

OPERATIONAL AND SCIENTIFIC MONITORING BRIDGING IMPLEMENTATION PLAN TEMPLATE

REVISION A | 12 MARCH 2021

australian petroleum production & exploration association limited

the voice of Australia's oil and gas industry

Acknowledgements

This document was developed and authored by BlueSands Environmental for APPEA with invaluable input and support provided by the Joint Industry Operational and Scientific Monitoring Steering Committee, including :

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Document Control

Version	Author	Date
Rev. A	Lucy Sands – BlueSands Environmental	12 th March 2021

HOW TO USE THIS DOCUMENT

This document is designed to provide Titleholders with a template from which to prepare their own Operational and Scientific Monitoring Bridging Implementation Plan. The information in this plan will enable Titleholders to use the Joint Industry OSM Framework. This means those Titleholders will not need to repeat the information already contained in the Joint Industry OSM Framework. However, this plan will still need to outline how the Titleholder will meet some of the requirements of the OPGGS (Environment) Regulations 2009, as outlined in Section 3 of the Joint Industry OSM Framework. This will need to be tailored to the nature and scale of the risks from the Titleholder's activities.

When editing this document, authors should read the blue text. The blue text provides notes, instructions and worked examples to assist authors include the relevant information for their OSM Bridging Implementation Plan.

Please delete the blue text and enter the Titleholder-specific information required. All blue text should then be changed to automatic (black).

Editing original black text should only be done using tracked changes and then approved by the Environment Unit Lead or Titleholder's Joint Industry OSM Steering Committee Member. This is to encourage a consistent industry approach to OSM documentation.

Titleholders should merge this document into their own Corporate templates.

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PART A – PREPAREDNESS

This Plan is presented in two parts. Part A outlines the relationship between the Titleholder’s environmental management document framework and the Joint Industry Operational and Scientific Monitoring (OSM) Framework (APPEA, 2021). Part B provides operationally focussed guidance for Titleholder personnel and OSM Service Providers to coordinate the implementation of monitoring plans.

1 INTRODUCTION

Worked example: <Titleholder> has elected to use the Joint Industry OSM Framework and supporting OMPs and SMPs as the foundation of its operational and scientific monitoring approach. The Joint Industry OSM Framework is available on the [APPEA Environment Publications Webpage](#). Use of the Joint Industry OSM Framework requires each Titleholder to develop a Bridging Implementation Plan (this plan) which fully describes how the Framework interfaces with Titleholders own activities, spill risks and internal management systems.

Table 1-1 describes key documents that form <Titleholder’s> environmental management document framework.

Activation of OSM should follow the process listed in Part B: Section 12 Activation Process.

Table 1-1: Key documents in Titleholder’s environmental management framework

Document	Description
Activity specific Environment Plan (EP)	Provide a summary of what is included in this document. Worked example: This plan describes the activity and the location, the environment, the risks to the environment as a result of the activity and the associated management controls. Of particular relevance to this plan, it identifies sensitive receptors, potential impacts from hydrocarbon spills and the environment that may be affected (EMBA)
Activity specific Oil Pollution Emergency Plan (OPEP)	Provide a summary of what is included in this document. Worked example: This plan provides the activation and response process for the credible spill scenarios, including incident management, spill impact mitigation analysis (SIMA)/net environmental benefit (NEBA) process and detailed implementation guidance for individual response options. Of particular relevance to this plan, it identifies the credible spill scenarios and protection priorities
<Insert relevant Emergency Management Plan that addresses all hazards/major accident emergencies>	Provide a summary of what is included in this document. Worked example: Describes roles and responsibilities of the IMT in response to an all hazards emergency, with the exception of OSM roles which are detailed in this plan
Emergency Management Contacts Directory (or similar)	Provide a summary of what is included in this document. Worked example: This document contains all relevant contact and communications information to enable effective communication amongst the response personnel and external stakeholders, including relevant OSM contacts. State frequency it is updated

2 EMBA AND MONITORING PRIORITIES

Guidance: Section 10.3 of the Joint Industry OSM Framework indicates that Titleholders will be required to identify how they have used the results of their risk assessment process, in particular the spill modelling results, to help determine their likely initial monitoring priorities from their list of receptors. It is recommended the monitoring priorities align to the protection priorities (and processes/methods) identified in the EP/OPEP. Examples and considerations of protection prioritisation methods are provided in Section 10.3 of the Joint Industry OSM Framework.

Step one: Titleholders should confirm the thresholds used to determine the outer boundary of the EMBA used for monitoring planning, noting the points raised in Section 10.3 of the Joint Industry OSM Framework. Example thresholds for monitoring:

- 1 g/m² floating oil thickness, which is considered to be below levels which would cause environmental harm and is more indicative of the areas perceived to be affected due to its visibility on the sea-surface
- 10 g/m² for accumulated (shoreline) oil, which represents the area visibly contacted by the spill
- 10 ppb for dissolved hydrocarbons corresponds generally with potential for exceedance of water quality triggers
- 10 ppb entrained hydrocarbons represents the low exposure zone and corresponds generally with potential for exceedance of water quality triggers.

Step two: If a Titleholder has multiple facilities within a similar geographical area, state if one facility is being used as the basis for oil spill monitoring planning for all of the Titleholder's activities in that area. Provide justification as to how that has been determined. If this is irrelevant then skip this step.

If a Titleholder has facilities in multiple geographic locations that are likely to have different protection priorities (e.g. Bass Strait and North West Shelf) then consider the requirement for multiple EMBA's and resultant monitoring priorities. This may also flow through to determination of resourcing, timing and capability.

Worked example: Facility A's geographical EMBA encompasses the EMBA's of Facility B and C, as determined through oil spill trajectory modelling.

Step three:

a) Outline the process the Titleholder uses to determine monitoring priorities. Consider the thresholds for scientific monitoring and potential impacts, as described in the EP. Consider protected matters, sensitivity and recoverability of receptors and impacts to other users (e.g. socio-economic). A number of Australian States have (or are working towards) oil spill risk assessments for coastal environments, supported by detailed protection prioritisation evaluation. These provide a useful analysis and rankings for various receptors.

Worked example: Monitoring priorities have been drawn from the protection priorities identified in the <refer to relevant OPEP and/or EP>. These priorities were identified through analysis of hydrocarbon spill modelling results against the location of key sensitive receptors with high conservation value; including habitat, species (e.g. State/Commonwealth protected areas, protected species), the sensitivity and/or recoverability of receptors to hydrocarbon impacts, and important socio-economic/heritage values. The Western Australian Department of Transport has conducted protection prioritisation assessments for coastal environments, which have been used in the determination of <Titleholder's> protection and monitoring priorities for the worst-case spill.

Detailed information on the spill risks, modelling analysis of scenarios and protection priorities is provided in the activity-specific EP and OPEP. The following tables provide a summary of the locations, key receptors and spill modelling results for the worst-case scenarios from the <refer to relevant OPEP and/or EP>.

b) Provide justification around why something is a priority over another receptor. Do some receptors have detailed existing baseline data available?

Worked example: Using spill trajectory modelling to help prioritise resources to implement monitoring programs, (including the collection of baseline data) can be useful. For example, sensitive locations with a high probability of rapid contact with an oil spill should be the priority of a monitoring program, compared to similar locations with a lower probability and longer time for contact following a spill, where time may permit the collection of reactive (post-spill but pre-contact) baseline data.

c) Present (preferably tabulated) the results for floating oil, including probability and time to contact at the low threshold, as described above. Also present the entrained oil results, aligning both entrained and floating concentrations to the relevant thresholds used in the OPEP/EP. If not using modelling data, then outline the relationship between the risk assessment process used in the OPEP/EP and the implementation of OSM.

d) Analyse the oil spill modelling results (or relevant risk assessment process) and how they were used to determine monitoring priorities. Discuss the results and outline if one particular scenario is used in the OSM Bridging Implementation Plan to determine priority locations.

Worked example: These results have been used to determine the priority monitoring locations and receptors within the EMBA. The priorities vary according to each spill scenario, although the <refer to relevant> scenario typically presents the worst-case time to contact and probabilities for floating oil. Quickest time and highest probabilities for entrained oil are represented by the <refer to relevant> scenario.

Step seven: If the EMBA includes any broadscale receptors that are shown to be impacted by modelling, state this and also state how they will be addressed in the OSM.

Worked example: In addition to these locations, there are receptors that are transient (i.e. cetaceans, seabirds) and others that are broadscale, such as managed fisheries with large spatial extents, Key Ecological Features (KEF) and Biologically Important Areas (BIAs). These receptors are described in detail in the activity-specific EP.

Two broadscale KEFs not listed in <refer to modelling results discussed above> include <insert relevant KEF and how they may be affected by spill>.

The relationship between exposure levels and degree of impact should be considered when finalising the monitoring design. It should be noted that the monitoring priorities provided in <refer to modelling results discussed above> are listed for planning purposes. The Titleholder will work with its monitoring providers and key stakeholders in the initial stages of the spill regarding priority receptors and to assist in the finalisation of the monitoring design. This process is outlined in Section 13.

3 RELEVANT EXISTING BASELINE INFORMATION SOURCES

The Titleholder has access to a number of different baseline data sources that are relevant to the high value receptors in the EMBA, as listed in Section 7 of the Joint Industry OSM Framework.

Step one: The Titleholder will need to provide instructions as to how personnel can log into the various data networks. Worked example: <Insert Titleholder name> Industry-Government Environmental Metadata System (I-GEMS) login access information can be found in the <Insert relevant location e.g. Emergency Management Contacts Directory (or similar – refer to this document in Section 1)>.

Step two: Outline if any receptors in the EMBA are covered by government management plans that identify the current condition of key receptors being managed for protection. For example:

- Rowley Shoals Marine Park Management Plan (2007) 2007–2017, Management Plan No. 56. DEC, Perth, WA
- Department of Parks and Wildlife (2014) Eighty Mile Beach Marine Park Management Plan 2014–2024, Management Plan No. 80, DPaW, Perth, WA
- Department of Parks and Wildlife (2016) North Kimberley Marine Park Joint management plan 2016. Uunguu, Balangarra, Miriuwung Gajerrong, and Wilinggin management areas, No. 89. DPaW, Perth, WA

Step three: Identify if there are any protected species and/or ecological communities in the EMBA covered by species recovery plans. If so, a cross reference to Section 14 and Appendix B may be useful, as well as including the following link for protected species: <http://www.environment.gov.au/cgi-bin/sprat/public/publicshowallrps.pl>

4 BASELINE DATA REVIEW

Guidance: As outlined in Section 7 of the OSM Framework, baseline data used will need to match the methods and parameters used in OMPs and SMPs, where possible and practicable. This will require Titleholders to examine the relevance of the baseline data sets they plan to use for operational and scientific monitoring. This Section provides detailed guidance and a worked example of this analysis.

Step one: Titleholders may prefer to conduct a detailed baseline analysis in a separate report (referred to as OSM Baseline Environmental Data Analysis (Doc ID) below) and log a copy in the Titleholder’s document management system for future reference (e.g. to enable access during internal or external audits). However, Titleholders will need to provide a summary in the OSM Bridging Implementation Plan (e.g. example provided in Appendix A and below).

This analysis should look at each receptor (e.g. water quality, benthic communities, fish assemblages, reptiles, birds, intertidal habitats) and list all known existing data sets for that receptor within the EMBA. Sources of data may include those listed in Section 7 of the OSM Framework, but may also include internally commissioned reports used during environmental impact assessments, reports published as a result of spill monitoring e.g. Montara and database searches.

The Titleholder must also specify the criteria used to conduct the relevance analysis. An example is provided in Table 4-1.

Worked example: <Titleholder> has compiled a list of baseline data relevant to the high value receptors in the EMBA (Appendix A: Baseline data sources) and reviewed this baseline information (OSM Baseline Environmental Data Analysis (Doc ID)) to assess the spatial and temporal relevance of this data and comparison of methods and parameters to those outlined in the Joint Industry SMPs. This review focused on priority monitoring locations with a minimum hydrocarbon contact timeframe of less than seven days for the worst-case spill (Refer back to modelling analysis Tables in Section 2).

The criteria used during the baseline data review is outlined in Table 4-1.

Table 4-1: Assessment criteria for baseline data review

Year of most recent data capture	Duration of monitoring program	Frequency of data capture	Similarity of methods to Joint Industry SMP	Similarity of parameters to Joint Industry SMP
High = 2015–2020	High = > 4 years	High = 4+ sampling trips per year	High	High
Medium = 2010–2014	Medium = 2–4 years	Medium = 2–3 sampling trips per year	Medium	Medium
Low = <2010	Low = <2 years	Low = one-off sampling trip	Low	Low

Step two: Titleholders will need to work through their OSM Baseline Environmental Data Analysis and determine if the assessment outcomes from applying the criteria in Table 4-1 indicate if the existing baseline data is relevant and suitable enough to detect change. Consideration must be given to the priority monitoring locations identified in Section 2. This information should be used to help understand where to prioritise monitoring resources to obtain post-spill, pre-impact monitoring data.

Worked example: This assessment was then used to determine if the available baseline data could be used to detect change in receptors at priority monitoring locations in the event of a significant impact. Table 4-2

compares priority monitoring locations and receptors, and provides guidance on where post-spill, pre-impact monitoring should be prioritised.

The different categories are listed in Table 4-2 include:

- Not applicable (N/A) – this receptor and relevant SMP is not applicable to the priority monitoring location (i.e. shoreline habitat not present at submerged shoals);
- Survey – current monitoring/knowledge is considered sufficient (i.e. could be used to detect level of change in the event of a significant impact) and is considered a lower priority for post-spill, pre-impact data collection; and
- Priority survey – current monitoring/knowledge is not in place, not suitable or not practicable; and post-spill pre-impact baseline data collection should be prioritised.

It is noted that it is difficult to obtain absolute statistical proof of oil spill impacts, due to the variability (spatially and temporally) of the natural environment, the lack of experimental control due to the nature of spills and because suitable baseline data may not be available (Kirby, et al. 2018). Alternative approaches exist for detecting impacts where post-spill, pre-impact monitoring may not be feasible. These include impact versus control design approaches and/or a gradient approach. The Joint Industry OSM Framework provides guidance and considerations for survey designs to enable the acquisition of sufficiently powerful data during SMP implementation.

Once SMP monitoring reports are drafted (post-spill) they should be peer reviewed by an expert panel (Refer to Section 10.10 of the Joint Industry OSM Framework).

Table 4-2: Recommended priority monitoring locations versus SMPs

Location	SMP									
	Water quality impact assessment	Sediment quality impact assessment	Intertidal and coastal habitat assessment	Seabirds and shorebirds	Marine mega-fauna assessment – reptiles	Marine mega-fauna assessment – whale sharks, dugong and cetaceans	Benthic habitat assessment	Marine fish and elasmobranch assemblages assessment	Fisheries impact assessment	Heritage and social impact assessment
Island A (emergent receptor)	Priority survey	Priority survey	Priority survey	Survey	Priority survey	Priority survey	Survey	Survey	Priority survey (Locations to be determined in consultation with key stakeholders to reflect current fishing zones/effort)	Priority survey (Locations to be determined in consultation with key stakeholders)
Shoal A (submerged receptor)	Priority survey	Priority survey	N/A	N/A	N/A	Survey	Survey	Survey		
Mainland site A (emergent receptor)	Survey	Survey	Priority survey	Survey	Survey	Survey	Survey	Survey		
Mainland site B (emergent receptor)	Survey	Survey	Priority survey	Priority survey	Priority survey	Survey	Survey	Survey		

5 OSM ORGANISATIONAL STRUCTURE

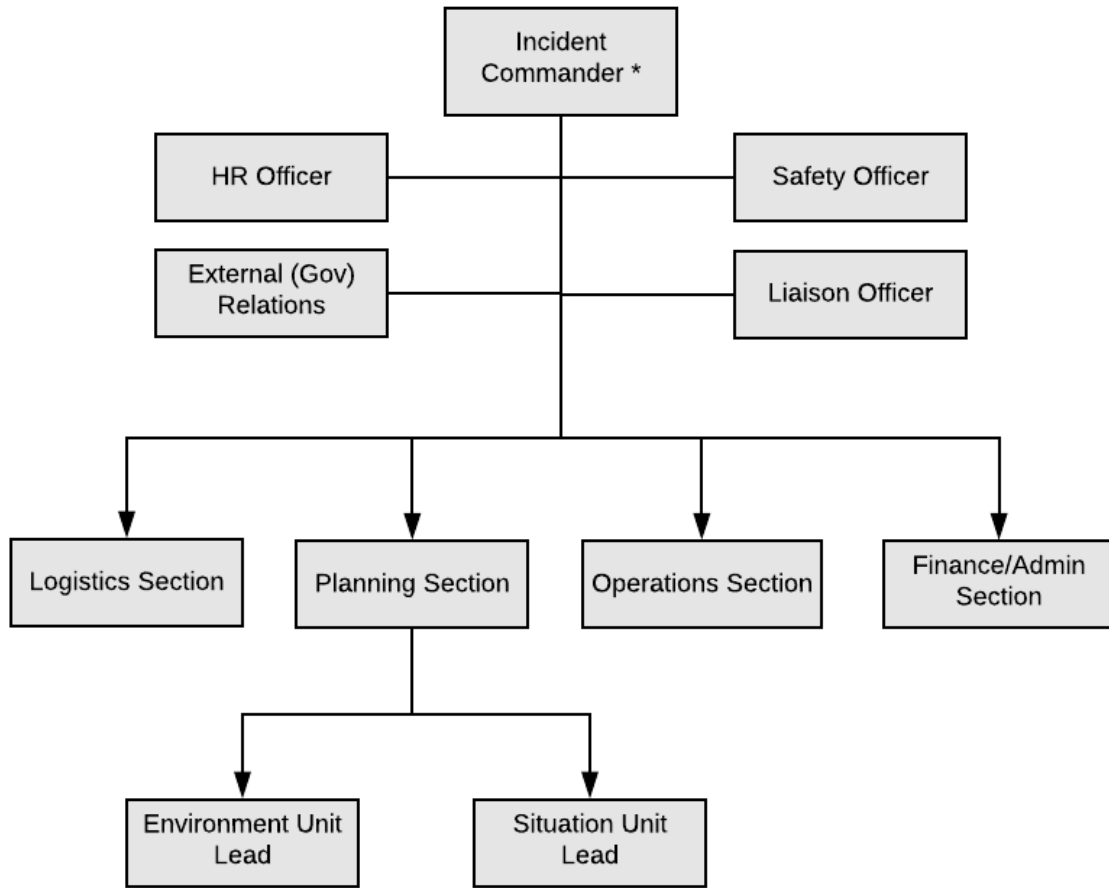
Guidance: Titleholders must identify what incident/emergency management system of command they use to respond to and manage incidents e.g. either Incident Command System (ICS) or Australasian Inter-Service Incident Management System (AIIMS). They must also identify the chain of command for OSM activities during a spill, and also post-spill, when the Incident/Emergency Management Teams are stood down.

The Titleholder should also outline any specific jurisdictional arrangements whereby the State/Territory is the Control Agency and if this influences OSM activities and chain of command. The figures used below may need modification to suit individual Titleholder's needs.

Worked example: <Titleholder> uses the Incident Command System (ICS) to respond to incidents and therefore adopts the key roles and responsibilities used in this system, as described in the activity EPs and/or OPEPs. The Incident Management Team (IMT) will be responsible for coordinating OSM activities, which will be led by the Planning Section within the IMT, with support from each Section, in particular the Operations Section.

The <Titleholder> IMT structure is shown in Figure 5-1. Where the <to include if another agency may be the Control Agency e.g. South Australian Department of Planning, Transport and Infrastructure> is the Control Agency, the IMT will be managed through coordinated command and <Titleholder> will still be expected to continue monitoring activities in <State/Territory> waters, with oversight from <relevant agency>.

Figure 5-2 illustrates the structure of the OSM Management Team during the response phase. The IMT Incident Commander is ultimately accountable for managing the response operation, which includes this plan. Depending on the scale of the event, individual people may perform multiple roles; similarly, multiple people may share the same role.



* In Level 2 and 3 spills where another party is activated as the Control Agency for State/Territory waters response, the IMT/EMT will be managed through coordinated command (e.g. Department of Planning, Transport and Infrastructure (South Australia) is the Control Agency in State waters, Titleholder is Control Agency in Commonwealth waters)

Figure 5-1: <Titleholder> IMT Structure

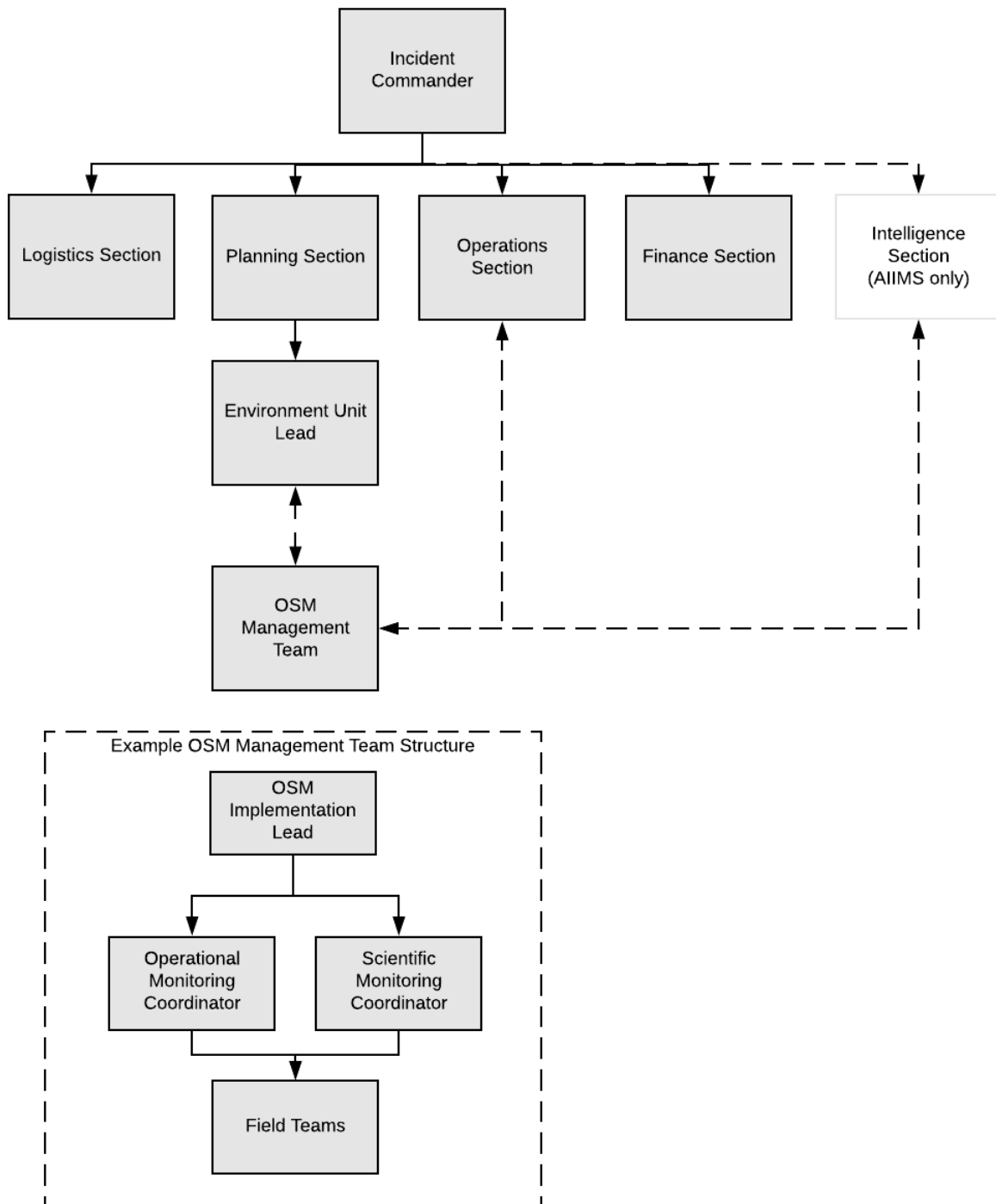


Figure 5-2: <Titleholder> IMT Structure with OSM Team

6 OSM ROLES AND RESPONSIBILITIES

Guidance: Section 10.13.2 of the Joint Industry OSM Framework outlines OSM roles and responsibilities. If the Titleholder wants to vary from this division of roles and responsibilities then they will need to specify that in this section. This section should outline who will hold key roles e.g. Titleholder or OSM Services Provider.

Titleholders must also specify how scientific monitoring will continue once the response phase is terminated. This section needs to identify who is responsible for implementing and making key decisions for scientific monitoring components.

Worked example: OSM roles and responsibilities are listed in Section 10.13.2 of the Joint Industry OSM Framework. Table 6-1 outlines the roles held by <Titleholder> and the OSM Services Provider.

During the post-response phase the <State relevant Titleholder position e.g. Senior Environment Advisor> and the OSM Services Provider OSM Implementation Lead will continue to be responsible for the coordination and delivery of monitoring plans.

Table 6-1: Worked example: Roles and responsibilities for OSM

Role	Held by
Environment Unit Lead (EUL)	<specify who this role is held by e.g. Held by Titleholder>
OSM Implementation Lead	<specify who this role is held by e.g. Held by Service Provider>
Operational Monitoring Coordinator and Scientific Monitoring Coordinator	<specify who this role is held by e.g. Held by Service Provider>
OSM Field Operations Manager	<specify who this role is held by e.g. Held by Service Provider>
OSM Field Teams	<specify who this role is held by e.g. Held by Service Provider>

7 MOBILISATION AND TIMING OF OMP AND SMP IMPLEMENTATION

Guidance: Section 10.5 of the Joint Industry OSM Framework provides considerations for determining suitable timeframes for the activation and implementation of the various OMPs and SMPs.

Note: as defined in Section 10.5.1 of the OSM Framework, ‘implementation’ of an OMP/SMP is being ready, at the point of staging or departure, to mobilise for monitoring.

The example provided below is linked to the spill modelling outputs discussed in Section 2. If the Titleholder elects to use a different mechanism to link to its risk assessment process, then this should be identified in Section 2 and below.

Worked example: Table 7-1 provides an indicative implementation schedule for OMP and SMPs in the EMBA and adjacent waters. The locations listed are aligned to the initial monitoring priorities described in Section 2.

Table 7-1: Worked example – Indicative OMP and SMP implementation schedule for OSM activities if initiation criteria are met

Proximity to spill source	Monitoring type	0–6 hours from OSM activation	0–48 hours from OSM activation	Within 72 hours of OSM activation	~7 days from OSM activation	>Two weeks from OSM activation
Spill site and surrounding waters	OM	<ul style="list-style-type: none"> OMP: Air quality modelling (responder health and safety) 	<ul style="list-style-type: none"> Activation of OMP Team Leads. Finalise OMPs. Commence activation and mobilisation of OM personnel. 	<ul style="list-style-type: none"> OMP: Hydrocarbon Properties And Weathering Behaviour, where resources are available (e.g. Supply Vessel with onboard sampling equipment). Continue to finalise OMPs. Continue to activate and mobilise OM personnel. 	<ul style="list-style-type: none"> OMP: Water Quality Assessment OMP: Sediment Quality Assessment OMP: Air Quality Modelling OMP: Marine Fauna Assessment OMP: Surface Chemical Dispersant Effectiveness 	As results from implemented OMPs are available, data are provided to relevant personnel in IMT/EMT (e.g. Situation/Intelligence Unit) and used in the Incident Action Planning process for the next operational period. OMP is redesigned or reallocated according to the specifics of the actual spill.
	SM		<ul style="list-style-type: none"> Commence activation and mobilisation process. Activation of SMP Team Leads. 	<ul style="list-style-type: none"> Continue to activate and mobilise personnel. Work on finalising SMPs. 	<ul style="list-style-type: none"> SMP: Water quality impact assessment SMP: Sediment quality impact assessment SMP: Marine fish and elasmobranch assemblages assessment 	Continue SMP monitoring until termination criteria are met
Sensitive receptors ¹ (including	OM		<ul style="list-style-type: none"> Activation of OMP Team Leads. Finalise OMPs. 	<ul style="list-style-type: none"> OMP: Oil properties and weathering behaviour at sea 	<ul style="list-style-type: none"> OMP: Water quality assessment 	As results from implemented OMPs are available, data are

¹ It is the responsibility of the Titleholder to determine its relevant sensitive receptors and ensure these align to the existing environment outlined in the EP and any identified protection priorities outlined in the EP and/or OPEP. The receptors listed here are provided as an example only. Time to contact with sensitive receptors may be derived from oil spill modelling results.

Proximity to spill source	Monitoring type	0–6 hours from OSM activation	0–48 hours from OSM activation	Within 72 hours of OSM activation	~7 days from OSM activation	>Two weeks from OSM activation
<p>shorelines) where modelling shows contact within 72 hours (3 days)</p> <p>Guidance: individual receptors or location names can be listed here with the minimum predicted time to contact e.g. Montebello Islands (3 days)</p>	SM		<ul style="list-style-type: none"> Commence activation and mobilisation of OM personnel. 	<ul style="list-style-type: none"> Continue to finalise OMPs. Continue to activate and mobilise OM personnel. 	<ul style="list-style-type: none"> OMP: Sediment quality assessment OMP: Shoreline clean-up assessment OMP: Marine fauna assessment <ul style="list-style-type: none"> Reptiles Dugongs Seabirds and shorebirds Fish 	<p>provided to relevant personnel in IMT (Situation Unit Lead) and used in the Incident Action Planning process for the next operational period. OMP is redesigned or reallocated according to the specifics of the actual spill until termination criteria are met</p>
			<ul style="list-style-type: none"> Activation of SMP Team Leads and finalisation of SMPs requiring reactive baseline monitoring data to be obtained pre-impact. 	<ul style="list-style-type: none"> Implementation of reactive baseline data monitoring (if applicable). Finalisation of the remaining SMPs (where individual SMP initiation criteria are met). 	<ul style="list-style-type: none"> Relevant SMPs are being implemented, where resources are deployed. 	<p>Continue SMP implementation.</p>
<p>Sensitive receptors (including shorelines) where modelling shows contact >10 days</p>	OM			<ul style="list-style-type: none"> Activation of OMP Team Leads. Finalise OMPs. Commence activation and mobilisation of OM personnel. 	<ul style="list-style-type: none"> Continue to finalise OMPs. Continue to activate and mobilise OM personnel. OMP: Oil properties and weathering behaviour at sea 	<p>As results from implemented OMPs are available, data are provided to relevant personnel in IMT (Situation Unit Lead) and used in the Incident Action Planning process for the next operational period. OMP is redesigned</p>

Proximity to spill source	Monitoring type	0–6 hours from OSM activation	0–48 hours from OSM activation	Within 72 hours of OSM activation	~7 days from OSM activation	>Two weeks from OSM activation
<p>Guidance: individual receptors or location names can be listed here with the minimum predicted time to contact e.g. Kakadu NP (10 days)</p>					<ul style="list-style-type: none"> • OMP: Water quality assessment • OMP: Sediment quality assessment • OMP: Shoreline clean-up assessment • OMP: Marine fauna assessment • Reptiles • Dugongs • Seabirds and shorebirds • Fish 	<p>or reallocated according to the specifics of the actual spill until termination criteria are met</p>
	SM			<ul style="list-style-type: none"> • Commence activation and mobilisation process • Activation of SMP Team Leads and finalisation of SMPs 	<ul style="list-style-type: none"> • SMP: Water quality impact assessment • SMP: Sediment quality impact assessment • SMP: Marine mega-fauna assessment - reptiles • SMP: Marine fish and elasmobranch assemblages assessment • SMP: Intertidal and coastal habitat assessment • SMP: Seabirds and shorebirds 	<p>Continue SMP monitoring until termination criteria are met</p>

Proximity to spill source	Monitoring type	0–6 hours from OSM activation	0–48 hours from OSM activation	Within 72 hours of OSM activation	~7 days from OSM activation	>Two weeks from OSM activation
					<ul style="list-style-type: none"> SMP: Benthic habitat assessment SMP: Commercial and recreational fisheries impact assessment 	

8 RESOURCE REQUIREMENTS

Guidance: The Titleholder will need to identify its relevant arrangements that will aid in the implementation of the OMPs and SMPs, including but not limited to personnel, equipment, access to suitable monitoring platforms, arrangements for analysis of samples and aviation contracts. This may be a mixture of contracted arrangements, internal personnel skills and any equipment the Titleholder may hold at its facilities or supply bases. It is the Titleholder’s responsibility to ensure its contractors have the capacity and capability to implement the monitoring plans or provide the equipment as noted in this section.

Worked example: The resources required to assist the IMT in the coordination and management of OSM are outlined in Table 8-1. The resources required to implement operational and scientific monitoring components are presented in Table 8-1 and Table 8-2 respectively, which is based on the monitoring priorities in Section 2 and implementation schedule outlined in Table 7-1. This assessment is based on <insert detail if a particular spill scenario was used>. It should be noted that a single spill will not contact all locations and receptors listed in Table 7-1.

Table 8-1: Resources required for key OSM coordination roles

Role	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
OSM Implementation Lead (OSM Monitoring Provider/s)	1 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Principal Scientist>	1 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Principal Scientist>	1 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Principal Scientist>	<List relevant OSM Provider Contract>
Operational Monitoring Coordinator and Scientific Monitoring Coordinator (OSM Service Provider/s)	2 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Principal Scientist>	2 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Principal Scientist>	2 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Principal Scientist>	
OSM Field Operations Manager (OSM Service Provider/s)	1 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Senior Scientist>	1 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Senior Scientist>	1 x <Insert relevant title for Titleholder’s own OSM Service Provider e.g. Senior Scientist>	

Table 8-2: Resources required for implementing operational monitoring plans

OMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Hydrocarbon properties and weathering behaviour at sea)*	<p>Guidance: Determine sites from spill modelling [Section 2] and timing [Section 7]. For example, Table 7-1 indicates this OMP will be implemented within 72 hours at the spill site and receptors where modelling shows contact within 72 hours, so the following resources would be required in week 1</p> <p>1 team (spill site and surrounds) 1 team (Site A) 1 team (Site B) Total 3 team leaders and 6 team members (3 per team)</p>	<p>Guidance: Add any sites where modelling shows contact >1 week e.g. Site C below</p> <p>1 team (spill site and surrounds) 1 team (Site A) 1 team (Site B) 1 team (Site C) Total 4 team leaders and 8 team members (3 per team)</p> <p>Note: these resources may not be required if relevant scientific monitoring components initiation criteria have been triggered.</p>	<p>1 team (spill site and surrounds) 1 team (Site A) 1 team (Site B) 1 team (Site C) Total 4 team leaders and 8 team members (3 per team)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p><State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement></p>
Shoreline clean-up assessment	<p>1 team (Site A) 1 team (Site B) Total 2 team leaders and 4 team members (3 per team)</p>	<p>1 team (Site A) 1 team (Site B) 2 teams (Site C) Total 4 team leaders and 8 team members (3 per team)</p>	<p>1 team (Site A) 1 team (Site B) 2 teams (Site C) Total 4 team leaders and 8 team members (3 per team)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p>AMOSC (AMOSPlan) <if AMOSC member></p> <p>OSRL Master Services Agreement <if OSRL member></p> <p>State/Territory Response Teams and AMSA National Response Team <if relevant></p>

OMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Surface chemical dispersant effectiveness and fate	<p>1 team leader</p> <p>1 team member (for visual observations, which may be performed by trained aerial observers used during monitor and evaluate if trained in observation and verification of chemical dispersant effectiveness)</p> <p>For water quality observations, refer to OMP: Water quality assessment</p>	<p>1 team leader</p> <p>1 team member (for visual observations, which may be performed by trained aerial observers used during monitor and evaluate if trained in observation and verification of chemical dispersant effectiveness)</p> <p>For water quality observations, refer to OMP: Water quality assessment</p> <p>Additional team/s (various locations as required)</p>	<p>1 team leader</p> <p>1 team member (for visual observations, which may be performed by trained aerial observers used during monitor and evaluate if trained in observation and verification of chemical dispersant effectiveness)</p> <p>For water quality observations, refer to OMP: Water quality assessment</p> <p>Additional team/s (various locations as required)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p>AMOSC (AMOSPlan) <if AMOSC member></p> <p>OSRL Master Services Agreement <if OSRL member></p> <p><State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement></p>
Subsea dispersant injection monitoring	<p>No subsea dispersant injection until week 2 due to transportation requirements</p>	<p><u>12 hour/day operation</u></p> <p>1 team leader/operations manager</p> <p>11 team members</p> <p><u>24 hour/day operation</u></p> <p>2 team leaders/operations manager</p> <p>16 team members</p>	<p><u>12 hour/day operation</u></p> <p>1 team leader/operations manager</p> <p>11 team members</p> <p><u>24 hour/day operation</u></p> <p>2 team leaders/operations manager</p> <p>16 team members</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment.</p> <p>Guidance: If Titleholder is a OSRL Subsea Well Intervention Service (SWIS) Capping Stack Member, then they have access to dedicated monitoring equipment and personnel</p>
Water quality assessment*	<p>Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)</p>	<p>Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)</p>	<p>Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)</p> <p>Additional teams, if required (dependent upon any modifications to sampling locations, frequency etc.)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p>

OMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Sediment quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites) Additional teams, if required (dependent upon any modifications to sampling locations, frequency etc.)	<State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement>
Marine fauna assessment	1 team to conduct initial aerial surveys for spill site, Site A, Site B, Site C (2 observers per aircraft) Note: these resources may not be required if relevant scientific monitoring components initiation criteria have been triggered.	If vessel based surveys selected: 1 team (Site A) 1 team (Site B) 1 team (Site C) Total 3 team leaders and 3 team members (2 per team)	If vessel based surveys selected: 1 team (Site A) 1 team (Site B) 1 team (Site C) Total 3 team leaders and 3 team members (2 per team)	<List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment> <State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement, aviation contractors>
Air quality modelling (responder health and safety)	1 team (all sites)	1 team (all sites)	1 team (all sites)	<List OSM Provider, or if performed by in-house personnel>

* Initial co-mobilisation between OMP: Hydrocarbon properties and weathering behaviour at sea, OMP: Surface chemical dispersant effectiveness and fate, OMP: Water quality assessment and OMP: Sediment quality assessment

Table 8-3: Resources required for implementing scientific monitoring plans

SMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Water quality impact assessment	<p>1 team (spill site and surrounds)</p> <p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>Total 3 team leaders and 6 team members (3 per team)</p> <p>Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered</p>	<p>1 team (spill site and surrounds)</p> <p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>1 team (Site C)</p> <p>Total 4 team leaders and 8 team members (3 per team)</p>	<p>1 team (spill site and surrounds)</p> <p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>1 team (Site C)</p> <p>Total 4 team leaders and 8 team members (3 per team)</p>	<p><List OSM Provider></p> <p>Marine contractors</p> <p>Laboratory arrangement</p>
Sediment quality impact assessment	Refer to SMP: Water quality impact assessment* (all sites)	Refer to SMP: Water quality impact assessment* (all sites)	Refer to SMP: Water quality impact assessment* (all sites)	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p><State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement, aviation contractors></p>
Intertidal and coastal habitat assessment	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>Total 2 team leaders and 2 team members (2 per team)</p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>Total 4 team leaders and 4 team members (2 per team)</p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>Total 4 team leaders and 4 team members (2 per team)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p><State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement ></p>

SMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Seabirds and shorebirds	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>Total 2 team leaders and 2 team members (2 per team)</p> <p>Note: can initially be performed by the same team as OMP: Marine fauna assessment – seabirds and shorebirds. This SMP may replace OMP: Marine fauna assessment – seabirds and shorebirds if the OMPs termination criteria are triggered</p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>Total 4 team leaders and 4 team members (2 per team)</p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>Total 4 team leaders and 4 team members (2 per team)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p><State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement, aviation contractors></p>
<p>Marine mega-fauna assessment</p> <p><Titleholder to note relevant Marine mega-fauna SMPs></p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>Total 2 team leaders and 6 team members (4 per team)</p> <p>Note: can initially be performed by the same team as the relevant OMP: Marine fauna assessment. This SMP may replace the relevant OMP: Marine fauna assessment if the OMPs termination criteria are triggered</p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>Total 4 team leaders and 12 team members (4 per team)</p>	<p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>Total 4 team leaders and 12 team members (4 per team)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p><State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement, aviation contractors></p>
Benthic habitat assessment	<p>1 team (spill site and surrounds)</p> <p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>Total 3 team leaders and 6 team members (3 per team)</p>	<p>1 team (spill site and surrounds)</p> <p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>1 team (Site D)</p>	<p>1 team (spill site and surrounds)</p> <p>1 team (Site A)</p> <p>1 team (Site B)</p> <p>2 teams (Site C)</p> <p>1 team (Site D)</p>	<p><List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment></p> <p><State relevant contracts or arrangements e.g. marine</p>

SMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Marine fish and elasmobranch assemblages assessment	1 team (Site B) 1 team (Site E) 1 team (Site F) Total 3 team leaders and 6 team members (3 per team) Note: can initially be performed by the same team as OMP: Marine fauna assessment – fish. This SMP may replace OMP: Marine fauna assessment – fish if the OMPs termination criteria are triggered	Total 6 team leaders and 12 team members (3 per team) 1 team (Site B) 1 team (Site E) 1 team (Site F) Total 3 team leaders and 6 team members (3 per team)	Total 6 team leaders and 12 team members (3 per team) 1 team (Site B) 1 team (Site E) 1 team (Site F) Total 3 team leaders and 6 team members (3 per team)	contractors, laboratory arrangement > <List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment> <State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement >
Fisheries impact assessment	2 teams (Commonwealth fisheries with the potential to be impacted/are being impacted <Refer to relevant section of EP for fisheries information> Total 2 team leaders and 4 team members (3 per team) Note: can initially be performed by the same team as OMP: Marine fauna assessment – fish. This SMP may replace OMP: Marine fauna assessment – fish if the OMPs termination criteria are triggered	3 teams (Commonwealth fisheries with the potential to be impacted/are being impacted <Refer to relevant section of EP for fisheries information> Total 3 team leaders and 6 team members (3 per team)	4 teams (Commonwealth fisheries with the potential to be impacted/are being impacted <Refer to relevant section of EP for fisheries information> Total 4 team leaders and 8 team members (3 per team)	<List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment> <State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement >

SMP	Week 1 (total)	Week 2 (total)	Week 3 (total) onwards	Arrangement
Heritage features assessment	1 team Total 1 team leader and 2 team members (3 per team)	1 team Total 1 team leader and 2 team members (3 per team)	1 team Total 1 team leader and 2 team members (3 per team)	<List OSM Provider. Note if this contract includes provision of sampling equipment. If not, who will supply sampling equipment> <State relevant contracts or arrangements e.g. marine contractors, laboratory arrangement >
Social impact assessment	1 team Total 1 team leader and 2 team members (3 per team)	1 team Total 1 team leader and 2 team members (3 per team)	1 team Total 1 team leader and 2 team members (3 per team)	<List OSM Provider, or if performed by in-house personnel>

9 CAPABILITY ARRANGEMENTS

Guidance: As per Section 11 of the Joint Industry OSM Framework, Titleholders will need to state how they will meet their OSM resource requirements outlined in Section 8 of this plan. This may be through internal staff arrangements and/or via a dedicated OSM service provision contract. Titleholders must ensure they have sufficient scalable capability to implement each OMP and SMP that may be triggered by their worst case spill scenario. They are also required to check with their OSM Service Provider if they have the necessary qualifications and experience to implement each monitoring plan that is relevant to the Titleholder’s spill risk profile and likely receptors/response options. This check should be performed on a regular basis and the frequency of capability reporting should be outlined in this section.

If the Titleholder has arranged for the OSM Services Provider/s to provide sub-contracted personnel through its contracted arrangements then this should be stated.

Note: some monitoring plans are not traditionally covered by OSM Service Contracts e.g. OMP: Air Quality Modelling, OMP: Subsea Dispersant Injection Monitoring, SMP: Heritage Features Assessment and SMP: Social Impact Assessment. Titleholders are required to check contracted capability matches the personnel competencies outlined in the various OMPs and SMPs.

Worked example: <Titleholder> has contracted <Company A> to provide standby OSM response and implementation services, which includes lead contract, logistics and reporting. <Include details of supporting companies if relevant to the contract e.g. <Company A> will be supported by <Company B> and <Company C> (who will both report through Company A).

Details of OSM services are provided in Table 9-1. <Titleholder> will maintain responsibility for implementing OMP: Air Quality Modelling (responder health and safety) and SMP: Social Impact Assessment.

The OSM Services Provider is contracted to provide <Titleholder> with a monthly Standby Capability and Competency Report, which details personnel requirements for OMPs/SMPs, numbers of available personnel and competencies for service provider and sub-contracted personnel.

Personnel listed on the monthly update will be contactable via mobile phone during this period and accessible to <Location A e.g. airport> or <Location B e.g. port> within 48 hours of <Titleholder> initial activation of OSM Services.

Table 9-1: Worked example – OSM services provider standby and implementation services

Standby	Implementation
24/7 monitoring support accessed through 24 hr. call out number	Provision of an OSM Implementation Lead to the <Titleholder> IMT within 12 hours of notification
Provision of a suitably trained personnel, which includes support from <Company B and Company C>	Provision of a first-strike scientific team within 24 hours of notification, available in <location A> and ready to deploy
Monthly reports on personnel and equipment availability	Development of scientific response and sampling plans (based on modelled hydrocarbon spill scenario)
Access to <Company A’s> global network of scientific and engineering consulting expertise	Provision of a second-strike scientific team within 72 hours of notification, available in <location A> and ready to deploy
Access to <Company A’s> local network of terrestrial consultants, laboratories and field service providers	Priority access to <Company A> staff and equipment

9.1 PERSONNEL COMPETENCIES

Guidance: Section 11.3 of the Joint Industry OSM Framework provides minimum competencies for the key OSM Management Team roles. If a Titleholder elects to use this Framework but wants to vary from these minimum competencies, then they will need to specify why they have deviated from the Framework in this section.

Worked example (where the Titleholder does not want to deviate from the Framework competencies): <Titleholder> OSM Service Contract specifies the competency requirements for key OSM personnel. Where the key OSM role is held by the Titleholder, this is outlined in the <Titleholder> <Insert relevant title and document reference e.g. Competency and Training Management System>.

In addition and where practicable, <Titleholder> will engage its most qualified local environmental advisors in the initial stages of the monitoring program to help activate and mobilise monitoring teams and support the OSM Services Provider in the finalisation of monitoring designs.

9.2 EQUIPMENT

Guidance: In addition to the personnel arrangements outlined in Section 9.1, the Titleholder will also need to state how it will meet its monitoring equipment requirements. This may be through internal equipment held at facilities or supply bases and/or via its OSM service provision contract. Titleholders must ensure they have sufficient capability to implement each OMP and SMP that may be triggered by their worst case spill scenario and are required to check with their OSM Service Provider if they have access to the necessary equipment to implement each monitoring plan.

Worked example: Equipment requirements are listed in the individual OMPs and SMPs. A generalised breakdown of equipment types and the source is listed in Table 9-2.

In accordance with the OSM services contract, the OSM Services Provider will provide all specialised field monitoring equipment to implement individual OMPs and SMPs. <Titleholder> will remain responsible for support and field logistics, including monitoring platforms (e.g. vessels, vehicles and aircraft), flights and accommodation for personnel and transportation/couriers for samples to be sent back to laboratories.

Availability of field equipment will be listed in the OSM Services Provider's Standby Capability and Competency Report.

Table 9-2: OSM equipment

Equipment type	Source
Desktop equipment (e.g. Oil Spill Response Atlas, GIS)	Coordinated through <IMT GIS Team>
In-field specialised monitoring equipment (e.g. fluorometers, sample bottles, ROVs)	Coordinated through the OSM Services Provider's standby OSM response and implementation services
Logistical equipment (e.g. in-field accommodation, vessels, aircraft)	Refer to <insert document reference to suppliers of this equipment e.g. Resource Directory in OPEP, marine contracts, aviation contracts>

9.3 EXERCISES

Guidance: As outlined in Section 11.4 of the Joint Industry OSM Framework, Titleholders have a requirement to test the operational readiness of their response arrangements for monitoring. This may involve stand-alone OSM exercises/drills or where OSM forms a component of a larger incident management exercise. Titleholders should ensure the information presented in this section aligns to information presented on testing of response arrangements in the Implementation Strategy of their EP or OPEP.

Worked example: <Titleholder> maintains an <insert relevant reference e.g. Exercise and Training Schedule> as detailed in <insert relevant reference document> to ensure its competency in responding to

and managing major incidents, including oil spills. The <insert relevant reference e.g. Exercise and Training Schedule> is reviewed and revised (if required) annually.

As part of this schedule, <Titleholder> conducts a number of different exercise types that may include a component of operational and scientific monitoring, which are outlined in Table 9-3.

Table 9-3: Exercise types

Exercise Type	Description	Frequency
Notification exercise	Test procedures to notify and activate the IMT, oil spill response organisations, third party providers (including OSM contractors) and regulators	At least annually
Tabletop exercise	Normally involves interactive desktop discussions of a simulated scenario. OSM tabletop exercises may involve the following focus areas: <ul style="list-style-type: none"> • Test the time required to finalise monitoring design; • Test arrangements for delivery and use of data by IMT in decision-making; or • Data exchange test with field (opportunistic when contractors in in the field) 	As per <insert relevant reference e.g. Exercise and Training Schedule>
Incident Management Exercise	Involves IMT activation to establish command, control, and coordination of a Level 2 or 3 incident. Can simulate several different aspects of an oil spill incident and may involve third parties. OSM activation may be included as component of this exercise.	As per <insert relevant reference e.g. Exercise and Training Schedule>

The purpose of this testing is to confirm that the response arrangements and capability in place is available when needed and function as intended. As part of the exercise process, <Titleholder> prepares a number of documents to ensure drills and exercises are well planned, conducted and evaluated. To support this, the following documents are used for Level 2–3 exercises:

- Exercise Scope Document – provides background context to the exercise, outlines the exercise need, aim, objectives, details of the scenario, participating groups and agencies, exercise deliverables and management structure. This document can be used to engage a third-party contractor to assist in conducting the exercise
- Exercise plan and instructions – provide instructions and ‘play’ (including any injects) for conducting the exercise
- Post exercise report – includes an after-action review of the exercise, evaluating how the exercise performed against meeting its aim and objectives.

<Titleholder> routinely undertakes post-exercise debriefings following Level 2–3 exercises and drills to identify opportunities for improvement and communicate lessons learned. Actions that are derived from drills and exercises including debriefs are documented in an action tracking system.

<Titleholder> annually tests its standby arrangements and activation process with its OSM contractors, to ensure IMT roles and key OSM Services Provider personnel are familiar with the activation process and to check the OSM Services Provider’s Standby Capability and Competency Report.

<Titleholder> incorporates OSM activation and planning into at least one tabletop or incident management exercise each year. <Mention any specific training or exercises that have incorporated OSM activation or planning>.

10 CAPABILITY ASSESSMENT

Guidance: Demonstrating capability to implement each OMP and SMP may include an assessment of each monitoring plan, including identification of likely monitoring platforms, major supporting infrastructure (e.g. offshore accommodation), reactive baseline monitoring requirements (Section 4), initial survey arrangements (e.g. aerial followed up with ground reconnaissance) and ability to combine with other monitoring plans.

Table 10-1: Worked example – OSM capability

Component	Total Personnel Required (Weeks 1–2) ²	Personnel available via OSM Service Provider Standby Contract	Personnel available via OSROs	Titleholder	Total Personnel Available
OSM Personnel embedded in IMT	1 OSM Implementation Lead 1 OM Monitoring Coordinator 1 SM Coordinator 1 Field Operations Manager	1 OSM Implementation Lead 1 OM Monitoring Coordinator 1 SM Coordinator 1 Field Operations Manager	N/A	1 OSM Implementation Lead (initial)	1 OSM Implementation Lead 1 OM Monitoring Coordinator 1 SM Coordinator 1 Field Operations Manager
OMPs					
Hydrocarbon properties and weathering behaviour at sea*	4 team leaders 8 team members	5 team leaders 10 team members	N/A	N/A	5 team leaders 10 team members
Shoreline clean-up assessment	4 team leaders 8 team members	13 team leaders 24 team members	13 team leaders (AMOSC) 12 team leaders (OSRL)	N/A	26 team leaders 36 team members
Surface chemical dispersant effectiveness and fate	Visual observations: 1 team leader 1 team member Water quality assessment – refer to SMP: Water quality assessment	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea	Visual observations: 3 team leaders 4 team members	N/A	Visual observations: 3 team leaders 4 team members
Subsea chemical dispersant injection monitoring	18 specialist personnel for 24 hour operation	N/A	18 specialist personnel available through <e.g. OSRL sub-contracts>	N/A	18 specialist personnel available through <e.g. OSRL sub-contracts>

² If additional resources are required for week 3 onwards then this will be identified early in the monitoring process and <Titleholder> will activate additional contracted resources through its OSM Services Provider to increase capacity

Component	Total Personnel Required (Weeks 1–2) ²	Personnel available via OSM Service Provider Standby Contract	Personnel available via OSROs	Titleholder	Total Personnel Available
Water quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea				
Sediment quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea				
Marine fauna assessment	1 aerial team (including 1 Marine Mammal Observer (MMO) and 1 Aerial survey observer) 3 vessel teams (including 2 vessel-based survey trained MMOs, 1 experienced vessel survey observer per team)	16 MMOs 11 Aerial survey observers 21 vessel survey observers 6 experienced ornithologists 2 personnel with pathology or veterinary skills	N/A	N/A	16 MMOs 11 Aerial survey observers 21 vessel survey observers 6 experienced ornithologists 2 personnel with pathology or veterinary skills
Air quality modelling (responder health and safety)	1 Air Quality Specialist			1 Air Quality Specialist Specialists from Project and Technology Team	1 Air Quality Specialist Specialists from Project and Technology Team
SMPs					
Water quality impact assessment	Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered				
Sediment quality impact assessment	Refer to SMP: Water quality impact assessment* (all sites)				
Intertidal and coastal habitat assessment	4 team leaders 4 team members	12 team leaders 21 team members	N/A	N/A	12 team leaders 21 team members
Seabirds and shorebirds	Note: can initially be performed by the same team as OMP: Marine fauna assessment – seabirds and shorebirds. This SMP may replace OMP: Marine fauna assessment – seabirds and shorebirds if the OMPs termination criteria are triggered				
Marine mega-fauna assessment	Note: can initially be performed by the same team as OMP: Marine fauna assessment. This SMP may replace OMP: Marine fauna assessment if the OMPs termination criteria are triggered				

Component	Total Personnel Required (Weeks 1–2) ²	Personnel available via OSM Service Provider Standby Contract	Personnel available via OSROs	Titleholder	Total Personnel Available
Benthic habitat assessment	6 team leaders 12 team members	6 team leaders 12 team members	N/A	N/A	6 team leaders 12 team members
Marine fish and elasmobranch assemblages assessment	3 team leaders 6 team members	2 senior marine scientists trained in fish identification and necropsy 9 scientists with fish survey and ROV/BRUV experience 7 team members	N/A	N/A	2 senior marine scientists trained in fish identification and necropsy 9 scientists with fish survey and ROV/BRUV experience 7 team members
Fisheries impact assessment	3 team leaders 6 team members	2 senior marine scientists trained in fish identification and necropsy 9 scientists with fish survey and ROV/BRUV experience 7 team members	N/A	N/A	2 senior marine scientists trained in fish identification and necropsy 9 scientists with fish survey and ROV/BRUV experience 7 team members
Heritage features assessment	1 team leader 2 team members (including either ROV operator or marine diver/s)	1 team leader 2 team members (including either ROV operator or marine diver/s)	N/A	N/A	1 team leaders 2 team members (including either ROV operator or marine diver/s)
Social impact assessment	1 team leader 2 team members	N/A	N/A	3–4 Social impact assessment specialists	3–4 Social impact assessment specialists

* Initial co-mobilisation between OMP: Hydrocarbon properties and weathering behaviour at sea, OMP: Surface chemical dispersant effectiveness and fate, OMP: Water quality assessment and OMP: Sediment quality assessment

11 REVIEW OF PLAN

As part of the Environment Plan review cycle, this document will be reviewed annually and revised, if required, in accordance with the <Titleholder's> Management of Change Manual. This could include changes required in response to one or more of the following:

- When major changes have occurred which affect Operational and/or Scientific Monitoring coordination or capabilities (e.g. change of service provider/s);
- Changes to the activity that affect Operational and/or Scientific Monitoring coordination or capabilities (e.g. a significant increase in spill risk);
- Changes to legislative context related to Operational and/or Scientific Monitoring (e.g. EPBC Act protected matters requirements);
- Following routine testing of the OSM if improvements or corrections are identified; or
- After a Level 2/3 spill incident.

The extent of changes made to this OSM Bridging Implementation Plan and resultant requirements for regulatory resubmission will be informed by the relevant Commonwealth regulations, i.e. the OPGGS (E) Regulations.

PART B – IMPLEMENTATION

12 ACTIVATION PROCESS

Guidance: The Titleholder must outline the triggers and sequence of steps for activating OSM. Whilst some of these may initially be tasks completed internally, they are also likely to quickly involve the OSM Service Provider. The Titleholder shall liaise with its OSM Service Provider and agree on the process for activating its contract and personnel prior to completing this section. This should also address timeframes for commencing each task.

Worked example: <Titleholder> IMT Environment Unit Leader is responsible for activating OSM components, subject to approval from the Incident Commander. Table 12-1 outlines <Titleholder> OSM activation process.

Table 12-1: OSM Activation Process

Responsibility	Task	Timeframe	Complete
Environment Unit Leader (Titleholder)	Review initiation criteria of OMPs and SMPs during the preparation of the initial Incident Action Plan (IAPs) and subsequent IAPs; and if any criteria are met, activate relevant OMPs and SMPs	Within 4 hours of spill notification	<input type="checkbox"/>
	Obtain approval from Incident Commander Leader to initiate OSM	Within 4 hours of spill notification	<input type="checkbox"/>
	Contact OSM Services Provider and notify on-call officer of incident, requesting provision of OSM Implementation Lead to the IMT	Within 4 hours of spill notification	<input type="checkbox"/>
	Provide monitor and evaluate data (e.g. aerial surveillance, fate and weathering modelling, tracking buoy data) to OSM Services Provider	Within 1 hour of data being received by IMT	<input type="checkbox"/>
	Liaise directly with OSM Services Provider to confirm which OMPs and SMPs are to be fully activated	Within 3 hours of monitor and evaluate data being received from IMT	<input type="checkbox"/>
	Provide purchase order to OSM Services Provider (cross reference OSM Standby Services Scope of Work)	Within 72 hours of initial notification to OSM Services Provider	<input type="checkbox"/>
	Record tasks in Personal Log	At time of completion of task	<input type="checkbox"/>
OSM Services Provider	On-call officer to notify Service Provider Manager of activation and contact OSM Implementation Lead and Scientific Logistics Coordinator	Within 8 hours of notification being made to OSM Services Provider	<input type="checkbox"/>
	Send OSM Implementation Lead and Scientific Logistics Coordinator to IMT	Within 12 hours of notification being made to OSM Services Provider	<input type="checkbox"/>
	Liaise directly with EUL to confirm which OMPs and SMPs are to be fully activated	Within 4 hours of monitor and	<input type="checkbox"/>

Responsibility	Task	Timeframe	Complete
		evaluate data being received from IMT	
	Confirm availability of initial personnel and equipment resources	Within 5 hours of monitor and evaluate data being received from IMT	<input type="checkbox"/>

13 MONITORING PRIORITIES

Guidance: This section should point the OSM Management Team to where the monitoring priorities are identified and then describe the tasks for confirming monitoring locations based on this assessment and other data inputs.

Worked example: As described in Section 2, the available spill trajectory modelling has been analysed to understand the likely initial monitoring priorities for its activities in the EMBA. In addition, Table 4-2 lists comparability of available baseline data for receptors, to assist in identifying where post-spill, pre-impact monitoring should be prioritised.

The monitoring priorities provided in Section 2 and Table 4-2 are to be used for guidance when confirming monitoring priorities in consultation with key stakeholders and monitoring service providers (including subject matter experts, where available) at the time of the spill. Table 13-1 provides a checklist to assist in the confirmation of monitoring priorities for individual spills.

Table 13-1: Checklist for determining monitoring priorities

Responsibility	Task	Timeframe	Complete
OSM Services Provider with input from Environment Unit Leader	Confirm monitoring locations for activated OMPs and SMPs based on: <ul style="list-style-type: none"> • Current monitor and evaluate data (i.e. situational awareness data, including predicted time to receptor impact, aerial/vessel surveillance observations, tracking buoy data, satellite data); • Nature of hydrocarbon spill (i.e. subsea blow out, surface release, hydrocarbon characteristics, volume, expected duration of release); • Seasonality and presence of receptors impacted or at risk of being impacted; • Current information on transient and broadscale receptors (surface and subsea); • Current operational considerations (e.g. weather, logistics); • Nature of hydrocarbon spill (i.e. subsea blow out, surface release, hydrocarbon characteristics, volume, expected duration of release); • Monitoring priorities identified in Section 2; and • Existing literature, baseline data, and monitoring programs. 	Within 12 hours of monitor and evaluate data being received from IMT	<input type="checkbox"/>

Responsibility	Task	Timeframe	Complete
	Evaluate monitoring priorities in consultation with key stakeholders, including the appointed State/Territory Environment and Science Coordinator	Within 12 hours of monitor and evaluate data being received from IMT	<input type="checkbox"/>
	Using the results of the baseline data analysis in Table 4-2 and the information above, determine priority locations for post-spill, pre-impact monitoring	Within 12 hours of monitor and evaluate data being received from IMT	<input type="checkbox"/>
	Confirm the need for any additional reactive baseline monitoring data for SMPs and determine suitable locations, noting that suitable control or reference sites may be outside of the EMBA	Within 12 hours of monitor and evaluate data being received from IMT	<input type="checkbox"/>
	Continually re-evaluate monitoring priorities in consultation with EUL and relevant key stakeholders throughout spill response (and with <insert relevant appointed person> – see Section 6 and relevant key stakeholders post-response)	Ongoing	<input type="checkbox"/>

14 PROTECTED MATTERS REQUIREMENTS

Guidance: Titleholder’s Environment Plans will list protected matters that exist within the EMBA such as World Heritage Areas, National and Commonwealth Heritage Areas, Australian Marine Parks, Ramsar wetlands, threatened ecological communities, threatened species and migratory species.

Titleholders will need to consider this information and outline if there are any relevant protected matters requirements from various plans or advice statements that must be reviewed and incorporated into the finalised monitoring design for relevant SMPs.

Worked example: Table 14-1 provides a checklist to ensure monitoring personnel consider protected matters requirements in the finalisation of OMPs and SMPs.

Appendix B outlines the management plans, recovery plans and conservation advice statements relevant for the protected matters within the EMBA that are likely to be relevant to the final design of the OMPs and SMPs. Appendix B also includes relevant priority monitoring locations where these receptors are known to occur in order to expedite consideration of relevant information into finalised monitoring designs.

Table 14-1: Checklist for inclusion of protected matters into monitoring designs

Responsibility	Task	Complete
OSM Services Provider with input from Environment Unit Leader	Review Monitoring, Evaluation and Surveillance data and available OMP data to determine likely presence and encounter of protected species in predicted trajectory of the spill	<input type="checkbox"/>
	Review the relevant recovery plan/conservation advice/management plan in Appendix B and determine if there have been any updates to the relevant conservation threats/actions. Integrate relevant considerations into the final monitoring design for affected OMPs and SMPs	<input type="checkbox"/>

Responsibility	Task	Complete
	Review restrictions on marine mammal buffer distances in SMP: Marine mega-fauna and ensure this is included in all relevant response and monitoring IAPs (e.g. Shoreline Protection Plan, Shoreline Clean-up Plan, OSM Plan), so that response and monitoring field teams maintain required buffer distances from fauna during operations	<input type="checkbox"/>

15 FINALISING MONITORING DESIGN

Worked example: The methods presented in the Joint Industry OMPs and SMPs are designed to allow Monitoring Providers with the flexibility to modify the standard operating procedures, so that the latest research, technologies, equipment, sampling methods and variables may be used. Monitoring designs may also be varied in-situ, according to the factors presented in Section 10.6 of the Joint Industry OSM Framework.

<Titleholder> checklist for finalising monitoring designs post-spill is provided in Table 15-1. The OSM Implementation Lead will be responsible for approving the finalised monitoring design used in the OMPs and SMPs.

Table 15-1: Checklist for finalising monitoring design

Responsibility	Task	Timeframe	Complete
OSM Services Provider	Confirm survey objectives, sampling technique, for each initiated OMP and SMP	Within 48 hours of initial monitoring priorities being confirmed by IMT	<input type="checkbox"/>
	Determine suitable sampling frequency	Within 48 hours of initial monitoring priorities being confirmed by IMT	<input type="checkbox"/>
	Finalise standard operating procedures	Within 48 hours of initial monitoring priorities being confirmed by IMT	<input type="checkbox"/>
	Scientific monitoring: <ul style="list-style-type: none"> • Establish benchmarks and guidelines to be used • Confirm indicator species • Confirm parameters and metrics 	Within 96 hours of initial monitoring priorities being confirmed by IMT	<input type="checkbox"/>

16 MOBILISATION

Worked example: When the monitoring design has been finalised for each OMP and SMP, the OSM Services Provider shall work in conjunction with the Titleholder to develop and execute a monitoring mobilisation plan, which will be incorporated into the Incident Action Planning process.

The OSM Services Provider will be required to coordinate the availability of personnel and equipment for all monitoring programs <note here if there are any exceptions e.g. OMP: Air Quality Modelling>. <Note the logistics that the Titleholder is responsible for e.g. <insert name> will be responsible for flights, accommodation and victualing for field personnel. <insert name> will also be required to procure all vessels, aerial platforms and vehicles for OMP and SMP implementation>.

A checklist for mobilising monitoring teams is provided in Table 16-1.

Note: OMP: Air quality modelling is a desk top assessment and should be mobilised as soon as practicable as it is not reliant on any mobilisation of field personnel.

Table 16-1: Checklist for mobilisation of monitoring teams

Responsibility	Task	Complete	
OSM Services Provider with input from Environment Unit Leader	Confirm availability of all monitoring personnel (noting required competencies in Section 10.1 and individual OMPs/SMPs)	<input type="checkbox"/>	
	Allocate number of teams, personnel, equipment and supporting resource requirements	<input type="checkbox"/>	
	Undertake HAZIDs as required and consolidate/review field documentation including safety plans, emergency response plans, and daily field reports	<input type="checkbox"/>	
	Develop site-specific health and safety plans which is compliant with health safety and environment systems (including call in timing and procedures)	<input type="checkbox"/>	
	Conduct pre-mobilisation meeting with monitoring team/s on survey objectives, logistics, safety issues, reporting requirements and data management collection requirements	<input type="checkbox"/>	
	Determine data management delivery needs of the IMT/EMT and process requirements, including data transfer approach and frequency/timing	<input type="checkbox"/>	
	Confirm data formats and metadata requirements with personnel receiving data	<input type="checkbox"/>	
	Logistics		
	Confirm flights, accommodation, and car hire arrangements are in place	<input type="checkbox"/>	
	Develop field survey schedules, detailing staff rotation	<input type="checkbox"/>	
Equipment			
Arrange survey platform (vessel, vehicle, aircraft) as required to survey or access survey sites and ensure they are equipped with appropriate fridge and freezer space for transportation of samples (and carcasses if collecting)	<input type="checkbox"/>		
Ensure vessels have correct fit-out specifications (e.g. winches, GPS, satellite, hiab, sufficient deck space, water supplies (fresh and/or salt), accommodation)	<input type="checkbox"/>		
Confirm consumables (including personal protective equipment) have been purchased and will be delivered to required location	<input type="checkbox"/>		
Liaise with NATA-accredited laboratories to confirm availability, limits of detection, sampling holding times, transportation, obtain sample analysis quotes and arrange provision of appropriate sample containers, Chain of Custody (CoC) forms and suitable storage options for all samples. Make arrangements for couriers (if necessary)	<input type="checkbox"/>		

Responsibility	Task	Complete
	Confirm specialist equipment requirements and availability (including redundancy)	<input type="checkbox"/>
	Check GPS units and digital cameras are working and that sufficient spare batteries and memory cards are available	<input type="checkbox"/>
	Confirm sufficient equipment to allow integration of survey software and navigational systems (e.g. GPS, additional equipment and adaptors), and additional GPS units prepared	<input type="checkbox"/>
	Confirm GPS survey positions (where available) have been QA/QC checked and pre-loaded into navigation software/positioning system	<input type="checkbox"/>
	Check field laptops, ensuring they have batteries (including spares), power cable, and are functional	<input type="checkbox"/>
	Check if a first aid kit or specialist PPE is required	<input type="checkbox"/>
	Confirm arrangements for freight to mobilisation port is in place	<input type="checkbox"/>

17 PERMITS AND ACCESS REQUIREMENTS

Guidance: Section 10.8 of the Joint Industry OSM Framework provides relevant permitting information for Commonwealth, Western Australian and Northern Territory receptors. Titleholders will need to modify this table to make it specific to their EMBA and include relevant locations or sites. Titleholders will also need to specify who will be responsible for obtaining the relevant permits.

Worked example: Permit and access requirements apply to Marine Parks, Marine Protected Areas, restricted heritage areas, operational areas of industrial sites, defence locations, certain fauna and managed fisheries. Table 17-1 lists relevant protected areas within the EMBA and the jurisdictional authority to be contacted to obtain the necessary permit or access permission.

The OSM Services Provider is responsible for submitting access and permit applications to all relevant Jurisdictional Authorities to conduct monitoring for OMPs and SMPs.

Table 17-1: Worked example – Permits required in EMBA

Receptor	Location	Jurisdictional Authority	Relevant information on permits
Permits for monitoring fauna	N/A	State/Territory government department with jurisdiction for fauna Department of Agriculture, Water and the Environment	Any interactions involving nationally listed threatened fauna may require approval from DoAWE (http://www.environment.gov.au/biodiversity/threatened/permits) WA- appropriate permits can be found at: https://www.dpaw.wa.gov.au/plants-and-animals/licences-and-authorities?showall=&start=4 NT- permits can be found at: https://nt.gov.au/environment/animals/wildlife-permits/permits-take-interfere-with-wildlife
State/Territory Marine Protected Areas; Fish Habitat Protection Areas	<ul style="list-style-type: none"> Lalang-garram / Camden Sound North Kimberley Rowley Shoals Eighty Mile Beach Montebello Islands Barrow Island Muiron Islands Ningaloo Shark Bay 	State/Territory government department with jurisdiction for parks and wildlife State/Territory government department with jurisdiction for fisheries	No specific permitting requirements exist for monitoring in WA marine protected areas, but additional information is available at: https://www.dpaw.wa.gov.au/management/marine , https://www.dpaw.wa.gov.au/management/marine/marine-parks-and-reserves and https://www.fish.wa.gov.au/Sustainability-and-Environment/Aquatic-Biodiversity/Marine-Protected-Areas/Pages/default.aspx No specific permitting requirements exist for monitoring in NT fish protection areas, but zones are described here: https://nt.gov.au/marine/recreational-fishing/when-and-where-to-fish/reef-fish-protection-areas
Ramsar wetland	<ul style="list-style-type: none"> Browse Island Ashmore Reef Marine Park Cobourg Peninsula Ramsar site Dales Ramsar site Hosnies Spring Ramsar site 	Commonwealth Department of Environment and Energy	Additional information on Ramsar wetlands and how they are protected as a matter of national environmental significance under the EPBC Act is available at: https://www.environment.gov.au/epbc/what-is-protected/wetlands

Receptor	Location	Jurisdictional Authority	Relevant information on permits
Australian (Commonwealth) Marine Parks	<ul style="list-style-type: none"> • Oceanic Shoals Marine Park • Arafura Marine Park • Arnhem Marine Park • Agro-Rowley Terrace Marine Park • Kimberley Marine Park • Cartier Island Marine Park • Gascoyne Marine Park • Mermaid Reef Marine Park • Eighty Mile Beach Marine Park 	Parks Australia	<p>Permit and licence application information for Marine Protected Areas (including monitoring) can be found at: https://onlineservices.environment.gov.au/parks/australian-marine-parks and https://onlineservices.environment.gov.au/parks/australian-marine-parks/permits</p> <p>Additional information on permitting requirements in Australian Marine Parks can be obtained through Parks Australia via email marineparks@environment.gov.au or phone 1800 069 352</p> <p>Information on permits to access biological resources in Commonwealth areas can be found at: http://www.environment.gov.au/topics/science-and-research/australias-biological-resources/access-biological-resources-commonwealth</p>
State/Territory Managed Fisheries	WA <ul style="list-style-type: none"> • Mackerel Fishery • Northern Demersal Scalefish Fishery • Northern Shark Fishery • Pearl Oyster Fisheries • West Coast Deep Sea Crustacean Fishery • Specimen Shell Managed Fishery • Marine Aquarium Fish Managed Fishery 	State/Territory government department with jurisdiction for fisheries	<p>No specific permitting requirements exist for WA Fisheries, but additional information is available at – https://www.fish.wa.gov.au/Fishing-and-Aquaculture/Pages/default.aspx</p> <p>No specific permitting requirements exist for NT Fisheries, but additional information is available at – https://dpir.nt.gov.au/fisheries</p>

Receptor	Location	Jurisdictional Authority	Relevant information on permits
	<ul style="list-style-type: none"> • Kimberley Gillnet and Barramundi Managed Fishery • WA Sea Cucumber Fishery • North Coast Prawn Fishery <p>NT</p> <ul style="list-style-type: none"> • Barramundi Fishery • Coastal Line Fishery • Coastal Net Fishery • Spanish Mackerel Fishery • Demersal Fishery • Offshore Net and Line Fishery • Mud Crab Fishery • Aquarium Fish/Display Fishery • Trepang Fishery • Timor Reef Fishery • Fishing Tour Operator Fishery • Pearl Oyster Fishery • Bait Net Fishery 		
Commonwealth Managed Fisheries	<ul style="list-style-type: none"> • Western Tuna and Billfish Fishery 	Australian Fishing Management Authority	Commonwealth Managed Fisheries (scientific permit for research/monitoring in an Australian Fishing Zone) https://www.afma.gov.au/fisheries-services/fishing-rights-permits

Receptor	Location	Jurisdictional Authority	Relevant information on permits
	<ul style="list-style-type: none"> Western Skipjack Fishery Southern Bluefin Tuna Fishery North West Slope Trawl Fishery Northern Prawn Fishery Western Deepwater Trawl Fishery 		
Indigenous Cultural Heritage	Sites are located throughout EMBA	State/Territory government department with jurisdiction for indigenous heritage	<p>Entry access permits to Aboriginal Lands in WA: https://www.wa.gov.au/service/aboriginal-affairs/aboriginal-heritage-conservation/apply-permit-access-or-travel-through-aboriginal-land</p> <p>Aboriginal heritage sites in WA: https://www.wa.gov.au/service/aboriginal-affairs/aboriginal-cultural-heritage/search-aboriginal-sites-or-heritage-places</p> <p>Indigenous heritage information in NT: https://nt.gov.au/leisure/arts-culture-heritage/visit-a-cultural-or-heritage-site/indigenous-heritage-information</p>
Defence/restricted military area	North Australian Exercise Area (NAXA) offshore training area and the Browse Basin and Northern Carnarvon Basin offshore air-to-air weapons ranges (maritime military zones)	Department of Defence	<p>Unexploded Ordnances (mapping information): https://www.defence.gov.au/UXO/default.asp</p> <p>Maritime military firing practice and exercise areas: https://www.hydro.gov.au/factsheets/FS_Navigation-Firing_Practice_and_Exercise_Areas.pdf</p>
Industry (e.g. operational zone of	<ul style="list-style-type: none"> Montara FPSO Facility (Jadestone) Ichthys Facility (INPEX) 	Operating company	Safety zones (up to 500 m from outer edge of well or equipment) – https://www.nopsema.gov.au/safety/safety-zones/

Receptor	Location	Jurisdictional Authority	Relevant information on permits
offshore oil or gas platform)			
Shipwrecks	<ul style="list-style-type: none"> A number of unnamed Indonesian fishing vessels and the <i>Sinar Bonerate</i> are known to be in the vicinity of Ashmore Reef and Cartier Island The <i>Unident</i> and <i>Selina</i> are known to be in the vicinity of Browse Island 	State/Territory or Commonwealth government department with jurisdiction for maritime cultural heritage/ archaeology	Underwater heritage protected zones (Commonwealth): www.environment.gov.au/heritage/underwater-heritage/protected-zones NT protected zones: https://nt.gov.au/leisure/arts-culture-heritage/visit-a-cultural-or-heritage-site/maritime-heritage

18 USE OF DATA IN RESPONSE DECISION-MAKING

18.1 OPERATIONAL MONITORING TO INFORM RESPONSE ACTIVITIES

Guidance: Titleholders should liaise with personnel nominated to form the OSM Management Team (e.g. OSM Service Provider/s) and determine their data transfer process between field teams and the IMT/EMT. Arrangements and processes of how the data may be used by the IMT/EMT support decisions should be outlined.

Worked example: The OSM Services Provider is responsible for the collection of data by field teams, which shall be QA/QC checked by the Field Team Lead in accordance with the requirements listed in the finalised OMPs and SMPs (where applicable). The Team Lead will be responsible for communicating data back to the OSM Management Team (led by the OSM Services Provider) via field reporting forms, debriefs and reports. Laboratory analysis reports should also be directed to the OSM Management Team.

The OSM Management Team is responsible for the interpretation and analysis of data. OMP data should be analysed rapidly so that it may be used to inform response planning and decisions in the current and/or next operating period. SMP data is designed to be more scientifically robust and long-term in nature and is not relied upon by the IMT for decision-making. Therefore, SMP data will be analysed more thoroughly by the OSM Management Team.

Once data is analysed and checked by the Field Team Lead, it will be provided to the IMT Situation Unit Lead, who will then distribute the data from each monitoring component to the relevant IMT Unit and/or Section. Table 18-1 provides guidance on the type of data generated from each OMP, which IMT Section/Unit requires the data and how the data may be used during a response. All SMP data received during a response will be received by the IMT Situation Unit Lead and IMT Environment Unit Lead simultaneously.

Analysed data will then be incorporated into the Common Operating Picture (managed by the Situation Unit Lead) and used by the Environment Unit Lead during development of the operational SIMA, which would be included in the IAP for the current or next operating period.

As ultimately responsible for the IAPs, the Planning Section Chief will be required to determine if the response options can be commenced, continued, escalated, terminated, or if controls need to be put in place to manage impacts of the response activities. These decisions will be communicated to the broader IMT during regular situation debriefs.

Table 18-1: Data generated from each OMP and how this may be used by IMT in decision-making

Operational Monitoring Plan	Data generated ³	IMT Section requiring data	How data may be used by IMT
Hydrocarbon properties and weathering behaviour at sea	Hydrocarbon physical characteristics (e.g. viscosity, asphaltene content, fingerprinting, weathering ratios of hydrocarbon chains)	Planning Section to aid in response option selection / modification	Changes to the hydrocarbon properties will affect the window of opportunity for particular responses and the associated logistical requirements of these responses, such as use of chemical dispersants, recovery and pumping equipment suitability, hydrocarbon storage and hydrocarbon disposal requirements
Shoreline clean-up assessment	Assessment of shoreline character; assessment of shoreline oiling; recommendations for response activities; post-treatment surveys	Planning Section to aid in IAP development and response option selection / modification	Confirmation of shoreline character, habitats and fauna present which may influence selection of response tactics (e.g. no mechanical recovery if turtles are known to be nesting); Oil deposition and/or removal rate for a shoreline sector will help determine effectiveness of relevant tactics (e.g. shoreline protection and/or clean-up operations); Assessment teams provide ground truthing of sites that are not possible via satellite imagery, therefore the IMT can rely on the recommendations of Assessment Teams (e.g. flagging access issues, suitable tactics, likely resourcing needs)
Surface chemical dispersant effectiveness and fate	Visual observations of dispersant efficacy; concentration of hydrocarbons in water column (see also water quality assessment);	Environment Unit for use in operational SIMA; Planning Section to aid in IAP development; Operations Section to confirm dispersant effectiveness for decision-making purposes in current operations period.	Determine the effectiveness of dispersant in removing oil from sea surface and how dispersed oil is being distributed through the water column. This information can be used in SIMA to help decide if dispersants are being effective at treating high value receptors (SIMA to evaluate any trade-offs between receptors)
Subsea dispersant injection	Visual observations of dispersant efficacy; concentration of hydrocarbons in water column (see also water quality assessment)	Source Control Branch to aid decision-making for other source control operations; Environment Unit for use in operational SIMA; Planning Section to aid in IAP development.	Determine efficacy of subsea dispersant in treating oil to help understand if injection should continue or be modified; understand the nature and extent of the subsea plume; and provide an initial assessment of potential ecological effects. This information can be used in SIMA to help decide if dispersants are being effective at

³ Summary only. For additional detail, please refer to individual OMPs. Also note data outputs will be reliant on finalised monitoring design.

Operational Monitoring Plan	Data generated ³	IMT Section requiring data	How data may be used by IMT
			<p>treating high value receptors (SIMA to evaluate any trade-offs between receptors) and also if subsea dispersants are effectively reducing volatile organic compound (VOC) levels so that operations are within lower explosive limits (LEL)</p>
Water quality assessment	Distribution of oil in water column and change in hydrocarbon concentrations (e.g. total recoverable hydrocarbons, BETEXN, PAH), physio-chemical parameters and dispersant detection	Situation Unit Lead to validate surveillance and modelling data; Planning Section for use in IAP	Confirm spatial extent of spill within the water column and verify spill modelling and surveillance data; extent of spill can in turn influence location of other OMP and SMP monitoring components and sites. Data can also influence ongoing use of dispersant through ongoing operational SIMA.
Sediment quality assessment	Distribution of oil in sediment and change in hydrocarbon concentrations (e.g. Total recoverable hydrocarbons, BETEXN, PAH)	Situation Unit Lead to validate surveillance and modelling data; Planning Section for use in IAP	Confirm spatial extent of spill; extent of spill can in turn influence location of other OMP and SMP monitoring components and sites
Marine fauna assessment <ul style="list-style-type: none"> • Reptiles • Cetaceans (observational only) • Dugongs • Seabirds and shorebirds • Fish 	Rapid assessment of presence and distribution of marine fauna; evaluate impact of spill and response activities on fauna	Planning Section for use in IAP; Oiled Wildlife Unit/Division to help in developing Wildlife Response Sub-plan	Understanding of species, populations and geographical locations at greatest risk from spill impacts. IMT can use this information to help qualify locations with highest level of protection priority (e.g. dugong nursery area is at risk of high contact therefore dispersant use closest to spill source may be a preferred option); understanding the impacts of spill response activities can help IMT to modify or terminate activities if they are assessed as creating more harm than the oil alone (e.g. large shoreline clean-up teams and staging areas may disturb shorebird nesting resulting in adults abandoning chicks)
Air quality modelling (responder health and safety)	Modelled outputs of airborne hydrocarbons, gases and chemicals and their predicted distribution	Operations Section to help determine safe zones in close vicinity of spill; Planning Section for use in IAP	Determine safe distances from spill source for response personnel; determine the presence and persistence of volatile organic compounds to know if response areas are safe for personnel

18.2 IMPACTS FROM RESPONSE ACTIVITIES

Worked example: Table 10-4 of the Joint Industry OSM Framework outlines the potential impacts from response activities and the relevant OMP/SMP for monitoring impacts. For example, if shoreline clean-up was being considered as a response option, then possible impacts resulting from that activity could include physical presence, ground disturbance, water/sediment quality decline and lighting/noise impacts to fauna.

When finalising monitoring designs, the OSM Implementation Lead shall review Table 10-4 of the Joint Industry OSM Framework to ensure potential impacts from response activities are considered and incorporated into relevant OMP/SMP designs.

18.3 OPERATIONAL MONITORING OF EFFECTIVENESS OF CONTROL MEASURES AND TO ENSURE EPS ARE MET

Guidance: Provide a description of how operational monitoring will confirm that Environmental Performance Standards are being met (e.g. when, where and how response resources are being deployed and response options implemented). The Titleholder will need to identify where their relevant Environmental Performance Standards are listed (e.g. OPEP and/or EP).

Worked example: When finalising monitoring designs, the OSM Implementation Lead and Environment Unit Lead (or delegate) shall review the Environmental Performance Standards listed in the <insert name> OPEP and integrate checks into the monitoring design that will help determine if relevant Environmental Performance Standards are being met.

Table 18-2 provides examples of Environmental Performance Standards listed in <insert name> OPEP and how operational monitoring may be able to confirm it is being met.

Table 18-2: Example Environmental Performance Standards

Environmental Performance Standard	Confirmation that Environmental Performance Standard is being met
Shoreline clean-up	
Clean-up activities in sensitive environments will be conducted in front of the primary dune and clean-up crews will not access land behind the primary dune	Ongoing implementation of OMP: Shoreline Clean-up Assessment will involve assessment teams conducting surveys over shoreline segments actively being cleaned. Assessment teams will note any areas of disturbance of these activities.
Dispersant application	
Visual efficacy of dispersant conducted prior to broader application of dispersant	OMP: Surface chemical dispersant effectiveness and fate includes visual effectiveness as Tier I of the Special Monitoring of Applied Response Technologies (SMART) Protocol and will be able to provide the IMT with confirmation (via OSM Management Team) of dispersant efficacy prior to broader application

19 DATA MANAGEMENT

Guidance: Minimum standards for data management are provided in Section 10.11 of the Joint Industry OSM Framework. If the Titleholder has any specific data management requirements for OSM then these should be stated here.

20 QUALITY ASSURANCE AND QUALITY CONTROL

Refer to Section 10.11 of the Joint Industry OSM Framework for QA/QC minimum standards.

21 COMMUNICATION PROTOCOLS

Guidance: In preparing this section, Titleholders will need to consider the pathways and key personnel for communications between its IMT and OSM Services Provider/s during the response phase and between the Titleholder and the OSM Services Provider/s post response. This is to ensure clear and consistent messaging in what would be a highly dynamic and evolving situation.

In addition, the Titleholder has obligations under various legislation to share monitoring outputs with regulatory agencies/authorities. This is described in Section 10.12 of the Joint Industry OSM Framework.

21.1 OSM SERVICES PROVIDER/S

Worked example: Communication protocols between <Titleholder> and its OSM Services Provider with respect to delivery of the OMPs and SMPs (during both preparedness and implementation) are intentionally defined to ensure clear and consistent information is provided in both directions.

The following communication protocols must be observed:

- Communication between <Titleholder> and its OSM Services Provider during the preparedness phase (pre-spill) and during activation (prior to deployment) will be between the Environment Unit Lead (EUL) (or delegate) and the OSM Services Provider Lead respectively.
- During implementation (post deployment), primary communication occurs via two pathways:
 - 1 EUL and the OSM Services Provider Lead for contractual, management, scientific and general direction matters; and
 - 2 <Titleholder> On-Scene Commander and the OSM Services Provider's Field Operations Manager for on-site matters.
- All OSM operational decisions should be logged in an OSM decision log by key personnel.
- All OSM tasks, actions and requirements should be documented in an IAP during the response phase of the spill.
- The <Titleholder> EUL will keep the Operations Section Chief, Logistics Section Chief and Planning Section Chief briefed of the OSM status as required.
- All correspondence (copies of emails and records of phone calls) between <Titleholder> and the OSM Services Provider during a response should be recorded and kept on file.
- All communication received by OSM Services Provider not in line with these protocols should be reported to the EUL who will seek guidance on the accuracy of the information received.
- Unless related to safety (e.g. evacuation), any direction or instruction received by the OSM Services Provider outside of these protocols should be confirmed via the <Titleholder> EUL or On-Scene Commander prior to implementation.

During the post-response phase all communications shall be between the <Titleholder> Environment Advisor and the OSM Services Provider OSM Implementation Lead.

21.2 EXTERNAL STAKEHOLDERS

Worked example: Results of OMPs and SMPs will be discussed with relevant stakeholders. Information will be shared with regulatory agencies/authorities as required and inputs received from stakeholders will be evaluated and where practicable, will be used to refine the ongoing spill response and/or ongoing operational and/or scientific monitoring.

<Titleholder> IMT Public Information Officer and/or Liaison Officer (initially be will same individual) will be the focal point for external engagement during the response operation.

Stakeholder communications post-response will be managed by <Titleholder> External (Government) Relations Team.

22 STAND DOWN PROCESS

Worked example: Monitoring for each component will continue until termination criteria for individual components are reached. Typically, OMPs will terminate when agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response or a relevant SMP has been activated. SMPs will continue after the spill response has been terminated and until such time as their termination criteria are also reached. A list of criteria is provided in the OSM Framework.

After OMPs are terminated, the OMP monitoring teams will be advised to stand down. Following this stage, the OSM Services Provider will run a lessons-learned meeting between <Titleholder>, all monitoring providers and other relevant stakeholders. It is the responsibility of <Titleholder> to ensure that lessons learnt are communicated to the relevant stakeholder groups. The lessons discussed should include both positive actions to be reinforced and lessons for actions that could be improved in future standby or response campaigns.

23 REFERENCES

APPEA (2021) Joint Industry Operational and Scientific Monitoring Plan Framework. Rev D. Report prepared by BlueSands Environmental for APPEA Marine and Environmental Science Working Group.

Department of Environment and Conservation (DEC) (2007) Rowley Shoals Marine Park Management Plan (2007) 2007–2017, Management Plan No. 56. DEC, Perth, WA

Department of Parks and Wildlife (DPaW) (2014) Eighty Mile Beach Marine Park Management Plan 2014–2024, Management Plan No. 80, DPaW, Perth, WA

DPaW (2016) North Kimberley Marine Park Joint management plan 2016. Uunguu, Balanggarra, Miriuwung Gajerrong, and Wilinggin management areas, No. 89. DPaW, Perth, WA

DPaW (2013) Lalang-garram / Camden Sound Marine Park management plan No. 73 2013–2023, DPaW, Perth, WA

Kirby MF, Brant J, Moore J, Lincoln S (eds) (2018) PREMIAM – Pollution Response in Emergencies – Marine Impact Assessment and Monitoring: Post-incident monitoring guidelines. Second Edition. Science Series Technical Report. Cefas, Lowestoft.

24 ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Definition
ALA	Atlas of Living Australia
AMOSOC	Australian Marine Oil Spill Centre
API	American Petroleum Institute
APPEA	Australian Petroleum Production and Exploration Association
BIA	Biologically Important Areas
CoC	Chain of Custody
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DBCA	Western Australian Department of Biodiversity Conservation and Attractions
DoAWE	Commonwealth Department of Agriculture, Water and the Environment
DoT	Western Australian Department of Transport
DPTI	South Australian Department of Planning, Transport and Infrastructure
EMBA	Environment that may be Affected
EP	Environment Plan
EUL	Environment Unit Lead
GIS	Geographic Information System
GPS	Geographic Positioning System
HSE	Health, Safety, and Environment
IAP	Incident Action Plan
ICS	Incident Command System
IMT	Incident Management Team
IMT Leader	Incident Management Team Leader. Equivalent to an Incident Controller or Incident Commander.
KEF	Key Ecological Feature
OMP	Operational Monitoring Plan
OPEP	Oil Pollution Emergency Plan
OPGGGS (E)	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 Regulations
OSM	Operational and Scientific Monitoring
OSRA	Oil Spill Response Atlas
OSRL	Oil Spill Response Limited
OSTM	Oil Spill Trajectory Modelling
OWR	Oiled Wildlife Response
PPE	Personal Protective Equipment
QA/QC	Quality Assurance and Quality Control
SIMA	Spill Impact Mitigation Assessment

Abbreviation/Acronym	Definition
SMP	Scientific Monitoring Plan
SSDI	Subsea Dispersant Injection
SWIS	Subsea Well Intervention Services
UAV	Unmanned Aerial Vehicle

APPENDIX A: BASELINE DATA SOURCES

Table A-1: Baseline data sources

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
Water and sediment quality	Hydrocarbon abundance and distribution (including natural seeps) in the vicinity of the Prelude/Ichthys fields of the Browse Basin	CSIRO/AIMS (Link to report)	East Browse Basin
	McAlpine, KW, Sim, CB, Masini, RJ and Daly, T 2010, Baseline petroleum hydrocarbon content of marine water, shoreline sediment and intertidal biota at selected sites in the Kimberley bioregion, Western Australia. Marine Technical Report Series No. MTR3, Office of the Environmental Protection Authority (OEPA), Perth, Western Australia.	WA EPA (Link to report)	Kimberley bioregion (16 shoreline sites, mainland and islands, spanning 340 km)
	Browse Island habitat descriptions – Draft EIS Technical Appendices – Appendix 4 Ichthys Gas Field Development Project Studies of the Offshore Marine Environment (also described in Ecological studies of the Bonaparte Archipelago and Browse Basin – Cetacean survey – additional detail on a 2006 aerial survey in contained in this report)	INPEX (Link to report)	Browse Basin Region (Ichthys Field to Echuca Shoal)
	Montara Reports ‘Control site water quality data’ (Operational Monitoring Study O2 – Monitoring of Oil Character, Fate and Effects, Report 02 Water Quality and Monitoring of Oil Character, Fate and Effects, Report 03 Dispersant Treated Oil Distribution)	PTTEP (Link to report)	Broome to Darwin (Mainland) Islands – Browse, Ashmore, Cartier, Hibernia Reef
Shorelines and intertidal habitats	Browse Island habitat descriptions – Draft EIS Technical Appendices – Appendix 4 Ichthys Gas Field Development Project Studies of the Offshore Marine Environment	INPEX (Link to report)	Browse Island
	Montara Reports: Shoreline Ecological Assessment Aerial and Ground Surveys 7–19 November 2009 (Kimberley Coast)	PTTEP (Link to report)	Kimberley Coast
	Shoreline Assessment Ground Survey: An operational component of the Monitoring Plan for the Montara Well Release Timor Sea (Ashmore, Cartier and Hibernia Islands).	PTTEP (Link to report)	Ashmore, Cartier and Hibernia Islands

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
Benthic communities and fish assemblages	Scott Reef Research Project – Long-term monitoring of shallow water coral and fish communities at Scott Reef	AIMS (Link to reports)	Scott Reef (South Reef, North Reef and Seringapatam Reef)
	The composition and structure of shallow benthic reef communities in the Kimberley, north-west Australia	WA Museum (Link to report)	Kimberley Region
	Montara: Vulcan, Barracouta East and Goeree Shoals Survey 2013; Heyward et al 2013; Report for PTTEP Australasia (Ashmore Cartier) Pty Ltd. Australian Institute of Marine Science, Perth.	PTTEP (Link to report)	Barracouta, Goeree and Vulcan Shoals
	Montara: Barracouta, Goeree and Vulcan Shoals Survey 2016 Report for PTTEP Australasia (Ashmore Cartier) Pty Ltd. Australian Institute of Marine Science, Townsville.	PTTEP (Link to report)	Barracouta, Goeree and Vulcan Shoals
	Montara reports: Final Report on Benthic Surveys at Ashmore, Cartier and Seringapatam Reefs (post-spill)	PTTEP (Link to report)	Ashmore, Cartier and Seringapatam Reefs
	Applied Research Program (ARP7): Subtidal Benthos: towards benthic baselines in the Browse Basin. Final report – Submerged Shoals	Shell/INPEX (Link to report)	Echuca and Heywood shoals
	Marine Biodiversity Survey of Mermaid Reef (Rowley Shoals), Scott and Seringapatam Reef	Western Australian Museum (Link to report)	Mermaid Reef (Rowley Shoals), Scott and Seringapatam Reef
	Browse Island habitat descriptions – Draft EIS Technical Appendices – Appendix 4 Ichthys Gas Field Development Project Studies of the Offshore Marine Environment	INPEX (2010) (Link to report)	Browse Island, Echuca Shoal, Ichthys Field
	ARP7: Subtidal Benthos: towards benthic baselines in the Browse Basin – Quantitative information on the abundance, diversity and temporal variability of benthos and associated fish – Browse Island reef	AIMS (Shell/INPEX)	Browse Island
Benthic primary productivity: production and herbivory of seagrasses, macroalgae and microalgae	WAMSI (Link to report)	Bardi Jawi Indigenous Protected Area (IPA), encompassing Cygnet Bay, One Arm Point, Jalan (Tallon Island) and Iwany (Sunday Island)	

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Baselines of benthic communities, herbivory and reef metabolism at Browse Island	CSIRO/UWA/AIMS (Link to report)	Browse Island
	Egg size and fecundity of biannually spawning corals at Scott Reef	AIMS – Foster, T and Gilmour, J (Link to report)	Scott Reef
Marine reptiles	Long term monitoring of the marine turtles of Scott Reef	SKM/Woodside (Link to report)	Scott Reef
	Marine Turtles in the Kimberley: key biological indices required to understand and manage nesting turtles along the Kimberley coast	WAMSI (Link to report)	Near complete coverage of Kimberley Coast and Islands (>44,000 georeferenced images)
	Ecology of Marine Turtles of the Dampier Peninsula and the Lacepede Island Group, 2009–2010	RPS/Woodside (Link to report)	Dampier Peninsula and the Lacepede Islands
	Ecological studies of the Bonaparte Archipelago and Browse Basin – Marine Turtles	INPEX (Waayers, D) (Link to report)	Maret Islands and other islands in the Bonaparte Archipelago
Seabirds and shorebirds	The status of seabirds and shorebirds at Ashmore Reef, Cartier Island and Browse Island. Monitoring Program for the Montara Well Release. Pre-Impact Assessment and First Post-Impact Field Survey	PTTEP (Clarke, R. et al) (Link to report)	Ashmore Reef (including Cartier Island) and Browse Island
	Evaluating the impacts of local and international pressures on migratory shorebirds in Roebuck Bay and Eighty Mile Beach	WAMSI (Rogers et al.) (Link to report)	Roebuck Bay and Eighty Mile Beach
	Adele Island Bird Survey Report	DBCA (Boyle, et al.) (Link to report)	Adele Island
	Shell/INPEX ARP6 Milestone Report #7- Lacepede Islands: Report comparing the diet composition, foraging habitat and breeding between species and between years on Lacepede islands	Monash/UWA/AIMS	Lacepede Islands
	Ecological studies of the Bonaparte Archipelago and Browse Basin – Seabird survey	INPEX (Link to report)	Browse Island and Maret Islands
Marine mammals	Humpback Whale Survey Report. Browse Marine Mammal Fauna Survey	Woodside (RPS) (Link to Humpback Whale report 2010) (Link to Humpback Whale report 2011) (Link to dugong report 2009)	Browse Basin – James Price Point Migration Corridor, Pender Bay, Gourdon Bay, Scott Reef

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Humpback whale use of the Kimberley: understanding and monitoring spatial distribution (analysis of historical data, including other reports mentioned in this review. Also provides analysis of whale survey techniques and recommendations for future monitoring)	WAMSI	Kimberley region
	Browse Island habitat descriptions – Draft EIS Technical Appendices – Appendix 4 Ichthys Gas Field Development Project Studies of the Offshore Marine Environment (also described in Ecological studies of the Bonaparte Archipelago and Browse Basin – Cetacean survey – additional detail on a 2006 aerial survey in contained in this report)	INPEX (Link to report)	Browse Basin Region (Browse Island to Scott Reef)
	Integrating Indigenous knowledge and survey techniques to develop a baseline for dugong (Dugong dugon) management in the Kimberley	WAMSI (Link to report)	North Kimberley (Broome to NT border) South Kimberley (Broome to Port Hedland)
Commercial fisheries	Commercial Fisheries data collected by WA Department of Fisheries (WA DoF) and Australian Fishing Management Authority (AFMA)	WA Department of Fisheries / Australian Fishing Management Authority	Australia wide
	Montara Well Release: Olfactory analysis of Timor Sea fish fillets	Curtin University/PTTEP (Link to report)	Timor Sea
	Montara Well Release Monitoring Study S4A – Assessment of Effects on Timor Sea Fish	Curtin University/PTTEP (Link to report)	Vulcan Shoal, Heywood Shoal, Browse Island, Echuca Shoal, Scott Reef
	Montara Well Release: Assessment of Fish catch for the presence of Oil	PTTEP (Link to report)	Northern Demersal Scalefish Managed Fishery (NDSF)
	Monitoring the Northern Demersal Scalefish Managed Fishery: Establishing Baseline Biomarker Levels in Commercially Important Demersal Fishes	Curtin/AIMS	East Browse Basin
	Monitoring the Northern Demersal Scalefish Managed Fishery: accounting for spatial variability and detecting change in key fish populations	Curtin/CSIRO/AIMS	East Browse Basin

APPENDIX B: PROTECTED MATTERS IN THE EMBA

Guidance: The table below provides an example of how Titleholders may choose to identify the relevant management plans, recovery plans and conservation advice statements in their OSM Bridging Implementation Plan. Authors should note that this list is not exhaustive and is only a brief summary. This list of receptors should align to the protected matters listing in the Titleholder’s relevant EPs (note the cross referencing in each category). It is likely that many receptors will need to be included in this table.

Table B-1: Worked example of how to list protected matters in the EMBA, relevant monitoring plans and priority sites

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
Mammals (refer to Section XX of EP for additional description of key receptors)				
Sei whale	Approved conservation advice <i>Balaenoptera borealis</i> (sei whale) (Threatened Species Scientific Committee 2015a)	<ul style="list-style-type: none"> Relevant threat/s: pollution, vessel disturbance Relevant management actions: report vessel strikes 	<ul style="list-style-type: none"> OMP: Marine fauna assessment – Cetaceans SMP: Marine mega-fauna assessment – Whale sharks, dugongs and cetaceans 	N/A
Humpback whale	Approved conservation advice for <i>Megaptera novaeangliae</i> (humpback whale) (Threatened Species Scientific Committee 2015c)	<ul style="list-style-type: none"> Relevant threat/s: habitat degradation, vessel disturbance or strike. Relevant management actions: Minimise vessel collisions. 		Location A (XX days – entrained)
Reptiles (refer to Section XX of EP for additional description of key receptors)				
Loggerhead turtle, green turtle, leatherback turtle, hawksbill turtle, flatback turtle, olive ridley turtle	Recovery plan for marine turtles in Australia (Commonwealth of Australia 2017)	<ul style="list-style-type: none"> Relevant threat/s: chemical and terrestrial discharge, light pollution, vessel disturbance, habitat modification Relevant management actions from recovery plan: <p>Chemical and terrestrial discharge</p>	<ul style="list-style-type: none"> OMP: Shoreline clean-up assessment OMP: Marine fauna assessment – Reptiles SMP: Marine mega-fauna assessment – Reptiles 	<ul style="list-style-type: none"> Location B (1.8 days) Location C (4.5 days) Location D (5.5 days)

⁴ Unless otherwise noted, all results are floating oil timeframes to contact.

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
		<ul style="list-style-type: none"> Ensure spill risk strategies and response programs adequately include management for marine turtles and their habitats, particularly in reference to ‘slow to recover habitats’, e.g. nesting habitat, seagrass meadows or coral reefs. Quantify the impacts of decreased water quality on stock viability. Quantify the accumulation and effects of anthropogenic toxins in marine turtles, their foraging habitats and subsequent stock viability. <p>Light</p> <ul style="list-style-type: none"> Artificial light within or adjacent to habitat critical to the survival of marine turtles will be managed such that marine turtles are not displaced from these habitats 		
Sharks and rays (refer to Section XX of EP for additional description of key receptors)				
White shark	Recovery plan for the white shark (<i>Carcharodon carcharias</i>) (DSEWPaC 2013)	<ul style="list-style-type: none"> Relevant threat/s: habitat modification. Relevant management objectives: Continue to identify and protect habitat critical to the survival of the white shark and minimise the impact of threatening processes within these areas 	<ul style="list-style-type: none"> OMP: Marine fauna assessment – Fish SMP: Marine mega-fauna assessment – Marine fish and elasmobranch assemblages assessment 	N/A

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
Whale shark	Approved conservation advice <i>Rhincodon typus</i> whale shark (Threatened Species Scientific Committee 2015d)	No relevant threat or management actions identified	<ul style="list-style-type: none"> OMP: Marine fauna assessment – Fish SMP: Marine mega-fauna assessment – Whale sharks, dugongs and cetaceans 	Location C (4.5 days)
Birds (refer to Section XX of EP for additional description of key receptors)				
Migratory shorebird species ⁵	Wildlife conservation plan for migratory shorebirds (Commonwealth of Australia 2015c)	<ul style="list-style-type: none"> Relevant threat/s: habitat modification, acute pollution, anthropogenic disturbance No relevant management actions identified 	<ul style="list-style-type: none"> OMP: Shoreline clean-up assessment OMP: Marine fauna assessment – Seabirds and shorebirds SMP: Seabirds and shorebirds 	Location D (5.5 days)
Red knot, knot	Approved Conservation Advice for <i>Calidris canutus</i> (Red knot) (Threatened Species Scientific Committee 2016a)	<ul style="list-style-type: none"> Relevant threat/s: damage to nesting habitat, pollution Relevant management actions: manage disturbance at important sites which are subject to anthropogenic disturbance when red knot are present – e.g. discourage or prohibit vehicle access, implement temporary site closures 	<ul style="list-style-type: none"> SMP: Seabirds and shorebirds 	<ul style="list-style-type: none"> Location C (4.5 days) Location D (5.5 days)
Threatened Ecological Communities (refer to Section XX of EP for additional description of key receptors for each location)				
Monsoon vine thickets on the coastal sand	Approved Conservation Advice for the Monsoon vine thickets on the coastal sand dunes of Dampier Peninsula	<ul style="list-style-type: none"> Relevant threat/s : Clearing (shoreline clean-up and/or shoreline based monitoring activities) 	<ul style="list-style-type: none"> OMP: Shoreline clean-up assessment SMP: Intertidal and Coastal Habitat Assessment 	Location A (23 days - entrained)

⁵ Red knot, great knot, greater sand plover, lesser sand plover and bar-tailed godwit.

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
dunes of Dampier Peninsula		<ul style="list-style-type: none"> Relevant management actions: Protect and conserve remaining areas of the ecological community, monitor condition of Monsoon vine tickets 		
RAMSAR Wetlands (refer to Section XX of EP for additional description of key receptors for each location)				
Ashmore Reef National Nature Reserve (birds, turtles, dugongs)	Ashmore Reef Commonwealth Marine Reserve Ramsar Site Ecological Character Description	<ul style="list-style-type: none"> Relevant threat: oil and gas exploration and mining – boat strike, lighting, toxic effects of oil spills Limits of acceptable change to elements (component, process, service) of ecological character defined in Table 27 of Ecological Character Description 	<ul style="list-style-type: none"> OMP: Water quality assessment OMP: Sediment quality assessment OMP: Shoreline clean-up assessment OMP: Marine fauna assessment – Seabirds and shorebirds SMP: Water quality impact assessment SMP: Sediment quality impact assessment SMP: Intertidal and Coastal Habitat Assessment SMP: Seabirds and shorebirds OMP: Marine fauna assessment – Dugongs SMP: Marine mega-fauna assessment – Whale sharks, cetaceans and dugongs 	<ul style="list-style-type: none"> Location C (4.5 days) Location D (5.5 days)

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
<ul style="list-style-type: none"> SMP: Benthic habitat assessment 				
Australian Marine Parks (refer to Section XX of EP for additional description of key receptors for each location)				
North-west Marine Parks Network	North-west Marine Parks Network Management Plan 2018	Relevant management actions: Park protection and management—timely and appropriate preventative and restorative actions to protect natural, cultural and heritage values from impacts	<ul style="list-style-type: none"> OMP: Water quality assessment OMP: Sediment quality assessment OMP: Shoreline clean-up assessment OMP: Marine fauna assessment – Seabirds and shorebirds SMP: Water quality impact assessment SMP: Sediment quality impact assessment SMP: Intertidal and Coastal Habitat Assessment SMP: Seabirds and shorebirds OMP: Marine fauna assessment – Dugongs SMP: Marine mega-fauna assessment – Whale sharks, cetaceans and dugongs SMP: Benthic habitat assessment 	<ul style="list-style-type: none"> Location B (1.8 days) Location C (4.5 days) Location D (5.5 days) Location A (23 days - entrained)

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
Western Australian Marine Parks (refer to Section XX of EP for additional description of key receptors for each location)				
Eighty Mile Beach Marine Park	Eighty Mile Beach Marine Park management plan 80 2014–2024	<ul style="list-style-type: none"> • Relevant management issues: oil spills, physical disturbance to reefs, anchoring from vessels, boat strike (turtles/cetaceans) • Relevant management actions: ensure the values of the park are fed into predictive models for oil spills, apply appropriate anchoring practices 	<ul style="list-style-type: none"> • SMP: Marine fish and elasmobranch assemblages assessment • OMP: Water quality assessment • OMP: Sediment quality assessment • OMP: Shoreline clean-up assessment • OMP: Marine fauna assessment – Seabirds and shorebirds 	N/A
Montebello Islands Marine Park/Barrow Island Marine Park/Barrow Island Marine Management Area	Management Plan for the Montebello/Barrow Islands Marine Conservation Reserves 2007–2017 Management Plan No 55	<ul style="list-style-type: none"> • Relevant management issues: oil spills, physical disturbance to reefs, anchoring from vessels, boat strike (turtles/cetaceans), lighting (turtles) • Relevant management actions: ensure the values of the park are fed into predictive models for oil spills, apply appropriate anchoring controls 	<ul style="list-style-type: none"> • SMP: Water quality impact assessment • SMP: Sediment quality impact assessment • SMP: Intertidal and Coastal Habitat Assessment • SMP: Seabirds and shorebirds • OMP: Marine fauna assessment – Dugongs • SMP: Marine mega-fauna assessment – Whale sharks, cetaceans and dugongs • SMP: Benthic habitat assessment 	N/A

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
World Heritage Properties (refer to Section XX of EP for additional description of key receptors for each location)				
Shark Bay World Heritage Property Strategic Plan 2008–2020	<ul style="list-style-type: none"> Potential pollution sources include: oil spills. Relevant management objective: Minimise the impact of pollution and waste on World Heritage values and the overall integrity of the World Heritage Property. 	Relevant actions: Manage wildlife interactions in accordance with controls and regulations provided under the Wildlife Conservation Act and CALM Act; In consultation with relevant management agencies, identify research and monitoring priorities for cultural heritage	<ul style="list-style-type: none"> SMP: Marine fish and elasmobranch assemblages assessment OMP: Water quality assessment OMP: Sediment quality assessment OMP: Shoreline clean-up assessment OMP: Marine fauna assessment – Seabirds and shorebirds 	N/A
Ningaloo Coast Strategic Management Framework	<ul style="list-style-type: none"> Major potential threats include: resource development. Management consistent with the objectives and underlying principles of the Ningaloo Coast management system, including Ningaloo Marine Park (Commonwealth), WA Ningaloo Marine Park and Muiron Islands Marine Management Area, Cape Range National Park, unallocated Crown land, freehold owners and leaseholders, Learmonth Air Weapons Range Facility. 	No relevant threats or management actions identified	<ul style="list-style-type: none"> SMP: Water quality impact assessment SMP: Sediment quality impact assessment SMP: Intertidal and Coastal Habitat Assessment SMP: Seabirds and shorebirds OMP: Marine fauna assessment – Dugongs SMP: Marine mega-fauna assessment – Whale sharks, cetaceans and dugongs SMP: Benthic habitat assessment 	N/A

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
			<ul style="list-style-type: none"> SMP: Marine fish and elasmobranch assemblages assessment 	
Commonwealth Heritage Places (refer to Section XX of EP for additional description of key receptors for each location)				
Ningaloo Marine Area – Commonwealth Waters	N/A	N/A	<ul style="list-style-type: none"> OMP: Water quality assessment OMP: Sediment quality assessment OMP: Shoreline clean-up assessment OMP: Marine fauna assessment – Seabirds and shorebirds SMP: Water quality impact assessment SMP: Sediment quality impact assessment SMP: Intertidal and Coastal Habitat Assessment SMP: Seabirds and shorebirds OMP: Marine fauna assessment – Dugongs SMP: Marine mega-fauna assessment – Whale sharks, cetaceans and dugongs SMP: Benthic habitat assessment 	N/A

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
			<ul style="list-style-type: none"> SMP: Marine fish and elasmobranch assemblages assessment 	
National Heritage Places (refer to Section XX of EP for additional description of key receptors for each location)				
Barrow Island and the Montebello-Barrow Islands Marine Conservation Reserves	N/A	N/A	<ul style="list-style-type: none"> OMP: Water quality assessment OMP: Sediment quality assessment OMP: Shoreline clean-up assessment 	Location A (23 days - entrained)
The Ningaloo Coast	Refer to The Ningaloo Coast World Heritage Area	N/A	<ul style="list-style-type: none"> OMP: Marine fauna assessment – Seabirds and shorebirds SMP: Water quality impact assessment SMP: Sediment quality impact assessment SMP: Intertidal and Coastal Habitat Assessment SMP: Seabirds and shorebirds OMP: Marine fauna assessment – Dugongs SMP: Marine mega-fauna assessment – Whale sharks, cetaceans and dugongs SMP: Benthic habitat assessment 	N/A

Receptor	Recovery plan / conservation advice (date issued)	Relevant threats and conservation actions	Relevant OMPs and SMPs	Relevant priority monitoring locations (quickest modelled time to contact ⁴)
			<ul style="list-style-type: none"> SMP: Marine fish and elasmobranch assemblages assessment SMP: Social Impact Assessment 	
Shark Bay, Western Australia	Refer to Shark Bay, Western Australia World Heritage Area			N/A
HMAS Sydney II and HSK Kormoran Shipwreck Sites	N/A			N/A

