provide support)				
IMT		Record relevant data e.g. equipment used, time deployed, weather conditions, JSA for all tasks.		❑
IMT		Hold pre-mobilisation team meeting, including communication of field schedules (provision for field personnel rotation).		❑
IMT		Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑
IMT		Assemble competent field team(s) (if required), including required PPE. Arrange any required inductions and/or permits.		❑
IMT		Arrange transportation (e.g. flights, vehicles), accommodation and food/equipment for field teams.		❑
IMT		Establish decontamination facilities (as required) for all equipment, vessels and personnel.		❑
IMT		Prepare a communications plan for field personnel.		❑

10.7 Oiled wildlife response – environmental performance

Table 10-4 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of OWR tactics in accordance with relevant State Oiled Wildlife Response Plans to prevent or reduce impacts, and to humanely treat, house, and release or euthanise wildlife.

Table 10-4: Environmental Performance – Oiled wildlife response

Performance Standard	Measurement Criteria
Response Implementation	
OWR Plan developed and included in the IAP to provide oversight and management of OWR operations.	Records indicate IAP OWR Plan prepared prior to OWR operations commencing.

11. Scientific Monitoring

Pilot Energy has developed an OSM-BIP which describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (Level 2-3) to marine waters. It is aligned to the Joint Industry Operational and Scientific Monitoring Framework (APPEA, 2021) and describes how this Framework applies to the Eureka 3D MSS activities and spill risks in Australian waters.

The OSM-BIP is structured so that it can provide a flexible framework that can be adapted to individual spill incidents. A series of Operational Monitoring Plans (OMPs) and Scientific Monitoring Plans (SMPs) form part of the Joint Industry Framework and provide detail on monitoring design, standard operating procedures, data management and reporting. Details on personnel, resources, logistics and mobilisation times are outlined in the OSM-BIP. Table 11-1 lists the plans that are relevant to Pilot Energy's activities and the objective of each monitoring plan.

There are two types of monitoring that would occur following a Level 2-3 spill event:

- Operational Monitoring (OM) – which is undertaken during the course of the spill and includes any physical, chemical and biological assessments which may guide operational decisions such as selecting the appropriate response and mitigation methods and / or to determine when to terminate a response activity. The design of operational monitoring requires judgements to be made about scope, methods, data inputs and outputs that are specific to the individual spill incident, balancing the operational needs of the response with the logistical and time constraints of gathering and processing information. There is a need for information to be collected and processed rapidly to suit response needs, with a lower level of sampling and accuracy needed than for scientific purposes. For details on initiation and termination criteria for OM's refer to the OSM-BIP.
- Scientific Monitoring (SM) - which can extend well beyond the termination of response operations. Scientific monitoring has objectives relating to attributing cause-effect interactions of the spill or associated response with changes to the surrounding environment. The SMs will be conducted on a wider study area, extending beyond the spill footprint, will be more systematic and quantitative and aim to account for natural or sampling variation. For further details on the SM's refer to the OSM-BIP.
- Pilot Energy will review the initiation criteria for OMPs and SMPs (Provided in Table 5-1 (OMPs) and Table 6-1 (SMPs) of the Joint Industry Operational and Scientific Monitoring Framework (APPEA, 2021) during the preparation of the initial IAPs, and subsequent IAPs. If any initiation criteria are met, then that relevant OMP and/or SMP will be activated via the relevant Monitoring Service Provider.

Table 11-1: Operational and Scientific Monitoring Plans Relevant to Eureka 3D MSS

Monitoring Plan	Aim/Objective
Operational Monitoring	
Hydrocarbon properties and weathering behaviour at sea	To provide in field information on the hydrocarbon properties, behaviour and weathering of the spilled hydrocarbons to assist in determining suitability of spill response tactics and strategies
Shoreline clean-up assessment	Provide information on the physical and biological characteristics of shorelines within the predicted trajectory of the hydrocarbon spill or that have been exposed to the spill Conduct sectorisation of shorelines to aid in response planning and implementation of response activities Inform suitable pre-impact and post-impact response options/activities to minimise the threat posed to sensitive receptors from the spill, taking into account shoreline character Establish clean-up end points for the shoreline Monitor effectiveness of shoreline protection and/or clean-up activities Inform the IMT/EMT of any potential or actual impacts to sensitive receptors from response options/activities Inform the IMT/EMT of any sensitive receptors that may be relevant to scientific monitoring programs
Water quality assessment	To provide a rapid assessment of the presence, type, concentrations and character of hydrocarbons in marine water to assess the extent of spill contact and inform impact predictions for other monitoring plans
Sediment quality assessment	To provide a rapid assessment of the presence, type, concentrations and character of hydrocarbons in marine sediments to assess the extent of spill contact and inform impact predictions for other monitoring plans
Marine fauna assessment • Cetaceans (observational only) • Pinnipeds • Seabirds and shorebirds	To undertake a rapid assessment of marine fauna to understand the species, populations, habitats and geographical locations at greatest risk from potential spill impacts To provide the IMT/EMT with information that assists in deciding protection priorities and selecting response options that minimise the potential impact on marine fauna To provide the IMT/EMT with information on the effects of response activities on marine fauna Assess and document mortality of fauna during the spill event and response activities Establish the need for scientific monitoring of fauna affected by the spill event and/or response activities.
Marine fauna assessment • Fish	Identify, report and monitor potential impacts on fish, sharks and rays resulting from the hydrocarbon and/or response activities To provide the IMT/EMT with information that assists in deciding protection priorities and selecting response options that minimise the potential impact on fish Determine the extent and level of hydrocarbon contamination and tainting of fish Determine any mortality of fish species and document any fish-kills during the spill event

Monitoring Plan	Aim/Objective
	Determine if fish harvested from the spill area meets statutory limits for hydrocarbon residues and is marketable Provide regulatory agencies, fisheries managers and other spill responders with information to help them evaluate the likelihood that a hydrocarbon spill will contaminate seafood (fish) for commercial, aquaculture, recreational, traditional purposes Assist in the decision-making process to restrict, ban, close or re-open a fishery Establish the need for scientific monitoring of fish affected by the spill event and/or response activities.
Scientific Monitoring	
Water quality impact assessment	Detect and monitor the presence, concentration and persistence of hydrocarbons in marine waters following the spill and associated response activities. The specific objectives of this SMP are as follows: • Assess and document the temporal and spatial distribution of hydrocarbons and dispersants in marine waters of sensitive receptors; • Consider the potential sources of any identified hydrocarbons • Verify the presence and extent of hydrocarbons (both on water and in water) that may be directly linked to the source of the spill • Assess hydrocarbon/dispersant content of water samples against accepted environmental guidelines or benchmarks to predict potential areas of impact • Provide information that may be used to interpret potential cause and effect drivers for environmental impacts recorded for sensitive receptors monitored under other SMPs
Sediment quality impact assessment	Detect and monitor the presence, concentration and persistence of hydrocarbons in marine sediments following the spill and associated response activities. The specific objectives of this SMP are as follows: • Assess and document the temporal and spatial distribution of hydrocarbons and dispersants in marine sediments of sensitive receptors • Consider the potential sources of any identified hydrocarbons; and • Verify the presence and extent of hydrocarbons that may be directly linked to the source of the spill • Assess hydrocarbon content of sediment samples against accepted environmental guidelines or benchmarks to predict potential areas of impact
Intertidal and coastal habitat assessment	To assess the impact (extent, severity, and persistence) and subsequent recovery of intertidal and coastal habitats and associated biological communities in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Collect quantitative data to determine short-term and long-term (including direct and indirect) impacts of hydrocarbon (and implementation of response activities) on intertidal and coastal habitats and associated biological communities, post-spill and post-response recovery

Monitoring Plan	Aim/Objective
	• Monitor the subsequent recovery of intertidal and coastal habitats and associated biological communities from the impacts of the hydrocarbon release and response activities
Seabirds and shorebirds	Document and quantify shorebird and seabird presence; and any impacts and potential recovery from hydrocarbon exposure and response activities. The objectives are to: • Identify and quantify, if time allows the post-spill/pre-impact presence and status (e.g. foraging and/or nesting activity) of shorebirds and seabirds in the study area • Observe, and if possible quantify and assess, the impacts from exposure of shorebirds and seabirds to hydrocarbons (i.e. post-impact) and to the response activities, including abundance, oiling, mortality, and sub-lethal effects • Identify, quantify and evaluate the post-impact status and if applicable, recovery of key behaviour and breeding activities of shorebirds and seabirds (e.g. foraging and/or nesting activity and reproductive success) over time and with regard to control sites
Marine mega-fauna assessment • Pinnipeds • Cetaceans	**Pinnipeds** Identify and quantify the status and recovery of pinniped populations (Australian sea lion, *Neophoca cinerea*) related to a hydrocarbon spill and response activities. The objectives are to: • Identify mortality of pinnipeds, where possible, that is directly related to the hydrocarbon spill or indirectly associated to spill-related impacts (including boat strike and/or use of dispersants) • Assess the impact of the hydrocarbon spill on pinniped species populations as recorded for breeding colonies and haul-out sites of hydrocarbon exposure/contact • Evaluate the recovery of pinniped breeding colonies **Cetaceans** Identify and quantify the status and recovery of whale sharks, dugongs and cetaceans related to a hydrocarbon spill and response activities. The objectives are to: • Observe and quantify the presence of whale sharks, dugongs and cetaceans within the area that may be affected by hydrocarbons • Where possible, assess and quantify lethal impacts and/or sub-lethal impacts directly related to the hydrocarbon spill or other indirect impacts (including vessel strike and/or use of dispersants and impacts to important habitats) • If applicable, evaluate recovery of key biological activities of impacted species following impacts due to a hydrocarbon spill and undertaking response options.

Monitoring Plan	Aim/Objective
Benthic habitat assessment	To assess the impact (extent, severity, and persistence) and subsequent recovery of subtidal benthic habitats and associated biological communities in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Collect quantitative data to determine short-term and long-term (including direct and indirect) impacts of hydrocarbon (and implementation of response options) on benthic habitats and associated biological communities, post-spill and post-response recovery • Monitor the subsequent recovery of benthic habitats and associated biological communities from the impacts of the hydrocarbon release
Marine fish and elasmobranch assemblages assessment	To assess the impacts to and subsequent recovery of fish assemblages associated with specific benthic habitats (as identified in SMP: Benthic Habitat Assessment) in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Characterise the status of resident fish populations associated with habitats monitored in SMP: Benthic Habitat Assessment that are exposed/contacted by released hydrocarbons • Quantify any impacts to species (abundance, richness and density) and resident fish population structure (representative functional trophic groups) • Determine and monitor the impact of the released hydrocarbons and potential subsequent recovery to residual demersal fish populations
Fisheries impact assessment	To monitor potential contamination and tainting of important finfish and shellfish species from commercial, aquaculture and recreational fisheries to evaluate the likelihood that a hydrocarbon spill will have an impact on the fishing and/or aquaculture industry. The specific objectives of this SMP are as follows: • Assess any physiological impacts to important fish and shellfish species and if applicable, seafood quality and safety • Assess targeted fish and shellfish species for hydrocarbon contamination • Provide information that can be used to make inferences on the health of fisheries and the potential magnitude of impacts to fishing industries (commercial, aquaculture and recreational)
Heritage features assessment	To detect changes in the integrity of significant shipwrecks as a result of a hydrocarbon release and/or associated response activities.
Social impact assessment	To assess the extent, severity and likely persistence of impacts on cultural, commercial, recreational and/or industrial users from a hydrocarbon release and associated response activities. The specific objective of this SMP is as follows:

Monitoring Plan	Aim/Objective
	• Determine direct and indirect impacts of a hydrocarbon or chemical spill and associated response activities on cultural, commercial, recreational and/or industrial users and identify areas where monitoring may need to continue for an extended period of time following termination of the response.

11.1 Scientific Monitoring - environmental performance

Table 11-2 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Implement monitoring programs to assess and report on the impact, extent, severity, persistence and recovery of sensitive receptors contacted by a spill or affected by spill response.

Table 11-2: Environmental Performance – Scientific Monitoring

Performance Standard	Measurement Criteria
Response Preparedness	
Maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of monitoring	Contract with third party service providers maintained through duration of Eureka 3D MSS
	Vessel contracts in place for the duration of Eureka 3D MSS
Response Implementation	
OMPs and SMPs will be activated in accordance with the initiation criteria provided in Table 9-1 and 9-2 of the Joint Industry OSM Framework (APPEA, 2021)	Incident Action Plan and Incident Log confirm OMPs and SMPs are activated in accordance with the initiation criteria provided in Table 9-1 and 9-2 of the Joint Industry OSM Framework (APPEA, 2021)
Initiation criteria of OMPs and SMPs will be reviewed during the preparation of the initial Incident Action Plan (IAPs) and subsequent IAPs; and if any criteria are met, relevant OMPs and SMPs will be activated	Incident Action Plan/s
Monitoring to be conducted in accordance with the Operational and Scientific Monitoring Bridging Implementation Plan (Appendix H)	Incident log and monitoring records
Implementation of operational and scientific monitoring will comply with the Minimum Standards listed in Appendix A of the Joint Industry OSM Framework (APPEA, 2021)	Incident log and monitoring records

Performance Standard	Measurement Criteria
Once post-spill SMP monitoring reports are drafted they will be peer reviewed by an expert panel	Monitoring records
OMPs and SMPs will be terminated in accordance with the termination criteria provided in Table 6-1 of the Joint Industry OSM Framework (APPEA, 2021)	Incident Action Plan and Incident Log confirm OMPs and SMPs are terminated in accordance with the termination criteria provided in Table 6-1 of the Joint Industry OSM Framework (APPEA, 2021)

12. Response Termination

Terminating the spill response may involve demobilising personnel and equipment from response locations, post-incident reporting, identifying improvement opportunities, reviewing and updating plans and restocking equipment supplies. Planning to demobilise should occur ahead of time, during the response, to facilitate rapid demobilisation of resources that are no longer needed, and which can significantly reduce response costs.

The decision to terminate individual response strategies will be made by the relevant Control Agency (Table 2-2), according to the termination criteria shown for each strategy (Sections 6 - 9).

Scientific monitoring may continue after response operations have ceased and may be used to inform remediation activities.

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Appendix A Roles and responsibilities of Titleholder personnel in State MEECC/ DOT IMT/ FOB

Table A1-1 outlines the key roles and responsibilities of titleholder personnel potentially required to be positioned in the State Maritime Environmental Emergency Coordination Centre (MEECC)/ DoT IMT/ FOB in the event of a Level 2/3 spill that impacts WA waters or land. It should be noted the requirements outlines in Table A1-1 are the initial requirements, and not the minimum or maximum requirements.

Table A1-1: Roles and Responsibilities of Titleholder Personnel Positioned in State Maritime Environmental Emergency Coordination Centre (MEECC)/ DOT IMT/ FOB

Key Roles	Responsibilities
Crisis Management Team Liaison Officer (DoT MEEC)	• Provide a direct liaison between the Crisis Management Team and the State MEECC. • Facilitate effective communications and coordination between the Crisis Management Team Leader and the State SMEEC. • Offer advice to SMEEC on matters pertaining to titleholder crisis management policies and procedures.
Deputy Incident Officer (DoT IMT)	• Provide a direct liaison between the titleholder IMT and the DoT IMT. • Facilitate effective communications and coordination between the titleholder Incident Controller and the DoT Incident Controller. • Offer advice to the DoT Incident Controller on matters pertaining to the titleholder incident response policies and procedures. • Offer advice to the Safety Coordinator on matters pertaining to titleholder safety policies and procedures, particularly as they relate to titleholder employees or contractors operating under the control of the DoT IMT.
Deputy Intelligence Officer (DoT IMT)	• As part of the Intelligence Team, assist the Intelligence Officer in the performance of their duties in relation to situation and awareness. • Facilitate the provision of relevant modelling and predications from the titleholder IMT. • Assist in the interpretation of modelling and predictions originating from the titleholder IMT. • Facilitate the provision of relevant situation and awareness information originating from the DoT IMT to the titleholder IMT. • Facilitate the provision of relevant mapping from the titleholder IMT. • Assist in the interpretation of mapping originating from the titleholder IMT. • Facilitate the provision of relevant mapping originating from the DoT IMT to the titleholder IMT.
Deputy Planning Officer (DoT IMT)	• As part of the Planning Team, assist the Planning Officer in the performance of their duties in relation to the interpretation of existing response plans and the development of incident action plans and related sub plans. • Facilitate the provision of relevant IAP and sub plans from the titleholder IMT. • Assist in the interpretation of the titleholder OPEP from titleholder. • Assist in the interpretation of the titleholder IAP and sub plans from the titleholder IMT. • Facilitate the provision of relevant IAP and sub plans originating from the DoT IMT to the titleholder IMT. • Assist in the interpretation of titleholder's existing resource plans. • Facilitate the provision of relevant components of the resource sub plan originating from the DoT IMT to the titleholder IMT. *Note: this individual must have intimate knowledge of the relevant titleholder OPEP and planning processes.*

Key Roles	Responsibilities
Environmental Support Officer (DoT IMT)	• As part of the Intelligence Team, assist the Environmental Coordinator in the performance of their duties in relation to the provision of environmental support into the planning process. • Assist in the interpretation of the titleholder OPEP and relevant TRP plans. • Facilitate in requesting, obtaining and interpreting environmental monitoring data originating from the titleholder IMT. • Facilitate the provision of relevant environmental information and advice originating from the DoT IMT to the titleholder IMT.
Deputy Public Information Officer (DoT IMT)	• As part of the Public Information Team, provide a direct liaison between the titleholder Media team and DoT IMT Media team. • Facilitate effective communications and coordination between titleholder and DoT media teams. • Assist in the release of joint media statements and conduct of joint media briefings. • Assist in the release of joint information and warnings through the DoT Information & Warnings team. • Offer advice to the DoT Media Coordinator on matters pertaining to titleholder media policies and procedures. • Facilitate effective communications and coordination between titleholder and DoT Community Liaison teams. • Assist in the conduct of joint community briefings and events. • Offer advice to the DoT Community Liaison Coordinator on matters pertaining to the titleholder community liaison policies and procedures. • Facilitate the effective transfer of relevant information obtained through the Contact Centre to the titleholder IMT.
Deputy Logistics Officer (DoT IMT)	• As part of the Logistics Team, assist the Logistics Officer in the performance of their duties in relation to the provision of supplies to sustain the response effort. • Facilitate the acquisition of appropriate supplies through titleholder's private contract arrangements. • Collects Request Forms from DoT to action via the titleholder IMT. *Note: this individual must have intimate knowledge of the relevant titleholder logistics processes and contracts.*
Deputy Operations Officer (DoT IMT)	• As part of the Operations Team, assist the Operations Officer in the performance of their duties in relation to the implementation and management of operational activities undertaken to resolve an incident. • Facilitate effective communications and coordination between the titleholder Operations Section and the DoT Operations Section. • Offer advice to the DoT Operations Officer on matters pertaining to titleholder incident response procedures and requirements. • Identify efficiencies and assist to resolve potential conflicts around resource allocation and simultaneous operations of titleholder and DoT response efforts.
Deputy Waste Management Coordinator (DoT IMT)	• As part of the Operations Team, assist the Waste Management Coordinator in the performance of their duties in relation to the provision of the management and disposal of waste collected in State waters. • Facilitate the disposal of waste through titleholder's existing private contract arrangements related to waste management and in line with legislative and regulatory requirements. • Collects Waste Collection Request Forms from DoT to action via the titleholder IMT.
Deputy Finance Officer (DoT IMT)	• As part of the Finance Team, assist the Finance Officer in the performance of their duties in relation to the setting up and payment of accounts for those services acquired through titleholder's private contract arrangements. • Facilitate the communication of financial monitoring information to the titleholder to allow them to track the overall cost of the response.

Key Roles	Responsibilities
	• Assist the Finance Officer in the tracking of financial commitments through the response, including the supply contracts commissioned directly by DoT and to be charged back to titleholder.
Deputy Division Commander (DoT FOB)	• As part of the Field Operations Team, assist the Division Commander in the performance of their duties in relation to the oversight and coordination of field operational activities undertaken in line with the IMT Operations Section's direction. • Provide a direct liaison between titleholder's Forward Operations Base/s (FOB/s) and the DoT FOB. • Facilitate effective communications and coordination between titleholder On-Scene Commander and the DoT Division Commander. • Offer advice to the DoT Division Commander on matters pertaining to titleholder incident response policies and procedures. • Assist the Safety Coordinator deployed in the FOB in the performance of their duties, particularly as they relate to titleholder employees or contractors. • Offer advice to the Safety Coordinator deployed in the FOB on matters pertaining to titleholder safety policies and procedures.

Appendix B Visual Surveillance Logs

Vessel visual observer log

Survey Details						
Date	Start time	End Time	Observers			
Incident			Area of Survey			
Vessel type	Call sign					
Weather Conditions						
Wind speed (knots)			Wind direction			
Cloud cover (%)			Visibility			
Time high water			Current direction			
Time low water			Current speed (nM)			
Slick Details						
Slick grid parameters by lat/long			Slick grid parameters (vessel speed)		Slick grid dimensions	
Length Axis	Width Axis		Length Axis		Width Axis	Length	nm
Start Latitude	Start Latitude		Time (seconds)		Time (seconds)	Width	nm
Start Longitude	Start Longitude					Length	nm
End Latitude	End Latitude		Vessel speed (knots)		Vessel speed (knots)	Width	nm
End Longitude	End Longitude					Grid area	km^2
Visual appearance slick						
Colours, emulsification etc.						
Any marine fauna or other activities observed						

Aerial surveillance observation log

Date	Incident	Aircraft type	Call sign	Start time	End time	Av altitude/ air speed
Wind speed (kts)	**Wind direction**	**Visibility (nm)**	**Cloud base (ft)**	**Sea state**	**Observer name/s**	**Spill source**
Survey start /end coordinates	**Survey start time**	**Survey end time**	**Time high tide**	**Time low tide**	**Current speed (nm)**	**Current direction**
Notes (e.g. remote sensing used, wildlife or sensitive receptors observed, any response activities observed):						

Slick details

Slick	Time local	Slick (centre or start)		Slick (end)		Slick Orient Degrees	Oil slick length			Oil slick width			Area km^2	Coverage %	Oiled area km^2
		LAT N/S	LONG E/W	LAT N/S	LONG E/W		SOG KT	Time seconds	Distance km	SOG KT	Time seconds	Distance km			
A															
B															
C															
D															
E															

Appendix C Shoreline Assessment Form

Department of **Transport**

When blank, this form is classed as **OFFICIAL**, when filled out, this form is classed as **OFFICIAL-SENSITIVE.**

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Shoreline descriptors:

Shoreline Type	Abbr.		Note
Cliff	Cl		Height and slope
Platform	Pl		Height relative to tide
Reef	Re		Reef is an intertidal platform
Beach	Be		
Dune	Du		
Flats	Fl		
Artificial	A		e.g. wharf, sea wall
Shoreline substrate	**Abbr.**	**Size**	**Note**
Bedrock or rock	R		
Boulder	B	Larger than head	
Cobble	C	Fist to head size	
Pebble	P	Pen diameter to fist size	
Gravel	G	2-4mm diameter	
Mud/silt/clay	M	Less than 0.6mm	Mix with water, if it goes cloudy = mud, if it sinks = sand
Earth	E		Usually cliffs only
Shellgrit	Sh		Usually with sand (i.e. Sh/S)
Coral	Co		Dead coral, i.e. coral rubble *(if corals are live, record as coral in both substrate type and biological character)*
Artificial	A		e.g. rip-rap

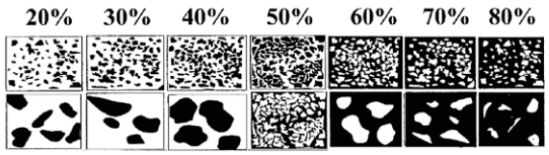
Note: S/B would indicate boulders and sand in equal amounts. S(B) would indicate sand was the dominant substrate.

Biological character
This is flora and fauna living on the shoreline. Document this and indicate location on sketch map.

Oil description/character

- **Colour**
- **Viscosity: Solid** *(doesn't flow)*, **Viscous** *(flow slowly)*, **Fluid** *(flows easily)*
- **Stickiness: Very sticky** *(can't be wiped/washed off)*, **Sticky** *(partly removed by wiping/washing)*, **Non sticky** *(wipes of easily)*

Percentage oil cover

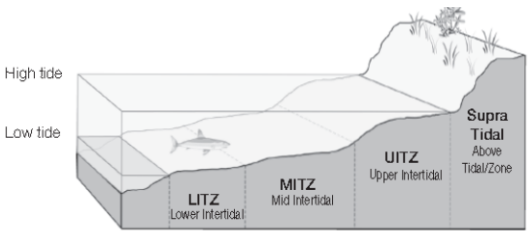


Oil thickness

Name	Abbr.	Thickness	Description
Pooled	Po	Can be measured in mm or cms	Pooled fresh or emulsified oil
Cover	Co	Over 1mm	Coverage of oil of measurable thickness but not pooled
Coat	Ct	Less than 1mm	This coach of oil that masks colour of substrate and can be scratched off with fingernail.
Stain	St	Less than 1mm	Very thin stain of oil which cannot be scratched off substrate with fingernail
Film or sheen	Fi or Shn	Extremely thin film or sheen	Substrate can usually be seen through oil. Can be described as brown, rainbow or silver.
Tar balls	Tb	Variety of sizes	Ball or clumps of weathered oil.

- To describe thickness of subsurface oil:
  - Depth = distance from substrate surface to top of buried layer
  - Thickness of lens = distance between top and bottom of buried layer

Shoreline tidal zones



Incident		**Ref No.**	
REPORTING DETAILS			
Assessment Team Leader		**Position/ Organisation**	
Team Members (name/org)			
Date Completed		**Time Completed**	
Reporting to		**Position/ Organisation**	
Date Received		**Time Received**	
LOCATION DETAILS			
Sector		**Segment**	
Name of Beach/Location		**Description (e.g. slope)**	
Topography/ Other Map		**Map Reference**	
Access Via	☐ Foot Only ☐ Road ☐ 4WD ☐ Boat ☐ Helicopter ☐ Gator/OUV		
Hazards			
TIMING			
First Assessment	☐ Yes ☐ No	**Last Assessment**	☐ Yes ☐ No
Timing	☐ Pre Impact ☐ Post Impact Before Clean-Up ☐ Post Impact After Clean-Up		
Time Since	Impact (days/hrs.):	Last Clean-up (days/hrs.):	

ASSESSMENT				
Parameter	**LITZ**	**MITZ**	**UITZ**	**Supratidal**
Shoreline Description				
Shoreline type				
Substrate type				
Length of shoreline				
Width of shoreline				
Biological character				
Oil Distribution and Character				
Oil band length				
Oil band width				
% cover in band				
Surface oil thickness				
Oil appearance/character				
Depth of buried oil (from surface)				
Description of buried oil				
Other				
Un oiled debris				
Oiled debris				

Sketch Map

Please include North point and scale

Notes
