CHA Operations Oil Pollution Emergency Plan (OPEP)

Triangle Energy (Operations) Pty Ltd Controlled Document

10HSEQENVPL15

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Document Control and Revisions

This Oil Pollution Emergency Plan (OPEP) for the Cliff Head Alpha (CHA) Offshore Operations is a controlled document. This OPEP shall be revised in the following circumstances:

- On discovery of a significant new risk; or
- On a significant change to the operation; or
- After a period of 5 years, as required under the Commonwealth's Offshore Petroleum and Greenhouse Gas Storage (OPGGS) (Environment) Regulations 2009

Revision History

Rev	Issue date	Revision summary	Originator	Reviewer	Approver
4	24/01/2023	Five-year review	J Chidlow	B Donaldson	B Donaldson
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3a	21/11/2019	Revised emergency response arrangements, update roles and responsibilities according to IGN personnel requirements and re-formatting	D Royal	B Donaldson	M Jacobs
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1	11/10/2016	Revised in response to NOPSEMA comments	A Badri	C Fu	A Smith

Approvals

This CHA Operations Oil Pollution Emergency Plan (OPEP) has been reviewed by Triangle Energy (Operations) Pty Ltd and is approved for the Cliff Head Alpha Operation.

Approval: Triangle Energy (Operations) Pty Ltd

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4	TEO Asset and Integrity Manager
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6	TEO HSEQ & Regulatory Manager
7	TEO Senior Environmental Advisor
8	Emergency Response Room (Perth IMT)
9	Business Incident Management Team (TEO)
10	AMOSC
11	AMSA
12	DoT Manager Maritime Environmental Emergency Response (MEER)
13	DMIRS
14	NOPSEMA
15	DoT MEER Operations Officer
16	Manager – AMSA EPG

References

Document Number	Document Name
10HSEQENVPC04	Prescribed Waste Management
10HSEQENVPL01	Cliff Head Field Offshore Operations Environment Plan
10HSEQENVPL02	CHA Operations Oil Spill Contingency Plan
10HSEQENVPL08	Cliff Head Onshore Operations Oil Spill Contingency Plan
10HSEQENVPL09	Cliff Head Field Onshore Operations Environment Plan
10HSEQENVPL11	Cliff Head Field State Offshore Environment Plan
10HSEQGENPL01	Cliff Head Emergency Management Plan
10HSEQGENPL01RG01	CHA-ASP Emergency Response Exercise Schedule
4716-HS-0114	Overarching Operational and Scientific Monitoring Plan
10HSEQGENPC08FM01	Job Hazard Analysis Form

Terms and Abbreviations

Abbreviation	Description
ADIOS	Automated Data Inquiry for Oil Spills. Oil weathering model developed by NOAA
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
CA	Control Agency
BIMT	Business Incident Management Team
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DBCA	Department of Biodiversity, Conservation and Attractions
DMIRS	WA Department of Mines, Industry Regulation and Safety
DoT	WA Department of Transport
DoT MEER	WA Department of Transport Maritime Environmental Emergency Response
DWER	WA Department of Water and Environmental Regulation
EPG	Environment Protection Group (AMSA)
TRT	Tactical Response Team
ESC	Environmental and Scientific Coordinator
HFO	Heavy Fuel Oil
HMA	Hazard Management Agency
HSES	Health, Safety Environment and Security
IAP	Incident Action Plan
IC	Incident Controller (Perth Incident Management Team Leader)
ICC	Incident Command Centre
IMT	Incident Management Team
IMTL	Incident Management Team Leader (Perth Incident Controller)
JBMP	Jurien Bay Marine Park
MAC	Mutual Aid Contact (AMOSPlan term)
MEE	Maritime Environmental Emergencies
MEER	Maritime Environmental Emergency Response
MEP	Marine Environment Protection (part of DoT responsible for oil spill coordination)
MOC	Management of Change
MOP	Marine Oil Pollution
NOPSEMA	National Offshore Petroleum Safety and Environment Management Authority
NATPLAN	National Plan
NEBA	Net Environmental Benefit Analysis
NRT	National Response Team
OH&S	Occupational Health and Safety
OO	Operations Officer
OSMP	Operational and Scientific Monitoring Plan (Overarching)
OPEP	Oil Pollution Emergency Plan
OMP	Operational Monitoring Plan
OSRA	Oil Spill Response Atlas
OSMT	Operational and Scientific Monitoring Team

Abbreviation	Description
OSTM	Oil Spill Trajectory Model
PIC	Person In Charge
POLREP	Pollution Report
RCC	Rescue Coordination Centre
SITREP	Situation Report
SMPC	State Marine Pollution Coordinator
SMP	Scientific Monitoring Plan
SMPEP	Shipboard Marine Pollution Emergency Plan
SOPEP	Shipboard Oil Pollution Emergency Plan
TEO	Triangle Energy (Operations) Pty Ltd
TRTL	Tactical Response Team Leader (Site PIC)
WAOWRM	Western Australian Oiled Wildlife Response Manual
WAOWRP	Western Australian Oiled Wildlife Response Plan

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OPERATIONAL SECTION

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1 Immediate Response Actions

1.1 Allocation of Control / Hazard Management Agency (HMA) Responsibility

During a spill response, there will be both a Jurisdictional Authority and a Controlling Agency assigned to the oil spill incident for all Spill Response Levels.

- The Jurisdictional Authority is the relevant Statutory Authority that has responsibilities for oil pollution in that jurisdiction.
- The Controlling Agency is the agency or company assigned by legislation, administrative arrangements or within the relevant contingency plan to control response activities to an oil pollution emergency.

With respect to a hydrocarbon spill from CHA operations, the relevant Jurisdictional Authority and Controlling Agency varies dependent upon:

- the location of the spill (Commonwealth or State waters);
- the nature of the incident (vessel or non-vessel based); and
- the Spill Response Level (Table 1-1).

Table 1-1: Jurisdictional Authorities and Controlling Agencies for oil spill response

Role	Spill Level	State Waters		Commonwealth Waters	
		Non-vessel	Vessel	Non-vessel	Vessel
Controlling Agency	1	Petroleum Titleholder (TEO)	DoT	Petroleum Titleholder (TEO)	AMSA
	2/3	DoT	DoT	Petroleum Titleholder (TEO)	AMSA
Jurisdictional Authority	1/2/3 (All spills)	DoT	DoT	NOPSEMA	AMSA

DoT: Western Australian (WA) Department of Transport

AMSA: Australian Maritime Safety Authority

Note: Cross jurisdictional authority: Where a Level 2/3 spill originating in Commonwealth waters moves into State waters, two Controlling Agencies will exist: DoT and the Petroleum Titleholder (Triangle Energy (Operations) (TEO)), each with its own Incident Management Team (IMT).

TEO will be responsible for coordinating a first-strike response to all spills until such time as WA DoT takes over the role as Controlling Agency, in the event of a Level 2/3 spill in State Waters, at which time TEO would provide all necessary resources (including personnel and equipment) as a Supporting Agency.

1.1.1 TEO Resource and Capability

TEO has the resources, experience, and technical expertise to act as the Control Agency for incident level one, two and three response actions within the scope of this OPEP.

TEO has the resources in place to cover costs arising from responding to oil spills resulting from its Petroleum Activities. This includes costs incurred by relevant Controlling Agencies (e.g. DoT, AMSA) and third-party spill response.

The decision to implement the spill response is made in consultation with the relevant Controlling Agency/s, Jurisdictional Authorities and other Statutory Authorities that play an advisory role (e.g. DBCA). This decision will be made with consideration of the following factors:

- The efficacy and benefit of response options
- Potential for additional pollution
- Potential for environmental damage caused by clean-up efforts; and
- An assessment of prevailing weather conditions that can increase risk to response teams or increase the efficacy in weathering hydrocarbon.

A Net Environmental Benefit Analysis (NEBA) will be conducted to inform the decision-making process.

1.1.2 Non-vessel Petroleum Activity Spill in Commonwealth Waters

For an offshore non-vessel oil spill incident in Commonwealth waters the Jurisdictional Authority is NOPSEMA. NOPSEMA is responsible for the oversight of response actions to pollution events from offshore Petroleum Activities, in areas of Commonwealth jurisdiction.

During a spill incident, NOPSEMA's role will be to implement regulatory processes to monitor and secure compliance with the *OPGGS Act 2006* and OPGGS (Environment) Regulations 2009, including the issuing of directions as required, and investigate accidents, occurrences and circumstances involving deficiencies in environment management.

Under the OPGGS (Environment) Regulations 2009 and the *OPGGS Act 2006*, the Petroleum Titleholder (i.e. TEO) is responsible for responding to an oil spill incident as the Controlling Agency in Commonwealth waters, in accordance with its OPEP.

TEO is the Control Agency for any spills from the CHA platform, pipeline and/or associated infrastructure and therefore has the operational responsibility to respond to the oil spill in accordance with this OPEP until such a time as the relevant Jurisdictional Agency (NOPSEMA) identifies the need to delegate control. In this situation, Controlling Agency responsibility may be delegated to AMSA who will assume control of the incident and respond in accordance with AMSA's National Plan for Maritime Environmental Emergencies (NatPlan). In such an occurrence, TEO would assume a Support Agency role and make available all necessary resources to support AMSA in AMSA's performance of their Controlling Agency responsibilities.

1.1.3 Non-vessel Petroleum Activity Spill in State Waters

For WA State waters, the DoT Marine Safety General Manager is prescribed as the Hazard Management Agency (HMA) for marine oil pollution as per the WA *Emergency Management Act 2005* and Emergency Management Regulations 2006.

The DoT as the HMA has developed the State Hazard Plan – Maritime Environmental Emergencies (MEE). This Plan contains information relating to the arrangements for managing marine oil pollution and marine transport emergencies.

These arrangements effectively nominate DoT as the equivalent Jurisdictional Authority for Petroleum Activity spills in State waters, whose responsibility is to ensure there is an adequate response to the State \ marine pollution. The Controlling Agency for Level 1 Petroleum Activity spills in State waters is the Petroleum Titleholder (TEO) with the Controlling Agency for Level 2/3 spills nominated as DoT.

While TEO is not the Controlling Agency for Level 2/3 Petroleum Activity spills in State waters, TEO is required to have adequate plans and resources available to effectively respond to a worst-case spill originating in State waters under State Petroleum legislation administered by DMIRS:

- *Petroleum (Submerged Lands) Act 1982 and Petroleum (Submerged Lands) (Environment) Regulations 2012*
- *Petroleum Pipelines Act 1969 and Petroleum Pipelines (Environment) Regulations 2012*.

1.1.4 Cross-jurisdiction Non-vessel Petroleum Activity Spills

For a Level 2/3 Petroleum Activity spill, there is the possibility of the spill crossing jurisdictions between Commonwealth and State waters. In these instances, the Jurisdictional Authority remains true to the source of the spill (i.e. NOPSEMA for Commonwealth waters and DoT for State waters).

Where a Level 2/3 spill originating in Commonwealth waters moves into State waters, two Controlling Agencies will exist: DoT and the Petroleum Titleholder (TEO), each with its own Incident Management Team (IMT).

1.1.5 Vessel Spills in Commonwealth Waters

For a vessel incident originating in Commonwealth Waters the Jurisdictional Authority and Control Agency is AMSA. AMSA is the national shipping and maritime industry regulator and was established under the *Australian Maritime Safety Authority Act 1990*. AMSA manages the NatPlan on behalf of the Australian Government, working with State and the Northern Territory governments, emergency services and private industry to maximise Australia's marine pollution response capability.

As with non-vessel spills, TEO is required to have adequate preparedness arrangements for spills from vessels undertaking Petroleum Activities within Commonwealth waters under *OPGGS Act 2006* and OPGGS (Environment) Regulations 2009.

TEO will be responsible for coordinating a first-strike response to a vessel-based spill in Commonwealth waters until such time as AMSA takes over the role as Controlling Agency, at which time TEO would provide all available resources as a Supporting Agency.

1.1.6 Vessel Spills in State Waters

For a vessel incident originating in State Waters the Jurisdictional Authority/Hazard Management Agency is DoT as it is for non-vessel spills. DoT is also the Controlling Agency for Level 2/3 vessel spills in State waters under State Hazard Plan - MEE arrangements.

As with non-vessel spills, TEO is required to have adequate preparedness arrangements for spills from vessels undertaking Petroleum Activities within State Petroleum legislation administered by DMIRS.

TEO will be responsible for coordinating a first-strike response to all vessel based spills until such time as DoT takes over the role as Controlling Agency, in the event of a Level 2/3 spill, at which time TEO would provide all necessary resources (including personnel and equipment) as a Supporting Agency.

1.2 Essential Information

This OPEP covers the Cliff Head Oil Field Development operational phase in offshore Commonwealth waters. Environmental sensitivities are included in the associated EP for these operations [10HSEQENVPL01]. Table 1-2 below provides a summary of the site and hydrocarbon types in the field.

Table 1-2: Hydrocarbon Summary

Site Details		
Platform Location	Lat -29º27'00.4"S, Long 114º52'12.11"E	
Water Depth at Platform	18 m	
Platform Distance from shoreline	10 km	
Length of Pipeline	12 km	
Volume of Pipeline	650 m^3 (4,088 bbl)	
Location of Pipeline at HDD	Lat -29º 25' 34.2", Long 114º 57' 58.7"	
Hydrocarbon Type		
Cliff Head crude oil Group III high pour point (Treat as Group IV)	API Gravity	33.5
	Density	856.7kg/m^3
	Dynamic Viscosity (cP)	13.5 cP @ 50 ºC
	Pour point	33ºC
Diesel Oils Group II	Density (gm/cm^3)	0.84 gm/cm^3 @ 15ºC
	Viscosity (cP)	4 cP@25ºC
	Pour point	~12ºC

1.3 Response Process

The process below provides an overview of how TEO manages a spill response.

The detailed check sheets, procedures and resources are shown in the organogram below.

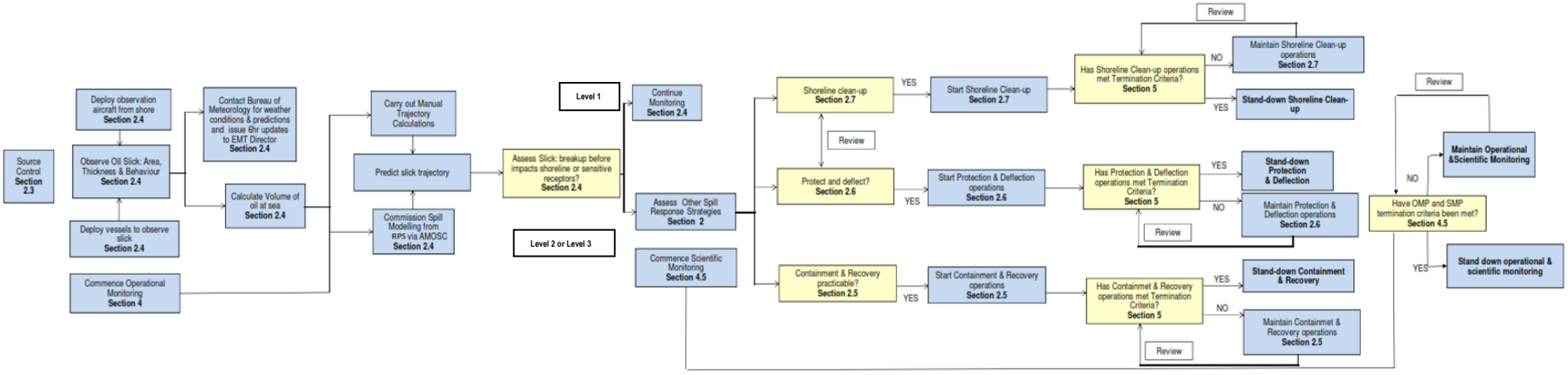


Figure 1-1: Response process for TEO oil spill management

1.4 Notifications

Prompt reporting of spills will facilitate a rapid and effective response and enable timely notifications as required by Government regulations.

Reporting and notifications are required throughout the incident.

Responsibilities for the immediate notifications are detailed in Table 1-3.

Regulatory notifications for spill incidents in Commonwealth and State waters are detailed in Table 1-4 and Table 1-5 below.

Table 1-3: Immediate Notifications to TEO

	Immediately	Within 1 hour
Observer	• Notify PIC of Incident	
Tactical Response Team Leader / Person in Charge (TRTL/PIC) (Workover Superintendent /DPIC/Vessel Master)	• Notify TRT • Provide verbal notification to AMSA as soon as possible (<60mins) • Initial notification to be followed up with a written POLREP • Copy POLREP form to DoT Maritime Environmental Emergency Response (MEER) Unit • (Section 6.2)	Notify/alert IMTL
Incident Management Team Leader (IMTL): TEO Management		Activate IMT (Perth) Mobilise or place on standby as required relevant resources e.g. AMOSC & Support Organisations (Section 6.3)

Table 1-4: Regulatory Notifications Matrix for spills in Commonwealth waters

Regulatory authority notification and reporting for spill incidents in Commonwealth Waters		
Spill reaching the marine environment with potential for moderate or greater environmental impact (including hydrocarbon spills >80L to the marine environment)		
NOPSEMA T: 1300 674 472 submissions@nopsema.gov.au	**Verbal**	**Within 2 hours of incident having been identified**
	Written	Initial notification by email within 24 hrs. Notification report within 3 days (using The NOPSEMA's incident reporting requirements)
DMIRS Environment Duty M: 0419 960 621 (24 hour) petroleum.environment@dmirs.wa.gov.au	**Verbal**	**Within 24 hours**
	Written summary	Notification report within 10 days
National Offshore Petroleum Titles Administrator (NOPTA) T: 08 6424 5300 resources@nopta.gov.au	**Verbal**	**Within 24 hours**
	Written summary	Notification report within 10 days
AMSA T: 1800 641 792 (24 hrs) https://amsa-forms.nogginoca.com/public/	**Verbal**	**As soon as possible (<60mins) of incident having been Identified**
	Written POLREP (Pollution Report)	Within 2 hours of incident having been identified

Regulatory authority notification and reporting for spill incidents in Commonwealth Waters		
Department of Climate Change, Energy, the Environment and Water (DCCEEW) T: +61 2 6274 1111 Email: EPBC.Permits@environment.gov.au	Written	Within 7 days (applies if spill incident ***injures or kills*** one or more of the following in a Commonwealth area): • an EPBC Act listed threatened species, • a member of EPBC Act listed threatened ecological community, • a cetacean, • an EPBC Act listed migratory species, • an EPBC Act listed marine species.
All other spills that reach marine environment (<80L) or which breach an EP performance outcome or standard.		
NOPSEMA	Written	By the 15th day of the following month (Recordable Report)

Table 1-5: Regulatory Notifications Matrix for spills in State waters

Spill **reaching the marine environment with potential for moderate or greater environmental impact (including hydrocarbon spills >80L to the marine environment)**		
DMIRS Environment Duty Officer M: 0419 960 621 (24 hour) petroleum.environment@dmirs.wa.gov.au	**Verbal**	Within 2 hours of incident originating in State waters having been identified
	Written	Within 3 days (using the DMIRS's incident reporting requirements)
Department of Transport (DoT) MEER Duty Officer 08 9480 9924 (24 hrs) marine.pollution@transport.gov.au	**Verbal**	Within 2 hours of spill incident originating or moving into State waters
	Written POLREP* (Pollution Report) Appendix B	As soon as practicable after verbal notification
	Written SITREP* (Situation Report) Appendix C	If requested, within 24 hours
Department of Biodiversity, Conservation and Attractions (DBCA) State Duty Officer (Oiled Wildlife Response) (08) 9219 9108 E: fauna@dbca.wa.gov.au	**Verbal**	Within 24 hours (applies to injury or death of Listed Species)
All other spills that reach marine environment (<80L) or which breach an EP performance objective, standard or nominated incident.		
Department of Mines, Industry Regulation and Safety (DMIRS)	Written	By the 15th day of the following month (Recordable Report)

1.4.1 Priority Contact List

Key organisations and their roles are provided in Table 1-6. All contact details (emails/telephone) are provided in Appendix A. This list is updated during OPEP testing and exercises to ensure correct details are on file and available in the event of an incident in the Incident Command Centre (ICC).

Table 1-6: Key Contacts for Immediate and Ongoing Notifications and Reporting

Organisation	Role/Function	Comments
Regulatory and Reporting		
AMSA Rescue Coordination Centre (RCC)	Regulatory reporting required. Control agency for all spills from ships in Commonwealth Waters. National Plan for Maritime Environmental Emergencies (NatPlan)	Report: • All slicks trailing from a vessel • All spills to the marine environment • All spills where National Plan equipment is used in a response POLREP form (Section 6.2)
Department of Biodiversity, Conservation and Attractions (DBCA)	Administrative body and lead agency for the oil wildlife response (OWR)	Leads the oiled wildlife response under the control of DoT Provide notification of oil spills threatening state waters.
Department of Mines, Industry Regulation and Safety (DMIRS)	Petroleum Environment Duty officer Requirement to submit regulatory report	Report of a Reportable Incident (within 3 days) Report Recordable incident (Monthly) Reports to be sent to petroleum.environment@dmirs.wa.gov.au
DPIRD	State Department of Primary Industries and Regional Development – primary contact for all fishermen.	Use both phone and e-mail. Consider e-mail copy of the POLREP form. POLREP/SITREP form (Section 6.2)
DoT MEER	State - Oil spill response including resources and personnel. Control agency in State waters	Phone or e-mail. Consider e-mail copy of the POLREP form. POLREP/SITREP form (Section 6.2)
NOPSEMA	Statutory Authority. Requirement to submit regulatory report.	Report of an Accident, Dangerous Occurrence or environmental Incident (FMO831) (Section 6.9.1) Recordable Environmental Incident Monthly Report (FMO928) (Section 6.9.2)
Industry Support		
AMOSC	Oil spill response including resources, personnel and Oil Spill Trajectory Modelling (through RPS)	AMOSC equipment lists are available via the Member Login webpage: AMOSC website: https://amosc.com.au/member-login/ AMOSC can arrange for transport of their equipment to Port Denison/Dongara Section 6.5
BMT	Operational and Scientific monitoring of oil spills, data analysis, and reporting for the SMP and OMP.	Section 4.4, 4.5 and 6.3
Bureau of Meteorology (BoM)	Predicting weather i.e. ocean currents and wind direction (e.g. used for Oil Spill Trajectory Model (OSTM))	
RPS	Oil Spill Trajectory Modelling (24hr support)	Sub-contracted via AMOSC. AMOSC obtains the appropriate OSTM input data form for submission to RPS. Section 6.5 and 6.6

1.5 Assessing the Spill

1.5.1 Spill Size

Spill assessment will be completed by the PIC/TRT Leader. The size of the spill will inform determination of the response level. The appearance of the oil will indicate the likely thickness and type of oil. From this and other data collated during surveillance operations, the volume of the spill can be estimated. Table 1-7 should be used which is based on the Bonn Agreement Oil Appearance Code which is also adopted by AMSA.

Table 1-7: Bonn Agreement Oil Appearance Code

Appearance of Film	Film Thickness	Quantity of Oil over an area of 1km²		
	(10^{-6}m)	(m³)	(bbl)	(tonnes)
Barely visible (under most light conditions)	0.05	0.05	0.31	0.04
Sheen Visible as silvery sheen on water surface	0.10	0.10	0.63	0.08
Rainbow Bright bands of colour	0.30	0.30	1.89	0.24
Dull Colours begin to turn dull	1.00	1.00	6.29	0.81
Dark Much darker colour	2.00	2.00	12.60	1.62

1.5.2 Response levels and escalation criteria

Hydrocarbon spills and their response requirements are categorised into three levels based on a combination of factors, including but not limited to:

- The scale and source of resources that will be deployed
- The proximity of the spill to environmentally sensitive areas
- The level of support and higher level management activated.

Under National Plan arrangements (AMSA 2020), three incident levels are used to identify the complexity and response actions to a hydrocarbon spill.

Table 1-8 summarises the hydrocarbon spill response model adopted by TEO, which are aligned with the National Plan arrangements.

The incident level will determine where the resources will be drawn from to respond to the spill and the level of incident management that is required to manage the response effort.

In the event of a spill occurring where effective response is considered beyond the capabilities within a particular level, the response will be escalated immediately to the next level.

In the event of a spill requiring resources exceeding those of the TEO organisation, additional personnel and resources will be obtained from; industry organisations (i.e. AMOSC), government support organisations (i.e. AMSA & DoT) and third-party contract services and spot hire.

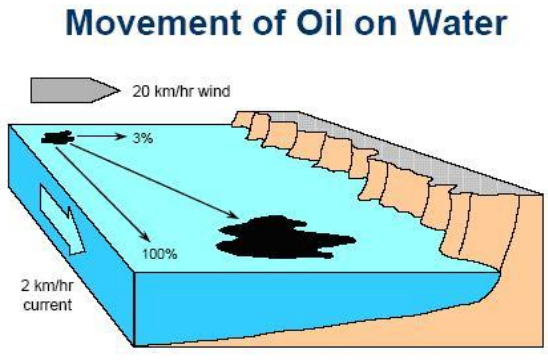
The decision to escalate a response to a higher level will be made by the responsible statutory or control agency as summarised in Table 1-8.

Table 1-8: Oil spill response level descriptions and escalation criteria

	Spill Level Guidance		
	Level 1	**Level 2**	**Level 3**
General description	Small response, generally able to be resolved through the application of onsite/ initial response resources (first strike response) located on project vessel.	Medium response, typically more complex in size, duration, resource management and risk than Level 1 incidents. May require additional off-site regional capabilities beyond the first strike response.	Major response, characterised by a high degree of complexity, require strategic leadership and response coordination. May require national and international response resources, including TEO interstate company business units and any other resource deemed appropriate.
Escalation criteria	Generally able to be resolved by TEO through first strike response. If additional response deemed necessary, consider escalating to Level 2	If mobilization of national or international resources required, consider escalating to Level 3	N/A
AMSA National Plan Levels and Escalation Criteria	Level 1 Generally able to be resolved by Responsible Party through the application of local or initial response resources (first strike response).	Level 2 Typically, more complex in size, duration, resource management and risk than Level 1 incidents. May require deployment of resources beyond the first strike response.	Level 3 Characterised by a high degree of complexity, require strategic leadership and response coordination. May require national and international response resources.
Indicative Spill Volume (m3)	< 10 m^3	10 m^3 to 1,000 m^3	> 1,000 m^3
TRT/IMT/BIMT Activation	TRT activated IMT notification	TRT activation IMT activation BIMT may be activated	TRT activation IMT activation BIMT activation

1.5.3 Spill Trajectory

The spill trajectory can be roughly calculated by adding the surface current velocity to 3% of the wind velocity. This is illustrated in Figure 1-2.



Calculations:

(1) On a map or chart, mark the location of the spill, (origin).

(2) Determine the present current direction and speed.

(3) Draw a scaled line from the spill origin in the compass direction of the current.

(4) Length = distance travelled in time interval (in 1 hour = approximately 1800m x current velocity in knots).

(5) Determine the wind direction and speed.

(6) Draw a second scaled line, starting from the end of the current vector, in the compass direction of the wind.

(7) Length = 0.03 x 1800m x wind velocity in knots.

Draw a line from the origin of the spill to the end of wind vector. This is oil movement in 1 hour.

Figure 1-2: Calculation of Oil Trajectory using Wind and Current Vectors (ITOPF)

1.6 Determine Response Levels

Determination of the level response depends on the size of the spill and whether the available equipment is enough to manage the response (Level 1) or whether additional support and resources are needed (Level 2 or Level 3). Guidelines are provided in Figure 1-3**.**

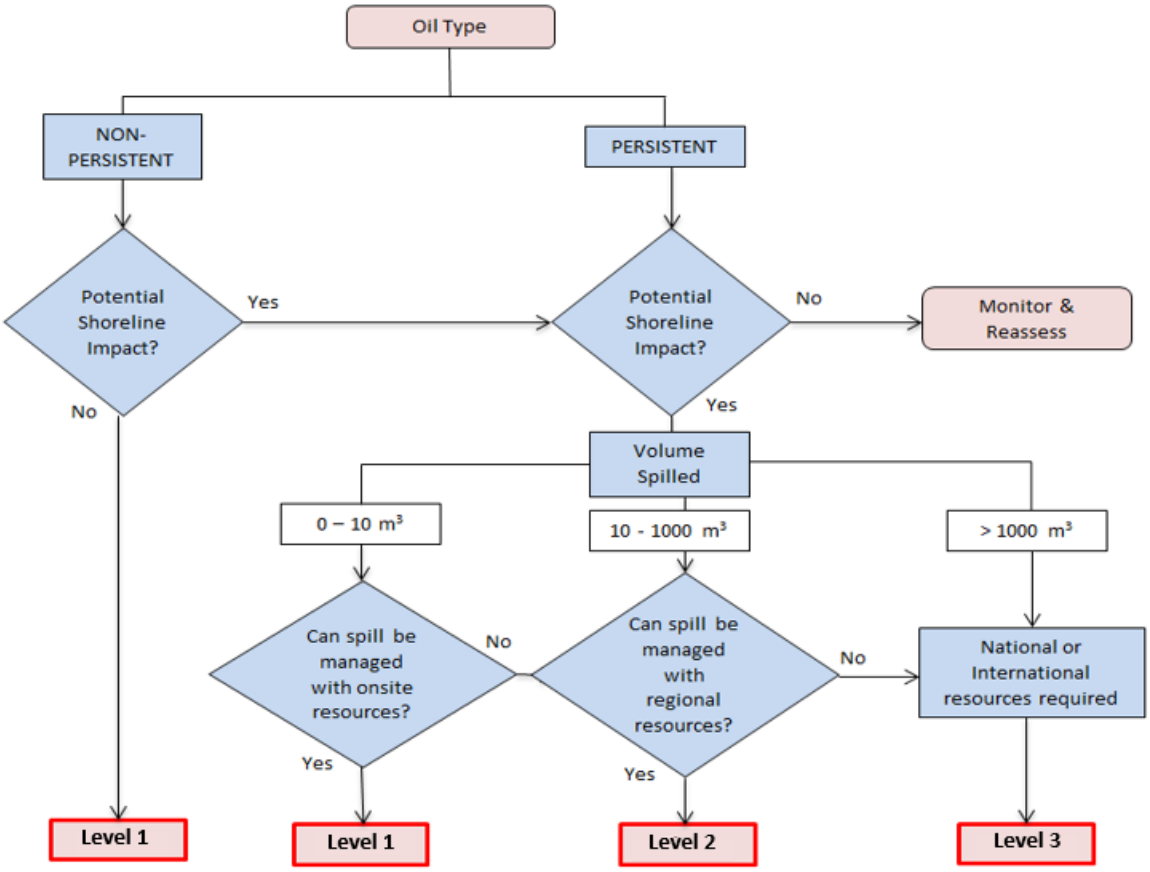


Figure 1-3: Guidelines for Determining the Level of Response

For small spills, classification will be made by the PIC who will, where necessary, consult with the IMTL. For larger spills, the IMTL will confirm the Level. Consultation regarding spill level classification with AMSA or DoT MEER may be undertaken at the discretion of the IMTL.

1.7 Incident Action Plan (IAP)

Incident action planning is the responsibility of the spill Controlling Agency. Where TEO is not the Controlling Agency, TEO will provide support to the incident action process adopted by the Controlling Agency through provision of situational awareness information and available resources.

Where there is more than one Controlling Agency (i.e. across jurisdictional response in coordination with DoT) TEO will undertake the IAP process as Lead IMT for those spill response activities it is responsible for and provide information and personnel to support DoT's planning function for those activities which DoT assumes control as Lead IMT. This is further detailed below.

1.7.1 TEO as Controlling Agency

In the event of a spill, the Planning, Operations and Logistics Officers will develop an Incident Action Plan (IAP) in compliance with the Cliff Head Emergency Management Plan with input from supporting units of the IMT team (see checklist for response personnel in Appendix M).

This plan will then be presented to the Incident Management Team Leader (IMTL) for approval prior to implementation. The IAP is a key step in managing any significant response; the process of updating models with actual information received from site and limiting the uncertainty due to stochastic modelling effects will produce a much more tightly defined area where response options need to be considered.

Recognising that all incidents are different and will be subject to variable factors such as weather, timing (seasons), sea state, duration, size and nature of release etc., the OPEP can only provide so much detail on the exact response that will be performed in any given situation.

The purpose of the IAP is to consider all of these variables and changing factors, to ensure the response continues to be suitable for the event as it unfolds. The IMTL will develop the IAP in accordance with the overarching Cliff Head Emergency Management Plan. With a set of maps indicating likely areas of impact, the IMT and Planning Co-ordinator can use resources to re-assess environmental risk, assign priorities based on the criteria within this plan, and allocate resources to the chosen response strategies.

There are a range of scenarios that the IMT may need to respond to, and the IAP allows a structured review of the challenge facing the team, and the resources available to respond to the incident (mobilisation of specialist teams such as monitoring specialists for example).

The Planning Coordinator will ensure coordination and monitoring of the IAP with input from the Incident Response Team, Operations Officer and Logistics Officer in consultation with the IMTL. This includes consolidation of the IAP aims, objectives, strategies and tactics developed by the IMT under the direction of the IMTL.

The IAP will cover initial monitoring (Type I monitoring, see Section 4) and focuses on obtaining timely information such that physical analysis can be carried out to assess efficiency of response and to predict oil behaviour (weathering) or effects. Long term (Type II monitoring) will be initiated as described in Section 4.

The plan will detail the response mechanisms and priority areas for protection based on the actual circumstances of the event, taking into account the spill trajectory, weather conditions, but also importantly safety considerations. The IAP will provide details of the operational activities and objectives to be achieved over a specified, short-term period. Initially this may be for the subsequent few hours only, but once the operation is underway it is likely to address the activities required over each of the following 24-hour periods or longer. The main steps in planning the response and preparing the IAP are:

- Set the incident objectives – e.g. actions needed and areas to protect;
- Describe the strategies – deployment of boom at location etc.; and
- Develop the tactics – detail how we will undertake these strategies for example, responsibilities and logistics.

Given the range of potential impacts from a hydrocarbon spill, an IAP is a critical step identified in the response strategy. Key activities to be addressed by the IAP include a review of Net Environmental Benefit Analyses (NEBA) (Appendix L), remodelling of oil spill trajectory modelling with relevant spill and environmental data, and ongoing consultation with affected/involved parties that may be required.

The IMTL has the responsibility to obtain available data with respect to the spill (including hydrocarbon characteristics, metocean conditions, trajectory modelling, environmental sensitivity data, etc.) and to call in required personnel, and to prepare, seek approval for and distribute the IAP.

To ensure that the IAP is appropriate for the nature of the spill, TEO proposes to seek the advisory support of technical experts as nominated by AMSA, DoT, AMOSC etc., and operators with activities within the potential spill area. These experts will provide advice and support to the IMTL in the development of an IAP in areas including (but not limited to):

- Monitoring and evaluating;
- Use of barriers for deflection and protection of priority areas;
- Environmental monitoring; and

- Other response strategies as appropriate.
- The DoT's Deputy Incident Controller (Commander) will work with the Petroleum Titleholder to determine protection priorities and undertake an initial and ongoing Net Environmental Benefit Analysis (NEBA) to determine the most appropriate response in State waters.

1.7.2 IAP Environmental Performance

Performance objective	Critical Controls	Performance Standard	Measurement Criteria
To develop, implement, monitor and evaluate spill response in accordance with TEO Incident Action Planning process to maximise effectiveness and reduce environmental impacts to ALARP.	Incident Action Planning Process. Incident Action Plans (IAPs).	Ongoing spill response (following initial 1st strike, notifications, and activations) will be under the direction of the relevant Controlling Agency. For Level 2/3 spills a TEO IMT will be formed to assist the Controlling Agency with ongoing spill response. The TEO IMT will gain situational awareness (includes assessment of the Spill Level) as described in Section 2.4 to be used for informing the Controlling Agency or developing the IAPs. The TEO IMT, in consultation with the relevant Controlling Agency, will assist in identifying protection priorities in forming response strategies TEO will provide personnel to assist the Controlling Agency's IMT in the IAP process The Controlling Agency Incident Commander will approve each IAP.	Incident Log Completed IAPs Completed NEBA records
		TEO IMT will use the IAP process for spill response activities where it is the Controlling Agency or Lead IMT (Section 1.7). The TEO IMTL will sign-off on each IAP. Performance against the objective for each IAP will be assessed during the response and recorded on the IAP following the operational period.	
	Net Environment Benefit Analysis (NEBA) process.	The TEO Operational NEBA process will be used to evaluate all response strategies under control of TEO as the Controlling Agency or IMTL to inform the development/refinement of IAPs The IMT applies the NEBA process to identify the preferred response options for sensitive receptors that may be potentially impacted by the spill. A NEBA will be applied as described in Section 2.2.1 and Appendix L. The IMT will revisit the NEBA regularly throughout the IAP process as more information becomes available (i.e. operational and scientific monitoring, surveillance, weather, oil behaviour, response effectiveness, identification of key sensitivities etc.).	
	Effective communication between the IMT and overall response team leaders.	The TEO IMTL will communicate with response Team Leaders for activities controlled by TEO who are present on site, to report on the effectiveness of the response. Communication to the IMT is done either verbally and through logs / reports / emails / photos sent to IMT throughout the response.	Incident log IAPs
	Effective communication between overall response team leaders and their respective personnel and team leaders	Personnel for each response strategy will communicate at least daily through reports to their respective Team Leaders.	Communication logs
	Termination criteria.	Response strategies under the control of TEO are terminated when each response termination criteria is met, as outlined in their respective sections within this OPEP.	Incident log IAPs

2 Spill Response Strategies

2.1 Introduction

This section details the marine, aerial, shoreline and oiled wildlife response strategies that may be deployed in the event of a spill. Response strategies have been developed on the basis of predictive modelling. The modelling outputs may require reassessment, using revised real-time modelling and observation of the spill. During an actual spill, the spill trajectory, size, spill time/season may result in a different impact than the scenarios provided in this document. Any such information must be incorporated into an IAP.

The potential options for oil spill response strategies implemented for the mitigation of oil spilled to sea for the different spill scenarios is provided in Table 2-1. TEO's response priorities are consistent with State response priorities and the National Plan.

Each response strategy proposed for deployment must be subjected to a NEBA assessment as detailed in Section 2.2.1 and Appendix L and supported by the relevant control agency.

Strategies for the mitigation of hydrocarbons which have reached the sea is provided in Sections 2.3 to Section 2.8. Each strategy is tabulated to provide tasks which may be carried out, resources required along with the objectives, standards and measurement criteria used to evaluate environmental performance of each strategy deployed.

Each strategy table provides guidance on which tasks might be carried out according to the Level of the spill. The IMTL will decide which tasks need to be carried out according to the specific circumstances of the incident and using the strategy tables for guidance.

Decisions on which strategy will be deployed in response to the specific spill circumstances will be informed by a NEBA assessment and controlling agency.

Note: The information has been developed by TEO for preparedness purposes. TEO may not be the Controlling Agency or Lead IMT for implementing a spill response. For example, for Level 2/3 spills within or entering State waters, DoT will ultimately determine the strategies and controls implemented for most State water activities with TEO providing resources and planning assistance.

The overarching Oil Spill Management Plan (OSMP) will be implemented for all spills at Level 2 or greater.

2.2 Selection of Spill Response Strategies

The NEBA and ALARP assessment process, detailed in Appendix L, identified monitor and evaluate as the response strategies that were considered ALARP and also appropriate for all environmental sensitivities and will therefore be implemented for all spills.

An overview of the response strategies, including activation and termination criteria, is provided in Sections 2.3 to 2.8. Potential response options are provided in Table 2-1.

2.2.1 Net Environmental Benefit Analysis

Response strategy selection requires subsequent evaluation of strategies against ALARP considerations (e.g. health and safety, practicability, feasibility, flexibility), in addition to geographic/environmental conditions and the fate and weathering characteristics of the spill. The aims of any spill response are to minimise damage to environmental and socio-economic resources, and to reduce the time for recovery of affected resources by achieving an acceptable standard of cleanliness. The final selection of response priorities and approaches will take into account the results of the Net Environmental Benefit Analysis (NEBA).

A preliminary assessment has been carried out in Section 7.5 of the Commonwealth EP [10HSEQENVPL01] and is documented in Appendix L.

This preliminary NEBA has discounted dispersant use because the oil will solidify within minutes on contact with water because the pour point of the Cliff Head crude is higher that the ambient temperatures of the sea water. Dispersants applied to a solid/semi solid hydrocarbon will simply run off and enter the sea without dispersing the oil. The net benefit of applying dispersants is negligible in comparison to the environmental cost associated with additional potential eco-toxicity of the dispersants relatively close to shore (<10 km).

Dispersants are not considered effective for diesel spills because of the rapid spreading will result in a thin film of oil which will be penetrated by the dispersant droplets, directly entering the water column without dispersing the hydrocarbon into the water column.

Evaluation and monitoring of all spills has been identified as having a net environmental benefit for all environmental sensitivities and will therefore be implemented for all spills.

In the event of a spill, a NEBA assessment will be carried out in the context of the actual circumstances of the spill to differentiate between the following response strategies: offshore containment & recovery, shoreline protection and deflection and shoreline clean-up.

Oiled Wildlife Response is not included in the preliminary NEBA or NEBA assessment procedure. Decisions to capture, treat and rehabilitate oiled wildlife will be taken by specialists on a case by case basis.

Table 2-1: Potential response options identified for different spill levels

The Control Agency will make the decision on whether each strategy is to be deployed.

TEO will provide any supporting services available under this OPEP to the Control Agency at the request and under the direction of AMSA/DoT or other Regulatory agency.

	L1 Deck Spillages CHA Platform (<2 m^3) and vessels (<1.8 m^3) diesel, lube, hydraulic oils, refuelling spills (<37m^3)	L2 Pipeline Leak at CHA Platform: Total of 97.0 m^3 Crude (0.192 m^3/day for 21 days)	L2 Pipeline Leak at State waters: Total of 97.0 m^3 Crude (0.192 m^3/day for 21 days)	L2 Vessel Collision: 500 m^3 Marine Diesel (3 hours)
Source Control (Section 2.3)	• Yes • Source control will be implemented in all scenarios			
Monitor and Evaluate (Section 2.4)	• Yes • Situational awareness is required for all scenarios to confirm level • Environmental benefits outweigh environmental costs for all scenarios			
Offshore Containment and Recovery (Section 2.5)	• No • Small volumes with no shoreline contact • Diesel, lube, hydraulic oil not suitable for offshore containment & recovery • Rapid spreading, evaporation and natural processes	• Consider • Weather dependant for effectiveness • Concentration of surface crude is predicted to be less than the concentration at which this strategy is likely to be effective (i.e. < 10 g/m^2) other than in the immediate vicinity of the spill • Standard offshore recovery equipment is unlikely to be very effective on solid waxy balls • Nets/boom nets and sieves etc. may be used where possible.	• Consider • Weather dependant for effectiveness • Concentration of surface crude is predicted to be less than the concentration at which this strategy is likely to be effective (i.e. < 10 g/m2) other than in the immediate vicinity of the spill • Standard offshore recovery equipment is unlikely to be very effective on solid waxy balls, • Nets/boom nets and sieves etc. may be used where possible	• Not recommended • Weather dependant for effectiveness • Surface hydrocarbons > 10 g/m2 • Given the fast spreading nature of diesel causing the slick to break up and disperse, this response is not considered to be effective in reducing the impacts of a diesel spill. The ability to contain and recover spreading diesel on the ocean water surface is extremely limited due the very low viscosity of the fuels.
Shoreline Protection and Deflection (Section 2.6)	• No • Small volumes with no or negligible shoreline contact or accumulations • Rapid spreading, evaporation and natural processes will remove surface hydrocarbons before shoreline contact • Little environmental benefit for shoreline disturbance	• Consider • Shoreline protection may reduce maximum accumulations along shorelines which are forecast to be, in the worst scenario, 47.7 m^3 in winter and 40.1 m^3 in summer. • There is a high probability for several sections of the shoreline to be contacted by hydrocarbons at thresholds > 100 g/m^2. The earliest contact will occur 36 hours after the spill, providing sufficient time to deploy shoreline protection.	• Consider • There is insufficient time to prevent contact with the shoreline around Dongara, which will contact 100 g/m^2 oil within 5 hours, in both summer and winter. • There is a slight probability for Leeman shoreline to be contacted by surface hydrocarbons at thresholds > 100 g/m^2 within 412 hours and 166 hours after the spill in winter and summer, respectfully. There is also potential for Cervantes shoreline to be contacted by surface hydrocarbons at thresholds > 100 g/m^2 within 536 hours in winter, providing sufficient time to deploy shoreline protection.	• Consider • Shoreline protection may reduce maximum accumulations at Dongara, which are forecast to be, in the worst scenario, 195 g/m^2 in winter and 166 g/m^2 in summer. • There is a possibility that shorelines around Leeman and Cervantes will contact 100 g/m^2 oil within 10 hours of a spill, providing sufficient time to deploy shoreline protection.
Shoreline Clean-up (Section 2.7)	• No • Small volumes with no or negligible shoreline contact or accumulations • Rapid spreading, evaporation and natural processes will remove surface hydrocarbons before shoreline contact • Little environmental benefit for shoreline disturbance	• Consider • May be applicable to mitigate accumulations - maximum forecast to occur at Irwin - 40.1 to 47.7 m^3 (summer and winter, respectively). • Accumulations at other locations forecast to be < 33 m^3	• Consider • Maximum accumulations are at Dongara, 24 m^3 (summer) and 27.5 m^3 (winter) which is a potential threat to marine fauna on shorelines. • Accumulations are forecast for two other locations. Accumulations around Leeman are predicted to be 9.2 m^3 (summer) and 17.4 m^3 (winter). Accumulations around Cervantes are predicted to be 9.4m^3 in winter (no contact in summer). • Concentrations of surface crude are predicted to be less than concentration of environmental significance (i.e. < 10 g/m^2) so oiling at sea less of a risk. • Due to the behaviour of the crude, it is not expected to form slicks and stick to fauna (it will be waxy balls) mostly concentrated around the spill release area and potentially along shorelines.	• Consider • Potential maximum accumulations at Dongara up to 195 m^3 in worst case replicate so light cleaning may be appropriate at some sites in this area e.g. hydrocarbon contaminated debris • Maximum accumulations outside of Dongara is low so unlikely shoreline clean up would be appropriate
Oiled Wildlife Response (Section 2.8)	• No • Small volumes with little/no shoreline contact • Very thin films of oil for very short period of time	• Consider • Maximum accumulations are forecast to be 40.1 to 47.7 m^3 (summer and winter respectively) which is a potential risk to marine	• Consider • Maximum accumulations are at Dongara, 24 m^3 (summer) and 27.5 m^3 (winter) which is a potential threat to marine fauna on shorelines.	• Consider • Surface hydrocarbons > 10 g/m^2 predicted around Dongara and Leeman, therefore greater potential for oiled wildlife

	L1 Deck Spillages CHA Platform (<2 m^3) and vessels (<1.8 m^3) diesel, lube, hydraulic oils, refuelling spills (<37m^3)	L2 Pipeline Leak at CHA Platform: Total of 97.0 m^3 Crude (0.192 m^3/day for 21 days)	L2 Pipeline Leak at State waters: Total of 97.0 m^3 Crude (0.192 m^3/day for 21 days)	L2 Vessel Collision: 500 m^3 Marine Diesel (3 hours)
		fauna on shorelines • Accumulations at other locations forecast to be < 33 m^3 • Concentration of surface crude predicted to be less than concentration of environmental significance (i.e. < 10 g/m^2) so oiling at sea less of a risk. • Due to the behaviour of the crude, it is not expected to form slicks and stick to fauna (it will be waxy balls) mostly concentrated around the spill release area and potentially along shorelines.	• Accumulations are forecast for two other locations. Accumulations around Leeman are predicted to be 9.2 m^3 (summer) and 17.4 m^3 (winter). Accumulations around Cervantes are predicted to be 9.4m^3 in winter (no contact in summer). • Concentrations of surface crude are predicted to be less than concentration of environmental significance (i.e. < 10 g/m^2) so oiling at sea less of a risk. • Due to the behaviour of the crude, it is not expected to form slicks and stick to fauna (it will be waxy balls) mostly concentrated around the spill release area and potentially along shorelines..	• Predicted shoreline accumulated concentrations at Dongara of up to 195 m^3.

2.3 Source Control

Relief wells are not applicable in the event of a loss of well control, e.g. during well workover activities. Based on field tests and analysis, and at the current water cut and reservoir pressure, none of the wells will naturally flow to surface. Therefore, a free flow oil spill scenario resulting from a loss of well control is not considered credible. For workovers on the wells, the ESPs will be electrically isolated and/or disconnected.

2.3.1 Level 1 Vessel or Platform Release

Small spills to deck on vessels or CHA could occur during operations.

Table 2-2: Vessel and Platform Release

Vessel and Platform Releases				
Initiation criteria	Notification of spill.			
Jurisdiction (Jurisdictional Authority)	Platform release: Commonwealth waters (NOPSEMA) Vessel releases: Commonwealth waters (AMSA) or State waters (DoT)			
Controlling Agency	Platform release: TEO Vessel releases (other): AMSA (Commonwealth waters) or DoT (State waters)			
Objective	Prevent further release of hydrocarbons to the marine and/or environment.			
Applicable hydrocarbons	Crude	Diesel	Hydraulic Oil	Lube Oil
	✔	✔	✔	✔
Resources	Shipboard Oil Pollution Emergency Plan (SOPEP), spill kits on vessels and CHA			
Implementation	For spills during pumping operations, pumping activity to cease immediately; • If drainage is open to the marine environment, drainage is to be isolated as soon as practicable following the spill to prevent discharge to the ocean (the Vessel Master or PIC will confirm that the drainage network is closed on the vessel before washing down the deck after excess oil has been cleaned up); • Use of onsite spill kit resources (i.e. sorbent material) to clean-up spills; • Recovery of dropped container where practicable, where containers of hydrocarbons are dropped during vessel to platform transfers; • Disposal of contaminated waste to licenced waste contractor; and • Isolation and repair of damaged, leaking equipment			
Implementation Time	Immediate implementation			
Termination criterion	Release of oil to the marine environment has ceased and the workplace environment is deemed environmentally safe and free of hydrocarbon.			

2.3.2 Level 2 Vessel Release

In the event of a vessel collision, the worst case credible scenario is an instantaneous release of up to 500 m^3 of marine diesel.

Table 2-3: Hydrocarbon Fuel Tank Rupture

Hydrocarbon fuel tank rupture			
Initiation criteria	Notification of incident/spill.		
Jurisdiction (Jurisdictional Authority)	Commonwealth waters (AMSA) or State waters (DoT)		
Controlling Agency	AMSA (Commonwealth waters) or DoT (State waters)		
Objective	Prevent further release of hydrocarbons to the marine and/or onshore environment.		
Applicable hydrocarbons	Crude	Diesel	Lube/Hydraulic Oil
	X	✔	X
Implementation	In a vessel impact situation, there is a likelihood of personnel injury, which will take priority over responses to reduce the hydrocarbon volume released to the marine environment. Where the vessel has a Shipboard Oil Pollution Emergency Plan (SOPEP) or procedure for responding to a ruptured fuel tank, the SOPEP or procedure will be followed as applicable. Notwithstanding vessel specific procedures for source control, the following activities would be immediately evaluated for implementation providing safe to do so: • Reduce the head of cargo by dropping or pumping the tank contents into an empty or slack tank; • Consider pumping water into the leaking tank to create a water cushion to prevent further cargo loss; • If the affected tank is not easily identified, reduce the level of the cargo in the tanks in the vicinity of the suspected area if stability of the vessel will not be compromised; • Evaluate the transfer of cargo to other vessels; • Trimming or lightening the vessel to avoid further damage to intact tanks; and/or • Attempt repair and plugging of hole or rupture.		
Implementation Time	Immediate implementation		
Termination criterion	The cargo in the ruptured fuel or storage tank is secured and release to the marine environment stopped.		

2.3.3 Level 2 Pipeline Leak

In the event of a leak from the pipeline due to a corrosion hole, the worst case credible scenario is a leak of up to 97.0 m^3 which is due to a leak of 0.192 m^3/day for 21 days as a result of the leak not being detected by low pressure alarms or by vessels in the vicinity.

Table 2-4: Subsea Infrastructure Failure Response

Subsea infrastructure failure response			
Initiation criteria	Notification of a subsea spill e.g. sheen observed during helicopter surveillance		
Jurisdiction (Jurisdictional Authority)	Commonwealth waters (NOPSEMA) or State waters (DoT)		
Controlling Agency	TEO (Commonwealth waters only spill); or TEO and DoT (spills within or entering State waters) – TEO is the Lead IMT for source control		
Objective	Prevent further release of hydrocarbons to the marine and/or onshore environment.		
Applicable hydrocarbons	Crude	Diesel	Other
	✔	X	X
Implementation	• Automatic shutdown system; or • Manual shutdown of pipeline to halt leak • Where and when safe to do so, an ROV and support vessel, will be mobilised to visually identify any subsea incident location, in addition to vessel and aerial surveillance conducted as per the Monitor and Evaluate Plan • IMR activities will commence to repair pipeline in accordance with the pipeline safety case		
Implementation Time	Immediate implementation		
Termination criterion	The oil cargo in the ruptured subsea export pipeline is secured and release to the marine environment stopped.		

2.3.4 Source Control Environmental Performance

Performance objective	Critical Controls	Performance Standard	Measurement Criteria
Implement source control to prevent further release of hydrocarbons to the marine and/or onshore environment.	Vessel SOPEPs. Bunkering Accident Plan.	Vessel SOPEPs are compliant with the requirements MARPOL 73/78 Annex 1- Shipboard Oil Pollution Emergency Plan and *Protection of the Sea (Prevention of Pollution from Ships) Act 1983.*	Vessel inspection records
		SOPEP source control measures will be undertaken to contain and clean up oil spills on vessels. Measures include: • pumping operations will cease immediately following the spill; • system receiving product immediately will shut down following spill; • drainage network is closed as soon as practicable following the spill to prevent discharge to the ocean (The PIC /Vessel Master will confirm that the drainage network is closed on the vessel before washing down the deck after excess oil has been cleaned up); • recover hose and identify leaking pipe; • make necessary repairs to pipe; and • use spill kit resources (i.e. sorbent material) to clean-up spills.	Incident log Vessel logs
		Clean-up waste will be stored in bunded or sealed area for onshore disposal.	
	Implement Hydrocarbons Storage and Fuel Tank Rupture Plan.	In the event of a hydrocarbon release from a storage or fuel tank rupture, vessel master is to follow procedures outlined with the vessel's SOPEP, where applicable, this may include the following measures: • Reduce the head of cargo by dropping or pumping the tank contents into an empty or slack tank; • Pump water into the leaking tank to create a water cushion to prevent further cargo loss; • If the affected tank is not easily identified, reduce the level of the cargo in the tanks in the vicinity of the suspected area if stability of the vessel will not be compromised; • Attempt repair and plugging of hole or rupture; • Transfer cargo to other vessels; and/or • Trim or lighten the vessel to avoid further damage to intact tanks;	Incident log Vessel logs
		Response terminated when end-point criteria is met.	
	Subsea Infrastructure Failure Response.	In the event of a confirmed leak in the subsea infrastructure, the following activities will be implemented: • Cease pumping and flush the line with sea water to remove hydrocarbons; • Isolate the line and mobilise repair crew; • Perform leak pressure test (if required); • Use either ROV or divers to visually determine the location of the leak; • Repair the leak; and • Following the leak detection and subsequent repair, the pipe line is flushed to remove hydrotest water (if required).	Incident log IAP
		If a rupture occurs in the pipeline, Emergency Shut Down (ESD) will be initiated as per the Cliff Head Emergency Management Plan	
		Response terminated when the end-point criteria is met	

2.4 Spill Monitoring and Evaluation Strategy

The trajectory, volumes and weathering state of slicks of oils spilled from the CHA platform, pipeline or support vessels, needs to be determined in order to predict potential impact on sensitive resources. Monitoring and Evaluation is a strategy which will be deployed for all spill scenarios. The Cliff Head Monitoring and Evaluation Strategy process is summarised in

Figure 2-1.

Monitor and evaluate involves the collection and evaluation of information and data to provide and maintain situational awareness in the event of a spill. This strategy includes fate and trajectory monitoring, spill tracking and field observations, while allowing natural processes to break up, degrade and weather the spill.

Whilst this strategy involves no direct response actions to mitigate the spill, it is considered the most appropriate response strategy for spills of non-persistent hydrocarbons such as marine diesel, or scenarios with no likelihood of shoreline contact from surface hydrocarbons above threshold levels (crude). In cases where spills of more persistent hydrocarbons occur monitor and evaluate may identify emerging risks to sensitive receptors.

In the event of a spill, the following monitoring will be implemented:

- Vessel/platform surveillance
- Aerial surveillance
- Spill fate modelling and in water tracking buoy.

Operational monitoring is detailed further in TEO's OSMP discussed in Section 4.

2.4.1 Vessel/Platform Surveillance

Direct observations from the platform or vessels can be used to assess the location and visible extent of an oil spill, aid with the verification of spill trajectory modelling and inform the application and effectiveness of response strategies. Due to the proximity of observers to the water's surface vessel surveillance is limited in its coverage in comparison to aerial surveillance and may also be compromised in rough sea state conditions or where fresh hydrocarbons at surface poses safety risks.

Table 2-5: Vessel/Platform Surveillance

Vessel Surveillance			
Initiation criteria	Notification of a Level 2/3 spill to IMTL.		
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)		
Controlling Agency	Platform/ pipeline spills Commonwealth waters: TEO State waters: DoT (Level 2/3 spills only) For spills moving from Commonwealth to State waters (cross-jurisdictional) TEO is the Lead IMT Vessel spills AMSA (Commonwealth waters) or DoT (State waters Level 2/3 spills only)		
Objective	• Maintain situational awareness and ongoing understanding of the success of response activities • Obtain information to inform evolution of the response plan to protect environmental sensitivities • Understand the likely fate and trajectory of the spill		
	Crude	Diesel	Other

Vessel Surveillance			
Applicable hydrocarbons	✔	✔	X

Vessel Surveillance	
Implementation	• Obtain visual observations from CHA platform personnel if it is manned. • Obtain visual observations from vessels of opportunity or marine support vessels in the area. • Carry out NEBA assessment to determine if other response options are required in addition to evaluation and monitoring.
Implementation Time	• Visual observations from CHA commenced within 15 minutes if CHA is manned • Visual observations from vessels in the vicinity within 15 minutes if present • If vessels are not in vicinity, vessel mobilised to location within 6 hours of IMTL being notified (assumes worst case of TEO contracted vessel being unavailable) • Trained observers on location within 24 hours of incident notification
Termination criterion	• Vessel-based surveillance is undertaken at scheduled intervals during daylight hours, and continues for 24 hours after the source is under control and a surface sheen is no longer observable, or no net environmental benefit being achieved; or when the termination criteria has been reached for each activated operational monitoring plan (Section 4.4). This decision will be made by the control agency. • Vessel surveillance will terminate if there are unacceptable safety risks e.g. weather conditions • The monitor and evaluate strategy action plan, which includes specific termination conditions are detailed in Section 5.2.

2.4.2 Aerial Surveillance

Aerial surveillance is used to record the presence and characteristics of oil at surface and other environmental observations including weather conditions, marine fauna and sensitive receptors in the area. Aerial surveillance provides superior coverage over vessel surveillance for estimating the spatial extent of a spill but is generally required only for larger Level 2/3 spills.

Table 2-6: Aerial Surveillance

Aerial Surveillance			
Initiation criteria	Notification of a Level 2/3 spill to IMTL.		
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)		
Controlling Agency	Platform/ pipeline spills Commonwealth waters: TEO State waters: DoT For spills moving from Commonwealth to State waters (cross-jurisdictional) TEO is the Lead IMT Vessel spills AMSA (Commonwealth waters) or DoT (State waters)		
Objectives	Monitor the spill behaviour, distribution and potentially impacted receptors in a timely and effective manner to gain situational awareness and inform response strategies.		
Applicable hydrocarbons	Crude	Diesel	Other
	✔	✔	X
Implementation	• Activate aerial support (1 x helicopter from Corsaire in Dongara on permanent standby contract to TEO) with trained local observer to observe the spill and report spill extent • Provide aerial surveillance results or the purposes of calculating likely spill trajectory and time scales to contact environmental sensitivities. • Frequency of aerial surveillance approved by IMT to: • Validate dispersion of the spill • Assess trajectory of the spill in conjunction with real-time spill modelling • Inform the developing IAP for initial and ongoing responses.		

Aerial Surveillance	
	• Aerial observer to provide observation log, spill mapping, photographs, marine fauna sightings to IMT • Trained observers can be deployed from TEO, AMOSC, AMSA and DoT MEER
Implementation Time	• Local trained observer in helicopter within 3 hours, allows for mobilisation of personnel and helicopter to location • Advance trained aerial observer undertaking visual surveillance within 24 hours
Termination criterion	• Aerial surveillance undertaken at scheduled intervals during daylight hours and continues for 24 hours after the source is under control and a surface sheen is no longer observable, or no net environmental benefit being achieved; or when the termination criteria has been reached for each activated operational monitoring plan (Section 4.4). This decision will be made by the control agency. • The monitor and evaluate strategy action plan, which includes specific termination conditions are detailed in Section 5.2.

2.4.3 Spill Fate Modelling & Satellite Imagery

Spill fate modelling will be undertaken to determine the spill trajectory and inform spill response strategies including where to deploy protection to identified sensitive receptors. In water satellite tracking buoy data and satellite imagery may be required to support the OSTM.

Table 2-7: Spill Fate Modelling and Satellite Imagery

Spill Fate Modelling and Satellite Imagery			
Initiation criteria	Notification of a Level 2 or 3 spill to IMT (OSTM). Satellite Imagery if recommended by control agency Satellite tracker buoy data		
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)		
Controlling Agency	Platform/ pipeline spills Commonwealth waters: TEO State waters: DoT For spills moving from Commonwealth to State waters (cross-jurisdictional) TEO is the Lead IMT Vessel spills AMSA (Commonwealth waters) or DoT (State waters)		
Objective	Monitor and evaluate spill in a timely and effective manner to gain situational awareness and inform response strategies.		
Applicable hydrocarbons	Crude	Diesel	Other
	✔	✔	X
Implementation	• Commission OSTM from RPS via the 24/7 emergency cover contract with AMOSC. • Provide visual observation and spill details to RPS • Deploy satellite tracking buoy at leading edge of spill plume from CHA platform, vessel or helicopter		
Implementation Time	OSTM commissioned within 2 hours of spill notification to IMTL Satellite tracking buoy as soon as practicable		
Termination criterion	Spill fate modelling will continue for 24 hours after the source is under control and surface sheens or in-situ hydrocarbons are no longer detectable, or until no longer beneficial to predict spill trajectory and concentrations; or when the termination criteria has been reached for each activated operational monitoring plan (Section 4.4). This decision will be made by the control agency.		

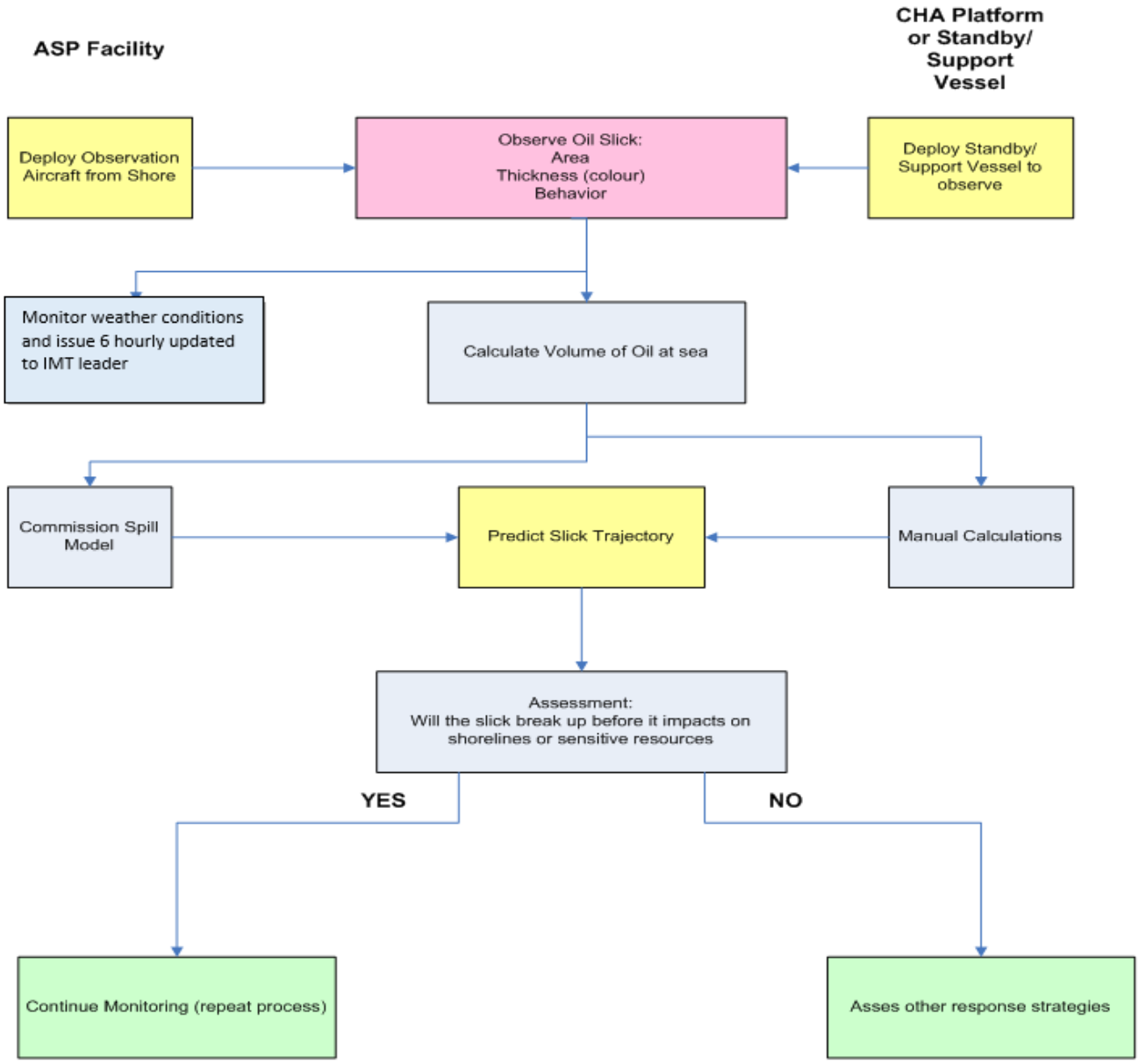


Figure 2-1: Monitoring Strategy Guidelines

2.4.4 Monitoring and Evaluation Summary and Environmental Performance

The monitoring and evaluation strategy is summarised in Table 2-8 along with the outcomes, standards and measurement criteria.

Table 2-8: Monitor and evaluate strategy summary of environmental performance

Performance outcome	Critical Controls	Resources	Performance Standard	Measurement Criteria
Monitor and evaluate spill in a timely and effective manner to inform response strategy and to gain situational awareness.	**Visual surveillance** is undertaken from CHA or vessel to gain situational awareness and assist decisions on the most appropriate response strategies.	>1 x on-site observer with spill assessment training > 1 x vessel	If personnel on CHA, visual surveillance undertaken from CHA within 15 minutes of spill notification from CHA or support vessel; OR A request for vessel mobilisation, to nearest available vessel/s, is made by the Controlling Agency Incident Commander or On-scene Commander (PIC) upon notification of the incident to allow for vessel mobilisation within 6 hours if winds <15 knts and sea state <2m and in daylight hours (i.e. safe to deploy vessel) Hourly vessel observer logs and verbal reports will be provided to the PIC providing information on spill location, weather conditions, marine fauna siting's and visual appearance of the slick. This information is to be included in the Vessel Observer Log. Trained observers are on location within 24 hours of incident notification Vessel surveillance continues until end-point criteria are met	Incident log Vessel observer log Training matrix ASP Control room log
	Aerial surveillance is undertaken to gain situational awareness and assist decisions on the most appropriate response strategies and ground truth OSTM.	Trained observer x 1 Helicopter x 1 or Fixed m wing aircraft Aerial support base x 1	The IMT will initiate aerial surveillance for Level 2 or 3 spills including: (8) Mobilise the aircraft and local trained observers to site within 3 hours (daylight permitting) of IMT's request. (9) Developing an over-flight schedule to define the frequency of aerial surveillance. (10) An Aerial Surveillance Observer Log will be completed for each flight. (11) Records taken for each fauna sighting including photographic records (12) An Aerial Observer will complete an aerial surveillance observation log for each flight and submit to the IMT. (13) Records to be provided to the Controlling Agency Incident Commander and spill fate modelling provider within 1 hour of end of flight.	Incident log IAPs Over-flight schedule Aerial Surveillance logs Marine fauna sighting records
	IMT to request spill fate modelling information to inform the NEBA process and assist decisions on the most appropriate response strategies	AMOSC contract with RPS. 1 x person in IMT with oil spill assessment training	If classified as a Level 2 or 3 incident IMT will commission OSTM within 2 hours after the incident occurred and commencement of fate modelling will occur within two hours of its submission. Spill fate modelling service provider is to provide at least daily updates of trajectory model outputs to the IMT to inform response planning. Information will be available to the relevant Controlling Agency during spill response. Spill fate modelling continues until termination criteria are met OSTM assessment outcome conducted within 3 hours of receipt of the OSTM output	Contract with spill modelling provider Modelling records Incident Log Documented NEBA
	Satellite Imagery may be required to identify the trajectory of the oil and ground truth the OSTM	Ad-hoc technical provider	Upon notification of a Level 2/3 spill, satellite imagery requested by IMT within 2 hours if recommended by modelling provider	IAPs Satellite imagery data
	Deployment of satellite tracking buoy to monitor movement of the surface oil and assist surveillance monitoring and inform modelling	1 x Tracking buoy at CHA platform 1x Tracking buoy at Hangar	Activate marine resources (e.g. vessels, helicopter) to deploy tracking buoy at the leading edge of the spill plume within 6 hrs, where practicable, of the spill event. Deploy buoy directly from CHA platform, where possible, if spill source is from platform	Buoy tracking data Incident log

2.5 Offshore Containment & Recovery Strategy

Containment of an oil spill relies on the effective and efficient deployment of vessels with appropriate recovery equipment suitable for the response conditions. Effective recovery requires the deployment of suitable vessels and adequate containers for storage of recovered oil. Spill fate modelling does not predict that floating oil will be above 10g/m^2 in the event of a release of crude from the pipeline. However, the crude is likely to form waxy balls that may be recovered through the use of nets (in storage at TEO warehouse in Duval Street, Port Denison). Containment and recovery of diesel can occur through the use of more conventional skimmers, although given the evaporative nature of diesel, the NEBA process may not support its implementation.

Containment and recovery operations may target surface oil in Commonwealth or State waters with the aim of reducing impacts to sensitive receptors. The DoT as the HMA has the authority to advise the response operations to go to locations they deem to have protection priority in State waters, and the preliminary NEBA conducted in the EP can be used to assist in identification of these locations.

Duval Street, Port Denison is 1hr steaming time from the CHA Platform. The Port of Geraldton is 4hrs steaming time from the CHA Platform. Land transportation between Geraldton and Dongara is approximately 45 minutes.

Through the deployment of booming strike teams, 40m^3 of crude oil can be recovered per day (or up to 200m^3 oily water waste) per vessel strike team, plus additional collection through the use of EcoNets.

Given the rate of release of crude from a pipeline leak is 0.192 m^3 per day and production will be shut-in on leak detection, the initial first strike response teams are unlikely to recover their maximum capacity (40m^3 per deployed team) through the use of booms or nets in the first few days of response.

The likely scenario is that oil will be in small patches following the detection of a leak after a number of days (up to 21 days), and oil will have already weathered and potentially be on shorelines and therefore containment and recovery is unlikely to be deployed (therefore up to a 3 vessel booming strike team is adequate, refer to Section 5.8 of the EP for ALARP discussion).

Booms are not as effective on diesel spills, although they are included for consideration in the event of a vessel collision. An instantaneous release of up to 500 m^3 marine diesel is considered credible during CHA operational activities. Before booms can be deployed to the location, > 50% of diesel will have evaporated resulting in a maximum of 250 m^3 spreading towards shorelines whilst entraining and weathering.

Therefore, the volume remaining on the sea surface is likely to be much less, with diesel rapidly evaporating, entraining and arriving on shorelines. Deployment of the booms would not necessarily prevent shoreline contact given the spread and thin sheens likely to be seen.

Table 2-9: Offshore Containment and Recovery Plan

Offshore Containment and Recovery Plan	
Initiation criteria	Operational monitoring predicts or observes containment would prevent significant shoreline contact from surface oil; or As directed by DoT
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)
Controlling Agency	Platform/ pipeline spills Commonwealth waters: TEO State waters: DoT For spills moving from Commonwealth to State waters (cross-jurisdictional) TEO is the Lead IMT Vessel spills

Offshore Containment and Recovery Plan			
	AMSA (Commonwealth waters) or DoT (State waters)		
Objective	• Limit the extent of environmental harm through deployment of vessels, booms and recovery systems. • Recover up to 10 m^3/hr for 4 hrs per day per strike team deployed equating to 40 m^3 recovered oil per strike team[1]. • Safely store recovered oil and other waste for transport back to shore for onward shipment to licensed facilities for safe disposal.		
Applicable hydrocarbons	Crude	Diesel	Other
	✔	✔	X
Implementation	Utilise small vessels appropriate for shallow waters e.g. tenders, flat bottom vessels as required The AMOSC Liaison Officer will facilitate equipment resources from AMOSC (Fremantle) and AMSA (Fremantle) stockpiles. Additional resources from AMOSC and AMSA can be obtained from stockpiles further afield if necessary. • Provide aerial support: • Activate aerial support by field wing or helicopter to direct the vessel operators to the oil location. • Each aircraft to be provided with a trained spotter Deploy EcoNets from TEO warehouse for containment and recovery of crude Deploy absorbent booms for containment and recovery of diesel Provide vessel support as requested by control agency: • 1 vessel booming strike team consisting of 2 vessels capable of towing the equipment and each able to store 200 m^3 oil/water waste, skimmer systems, booming system and recovery equipment capable of recovering surface oil from the sea surface; • 1 single vessel V-sweep strike team capable of towing the V-sweep system and able to store 200 m^3 of oil water waste, and skimmers capable of recovering surface oil; • Single vessel side sweeping with own recovery systems and 200m^3 storage tanks;		
Implementation time	Operational NEBA conducted within 6 hours of spill notification to IMT Recovery equipment deployed to site within 18 hours of spill notification to IMT Aerial support provided via aerial surveillance which is mobilised within 3 hours of spill notification to IMT, aircraft mobilised to location prior to deployment of recovery equipment For Level 2/3 spills, outside the resources of TEO, NatPlan and State Hazard Plan – MEE, resources will be obtained through the AMSA or DOT Liaison Officers providing extra containment/recovery resources to the site within 24hours		
Termination criterion	As directed by DoT The strategy will be suspended if weather conditions may prevent safe and / or effective operations		

[1] This allows time for locating areas as directed by the Incident Response Teams, OSTM and aerial surveillance and deploying and recovering equipment during daylight hours.

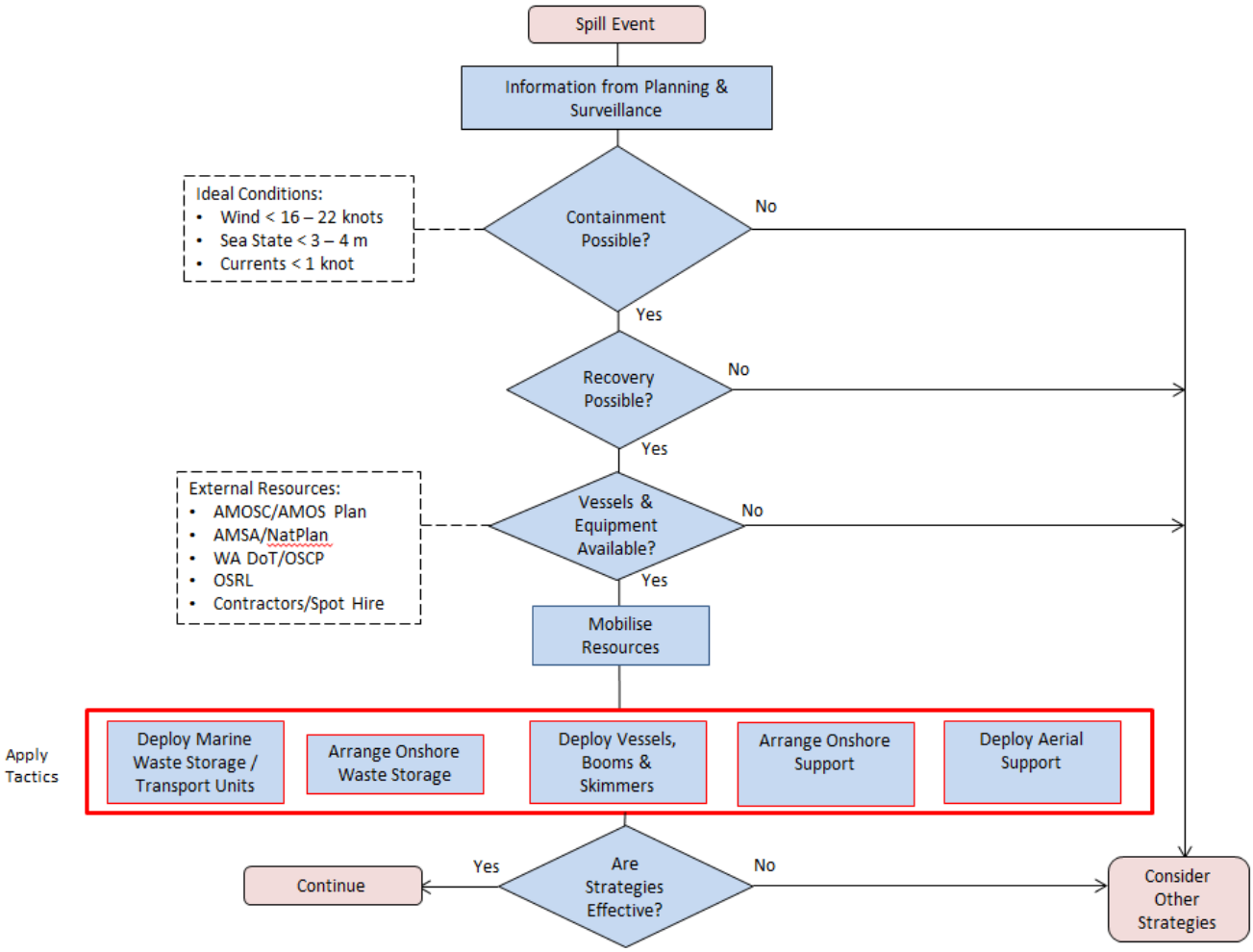


Figure 2-2: Containment & Recovery Strategy Guidelines

2.5.1 Offshore Containment Strategy Summary and Environmental Performance

The offshore containment and recovery strategy is summarised in Table 2-10 along with the objectives standards and measurement criteria.

Table 2-10: Offshore containment and recovery strategy summary and environmental performance

Performance outcome	Critical Controls	Resources	Performance Standard	Measurement Criteria
Initial NEBA undertaken by the response team to identify which sensitivities at risk require spill response activities to be implemented.	Undertake operational NEBA in consultation with DoT/ DBCA to identify sensitivities at risk	OSMP identifies sensitive receptors Preliminary NEBA documented in EP	Operational NEBA completed within 6 hrs of the spill	Incident log NEBA
Implement containment and recovery resources.	Relevant Controlling Agency uses or requests containment and recovery equipment and/or resources during on-going spill response.	Trained observer x 1 Aircraft x 1	Helicopter[2] undertaking visual surveillance is used to direct offshore containment and recovery operations to hydrocarbon windrows heading for sensitivities identified in the operational NEBA assessment. Aircraft mobilised ahead of vessels to site	Aerial surveillance log Incident log MoU testing undertaken in spill exercises Confirmation with providers on MoU arrangements
		Low sided vessel/s (Southern Spirit, and/or similar from Harbour Services Australia)	TEO owned/operated vessels and equipment capable of containing and recovering oil at sea are mobilised to site within 18 hours of request by control agency. Spill equipment maintained at TEO Duval Street storage facility	Incident log Vessel observer log Training matrix Vessel specification sheets
		High density landing nets		
	Implement offshore containment and recovery measures to reduce potential hydrocarbon exposure at sensitive receptors	Additional vessels and booms	Other spill equipment resources deployed within 24 hours through NatPlan and State Hazard Plan - MEE Efficiency of the effectiveness of offshore containment and recovery (visual confirmation that booming acting as effective barrier and effective recovery of hydrocarbons is being achieved) is recorded and reported to inform NEBA assessment Decant oily water from offshore containment and recovery behind boom to prevent spread of oily water Demarcation and barriers to indicate areas for wash down of equipment onshore, no access and quarantine (as required) No night time nearshore vessel (e.g. booming) operations (vessels stand-off at night with navigation lighting only)	Field logs
	Safely store recovered oil and other waste for transport back to shore for onward shipment to licensed facilities for safe disposal	IBC's and IBC funnels	IBCs and IBC funnels maintained at TEO Duval Street storage facility	Equipment inventory at Duval Street
	Implement offshore containment and recovery measures to reduce potential hydrocarbon exposure at sensitive receptors	Heavy Duty Oil Boom and Reel Booms & Accessories	Spill equipment maintained at TEO Duval Street storage facility	Equipment inventory at Duval Street
Trained operators to deploy, operate and recover offshore containment and recovery systems	Only trained operators to deploy and monitor booms to ensure that booms are operating effectively	TEO trained personnel or third-party providers	Trained operators of booms are provided as soon as NEBA assessment indicates offshore containment and recovery is required. Personnel have appropriate training in containment and recovery equipment deployment before mobilising to spill location to implement strategy	Induction and training materials and personnel training records. Incident log
Marine operating base that can accommodate vessel and crews close to the response site	Suitable marine operating base identified and available during operation of the CHA facility	Wharf space (Heavy Lift – Duval Street, Port Denison) Loading areas / Duval Street warehouse	Appropriate marine operating base identified and access rights in the event of an incident confirmed Decontamination zones identified onshore for equipment wash-down	Consultation with site owners (DoT Dongara)

[2] A helicopter is on contract to TEO, but in the event of an incident, fixed wing aircraft or helicopters may be used depending on availability

2.6 Shoreline Protection and Deflection Strategy

Cliff Head crude will cool very quickly on release to the sea and weather to produce waxy solids with pour point greater than 33°C, potentially reaching a pour point of 45°C or greater. While in the marine environment, waxy residues will remain solid but if allowed to beach, then under warm conditions on land, the solids may melt, mobilise and become more difficult to clean up e.g. by percolating into rocky crevices, between gaps in pebbles and thorough sand and soils.

Diesel will evaporate quickly at sea surface, but spill modelling predicts accumulations along shorelines in the vicinity of the release site, therefore protection and deflection may be considered.

Protection and deflection is subject to amenable weather and sea conditions, and involves the use of physical barriers to separate hydrocarbons from shoreline sensitivities, or to deflect hydrocarbons to other areas where they may be naturally collected for recovery, or deflect it to other areas where they will do less harm. This strategy will be implemented when the relevant Controlling Agency uses or requests protection and deflection equipment and/or resources during on-going spill response.

Booms can be used to create physical barriers on the water surface to protect sensitive receptors in intertidal and nearshore environments with the intent of taking the oil plume off its trajectory path. Booms can also be used to deflect the oil spill to locations easier for shoreline clean-up, for example moving oil from rocky shorelines to sandy shorelines. Following a spill of crude, the waxy solids that are expected to form on the surface will not form a typical ‘slick’ of oil, and therefore it may be difficult to determine the leading edge of a plume to place protect and deflect booms in front of it, however as discussed above the strategy will be considered to allow deflection of oil to sandy beaches for clean-up (away from rocky shorelines or socio-economic resources).

In the area that may be impacted by a spill of crude, the dominant habitat is sandy shorelines with coastal towns identified which have harbours, piers and other social amenities. These beaches are readily accessible via four-wheel drives (4WD) or all-terrain vehicles (ATV) to allow clean-up to occur. Accessibility has been verified through desktop research and operating experience in the area. Shorelines selected for protection and deflection will be based on a NEBA and advice from DoT in the event of a spill as the controlling agency.

Spill modelling indicates the potential for accumulated oil to occur along shorelines along the mainland, including around the port of Port Denison (Dongara) and Geraldton (refer Section 12.4). These ports would potentially require protection to ensure stakeholders are satisfied and reduce clean-up of vessels and harbour walls and protect those resources. An example of the response required at one of these locations is discussed below.

2.6.1 Port Denison Response

Vessels utilised by TEO are berthed and mobilised from Port Denison and the community are key stakeholders in TEO operations and would potentially supply resources in the event of an incident (e.g. vessel, accommodation, food). Therefore, it is considered likely that the harbour would be identified as a key priority for protection following NEBA. To protect the harbour, general purpose boom or shoreline land and sea booms could be utilised.

The entrance to Port Denison harbour is 100 m wide. A combination of shoreline response booms could be utilised for the protection from and deflection of oil away from the harbour. A range of shoreline booms are part of the AMOSC stockpile in Fremantle and could therefore be mobilised to location rapidly (~4 hour transportation time, plus ~2 hours to mobilise). Additional boom is also available in Geelong, although it is unlikely to be required given the scale of the potential spills associated with Cliff Head operations; and can be deployed within 24 hours to ensure adequate protection and deflection at this location.

2.6.2 Other shoreline Receptors

Additional boom can be mobilised to locations that are suitable for the shorelines in the zone of potential impact from a spill using AMOSC resources and personnel, if required. The equipment available through the Fremantle stockpile (closest to Cliff Head operations) is suitable for use in proximity to shorelines in the vicinity: sandy beaches and harbours.

2.6.3 Alternatives

There are no other reasonable alternatives for protection and deflection strategies other than having the booms on standby at Port Denison. AMOSC maintain the equipment and test it regularly, including during response exercises to ensure it is fit for purpose. TEO rely on the expertise and training of AMOSC personnel to deploy these resources and therefore training their own personnel to undertake boom deployment and maintenance is considered disproportionately expensive to the risk. Particularly given the negligible environmental benefit gained given that AMOSC resources can fulfil the requirements to the required standard.

Having this type of boom on standby on location at Port Denison 24/7 is not considered to be ALARP given the cost of boom maintenance and storage, training of personnel versus the availability of equipment, resources and trained personnel through AMOSC membership that ensures the needs can be met. The ports and shorelines are easily accessed, and deployment of booms can be completed via vessels (as described below). TEO has at least one vessel on contract at all times, with ready access to other vessels as required through local contractors such as Harbour Services Australia.

Protection and deflection equipment available for use by TEO is a combination of AMOSC, AMSA and DoT equipment. Booms would be deployed from vessels (probably small tenders given the shallow water locations). Shoreline boom configurations may be utilised to deflect oil onto designated beaches for clean-up.

Table 2-11: Protection and Deflection Plan

Protection and Deflection Plan	
Initiation criteria	Operational monitoring predicts or observes shoreline contact from surface oil; or, as directed by DoT
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)
Controlling Agency	DoT (Level 2/3)
Objective	Protect the highest shoreline and near-shore environmental sensitivities and which can be boomed effectively To deflect or collect oil to avoid contact with key sensitive receptors.

Protection and Deflection Plan			
Applicable hydrocarbons	Crude	Diesel	Other
	✔	✔	X
Implementation	• Priorities for shoreline protection will be agreed in consultation with DoT to protect sensitive shorelines or sensitive species from the impact of oil. • Prioritisation of protection and deflection measures to minimise the need to access sensitive shoreline (Section 12.6) • NEBA process is applied when preparing the IAP for the spill response strategies • Prioritise locations through environmental sensitivity and oil spill trajectory through NEBA output, for example potential priorities could include Abrolhos, Cervantes, Geraldton, Dongara, Leeman. • Prioritise the environmental sensitivities identified in Section 12.6. • TEO will provide the resources and/or equipment requested by the controlling agency via NatPlan resources. • Where NEBA assessment and DoT concludes Shoreline Protection and Deflection is viable, deploy: • 2 land-side crews • 1 marine-side crew • Deploy land-side and marine-side crews to prioritised locations with numbers for the crews determined on the basis of real time OSTM, aerial surveillance and shoreline assessment team reports. • Scale deployment upwards or downwards when spill trajectory modelling and aerial surveillance provides sufficient data to forecast extent and location of shoreline impacts. • Provide advice on practical precautions to minimise contact with flora and fauna; and assist with the NEBA process when selecting spill response strategies and to evaluate the impact of strategies. • Utilise small vessels appropriate for shallow waters e.g. tenders, flat bottom vessels		
Implementation time	• As directed by control agency		
Termination criterion	• As directed by DoT		

2.6.4 Considerations

- Booms will need to be a mix of:
  - Shore Sealing-intertidal areas
  - Self-inflating - less bulk for transport
  - Solid-flotation - more chaff resilient
- Standard personnel number is a team of 6 (based on advice from AMOSC) for boom deployment and preparation, led by a trained AMOSC Core Group member, plus necessary vessel crew
- Depth of water and the lack of detailed marine charts
- Anchors will damage coral; care must be taken to lay anchors in sand
- Coral will damage booms, lay booms only in sand
- Minimise disruption to wildlife by avoiding excessive noise
- Report any oiled wildlife to IMT.

2.6.5 Safety

- Conduct safety briefing/prestart daily meeting; Refer to JHA procedure in development of any JHA's
- Use appropriate levels of PPE taking into account all hazards including environmental (heat water etc)
- Continually assess and evaluate hazards and adjust controls accordingly.

Using these stockpiles, the range of protection and deflection methods include near-shore booms anchored close to the identified protection priority areas, or open water booms placed at significant distances from shorelines to deflect the open water pathway of the oil to force the oil to miss the predicted shoreline requiring protection.

Protection and deflection personnel available to TEO is a combination of TEO staff, AMOSC Core Group Responders, State Response Team members and National Response Team members.

Deployment of equipment and personnel will be commensurate to the severity of the spill and timing/ location of potential shoreline impact. Following deployment of protection and deflection booms, daily inspections and maintenance of the booms is to be undertaken by response personnel to ensure locations and formations are maintained so that they remain effective in achieving objectives.

TEO will direct first strike deployments of protection and deflection resources, as required based on spill trajectory mapping and operational monitoring. DoT will assume control of the response as the relevant Controlling Agency for shoreline response activities and will direct deployment following hand-over of control.

During a spill response, locations identified or predicted to receive shoreline loading (based on operational monitoring), are to be cross-referenced with the shoreline sensitivity information acquired from aerial and vessel surveillance, shoreline assessments and the OSMP.

2.6.6 Protection and Deflection Strategy Summary and Environmental Performance

The shoreline protection & deflection strategy is summarised in Table 2-12 along with the objectives, standards and measurement criteria.

Table 2-12 Protection and deflection strategy summary

Performance outcome	Critical Controls	Resources	Performance Standard	Measurement Criteria
Initial NEBA undertaken by the response team to identify which sensitivities at risk require spill response activities to be implemented.	Undertake operational NEBA in consultation with DOT/ DBCA to identify sensitivities at risk	OSMP identifies sensitive receptors Preliminary NEBA documented in EP 1 x person in IMT with oil spill assessment training	Operational NEBA completed within 6 hrs of the spill	Incident log NEBA
Implement protection and deflection resources.	Relevant Controlling Agency uses or requests protection and deflection equipment and/or resources during on-going spill response.	Appropriate vessels with shallow draft for nearshore activities (e.g. tenders or fast rescue craft from Harbour Services Australia)	Vessels capable of working in shallow coastline waters and protection and deflection equipment are deployed within 24 hours through NatPlan and State Hazard Plan - MEE Efficiency of the effectiveness of protection and deflection (visual confirmation that booming acting as effective barrier) is recorded and reported to inform NEBA assessment	Incident log Vessel observer log Vessel specification sheets Field logs
Trained operators to deploy, operate and recover protection and deflection systems	Only trained operators to deploy and monitor protection and deflection equipment to ensure the equipment is operating effectively	As per standard personnel requirements: Marine side team(s) (1 x trained operators/team leader and 2 x Labourers per team) Land side team(s) (2 x Trained operator/Team Leader(s) able to direct deployment of booms in waterways and shallow seas and 10 x Labourers)	Trained operators are provided through industry arrangements as soon as HMA requests protection and deflection resources deployment to ensure effective deployment and minimisation of negative environmental impacts e.g. ensure that booms in very shallow water do not trap wildlife. Booms are maintained and inspected daily once deployed to ensure they are functioning effectively throughout the response	Induction and training materials and personnel training records. Field logs demonstrating that team members responsible for protection and deflection are those with training and induction records for this activity. Field logs demonstrate daily inspection of booms throughout response
Consultation to take place with local authorities at early stages	Stakeholder consultation undertaken	1 x person in IMT with media training	To reduce disruption to other users of the marine and coastal areas, early awareness of spill response activities is provided Assessment of local resources available (e.g. hotels) to reduce strain on accommodation prior to deployment of personnel	Consultation records
No dispersant to be used for spill response	No dispersant to be used for spill response	None applicable	No dispersant used during a response to a spill in the Cliff Head field	Incident log

2.7 Shoreline Clean-up Strategy

The decision to implement shoreline clean-up will be taken by the IMT when the relevant controlling agency requests shoreline clean-up resources.

Shoreline clean-up techniques will be determined by the properties of the residues which may beach. The solid waxy tar-balls are predicted to accumulate on the shoreline. The pour-point of the weather solids is anticipated to be greater than the 33°C of fresh crude, potentially reaching a pour-point of up to and beyond 45°C. These are susceptible in summer conditions to cycles of melting, mobilisation and re-solidification. This will potentially result in the mobilised hydrocarbons flowing into crevices, between gaps between pebbles and rocks and percolating thorough sand and soils. Diesel is also predicted to accumulate on shorelines in the event of a vessel tank rupture.

To assist in determining which response methods are most appropriate for shorelines, it is necessary to obtain information about shoreline character (topography, complexity, exposure etc.), degree and distribution of oiling, if present, presence of sensitive receptors (habitats, fauna etc.) and information on shoreline processes and access routes that could aid or hamper response efforts. This detailed information can be collected from on-ground assessments.

DoT are the designated Controlling Agency for shoreline response for all spills identified in this OPEP and will direct resources provided through TEO for the purposes of on-ground shoreline assessments and shoreline response activities. TEO will provide additional information on shoreline character and oiling collected as part of aerial surveillance activities carried out under its control (refer Section 2.4).

In the event of a spill with the potential for shoreline contact, the actual survey objectives, methodology, deployment locations and resource allocation will be controlled by DoT, as the Controlling Agency (with TEO acting as a Supporting Agency) and therefore may differ from that included below.

DoT provides guidance on shoreline assessments within their Oil Spill Contingency Plan (DoT 2015).

2.7.1 Shoreline and Coastal Habitat Assessment

Table 2-13: Shoreline and Coastal Habitat Assessment

Shoreline and Coastal Habitat Assessment			
Initiation criteria	Operational monitoring predicts or observes shoreline contact from surface oil; or As directed by DoT		
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)		
Controlling Agency	DoT (Level 2/3)		
Objective	To provide a rapid assessment of: • shoreline character and processes, • distribution of coastal habitat/ fauna, • level of oil contamination and oil characteristics (if oil present), • any constraints to responding to shoreline (e.g. access and safety constraints) Based on this information appropriate response strategies, in particular, shoreline-clean-up activities will be determined.		
Applicable hydrocarbons	Crude	Diesel	Other
	✔	✔	x
Termination criterion	As directed by DoT		
Implementation	Existing information on shoreline character, distribution of habitats/fauna and access/ safety constraints can be obtained from the following sources: • Oil Spill Response Atlas (OSRA) Web Map Application (WMA)		

	• TEO OSMP • The information from the shoreline assessment team will be used to complete the NEBA assessment.
Resources	Shoreline clean-up specialists and other trained oil spill responders from: • AMOSC Core Group • DoT State Response Team • AMSA National Response Team • TEO aerial surveillance reports • TEO contracted vessels and vehicles as required for shoreline access. • BMT Team

A shoreline assessment comprises the following tasks:

1. Assessment of shoreline character, habitats and fauna including:
    - shoreline structured biotic habitats
    - distribution of fauna
    - shoreline energy and processes (e.g. wave energy, tidal flows)
    - shoreline substrate (e.g. mud, sand, pebble, rock)
    - shoreline form (e.g. width, shape and gradient)
    - access/ safety constraints
2. Assessment of shoreline oiling (if present):
    - surface distribution and cover
    - subsurface distribution
    - oil type, thickness, concentration and physical character
3. Recommendations for response;
    - applicable strategies based on oil type and habitat
    - potential access, safety and environmental constraints
    - Likely resourcing (personnel and equipment) requirements

Ground surveys undertaken on foot, by vehicles or by small vessel will occur at prioritised areas to provide a close-range assessment of shoreline physical characteristics, coastal habitats/fauna, scale and character of oiling and safety/access constraints.

Ground surveys are to be provided by trained shoreline clean-up specialists and other trained oil spill responders as per those required for managing shoreline clean-up operations. This includes the use of AMOSC Core Group personnel across industry and State and National Response Teams as provided for under State Hazard Plan - MEE and NatPlan.

The deployment of ground survey teams will be directed by DoT as the Hazard Management Agency (HMA) and Controlling Agency for coastal/shoreline pollution in WA. The deployments will be informed by the observed and predicted contact of oil and from existing baseline information on shoreline character.

Shoreline surveys will be undertaken within segments that are recorded and/or mapped that share common traits based on coast geomorphology, habitat type, fauna presence, level of oiling or access.

Information on shoreline character and habitat/fauna distribution for each segment will be recorded through the use of the following techniques:

- Still or video imagery collected with simultaneous GPS acquisition
- Field notes together with simultaneous GPS acquisition
- Mud maps outlining key natural features, oil distribution, imagery locations of quantitative data (transects, oil samples)
- Transects (cross-shore, longshore) and vertical sediment profiles
- Samples of oil and/or oiled sediments
- The following parameters are to be assessed

- physical characteristics: rocky, sandy beach, flat, dune, other wetland
- major habitat types: mangrove, salt marsh, saltpan flats, fringing reef, rubble shore, seagrass verge
- Coastal fauna and key habitats (e.g. nests) including quantification/ distribution of oiled fauna
- state of erosion and deposition: deposition, erosion, stable
- human modified coastline (access tracks, facilities etc).

Oil character, if present, including appearance, surface thickness, depth (into sediments), distribution, area and percentage cover.

2.7.2 Shoreline Clean-up

Clean-up of shorelines may be required for a worst-case spill of diesel or crude. Diesel is light and volatile with a very low proportion of residue following weathering. This type of hydrocarbon is difficult to handle for removal given the light nature but is readily washed from sediments by wave and tidal flushing and therefore shoreline clean-up is unlikely to be environmentally beneficial for a diesel spill.

Cliff Head crude will cool very quickly on release to the sea and weather to produce waxy solids with pour point greater than 33°C, potentially reaching a pour point of 45°C or greater. While in the marine environment, waxy residues will remain solid but if allowed to beach, then under warm conditions on land, the solids may melt, mobilise and become more difficult to clean-up e.g. by percolating into rocky crevices, between gaps in pebbles and thorough sand and soils. Clean-up on beaches can be completed during cooler hours (early morning) when the crude remains solid on the shoreline. Optimal techniques for this type of spill given the low volumes and the fact that floating oil will not arrive on shorelines, but will accumulate over time, are manual labour using shovels and bags to contain the crude and oily sediments. Many of the shorelines in the vicinity of the spill are easily accessible via sandy tracks off sealed roads, making access with ATVs or similar vehicles easier. Heavy machinery (such as tractors and excavators) may not be as effective given the likely distribution of oil in small patches along the coastline as it accumulates over time. Heavy machinery could result in damage to shorelines and dunes if used, rather than the more mobile use of ATVs and personnel to transfer oily waste to larger vehicles on sealed roads. This will also assist in minimising the spread of contaminated sediments along the shoreline through the minimal use of vehicles.

Shoreline clean-up is part of an integrated nearshore/ shoreline response to be controlled by DoT as the relevant Controlling Agency. TEO will undertake first-strike clean-up where required. Upon assumption of Controlling Agency responsibilities, DoT will direct resources (equipment and personnel) provided by TEO for the purposes of shoreline clean-up. TEO will provide all relevant information on shoreline character and oiling collected as part of surveillance activities carried out under its control. Modelling of credible spill scenarios (Section 12.2) for the Cliff Head Offshore Operations EP predicts shoreline accumulation of hydrocarbons from a pipeline spill of crude above the 100g/m^2 threshold, with a maximum average accumulation of 16 m^3 and a worst case volume of 36.3 m^3 in summer and 35.4 m^3 in winter. For a 500 m^3 diesel spill modelling predicts a maximum average accumulation of 39 m^3 and a worst case volume of 166 m^3 in summer and 195 m^3 in winter. Following receipt of modelling (refer monitor and evaluate above), shoreline assessment teams and shoreline clean-up teams will be deployed to locations where oil is predicted to reach shorelines.

Shoreline clean-up teams will typically be small teams (e.g. 6 people per team), and it is assumed that 1 person can collect 1 m^3 of oily waste per day. As oil is predicted to accumulate over time along the shorelines, rather than arrive as floating oil in a slick, it is likely that only 1 or 2 teams would be required to be deployed daily, rather than multiple teams at once. However, assuming a worst case of 40 m^3 accumulating along shorelines at once (in the possible case of a worst-case pipeline spill of crude), this would therefore require 40 people with shovels and bags to clean up the oil as manual labour removal is considered most appropriate along shorelines where oil is most likely to occur (sandy beaches). Additional personnel may also be required in the event of a worst-case diesel spill. Personnel available are a combination of TEO staff, AMOSC Core Group Responders, State Response Team members and National Response Team members; the AMOSC core group alone

has between 80 and 100 personnel, and therefore more than adequate resources for a clean-up of this size.

Bags of oiled waste would be collected in larger 10 kg bags which can then be transported via ATVs along the beach to access points and transported to the receiving area. By keeping the waste bags smaller, ATV's can be utilised to access shorelines and it reduces the need for heavy machinery for lifting large bags. Given the type of clean-up required (manual labour), equipment can be readily procured from local hardware stores and AMOSC contacts.

Table 2-14: Shoreline Clean-up

Shoreline Clean-up			
Initiation criteria	Operational monitoring predicts or observes shoreline contact from surface oil; or As directed by DoT		
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters)		
Controlling Agency	DoT (Level 2/3)		
Objective	To clean-up all recoverable oil from targeted shorelines where it results in a net environmental benefit		
Applicable fuel source	Crude	Diesel	Other
	✔	✔	X
Implementation	The information from the shoreline assessment team will be used to complete the NEBA assessment. TEO will provide operational monitoring results and sensitive receptor information (from OSMP) to DoT to aid in planning and NEBA assessment of clean-up response strategies Shoreline assessment teams deployed to shorelines where modelling predicts oiling to occur, personnel sourced from AMOSC core group responders through AMOSC membership Shoreline clean-up specialists deployed to shorelines where oiling has occurred, personnel sourced from AMOSC core group responders through AMOSC membership Clean-up equipment including shovels, plastic bags, rakes, buckets wheelbarrows, decon kit, power packs, pumps waste storage, vehicles, trailers, absorbents PPE. ATV hired for use on oiled beaches in transporting larger (10kg bulki bags) of oiled waste to waste containment area above high tide line. Crane for lifting 10kg bulki bag(s) onto flatbed truck (onshore mainland) for transport to waste containment area (refer **Section 3**). During shoreline response, the following will also be considered and implemented: • Induction and training of onshore team accessing uninhabited islands. Induction to include that spill response teams should avoid disruption of environment and take practical tactical precautions to avoid contact with flora and fauna; • IMT to coordinate basic training to clean-up contractors; Oversee the clean-up process to ensure appropriate procedures are used to minimise the impact on the environment; Provide advice on practical precautions to minimise contact with flora and fauna; and assist with the NEBA process when selecting spill response strategies and to evaluate the impact of strategies.		
Implementation Time	• Shoreline assessment team on shorelines where oil is predicted or sighted within 24 hours of IMT activation • Shoreline clean-up (if appropriate) commenced within 24 hours of shoreline assessment team assessment results		
Termination criterion	As directed by DoT		

Table 2-15: Summary of possible shoreline clean-up techniques

Shoreline Type	Technique
Sandy beach	Manually remove waxy solids from the surface of the sand with rakes, shovels, barrows to bins, bunds and drums. Manually remove oil contaminated sand/soil into bins, bunds and drums (e.g. layer of solidified wax formed under the surface of the beach by percolating melted wax).
Pebble and Rocky beaches	Waxy solids which have not melted will be picked up by hand and placed in bins, bunds, drums and bags. Peel and scrape waxy solids which have melted and resolidified from accessible rocky surfaces into bins, bunds and drums. Use absorbents to mop up liquefied wax (where surface temperatures exceed the pour point of the hydrocarbons). Dispose of contaminated absorbents into bags, bins, drums. Absorbent booms may be place around accumulations of solids between to prevent spreading of melting wax to uncontaminated or cleaned areas. Consider pressure washers to remove oil from difficult areas.
Intertidal Mudflats	Manually remove waxy solids from the surface of the mud with rakes, shovels, to bins, bunds and drums Manually remove oil contaminated sand/soil into bins, bunds and drums.
Mangroves	Waxy solids which have not melted will be picked up by hand and placed in bins, bunds, drums and bags. Use absorbents to mop up liquefied wax (where surface temperatures exceed the pour point of the hydrocarbons). Dispose of contaminated absorbents into bags, bins, drums.
Anthropogenic structures	Waxy solids which have not melted will be picked up by hand and placed in bins, bunds, drums and bags. Use absorbents to mop up liquefied wax (where surface temperatures exceed the pour point of the hydrocarbons). Dispose of contaminated absorbents into bags, bins, drums. Consider pressure washers to remove oil from difficult areas.

2.7.3 Shoreline Clean-up Strategy Summary and Environmental Performance

The shoreline clean-up strategy is summarised in Table 2-16 along with the objectives, standards and measurement criteria.

Table 2-16: Shoreline clean-up strategy summary

Performance objective	Critical Controls	Resources	Performance Standard	Measurement Criteria
To clean-up all recoverable oil from targeted shorelines where it results in a net environmental benefit	Relevant Controlling Agency requests shoreline clean up equipment and/or resources during on-going spill response. Shoreline Clean-up Plan Waste Management Plan	Operational NEBA and preliminary NEBA Cliff Head OSMP	TEO IMT will provide operational monitoring and sensitive receptor information to DoT to aid in planning and NEBA assessment of clean-up response strategies	Shoreline assessment records dated and timed to demonstrate assessment teams on site within 24 hours of the spill notification. Shoreline assessment records identifying assessment personnel. Shoreline assessment personnel CVs demonstrating appropriate expertise IAP and NEBA assessment with shoreline assessment input
		Shoreline assessment team drawn from resources identified in Section 6.3 to include expertise to evaluate potential wildlife, marine and oil spill response requirements. 1 x Wildlife expert 1 x Marine environmental specialist 1 x Oil spill response specialist 1 x shoreline clean-up assessment team Clean-up equipment including shovels, plastic bags, rakes, buckets wheelbarrows, decon kit, power packs, pumps waste storage, vehicles, trailers, absorbents PPE.	TEO IMT will provide clean-up resources (equipment and personnel) as directed by DoT	
			On initiation of response, TEO will activate Shoreline Clean-up Specialists from AMOSC Core Group Responders to assist with shoreline assessments and shoreline clean-up	
			Mobilisation time for the AMOSC Core Group Shoreline Clean-up Specialists will be 24 hours from IMT initialisation.	
			The Shoreline Clean-up Specialists will prepare maps and forms detailing the area surveyed and defining specific clean-up tactics.	
			Shoreline Clean-up Specialists will verify the effectiveness of clean-up, modifying tactics as needed if conditions change. Shoreline Clean-up Specialists will establish exclusion and low traffic zones.	
			The AMOSC and DoT shoreline clean-up specialists shall verify clean-up effectiveness and conduct final evaluations.	
		n/a	Shoreline clean-up will continue until Terminated by DoT	
		Clean-up equipment including shovels, plastic bags, rakes, buckets wheelbarrows, decon kit, power packs, pumps waste storage, vehicles, trailers, absorbents PPE.	Shoreline clean-up (if appropriate) commenced within 24 hours of shoreline assessment team assessment results. Assess area following impact with oil to evaluate the oil remobilisation potential. Minimise foot traffic to minimise trampling oil into sediments. Control the movement and spread of mobile oil within the sand to prevent contamination of adjacent areas. Trained shoreline clean-up specialists, core group responders and experienced Team Leaders.	Shoreline assessment records dated and timed to demonstrate clean-up teams on site within 24 hours assessment results. Shoreline clean-up personnel CVs or induction records demonstrating appropriate expertise IAP and NEBA assessment with shoreline assessment input and clean-up results
Access to resources maintained	Master Service Contract with AMOSC MOU's with recruitment agencies	AMOSC resources NatPlan resources DoT Resources	Maintenance of access to shoreline clean-up equipment and personnel through AMOSC, AMSA National Plan and DoT State Hazard Plan - MEE throughout operation via spill exercises Maintain access to shoreline clean-up personnel through recruitment agencies.	Spill exercises Master Service Contract with AMOSC Consultation with AMOSC, AMSA, DoT; MOU's with multiple recruitment agencies.
	MOU with waste contractor	Waste contractor	Maintain access to waste tanks and waste transfer equipment throughout activity. MOU with waste contractor includes emergency response services.	MOU with waste contractor
Trained operators to undertake shoreline clean-up	Only trained operators to undertake shoreline clean-up to ensure environmental benefit from undertaking clean-up	Clean-up teams	Trained operators are provided through industry arrangements as soon as HMA requests shoreline clean-up deployment to ensure effective deployment and minimisation of negative environmental impacts. Teams on location undertaking shoreline assessment within 24 hours of spill notification and commence clean-up within 24 hours of assessment team's assessment provided to IMT. Decontamination zones identified for wash-down to prevent spread of hydrocarbons from clean-up site All shoreline clean-up personnel are trained and have received an induction on the environmental sensitivities prior to commencing clean-up to include: • Appropriate access routes to/from contaminated areas to prevent spread of spill considering sensitive vegetation, bird nesting/roosting areas and turtle nesting habitat • Training on decontamination e.g. removal of contaminated clothing and equipment prior to entering clean areas • Review shoreline lighting type and placement in consultation with DoT and DBCA if in sensitive areas for marine fauna (e.g. turtle/bird nesting)	Induction and training materials and personnel training records. Field logs demonstrating that team members responsible for shoreline clean-up are those with training and induction records for this activity.
Trained personnel to provide advice to local authorities regarding access	Advice sought from appropriate personnel in DoT	DoT Resources NatPlan resources Third party contractors (as required)	Liaison with local authorities regarding access to: • ports • beaches/shorelines • decontamination zones To ensure that personnel not involved in the response are kept away from the area ensuring only trained personnel conduct clean-up	Consultation logs IAP
Access to spill areas is demarcated	Advice sought from appropriate personnel in DoT and local shire	DoT Resources NatPlan resources Third party contractors (as required)	Prioritise existing roads and tracks for all vehicle and personnel movements to minimise erosion and vegetation damage unless otherwise advised by the HMA or specialists Demarcation and barriers to indicate areas for wash down, no access and quarantine (as required) Use of a heritage advisor if operational area overlapped with potential areas of cultural significance	Field logs IAP

2.8 Oiled Wildlife Response Strategy

In the event of a hydrocarbon spill, the impact on wildlife is determined by the types of fauna present, the type of hydrocarbon spilt and the extent of exposure. Of the potential spill scenarios associated with the OPEP, oiled wildlife operations will be considered in the event of a spill which has the potential to visibly oil wildlife. The decision to implement oiled wildlife response will be taken by the control agency if the findings of the NEBA demonstrate that techniques used will do more good than harm. This decision will be incorporated into the IAP.

The greatest potential for oiled wildlife will be for spills adjacent to, or moving towards, shorelines and shallow waters in State waters. The location and scale of the spill will determine the Controlling Agency. DoT is the single Controlling Agency for oiled wildlife response in State waters. DBCA will remain as the administrative body and lead agency for the oil wildlife response (OWR) under the control of the appointed controlling agency and will play an advising role in the response and the provision of a DBCA Oiled Wildlife Advisor (OWA). The Western Australia Oiled Wildlife Response Plan (WAOWRP) provides information and guidance to stakeholders, including government and industry (petroleum titleholders, ports and shipping) for the necessary arrangements for wildlife response to Marine Oil Pollution (MOP) incidents in State and port waters. Further, the plan addresses regulatory requirements and community expectations regarding the response to wildlife impacts stemming from a MOP incident. The Incident Management Team (IMT) is responsible for coordinating resource responses for a MOP incident and will liaise with DBCA regarding OWR resourcing requirements. The wildlife unit will provide all personnel with wildlife skills and expertise to assist in an oiled wildlife response. The Department of Fire and Emergency Services (DFES) could provide accommodation facilities and support equipment's based on availability. The Australian Marine Oil Spill Centre (AMOSC) coordinates a team of OWR trained industry personnel across various Petroleum Titleholder (TH) companies that can be called upon if an MOP incident occurs. Under the WAOWRP arrangement, DBCA and AMOSC may request assistance from each other if required. Petroleum TH are responsible for ensuring MOP presentation and mitigation strategies relative to their operations are adequately implemented and maintained an EP that includes OPEP or oil spill contingency plan (OSCP). Team will work in conjunction with DBCA OWR capability under the direction of the DBCA OWA.

Given the Level 2 spills from Operational activities involve light, low viscosity hydrocarbons (diesel) and Cliff head crude which forms waxy balls (rather than the typical homogenous slick), the risk of physical oiling of wildlife at the sea surface (e.g. birds, turtles and marine mammals) is diminished. A greater risk from these hydrocarbons is toxic components entraining and dissolving into the water column, potentially exposing aquatic organisms and sub-tidal habitats. These effects will be monitored through the Scientific Monitoring Plan.

This Oiled Wildlife Response Plan describes how, in the event of a spill that will or could potentially oil wildlife, the IMT will activate DBCA OWA as stipulated in the WA Oiled Wildlife Response Plan (WAOWRP) and WA Oiled Wildlife Response Manual (WAOWRM). These roles ensure minimum standards for Oiled Wildlife Response (OWR), as outlined within the WAOWRP, are met and ensure timely mobilisation of appropriate resources (equipment and personnel) through communication with the wildlife logistics team.

Table 2-17: Oiled Wildlife Response Plan

Oiled Wildlife Response Plan		
Initiation criteria	Operational monitoring shows wildlife are contacted or predicted to be contacted by a spill; or, as directed by DoT	
Jurisdictional Authority	Platform/offshore pipeline releases: NOPSEMA (Commonwealth waters) or DoT (State waters) Vessel releases: AMSA (Commonwealth waters) or DoT (State waters) **NB:** DCCEEW and DBCA are relevant Statutory Authorities for the protection of wildlife in Commonwealth and State waters, respectively.	
Controlling Agency	Platform/ pipeline spills Commonwealth waters: TEO State waters: DoT For spills moving from Commonwealth to State waters (cross-jurisdictional) TEO is the Lead IMT Vessel spills AMSA (Commonwealth waters) or DoT (State waters)	
Outcome	• Maximise the best achievable and practicable protection measures to wildlife and their habitats during marine pollution incidents. • Minimise the risk of impacts to oiled wildlife and wildlife threatened by oil; • Minimise injuries to wildlife threatened or impacted by other operational activities associated with the response (e.g. containment and clean up, aviation); • Provide achievable care for wildlife in line with best practices, to return as many rescued wildlife back to the wild; • Document and monitor any impacts observed from the marine pollution incident or associated operational activities (scientific monitoring); and Document the operational processes undergone and their effectiveness (operational monitoring)	
Applicable hydrocarbons	Crude	Diesel
	✔	✔
Implementation	If marine fauna are identified as requiring treatment through monitoring activities, TEO will call on timely provision of equipment and personnel from AMOSC and contracted service providers (Table 2-18**)** who are licensed and experienced in handling oiled wildlife, clean-up and rehabilitation. Under the WAOWRP arrangement, the AMOSC OWA may request further assistance from DBCA in the form of trained personnel, and vice versa, if their own expertise has been exhausted. The following activities will be implemented: • Deploy an industry Oiled Wildlife Advisor (OWA) from third party provider to the IMT who will liaise with DBCA and Industry as per the WAOWRP (Figure 2-3**)**. • Deploy hazing equipment to move wildlife away from oil contaminated surfaces and oil spill response activities e.g. offshore containment and recovery sites; • Pre-emptive capture – data recording capture of threatened wildlife and subsequent transfer to safe areas or held pending release once area is safe; • Provide care for oiled wildlife; and • Return as many rescued wildlife back to the wild as possible.	
Implementation Time	Field assessment completed within 18 hours of spill notification to IMT Response team on location within 24 hours of spill notification to IMT (if advised by control agency)	
Termination criterion	As directed by DoT	

Table 2-18: Potential oiled wildlife response service providers

Company	Experience
State Maritime Environmental Emergency Response Committee (SMEERC) DBCA	MEER Duty officer is on call 24 hours a day, 365 days a year, personnel include: • DBCA SDO is available 24 hours, 365 days a year as a first point of contact for those wishing to notify DBCA of an MOP
AMOSC	AMOSC staff are on call 24 hours a day, 365 days a year, personnel include: AMOSC Technical Advisor – Oiled Wildlife – assistant in IMT (as industry OWA if required) AMOSC OWR Industry Team– trained industry (30 pax) and wildlife rehabilitation groups (50 pax).

2.8.1 Administrative Structure

The State Hazard Plan - MEE indicates that both the petroleum industry and DBCA have operational plans for OWR and that these plans should align with State Hazard Plan - MEE. WAOWRP establishes the framework for responding to potential or actual wildlife impacts in the event of MEE incident in WA in state or port waters. It also covers spills of oil that impact shorelines from waters outside state waters and port waters. DBCA is the administrative authority for WAOWRP in accordance with the state hazard plan for maritime environmental emergencies (SHP-MEE) administrated by DoT. The WAOWRP and WAOWRM address both these requirements and outline the OWR regardless of the spill source. DoT is responsible for developing and maintaining emergency plans and arrangements for MOP incident occurring in state-waters, through the SHE-MEE.

The WAOWRP and WAOWRM apply to all instances of OWR in State and Commonwealth Waters. The documents detail the legislative responsibilities, relationships to other plans, roles and responsibilities, wildlife division structure, standards and best practice procedures for OWR. While the WAOWRP is a sub-plan to the State Hazard Plan - MEE, it is the responsibility of DBCA to administrate and approve the WAOWRP.

DBCA is not a HMA for MOP or OWR and therefore to manage its financial risk it must ensure all of its expenditure for OWR is approved by the designated controlling agency and their cost recovery arrangements for OWR under the SHP-MEE are in accordance with the AMSA National Plans and the polluter pays principle. The WAOWRP is to be activated when there is imminent or actual impact to wildlife as a result of a spill incident.

2.8.2 Activation Procedure

The IMT will provide a formal notification to DBCA and activate the WAOWRP when there is an oil spill incident that has potential to result in oiled wildlife. Figure 2-3 depicts the WAOWRP activation process adapted from WAOWRP document.

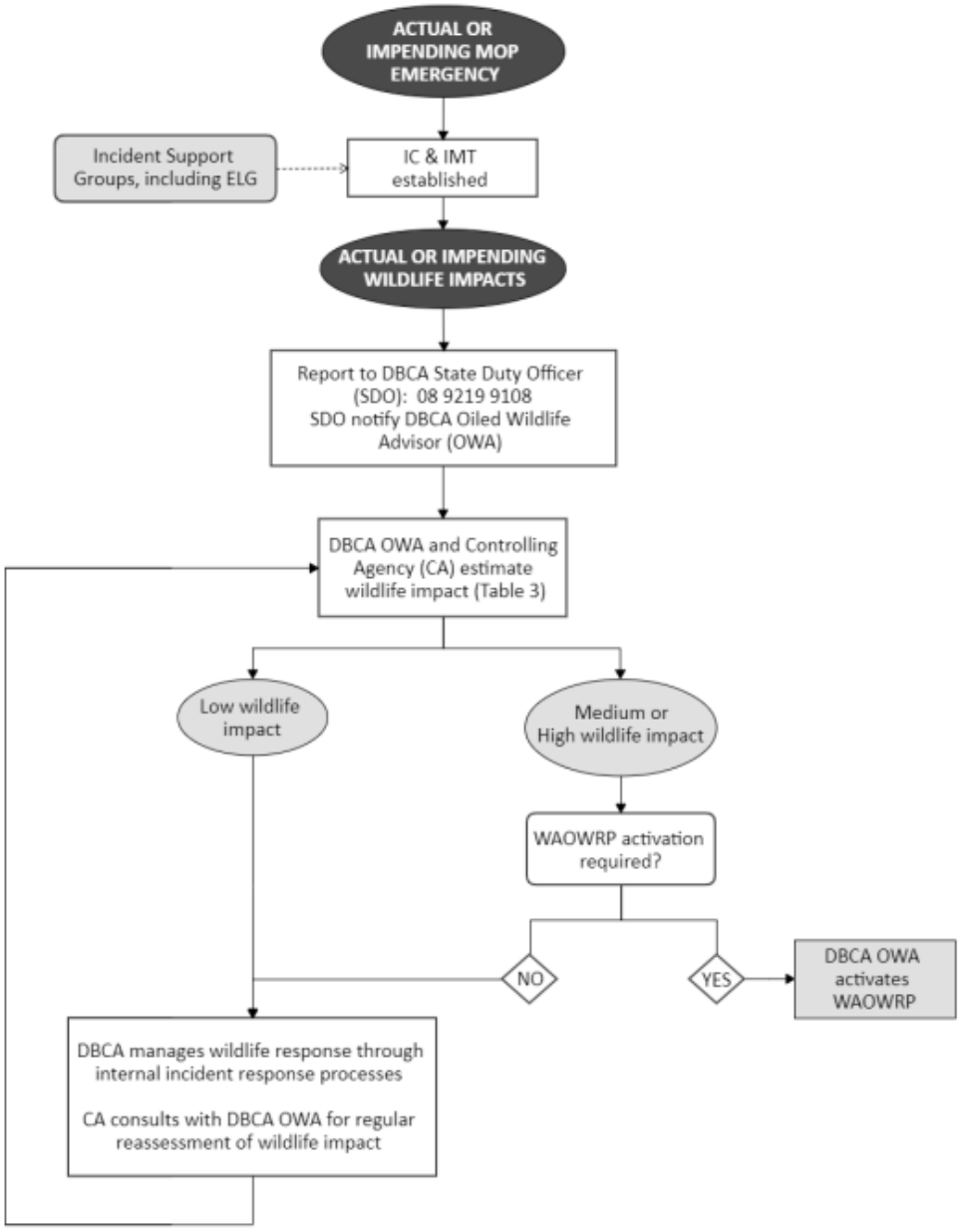


Figure 2-3 WAOWRP activation process (adapted from WAOWRP)

DBCA oil wildlife advisor (DBCA OWA) will provide planning input to the controlling agency and IMT on the wildlife response. The DBCA OWA will work with IC or controlling agency representative to estimate the magnitude of the wildlife impacts, based on likely duration of wildlife impacts, total number and condition of species, and the requirement of primary care facility. The OWR resources mobilised will be measured by the nature and scale of the incident. Once the WAOWRP is activated, the DBCA OWA will provide notification to the corresponding staff (Figure 2-4) and appoint a Wildlife Coordinator.

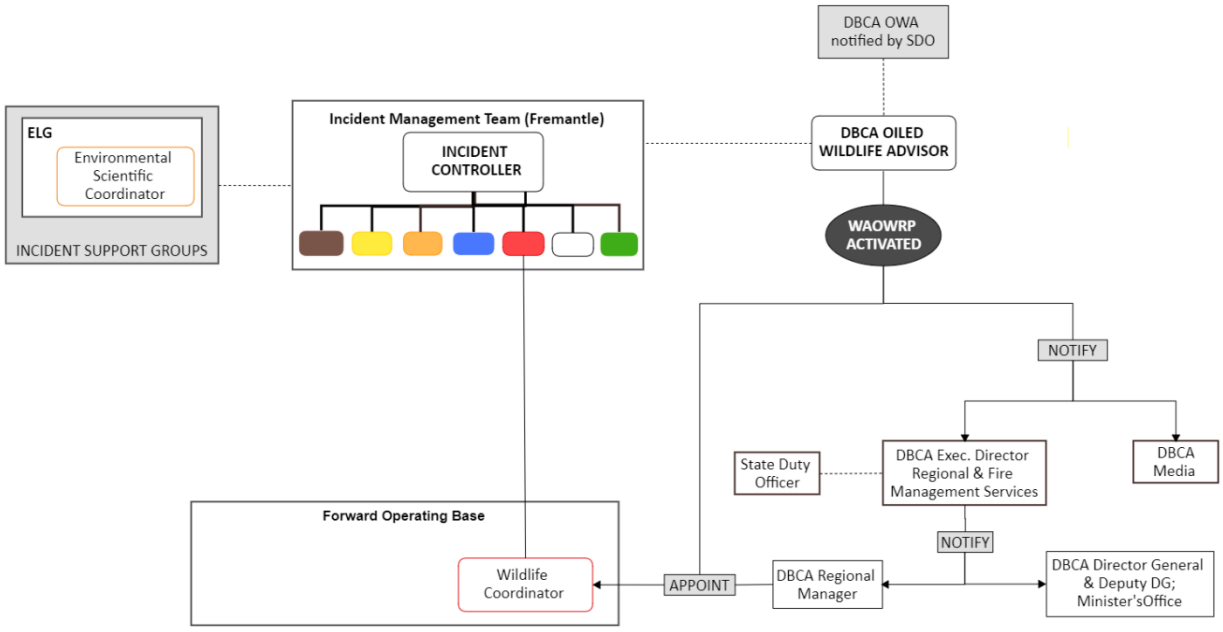


Figure 2-4 DBCA initial response on the activation of the WAOWRP

2.8.3 Operational Stages of Wildlife Response

Oiled wildlife response undergoes eight operational stages as portrayed in Figure 2-5. Each stage is described in detail in the WAOWRP (Page 21-25) and will only be activated upon approval from the IMT. Approval will be based on the incident specific conditions and circumstances and the advice received from the DBCA advisor.

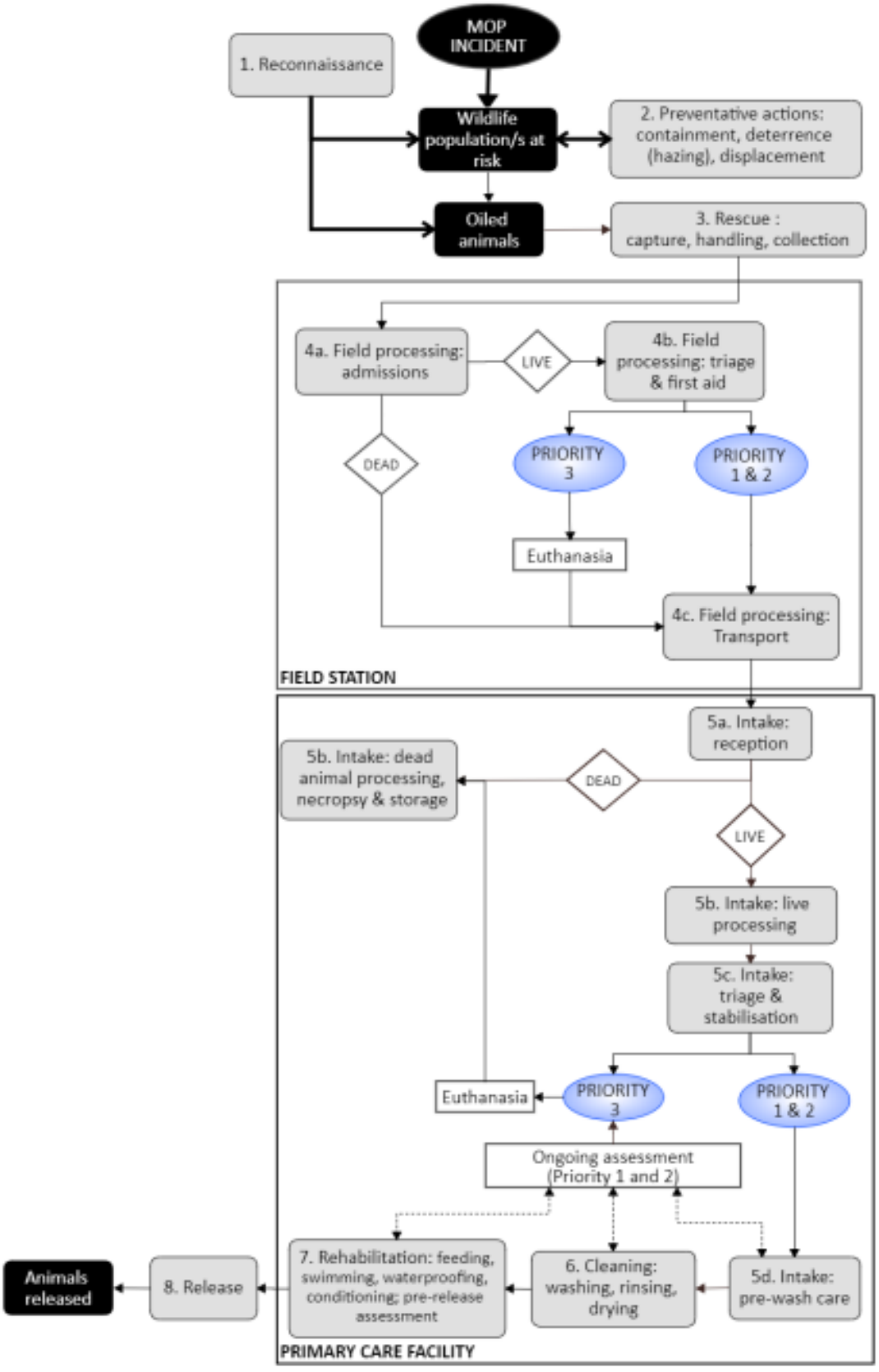


Figure 2-5 Operational stages of the OWR

2.8.4 Oiled Wildlife Advisor Role (DBCA OWA)

DBCA OWA is the first point of contact in case of MOP incident (If DBCA OWA cannot be contacted notify the Executive Director Regional and Fire Management Services, who will temporarily take the role). The OWA role is to advise the IMT on behalf of DBCA, ensuring that the minimum standard for OWR is being adhered to whilst providing expert advice for critical decision making. OWA will provide advice on to resources and support available from DBCA. The OWA's role is to carry out the following:

- Aid in determining the level of wildlife impacts
- Activate the WAOWRP if required
- If WAOWRP not activated: monitor the situation in case escalation is required and manage OWR through normal DBCA incident response processes
- If DoT is not the controlling agency: establish contact with CA and coordinate DBCA support to CA
- Liaise with WC and expedite their requests to IMT for OWR resources and facilities
- Assist in establishing and coordinating inter-agency contacts between DBCA and CA for intelligence, public information, logistics, finance, and other areas as required
- Monitor wildlife operations to identify and assist in resolving current or potential inter organisational issues relating to OWR
- Provide strategic and advisory input to the WA
- Assist in expediting WC requests within the IMT
- Participate in planning, providing current resource status providing current resource status, limitations & capability of DBCA
- Assist with forward planning for utilisation of available DBCA resources and facilities
- Coordinate input of relevant DBCA expertise to IMT functions as required
- Issue ongoing briefings to Director General and Minister's Office as required
- Review and advise on wildlife communications and media releases
- Expedite DBCA licensing and regulatory approvals
- Undertake forward planning for post-release monitoring of wildlife early in the response and expedite
- Post release research requests and licencing.

2.8.5 Termination Procedure

Once the decision has been made to terminate operations, the IMTL will stand down individual participating and supporting agencies when parties agree that the incident/emergency has been satisfactorily controlled and their input is no longer required. This is likely to involve the progressive stand down of different sections of the response teams as some may need resourcing for longer than others.

In the event of a spill that impacts on wildlife, ongoing resourcing may be required, beyond the termination of clean-up operations, to complete the rehabilitation of some affected animals and to conduct monitoring programs after their release. Demobilisation of the wildlife response will be guided by parameters established by the Wildlife Coordinator at the beginning of operations and incorporated into the Incident Action Plan (IAP) in consultation with the IMTL.

2.8.6 Testing the Oiled Wildlife Response Plan

Testing of the OWRP will be conducted during OPEP testing as outlined in Section 13. Testing the OWRP will involve:

- Notification of AMOSC, DBCA and third-party specialist by the IMTL
- Assignment of OWAs and the completion of the NEBA
- Development of the OWRP based on the NEBA
- Sourcing of equipment and personnel which would be required under the developed OWRP.

2.8.7 Oiled Wildlife Strategy Summary and Environmental Performance

The oiled wildlife strategy is summarised in Table 2-19 along with the outcomes, standards and measurement criteria.

Table 2-19: Oiled wildlife strategy summary

Performance objective	Critical Controls	Performance Standard	Measurement Criteria
Protection and treatment of wildlife that are or likely to be impacted by a spill.	DoT implements or requests **oiled wildlife response** equipment and/or resources during on-going spill response.	At the request of DoT as the relevant Controlling Agency and Lead IMT, TEO will mobilise OWR personnel and equipment through AMOSC.	AMOSC Participating Member Contract Incident Log Field logs Fauna sighting records
		Oiled wildlife assessment team will be notified within 1 hour of a Level 2 spill and a first field assessment will be completed within 18 hours of the spill notification.	
		Notification to DBCA Oiled Wildlife Advisor by IMT to occur immediately following assessment of oiled wildlife event.	
		Demobilisation of the wildlife response will be guided by parameters established by the Oiled Wildlife/ shoreline Clean-up Officer Wildlife Coordinator at the beginning of the operations and incorporated into the IAP.	
		Personnel mobilised by TEO will work under the direction of the DoT Incident Controller and Wildlife Units	

3 Waste Management

3.1 Overview

The temporary storage, transport, treatment and disposal of waste material must be correctly managed to safeguard against any adverse environmental effects which may inhibit clean-up activities. Waste generated and collected during an oil spill response requiring management and disposal may consist of liquids (recovered oil/water mixture) or semi-solids/solids (oily solids/debris).

3.2 Objectives

- Minimise the environmental impact of waste generation from oil spill response activities through implementation of the waste management hierarchy of control: prevent, reduce, reuse, recycle, energy recovery and dispose
- Organise adequate waste management arrangements (i.e. storage, handling, transport, equipment and resources), facilities and disposal capability to allow a continuous response to be maintained.

3.3 Operational requirements

Expected waste volumes during an oil spill response are likely to vary depending on volume of hydrocarbon released, mitigation controls employed and how fresh/weathered hydrocarbons are. Waste management, handling and capacity should be scalable to ensure continuous response operations can be maintained.

Table 3-1 summarises the waste storage, treatment and disposal options available to manage waste associated with the spill response strategies. The options outlined in Table 3-1 are available through AMSA, AMOSC and DoT. Waste for onshore disposal will be transported to licensed waste disposal facilities by a dedicated waste contractor. TEO has a MOUs with contractors, which includes the provision of waste management services during a spill response. Transport to the licensed waste management facilities would be undertaken via controlled-waste-licensed vehicles and in accordance with *WA Environmental Protection (Controlled Waste) Regulations 2004*.

Table 3-1: Hydrocarbon contaminated waste storage, disposal and treatment options for hydrocarbon contaminated waste

Waste type	Onsite storage	Possible treatment and disposal options	Location of onshore waste holding facilities	Disposal site/end destination
Liquid waste (e.g. recovered oil/water mixture)	Holding on vessels, oil drums, tanks, oil barges/dracones and flexible bladders	Wastewater treatment process (oil-water separation, demulsify) and recycle	Arrowsmith Stabilisation Plant (ASP) – TEO's own facilities ASCO Facilities – Pye Road, Dongara Dongara Concrete Laydown Area	Cleanaway Toll Veolia Australia and New Zealand RMD Services Western Resource Recovery
Solid waste (e.g. oily PPE, booms, sorbent pads, solid oil[1], oily sediment)	Lined skips, oil drums, industrial waste bags, plastic rubbish bags	Recovery and recycling Incineration Landfill		
Oiled wildlife	Industrial waste bags, plastic rubbish bags	Incineration Landfill		

Note [1] Solid oil may include tar balls and high viscosity emulsions

Waste will be managed in accordance with the TEO Prescribed Waste Management Procedure (10HSEQENVPC04), MARPOL 73/78 (as appropriate to vessel class), relevant Commonwealth and WA regulations, and the contractor waste management plan to dispose of waste generated as a result of spill response strategies.

Although the TEO Prescribed Waste Management Procedure (10HSEQENVPC04) does not directly refer to spill response activities, it does provide guidance for the handling and management of waste generated from spill response operations. All waste stored or transferred should be documented, including details of the volumes and nature of the waste, receiver and destination of the waste. Should waste management activities be required in environmentally sensitive locations, the impact of the activities will be monitored and appropriate controls implemented as informed by operational NEBAs.

3.3.1 Implementation of the Waste Management Response Guidelines

For Level 1 responses the IMT HSE Officer in consultation with the Shore Base Supervisor, will coordinate waste storage and disposal.

For Level 2 and Level 3 responses, consider appointing a Waste Management Coordinator (WMC) to undertake the task of managing waste and where necessary develop a Waste Management Sub-Plan:

- Oily waste is properly handled and stored
- Oil and oily debris is adequately segregated, treated and stored at the point of collection
- Oil and oily debris is rapidly collected and taken to designated sites for storage, treatment or disposal
- Treatment or disposal practices ensure that the waste poses no future threat to the environment.

Establish a temporary waste handling base to allow for the separation of waste, the selection of suitable disposal routes and collection of wastes for transport to licensed disposal facilities. The IMT Logistics Coordinator must, where required, provide Marine response units with assistance in the establishment of storage facilities on jetties or other locations. The IMT Logistics Coordinator must, where required, provide shoreline units with assistance in the establishment of temporary waste storage areas behind beaches being cleaned.

As detailed in Table 3-1, waste holding facilities are available at the following locations:

- Arrowsmith Stabilisation Plant
- ASCO Transport & Logistics yards
- ‘Dongara Concrete’ laydown area.

Note that these sites will require preparation as follows:

- locate and cordon areas as required
- mark/sign the areas as appropriate e.g. ‘for hydrocarbon waste only’
- line the area with HDPE liner
- establish an adjacent decontamination station.

As far as reasonably practicable, wastes will be segregated in accordance with the preferred segregation as provided in the table below (Table 3-2).

Table 3-2: Segregation of wastes

Field Segregation		Preferred Segregation
Liquid	Oils	Non-emulsified oils
		Emulsified oils
	Wastewater	Water from temporary storage
		Water from heat or gravity separation of emulsions
		Water from chemically demulsified oil
Solid	Oils	High pour point oils
		High viscosity emulsions
		Tar balls
	Oily debris	Oil mixed with cobble or sand
		Oil mixed with wood, vegetation, plastics or sorbents

3.3.1.1 Onsite handling offshore

Small tankers, barges, towed flexible containers (e.g. "Dracones"), IBCs, dip-nets, zoom-booms, sorbents will be used for moving collected oil from the oil recovery vessels to the shore station. Available equipment is listed in Section 6.10.

3.3.1.2 Onsite handling onshore

Table 3-3 lists some of the equipment available for transport and storage of wastes along shorelines. Available equipment is listed in Section 6.10.

- Attention will be given to the prevention of leaching or spillage of oil from vehicles or containers.
- Vehicles will be sealed using plastic sheeting.
- Skips and other containers will also be sealed prior to use.

Note: Any container used for storage must be covered if rain is possible, to avoid overflow.

Table 3-3: Temporary waste storage and handling

Waste Type	Container	Handling	
Liquid Oils and Wastewater	200 litre drums	Onshore	Half fill only, care in handling
	Fast tank[1]	Onshore	Can be used for transport on truck with care
	Vacuum trucks	Onshore	Should not be used on volatile oils
	Skips	Offshore/onshore	Bottom drainage hole to be plugged
	Large flexible bags/ containers [1]	Offshore/onshore	Onshore should be loaded onto flat-bed trucks prior to filling
	Barges & Dracones[1]	Offshore	-
Solid Oils and Oily Debris	200 litre drums	Onshore	Half fill only, care in handling
	Skips	Onshore	Bottom drainage hole to be plugged
	Plastic bags	Onshore	Half fill only, should be moved using Bobcat or Front-end Loader

Note (1) Available via MAC, Geraldton Port Authority, DoT MEER, AMOSC or AMSA

3.3.1.3 Temporary Onsite Waste Storage

Oily Sediment: No Free Oil:

- Stored above the high-tide mark in pits no deeper than 1 m.
- The storage site should avoid vegetated areas and low-lying areas.

Oily Sediment or Debris: Some Free Oil

- A shallow pit lined with plastic. Edges should be elevated above sediment level. Depth of pit should not be such that intrusion of sediment water occurs.
- Plastic bags; no more than one third full and stored above the high-tide mark.
- Use of 200 litre drums. These should not be filled to the top; (two thirds full is sufficient). Drums should be covered if possible to avoid the entry of rainwater with consequent overflow.

Free Oil: Oily Debris

- Storage pits and drums as per oily sediment/some free oil, except that greater care is needed in the siting of temporary storage pits.
- Unless sediment water is encountered, pits should be deeper than above and left no more than two thirds full if possible. Storage pits should be covered.

CAUTION

Care should be taken that all vessels, vehicles, or containers used for the transport of oily wastes are effectively sealed and leak-proof.

Waste Separation

The waste management sub-plan should consider preliminary treatment options shown in Table 3-4.

Table 3-4: Separation and Disposal of Waste Materials

Waste Type	Separation Method
Non emulsified oils	N/A
Emulsified oils	Heat treatment Gravity separation (1) Demulsifiers (2)
Water from temporary storage areas	N/A (3)
Water from heat or gravity separation	N/A (3)
Water from chemically demulsified emulsion	N/A
High pour point oils	N/A
High viscosity emulsions	N/A
Tar balls	Sieve to remove sand (1)
Oil and sediment	Collect oil leaching from storage pits or piles (1)
	Wash with water or solvent
Oil mixed with wood or other debris	Collect oil leaching from storage pits or piles (1)
	Wash with water

Note

(1) May be undertaken at the point of collection (shoreline).

(2) May be undertaken at the point of collection but is not preferred.

(3) Will not be undertaken on site

3.3.1.4 Disposal

Waste must be disposed of in accordance with WA regulations. Table 3-5 indicates methods of disposal that will be used.

Table 3-5: Disposal Methods and Regional Sites

Type of Material	Service Provider/ Disposal Site	Possible Disposal Method
Liquid Oil Waste (Oil with some water).	Cleanaway Toll Veolia Australia and New Zealand RMD Services Western Resource Recovery	Recycle
Oily Water(Water with some oil).		Oil-water separator
Oil-Water Emulsions.		Demulsify/ recycle oil
Solid Oily Waste.	Cleanaway Toll Veolia Australia and New Zealand RMD Services Western Resource Recovery	Landfill Oil content should be <30ppm
Non Oily, Non-Prescribed Waste Materials.		Landfill or Recycle where possible: • Paper • Drums • Batteries • Glass • Aluminium/metals
Prescribed Wastes.		• Incineration • Landfill
Hazardous Wastes (Other than oil).	Cleanaway	This should not be produced. Contact HSES immediately.

3.3.1.5 Waste Management Environmental Performance

The waste management strategy is summarised in Table 3-6 along with the objectives, standards and measurement criteria.

Table 3-6: Waste management strategy summary

Performance objective	Critical Controls	Resources	Performance Standard	Measurement Criteria
Recycle waste and comply with waste treatment, transport and disposal regulations to prevent secondary contamination.	DoT requests waste management equipment and/or resources during on-going spill response.	The Prescribed Waste Management procedure (10HSEQENVPC04) requires: • All solid waste will be segregated into covered marked containers or collection areas prior to disposal or recycling at an appropriate site on shore. • Liquid wastes for disposal onshore will be segregated from solids into secure appropriate containers. • Care will be taken to ensure all wastes are contained and not blown away from containment areas (e.g. waste skips and rubbish bins will be covered to contain wastes). • All spill response personnel are inducted in waste management requirements. • All wastes for onshore disposal will be sent to a licensed waste management contractor In the event that additional waste holding facilities area required, (ASP, ASCO Transport & Logistics yards and Dongara Concrete laydown area) they will be made ready to receive waste within 6 hours of the requirement being identified.	For waste generated during a shoreline clean-up, DoT as the HMA will manage clean-up activities with support from TEO IMT	Incident log IAP
			TEO's Waste Service Provider in conjunction with the Logistics Team IMT will identify applicable waste management methodologies for inclusion in DoT's IAP process.	
			At request of the DoT IMT, the TEO Waste Service Provider will mobilise waste resources for each collection point based on predicted volumes of solid oily waste.	
			The TEO Logistics Team will inform resources required by DoT, as the Controlling Agency, and response effectiveness.	
			Volumes of oily waste collected, transported and disposed of by TEO's Waste Service Provider will be recorded on relevant Controlled Waste Tracking Forms	Controlled Waste Tracking Form Incident log
			Oily water collected by TEO's Waste Service Provider will be sent to oily-water separation systems capable of segregating oils and water such that the water is suitable for on-site evaporation.	
			Oil contaminated soils will be classified (Class III or IV) before being disposed of at landfills. Solid waste considered too contaminated for both landfill sites will be segregated and despatched for incineration or provided to a Class V facility.	Waste tracking records
			TEO's Waste Service Provider will segregate wastes in temporary sites prior to final disposal if not previously segregated.	
			TEO have an MOU arrangement to contract Waste Service Provider with an oil spill response Waste Management Plan outlining activation, resourcing and logistics requirements.	Contract/MOU

4 Overarching Oil Spill Monitoring Plan (OSMP)

4.1 Introduction

TEO has developed an OSMP (4716-HS-0114). The OSMP includes five Type I operational monitoring plans (OMPs) and seven Type II scientific monitoring plans (SMPs) for implementation following a level 2 or level 3 hydrocarbon spill incident, used to guide the spill response, assess potential environmental impacts and inform any remediation activities. Initiation and termination criteria are provided in Sections 4.4 and 4.5.

- Type I (operational monitoring) which must be undertaken during the spill response to support planning and operations. This monitoring gathers data to track the ongoing response against the response strategy and IAP objectives. The initiation and termination criteria, rationale, objectives and outcomes are provided in Table 4-2.
- Type II (scientific monitoring) includes short term environmental damage assessments and long-term damage assessments (including recovery) as well as scientific studies. The monitoring strategy will determine whether the oil spill response strategies implemented have been effective in protecting the environmental sensitivities under threat. SMPs are discussed in more detail in Section 4.5.
- Plans will only be implemented where triggered, and hence, the scale and scope of OSMP response is dictated by the nature and scale of the spill and likely priority protection areas risk. The OSMP will be enacted as determined by the initiation triggers within respective OMP and SMP studies as detailed in Sections 4.4 and 4.5.
- Consultation will be undertaken with relevant industry bodies prior to implementation as the IMT assesses the requirement for monitoring to be implemented with input from other industry bodies, agencies and experts.

4.2 Reporting

- Operational monitoring reporting will be provided to the TEO IMT to maintain situational awareness and advise response strategy requirements. The reporting requirements of the scientific monitoring program will be specific to the individual scientific monitoring plans (SMPs) deployed (see Section 4.5). The terms of responsibilities, report templates, schedule and QA/QC practices will be agreed with the nominated environmental service providers engaged to conduct the SMPs.
- Once finalised, operational and scientific monitoring reports will be released to relevant government agencies (and the public, if deemed necessary by the government) in order to share the knowledge gained and to allow government input in determining the need for further surveying.

4.3 Personnel and response readiness

- TEO has a number of existing contracts, master service agreements, and business support relationships and alliances with service providers in place to provide support in the event of a spill, as outlined in Section 11, and has additional agreements in place with environmental service providers to deliver the OMPs and SMPs for the CHA operations.
- Given the likelihood of a spill occurring from the CHA operations is considered rare, it is not considered of benefit to have all resources that may be required on standby for the activity. The cost would be disproportionate to the risk. Approximate costs for standby is $40K per provider per year. Given the resources available through NatPlan and State Hazard Plan - MEE, and the MoU's in place with potential providers, resources can be mobilised to site quickly and within the timeframes identified in the OPEP.
- Table 4-1 and Appendix A include a summary of the organisations contracted to support TEO implement and deliver the OSMP and the support they provide.

4.4 Operational Monitoring Plan (Type I)

The focus of operational monitoring is to maintain situational awareness, to obtain and process information regarding the nature and scale of a spill, and the resources at risk; so that it can be acted upon in an adaptive manner to inform secondary response (if required) and response termination and determine the initial impacts to the environment to inform the initiation of scientific monitoring.

Implementation of the Type I OMP will be initiated and overall management will be exercised by the IMT Planning Officer, working in consultation with operational and scientific experts. Figure 4-1 provides an overview of the Type I OMP and Table 4-1 provides the strategy summary for the implementation of this monitoring plan and the contractors which need to be deployed and their respective roles in implementing the plan.

Each of the studies in the Type I OMP has specific triggers for implementation. The Type I OMP includes a detailed description of these triggers, the objectives of each study, and termination criteria for each study as shown in Table 4-2.

The Type I OMP also describes the guidance by which each study will be implemented, the methods will be refined at the time of an incident to take account of the specific circumstances of the spill and response activities and will be agreed in consultation with relevant operational and scientific experts (identified in Table 4-1 and Section 6.3) prior to implementation.

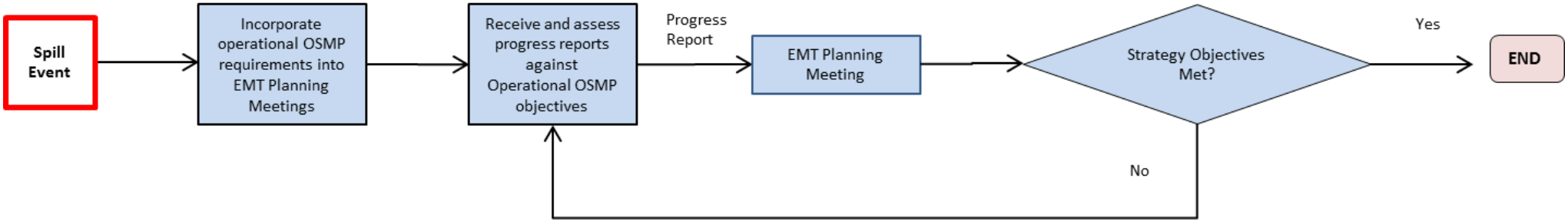


Figure 4-1: Overview of Type I OSMP

Table 4-1: Type I OMP Strategy

Operational Monitoring Plan	Scope	Primary Service Provider	Role and Capability
(1) **Oil Distribution Monitoring – sea surface, shorelines and water column.**	Determine: • Spill location, area and coverage of the slick for purpose of focus spill response activities and resources and potential contact with sensitive environmental receptors • Temporal 3-D distribution of dispersed oil to inform future scientific monitoring requirements	AMOSC TEO	Trained staff and core team members for aerial (helicopter), shoreline and vessel observation and surveillance as appropriate.
		RPS via AMOSC	AMOSC has contract with RPS for surface oil modelling. RPS can be contacted directly for ad hoc service for modelling e.g. hazardous vapours for establishing exclusion zones. RPS has the following experience: • Surface/subsurface detection of dispersed oil plumes during response operations to monitor effectiveness, trajectory and fate. • Incident response examples i) Pacific Adventurer oil and chemical spill in Queensland, ii) Montara oil spill in the Timor Sea, iii) Shen Neng oil spill and grounding in the Great Barrier Reef Marine Park and iv) BP Deep Horizon oil spill in the Gulf of Mexico. • RPS has 24/7 availability for operational and scientific monitoring
(2) **Oil Character and Fate Modelling**	Obtain data for the physical and chemical properties of the oil to facilitate development and assessment of potential success of proposed response strategies. Assess potential impacts of spilled oil in wildlife and other environmental sensitivities to facilitate selection of response priorities.	RPS via AMOSC ADIOS is another resource	In addition to the experience above, RPS has the following experience: Monitoring of oil properties, behaviour and weathering during a marine pollution event.

Operational Monitoring Plan	Scope	Primary Service Provider	Role and Capability
(3) **Shoreline Assessment**	Determine area and thickness of oil on contacted shorelines Determine nature of the oil (chemical and physical state) Assess shoreline for potential clean up success and techniques	AMOSC	AMOSC core group responders provide shoreline response specialists (including oiled wildlife) who can undertake shoreline assessment. Further resources can be mobilised from the DoT response team and AMSA national response team. AMOSC hold beach clean-up equipment (including wildlife response equipment) and training capability. General labour will be sourced from within AMOSC or provided via TEO MOU's with Toll Energy & Marine Logistics.
		BMT	Operational and Scientific Monitoring Team (OSMT) as providers of the scientific monitoring plan will in the event of a spill mobilizes an operational emergency environmental monitoring response team and an emergency data compilation and analysis team.
		Toll Energy & Marine Logistics	Provision of general labour for execution of the shoreline clean-up and wildlife response.
(4) **Wildlife Impact Monitoring**	Determine the number of oiled wildlife of various types, distribution and condition in order to plan and resource wildlife response strategies	BMT	OSMT as providers of the scientific monitoring plan will in the event of a spill mobilizes an operational emergency environmental monitoring response team and an emergency data compilation and analysis team.
		AMOSC	AMOSC provide oiled wildlife responders. Further resources can be mobilised from DBCA, the DoT response team and AMSA national response team.
(5) **Response strategy monitoring**	Monitor performance of the oil spill response for: • Efficiency e.g. recovery rates • Appropriateness of scale e.g. waste management plans	TEO	TEO as Control Agency will: i) coordinate & manage all response strategies and ii) collate and report on resource deployment.
		Response providers	Service providers will be responsible for reporting relevant monitoring data to AMOSC during the oil spill response to the relevant IMT Personnel.

Table 4-2: Operational Monitoring Plans

Step	Requirements
OMP 01: Monitoring and Evaluation for Surface Oil Distribution (Sea and Shorelines) and Dispersed Oil Monitoring	
Initiation	Any known or suspected spill from CHA platform, pipeline or associated facilities.
Termination	See Section 5.
Rationale	The trajectory, volumes and weathering state of slicks of oils spilled from the CHA platform or support vessels, needs to be determined in order to predict potential impact on sensitive resources. Monitoring and Evaluation is a strategy which will be deployed for all spill scenarios.
Objectives	Maintain situational awareness and ongoing understanding of the success of response activities. Obtain information to inform evolution of the response plan to protect environmental sensitivities including shorelines and fauna. Understand the likely fate and trajectory of the spill
Outcomes	Aerial and Vessel slick and fauna observations recorded using structured format see example in **Section 6.7**. Photographic record of sightings where practicable referenced to location data. Oil location, condition and trajectory data for input into oil spill trajectory models.
Guidelines	See Section 2.4.
OMP 02: Oil Character and Fate Modelling	
Initiation	Level 2 or Level 3 spill. Oil has or is predicted to impact shorelines. There is doubt about the source of the oil so characterisation of the oil will provide evidence of source.
Termination	See Section 5. No further field response options required and no risk of shoreline impacts from the spill.
Rationale	Sampling and analysis of oil and water will provide data on the behaviour and fate of the oil. This informs the development and review of the response strategies for the mitigation of the environmental and social impacts of the spill. Physical samples will confirm and inform the OSTM. The data gathered may also inform the design of the scientific monitoring programme.
Objectives	Obtain data for the physical and chemical properties of the oil to facilitate development and assessment of potential success of proposed response strategies. Assess potential impacts of spilled oil in wildlife and other environmental sensitivities to facilitate selection of response priorities. Obtain relevant data for physical and chemical properties of the spilled oil to inform development of the response strategies and IAP.
Outcomes	Analysis report from nominated laboratory and Report providing assessment and discussion on the implications of the analysis data.
Guidelines	Obtain samples of surface oil from vessels. Obtain samples of oil during offshore containment and recovery operations. Surface Hydrocarbons - Physical Properties: • Specific gravity/density • Viscosity • Pour Point • Flash Point • General physical observations e.g. tendency of tar balls to stick to surfaces Surface Hydrocarbons - Chemical Data: Aliphatic hydrocarbons Wax content Ashphaltenes content Distillation profile Total PAH and detailed breakdown by GC/MS (note this analysis only relevant for fresh crude) C17/Pristane rations and C18/Phytane ratios Volatiles including % loss Water content

Step	Requirements
	Water Column Water column sampling should be considered to confirm levels of entrained or dissolved aromatics using a fluorometer e.g.: • Immediately below the surface of the sea • 1 m, 3m, 5m, • If hydrocarbons are observed at 3m or 5m then samples at 10m and 20m should be taken In addition to the fluorometer readings for Total Petroleum Hydrocarbons (TPH), samples must be taken for laboratory analysis to confirm the fluorometer readings and provide more detailed analysis as follows: • Total Petroleum Hydrocarbons (TPH) in seawater • Mono-aromatic Hydrocarbons (MAH)/Benzene, Toluene Ethylbenzene and Xylenes (BTEX) in seawater • Poly-aromatic Hydrocarbons (PAH)
OMP 03: Shoreline Assessment	
Initiation	Prediction of shoreline contact. Actual shoreline contact by the spill.
Termination	No further risk of significant shoreline impacts or Termination criteria for shoreline clean-up have been met (Section 5.2)
Rationale	Shoreline responses (Shoreline protection and deflection and Shoreline Clean-up) require assessment of shorelines threatened or impacted with hydrocarbons to inform the allocation of resources and development of the IAP.
Objectives	Assess oiled shorelines using NEBA techniques to confirm environmental benefits outweigh environmental impacts.
Outcomes	Completed shoreline assessment forms for impacted shorelines (Section 6.8). Photographic record for each impacted or threatened shoreline. Prioritised list of shorelines for protection/deflection/clean-up. Data input for scientific monitoring.
Guidelines	Shoreline assessments will be carried out by qualified and experienced personnel from third party specialist (e.g. Pendoley) and in a manner consistent with methods detailed in AMSA 2003 Oil Spill Monitoring Handbook. Maintain a photographic record for each site impacted or threatened. This will be informed by the OSTM. Shoreline assessment team will consist of 2 to 4 people such that the team has knowledge and experience of i) shoreline assessment, oil behaviour and shoreline protection/deflection and clean up techniques and, ii) wildlife and ecological knowledge relevant to the areas impacted or threatened. Assessment of the shoreline will be maintained throughout the response and will cease once shoreline clean-up termination criteria has been met (Section 5.2). Where there is residual oil or impacted shorelines have not been cleaned (as dictated by NEBA assessment) then a post spill monitoring of these shorelines will be included in the SMP.
OMP 04: Wildlife Impact Monitoring	
Initiation	Oil Spill Monitoring and Evaluation/OSTM predicts or shows shoreline or intertidal oiling has occurred.
Termination	When termination criteria in **Section 5** have been met for Oiled Wildlife response.
Rationale	The potential for oiling of wildlife is assessed through implementation of Study 01 which includes visual observation and OSTM. Monitoring of oiled wildlife assesses the actual impact to wildlife from oiling and provides information on the effectiveness of the response.
Objectives	Carry out pre-impact survey to determine the number and type of wildlife that could be impacted by the oil to inform protection strategies, assess scale and appropriate clean-up methods, determine appropriate rehabilitation, prioritise species/locations for response and establish baseline for subsequent scientific monitoring. Carry out post impact survey to determine the effectiveness of oiled wildlife response, assess logistics and material requirements and assess actual impacts.
Outcomes	Data specifying: • Species: location, habitat type, species affected, number dead, number oiled, % oiling, sub-lethal effects • Habitat: Location, species location, species affected, area, area oiled, % oiling, sub-lethal effects

Step	Requirements
	Where practicable, the data will be accompanied by photographic records. A summary report will be produced after the response.
Guidelines	Oiled wildlife response plan will be implemented (Section 2.8) A photographic record will be established for each impacted or potentially impacted site. Monitoring of oiled wildlife areas will be maintained throughout the response. Where oil remains in areas such that a risk remains to wildlife, then ongoing monitoring will be continued under the scientific monitoring programme.
OMP 05: Response strategy monitoring	
Initiation	All oil spill events which require an operational response
Termination	On meeting response termination criteria in Section 5.
Rationale	Oil spill response implementation is monitored against objectives, standards and measurement criteria established in Section 2.4.4 to allocate resources such that the most effective balance of strategies is applied to the overall response.
Objectives	Spill Monitoring and Evaluation Offshore Containment and Recovery Shoreline Protection and Deflection Shoreline Clean-up Oiled Wildlife
Outcomes	Data will be gathered during the response by the individual response units and collated by the Planning Officer.
Guidelines	Monitor: - Outcomes/data from Study 01 to 05 inclusive as appropriate. - Waste recovery data. - Records of equipment deployed and used and projected requirements against availability. - Assign someone within the IMT to collate and monitor data gathered.

4.5 Scientific Oil Spill Monitoring Plan (Type II)

In the event of a Level 2 spill, the contractor selected to implement the Type II SMP (OSMT) is to be immediately notified (Section 1.4.1) so that the Type II SMP can be implemented (Figure 4-2).

Scientific monitoring is focused on objectives that do not influence response operations, but on evaluating the impact from a spill. It may include reactive baseline collection (post-spill pre-impact), estimating environmental damage and post-response recovery. Reactive scientific monitoring may commence during the spill response phase where an assessment of the available baseline data in comparison with the nature and scale of the spill (e.g. spill trajectory and extent) and resources at risk identify a potential gap. The intent of scientific monitoring is to determine the changes to the environment that have resulted from the hydrocarbon spill, including:

- Short term environmental damage
- Longer term changes to the environment
- Recovery of the environment following changes that can reliably be identified as a result of the hydrocarbon spill.

SMPs have been developed for different environmental sensitivities which may need monitoring in the event of a spill, including water quality, sediment quality, shoreline and intertidal benthos, seabirds and shorebirds, marine mammals and reptiles, and fisheries and tourism. Further details are provided in Table 4-3 indicating initiation and termination criteria, inputs and outputs for each SMP. Note that initiation of SMPs is routinely linked to the information collected during OMPs as described in Section 4.4.

The overarching objectives of the Type II SMP are:

- Monitor the effectiveness of the oil spill response in protecting biodiversity threatened by the oil spill
- Collate and process environmental baseline data from identified stakeholders in the OSMT data governance and metadata manual.
- Carry out field surveys to collate data to track against baseline data
- Develop and implement Scientific Monitoring Information System, to automate management effectiveness reporting through report cards.

In the event of an incident, the primary service provider (BMT) would be notified of the event and they would go into standby mode. This entails preparing to go to site, including review of the SMP's provided by TEO, preparing scopes of work, confirming schedules of personnel availability and equipment so that personnel are able to mobilise to site when activated.

Table 4-3: Scientific Monitoring Plans

Plan	Description & Rationale	Objective	Initiation Criteria	Termination Criteria	Inputs	Outputs
SMP01 - Scientific monitoring of hydrocarbons in marine waters (including weathering) (4716HSH0114/11)	Assess the concentrations of various hydrocarbon fractions in marine water, from which inferences about the nature of hydrocarbon contamination can be made. This information will inform investigations of cause/effect relationships between the oil spill and impacts to natural resources can be identified	Quantify the nature of hydrocarbons attributable to the spill over time. This data can subsequently be related to changes in the health and/or condition of key sensitive receptors potentially affected by spilled hydrocarbons, for the purpose of assessing the impact of the spill on environmental values and sensitivities	Upon notification of a Level 2 or 3 event	No statistically significant difference in hydrocarbon concentrations between impact and reference sites. In the absence of baseline or similar non-impact sites, concentrations of hydrocarbon contaminants, attributable to the released hydrocarbon, are below the relevant hydrocarbon contaminant trigger level within the ANZECC/ARMCANZ (2000) Guidelines for Fresh and Marine Water Quality, or the relevant regulatory site-specific trigger level (where these exist), if this is lower.	Current and previous distribution of hydrocarbons from the spill (OMP01) The predicted spill trajectory (OMP01) Concentration of hydrocarbons in water from operational monitoring (OMP01)	Reporting to stakeholders Water quality data for use in other SMPs
SMP02 - Scientific monitoring of hydrocarbons in marine sediments (4716HSH0114/12)	Assess the concentrations of various hydrocarbon fractions in marine sediments, from which inferences about the nature of hydrocarbon contamination can be made. This information will inform investigations of cause/effect relationships between the oil spill and impacts to natural resources	Quantify the nature of hydrocarbons within sediments attributable to the spill over time. This data can subsequently be related to changes in the health and/or condition of key sensitive receptors potentially affected by spilled hydrocarbons, for the purpose of assessing the impact of the spill on natural resources	OMP01 results or SMP01 indicates that sediment habitat is contacted or likely to be contacted by a hydrocarbon spill above the levels of 10 g/m^2 (floating oil) or 50 ppb (DAH)	No statistically significant difference in sediment hydrocarbon concentrations between impact and reference sites. In the absence of baseline or similar non-impact sites, hydrocarbon contaminant concentrations are below marine sediment quality interim guideline levels within the ANZECC and ARMCANZ (2000) Guidelines for Fresh and Marine Water Quality, or the relevant regulatory site-specific trigger level (where these exist), if this is lower	Current and previous distribution of hydrocarbons from the spill (OMP01) The predicted spill trajectory (OMP02) Concentration of hydrocarbons in sediments from operational monitoring (OMP01)	Reporting to stakeholders Sediment quality data for use in other SMPs
SMP03 - Scientific monitoring of shoreline and intertidal benthos (4716HSH0114/13)	Assess the environmental impacts and subsequent recovery resulting from a hydrocarbon release and associated response activities on shoreline and intertidal environments, including: The presence of beached hydrocarbons The concentrations of hydrocarbon fractions in sediments The effects of hydrocarbons on intertidal biota and subsequent recovery	Quantify the nature of hydrocarbons within intertidal and shoreline sediments attributable to the spill over time. Quantify the distribution, abundance and community composition of intertidal marine biota and the ecological impacts that have resulted (if any) from exposure to spilled hydrocarbons; and Determine the subsequent recovery of benthic organisms and communities impacted by spilled hydrocarbons	OMP01 or OMP03 indicates shoreline contact has occurred or is likely	No statistically significant difference in sediment hydrocarbon concentrations between impact and reference sites OR Oil pollution effects on benthos are no longer detectable by statistical assessment OR Evidence of key ecological processes (e.g. recruitment) necessary for post-impact recovery is demonstrated	Current and previous distribution of hydrocarbons from the spill (OMP01) The predicted spill trajectory (OMP01) Operational assessment of hydrocarbons in water and sediments (OMP01) Evidence of shoreline contact (OMP03)	Reporting to stakeholders Shoreline assessment potentially used in other SMPs
SMP04 - Scientific monitoring of subtidal benthos (4716/HS/H0114/14)	Assess the environmental impacts and subsequent recovery from a hydrocarbon release on subtidal benthic habitats, including: Seagrasses Macroalgae Sponges / filter feeders Hard corals Soft corals	Quantify the distribution, abundance and community composition of benthic marine organisms and the ecological impacts that have resulted (if any) from exposure to spilled hydrocarbons; and Determine the subsequent recovery of benthic organisms and communities impacted by spilled hydrocarbons.	Hydrocarbon spill surveillance or spill trajectory modelling (OMP01) indicate that oil may have contacted, or is likely to contact, benthic habitats OR Evidence of oiling of benthic habitats	Oil pollution effects on benthos are no longer detectable by statistical assessment OR Evidence of key ecological processes (e.g. recruitment) necessary for post-impact recovery is demonstrated	Current and previous distribution of hydrocarbons from the spill (OMP01) The predicted spill trajectory and fate (OMP01 and OMP02) Evidence of oiling of sediments or benthic habitats	Reporting to stakeholders

Plan	Description & Rationale	Objective	Initiation Criteria	Termination Criteria	Inputs	Outputs
SMP05 - Scientific monitoring of seabirds and shorebirds (4716/HS/H0114/15)	Assess the impacts and subsequent recovery of seabird and shorebird populations in response to a hydrocarbon spill event and spill response activities	Collate and quantify impacts to seabirds and shorebirds from results recorded during Operational Monitoring Plan 04 (OMP04 (4716-HS-H0114-04)) (such as mortalities, oiling, rescue and release counts) and undertake a desk-based assessment to infer potential impacts at species population level Undertake monitoring to quantify and assess impacts of hydrocarbon exposure to seabirds and shorebird populations at breeding colonies or roosts that may have been impacted by spilled hydrocarbons	Spilled hydrocarbons overlapping known bird habitat (OMP01 and OMP04) Evidence of oiling of birds (OMP04)	The level of impact to affected seabird and shorebird populations has been quantified OR The impacts to important habitat (feeding, breeding and roosting areas) are not significantly different to reference areas or baseline OR The impacts of the hydrocarbon spill are no longer statistically detectable	Current and previous distribution of hydrocarbons from the spill (operational monitoring plan (OMP01) The predicted spill trajectory and fate (OMP01 and OMP02) Evidence of contact with seabird or shorebirds during operational response (OMP04) Information on the nature of the spilled hydrocarbon over time (SMP01) Areas known to or expected to host seabird and shorebird aggregations	Reporting to stakeholders
SMP06 - Scientific monitoring of sea lions, cetaceans and turtles (4716/HS/H0114/16)	Assess impacts which may have resulted from the hydrocarbon spill to large marine fauna (referred to as significant fauna), including: Sea lions Cetaceans Marine turtles	Observe and quantify the presence of significant fauna within the area affected by a hydrocarbon spill Assess and quantify lethal or sub-lethal impacts (e.g. behaviour and/or condition changes) of this exposure or interactions Evaluate/confirm if hydrocarbons or spill response activities were the cause of observed impacts Evaluate recovery of key biological activities (i.e. foraging activity, breeding etc.) for significant fauna following impacts due to a hydrocarbon spill and clean-up procedures.	Spilled hydrocarbons overlapping known significant fauna habitats (OMP01 and OMP04) Evidence of oiling of significant fauna (OMP04)	The level of impact to affected significant fauna populations has been quantified OR The impacts to important habitat (feeding, breeding and migration areas) are not significantly different to reference areas OR The impacts of the hydrocarbon spill are no longer statistically detectable	Current and previous distribution of hydrocarbons from the spill (operational monitoring plan (OMP01) The predicted spill trajectory (OMP01) Evidence of contact with significant fauna during operational response (OMP04) Areas known to or expected to host significant fauna	Reporting to stakeholders
SMP07 - Scientific monitoring of fisheries and tourism resources (4716/HS/H0114/17)	Quantify the potential contamination and tainting of fisheries resources (including finfish, elasmobranchs, shellfish and crustaceans) exploited by commercial and recreational fishers from hydrocarbon exposure/contact	Assess fisheries resources for hydrocarbon contamination Assess any physiological impacts to fisheries resources and if applicable, seafood quality and safety Provide information that can be used to make inferences on the health of fisheries and the potential magnitude of impacts to fishing industries (commercial and recreational).	Contact with fisheries / tourism resources occurred or likely (e.g. evidence of fish kills)?	The level of impact to affected fish and shellfish populations has been quantified OR The impacts to important fisheries resources are not significantly different to reference areas or baseline OR The impacts of the hydrocarbon spill are no longer statistically detectable	Current and previous distribution of hydrocarbons from the spill (operational monitoring plan (OMP01) The predicted spill trajectory (OMP01) Evidence of contact with fisheries resources during operational response (OMP04) Areas known to or expected to host fisheries resources	Reporting to stakeholders

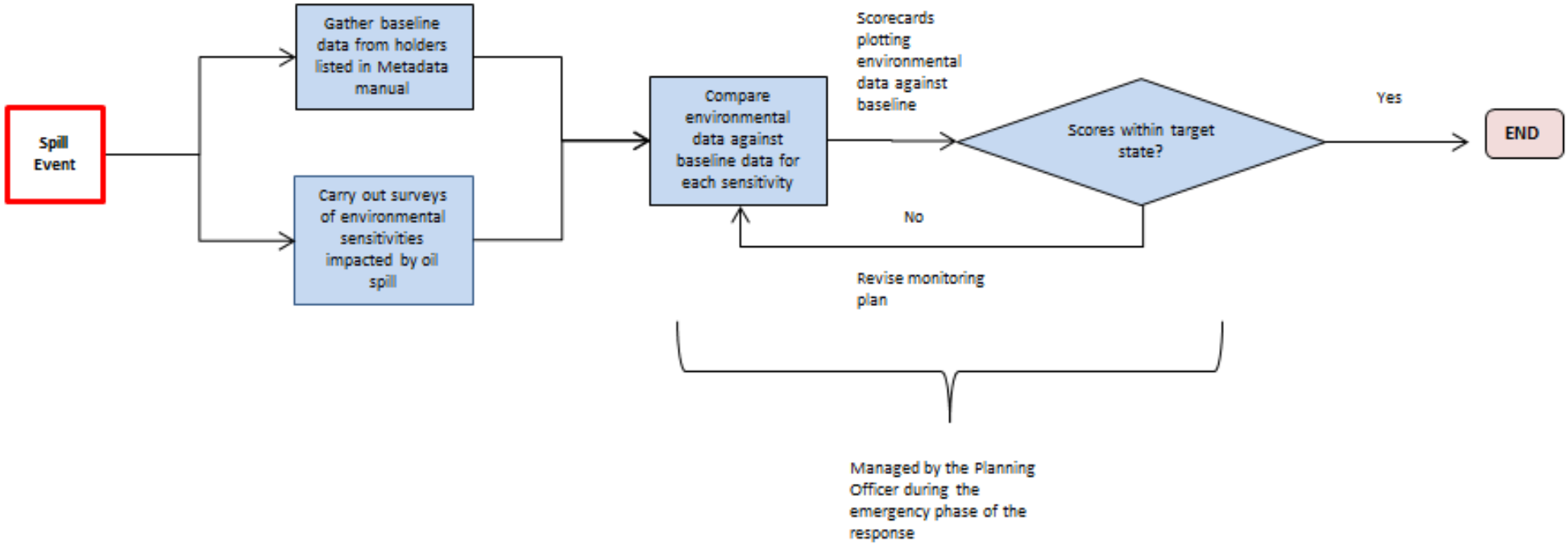


Figure 4-2: Overview of Type II SMP to be implemented by OSMT

4.5.1 Type II SMP Implementation

On notification of a Level 2 spill, the IMT will commence a NEBA analysis to determine the strategies to be deployed for environmental protection and mitigation (Section 2.2.1 and Appendix L). The identification of the spill response strategies for the protection and mitigation of impacts of environmental sensitivities at specific locations for the particular circumstances of the spill will also determine the scientific SMP methodologies (See Table 6-2) which will be employed to evaluate the effectiveness of the spill response strategies.

In the event that this monitoring is required, OSMT will deploy a field team to site and a desk based data and information management team (Figure 4-2). The field team will be deployed to high priority sites selected and prioritised on the basis of the NEBA analysis informed by field observations, manual spill trajectory calculations and OSTM as described in Section 2.4. Prioritisation of SMP resources will be determined by the predicted consequence impact and estimated time to contact of the spilled hydrocarbons with the sensitivities/locations. This prioritisation is carried out as part of the NEBA analysis described in Section 2.2.1 and Appendix L.

Following notification of an incident and once the requirement for scientific monitoring is established, the response will be carried out in three phases:

- Pre-exposure monitoring: to carry out environmental sampling and analysis immediately before the sites are impacted by the spilled hydrocarbons. This information will supplement the existing baseline information available. Note some sites have been identified in the planning phase as likely to be impacted within very short time scales and therefore pre-exposure monitoring is unlikely to be practicable. Data for these sites will be obtained from the meta-data manual and/or identified reference sites.
- Post-exposure short-term monitoring to evaluate the environmental impact (or absence of impact) to sites following exposure, or suspected exposure, to spilled hydrocarbons.
- Recovery monitoring where post exposure monitoring has indicated a negative environmental impact as a result of the hydrocarbon spill, then monitoring will be continued to inform status of ongoing environmental remediation or recovery work and to monitor natural recovery.

This three-phase strategy is summarised in Table 4-4. OSMT (e.g. BMT) will provide advice to the IMT throughout the deployment of the scientific OSMP and provide reports on the output of all three phases of the strategy.

4.5.2 Type II SMP outputs for evaluation of effectiveness of oil spill response

The SMP team will carry out analysis of the data through the data and information management team to provide environmental control charts summarised in report cards containing both baseline/target data and new data monitored against the target state summarised in Table 6-3:

- The statistical analysis of the data will provide threshold of significance against which the new data can be assessed within the report cards
- New data below the threshold limits will suggest that the environmental protection measures are protecting the environment and that the response strategy environmental objectives for environmental protection have been achieved
- Data exceeding the threshold limits will indicate the requirement for continuation and where necessary adaption, of the monitoring
- Where necessary, additional management measures to be implemented or additional oil spill response measure to be considered.

OSMT (BMT) will provide the output of the data collation, processing and analysis in the form of control charts and controlled impact scientific studies with information summarised as environmental report cards.

Table 4-4: Summary of the three phase Type II SMP activities for Level 2 hydrocarbon spill scenarios

Task	Activity	Purpose	Output
Pre-exposure	**ALL LEVEL 2 SCENARIOS** OSMR team mobilisation to high priority protection areas. Later mobilisation of the data analysis and evaluation team.	**ALL LEVEL 2 SCENARIOS** Data Governance Manual, with data governance and data standards (Darwin Core) for informing spatial information, scales of measurement, data metrics and providing a statistical meta-analysis workflow that links point and spatial data is to be completed. Rapid assessment of seabird, marine turtle, mammal assets, and shoreline/benthic habitats where possible, within the area potentially impacted by the site. This is to allow reporting of current state of high biodiversity values that have high spatial and temporal variance (e.g. high inter-annual differences in breeding).	**ALL LEVEL 2 SCENARIOS** Confirmation of the diversity and abundance of high biodiversity values through reporting to TEO within 4 weeks of mobilisation. This validates the current state of the high value assets prior to potential exposure. Data manual and statistical meta-analysis.
	PIPLINE LEAK WITHIN STATE WATERS (90.7 m^3) VESSEL COLLISION SPILL (500 m^3) Data requiring mobilisation that can't be survey pre-exposure/post spill will be obtained from baseline data gathered in the planning phase and identified in the meta-data manual and/or data collection at reference sites.		
Post-exposure	**ALL LEVEL 2 SCENARIOS** OSMR team mobilisation to high priority protection areas at intervals as required. Analysis of Type I monitoring outputs and short-term Type II analysis.	**ALL LEVEL 2 SCENARIOS** Continued development of the data and information management system following MIKE 2.0 framework for information management and reporting. Repeat-measure of biodiversity value metrics within high priority protection areas. Type II analysis requires compilation and analysis of TEO and other available data sets to allow validation of the impact of exposure using inferential numerical modelling analyses.	**ALL LEVEL 2 SCENARIOS** Analysis of data and reporting of short-term monitoring results.
Recovery	**ALL LEVEL 2 SCENARIOS** OSMR team mobilisation as required by TEO. Analysis and monitoring outputs and evaluation of management outcomes.	**ALL LEVEL 2 SCENARIOS** Repeat-measure of biodiversity value metrics. Type II analysis requires compilation and analysis of TEO and other available data sets to allow validation of the impact of exposure using inferential numerical modelling analyses. Non-parametric (say Random Forests) parametric mixed-effects models and Bayesian inference to be considered.	**ALL LEVEL 2 SCENARIOS** Evaluation of TEO oil spill response management effectiveness for the conservation of priority protection areas. Program review.

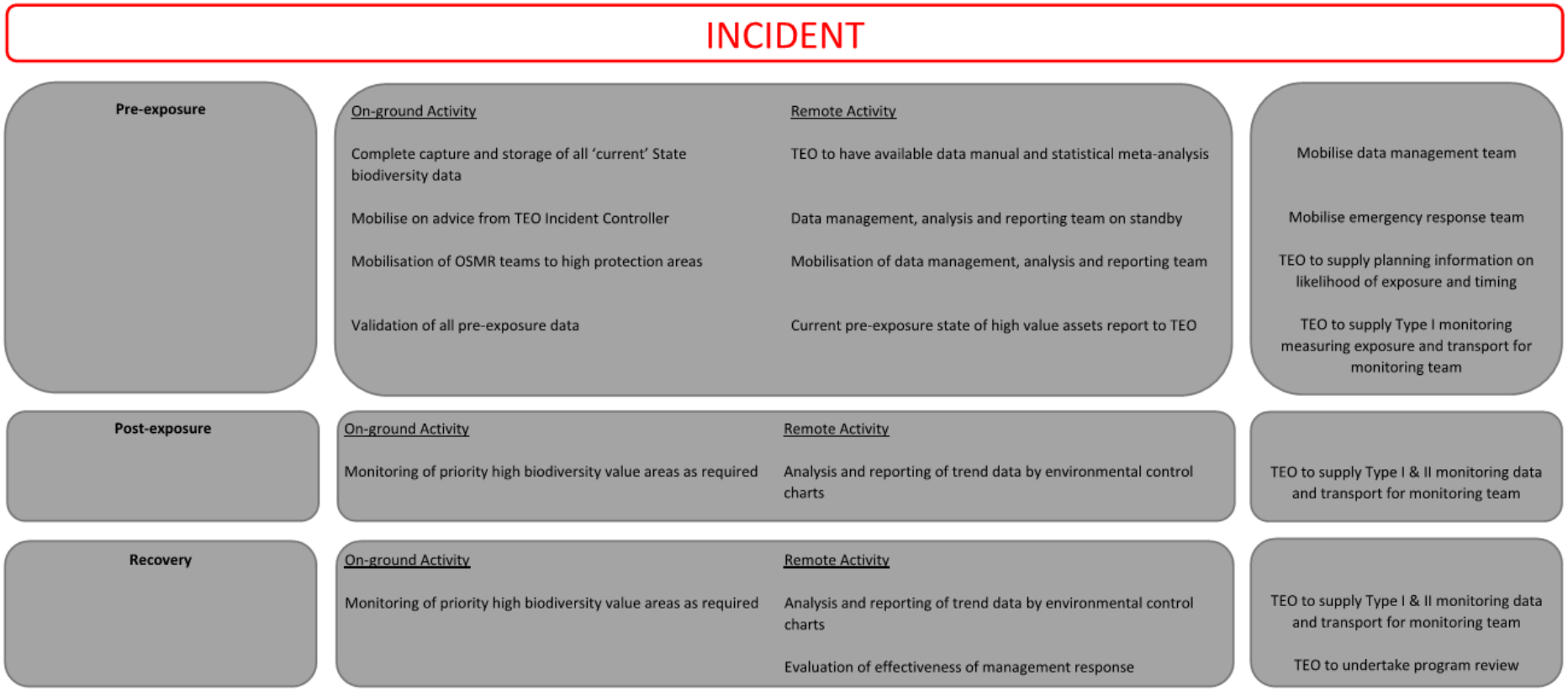


Figure 4-3: Summary of how the Type II SMP will be integrated into the IMT activities to protect high biodiversity values

Table 4-5: SMP strategy summary with performance objectives, standards and measurement criteria

Task	Resources	Performance Outcome	Performance Standard	Measurement Criteria	Level
Maintain standby status of the Type II SMP	OSMT desk based and field teams available for mobilisation in the event of an incident.	Maintain a permanent state of readiness to respond to a spill during Cliff Head operations including personnel, equipment resources and knowledge of current state of high biodiversity values via multiple/contingency MOU providers	OSMT OSM team personnel defined in MOU will be on an on-demand standby status. Data standard, meta-data manual and data information management system will be maintained by OSMT such that it represents best practicable understanding of the high biodiversity values in the area of influence from a potential spill scenario as identified in Table 2-1.	MOU between OSMT and TEO defining the personnel that will be available to TEO in the event of a call out*.	N/A
Type II SMP Activation	OPEP and associated resources as detailed in this document SMP and associated resources as detailed in the document and summarised in Table 6-2	Following any Level 2 hydrocarbon spill the IMT will make a decision on whether or not to activate the SMP.	In the event of a Level 2 spill, the IMTL director will consult with the relevant regulatory agencies and scientific experts to decide whether the SMP should be activated and record the decision in the IMT log. Scientific monitoring will be implemented if: • an environmental resource has been damaged or is under threat from the oil or the oil spill response actions • the harm is likely to be significant and can be quantified through implementation of this Type II SMP • the impact meets the criteria for significant impact criteria detailed in the EPBC Act Policy Statement Significant Impact Guidelines (2006). OSMT field team will deployed to site within 24 hours of being alerted by the TEO IMT that monitoring is required and scientific monitoring will be implemented as soon as the OSMT field team arrive on site and within 36 hours of activation. OSMT desk-based team will commence monitoring of the SMP implementation within 24 hours of being alerted by the TEO IMT to monitor the scientific monitoring implementation Field surveys for biodiversity values for which post incident/pre-exposure monitoring is not practicable will be carried out in accordance with procedures, scope and frequency identified in the TEO/OSMT data standard and meta-data manual and associated procedures following initiation of the SMP.	Documented decision in the IMT log signed by the IMTL	>L2
Pre-exposure monitoring	Resources detailed in OSMP, individual SMPs and summarised in Table 6-2	Confirmation of the diversity and abundance of the high biodiversity values at high priority sites identified by the NEBA assessment prior to impact:	Sites survey in accordance to the priority sites identified by the NEBA assessment and for which pre-exposure monitoring is practicable, allowing for predicted contact times and site accessibility, safety etc. Report to TEO within 4 weeks of mobilisation confirming the pre-exposure diversity and abundance of the high biodiversity values.	Documented OSMT report in TEO document control system demonstrating an evaluation of selected high biodiversity sites following	≥L2

Task	Resources	Performance Outcome	Performance Standard	Measurement Criteria	Level
		• support the baseline data already held and • confirm the current status of naturally high inter-annual variability in identified biodiversity values		an oil spill and prior to shoreline contact.	
Post exposure monitoring	Resources detailed in OSMP, individual SMPs and summarised in Table 6-2	Evaluate the impact of high biodiversity values exposed (or potentially exposed) to hydrocarbons following a hydrocarbon spill event to evaluate short term effectiveness of the TEO oil response strategies deployed against defined target state parameters summarised in Table 6-3.	Scientific oil spill monitoring team deployed to high priority sites identified by the NEBA assessment and at a frequency determined by the IMT team in consultation with OSMT Senior Scientist and DoT and DBCA Repeat measure of biodiversity value metrics taken and analysed to allow evaluation of exposure impact using inferential numerical modelling analysis	Report cards plotting new environmental data against baseline/target data in the context of thresholds indicating presence or absence of environmental impact.	>L2
Recovery monitoring	Resources detailed in OSMP, individual SMPs and summarised in Table 6-2	Determine the long term effectiveness of the oil spill response activities and monitor the recovery of impacted high biodiversity values to within defined target state parameters summarised in Table 6-3.	Scientific oil spill monitoring team deployed to high priority sites identified by the NEBA assessment and at a frequency determined by the IMT team in consultation with OSMT Senior Scientist and DoT and DBCA Repeat measure of biodiversity value metrics taken and analysed to allow evaluation of the recovery of specific biodiversity values using inferential numerical modelling analysis. Non-parametric (e.g. Random forests parametric mixed-effects models and Bayesian inference to be considered.	Report cards plotting new environmental data against baseline/target data in the context of thresholds indicating recovery status of identified high biodiversity values.	≥L2

4.6 Environmental performance summary for scientific monitoring

Performance objective	Critical Controls	Performance Standard	Measurement Criteria
To conduct scientific monitoring to characterise the environmental impacts and monitor subsequent recovery from the oil spill and/or response activities.	TEO activates SMPs and monitoring service provider to undertake scientific monitoring Scientific Monitoring Plans	Individual scientific monitoring plans (SMP) will be triggered based on their initiation criteria and continue until termination criteria are met.	SMP reports Incident log IAPs
		The monitoring program for each activated SMP will consider operational monitoring data, sensitive receptor distribution and availability of baseline data.	SoW IAPs
		SoWs and logistics requests provided by the Monitoring Provider to be approved by the TEO IMTL. SoWs related to State waters monitoring to be approved in consultation with DBCA and DoT	SoWs Communications records Logistics Request Forms

5 Termination of the Response

The decision to terminate the spill response is made in consultation with the relevant Controlling Agency/s, Jurisdictional Authorities and other Statutory Authorities that play an advisory role (e.g. DBCA). This decision will be made with consideration of the following factors:

- The efficacy and benefit of current response options;
- Any potential for additional pollution;
- Any potential for additional environmental damage caused by further clean-up efforts; and
- An assessment of prevailing weather conditions that can increase risk to response teams or increase the efficacy in weathering hydrocarbon.

A NEBA will be conducted to inform the decision-making process. Termination criteria are defined within each section of response activities defined within the OPEP.

5.1 Responsibility for Termination of the Response

5.1.1 Level 1

A Level 1 response is terminated by the TRT Leader in consultation with the IMTL.

5.1.2 Level 2 and Level 3

When TEO is the Control Agency the decision to terminate a Level 2 or Level 3 response is taken by the nominated by the IMTL. The termination of response will be based on the performance objectives for the strategies being met, consultation with NOPSEMA and statutory agencies (including DBCA, DCCEEW and DoT) and experts from other bodies will also inform the termination decision.

5.2 Conditions of Termination

The decision to stop active clean-up is taken when the termination criteria in Table 5-1 are met.

Table 5-1: Response Termination Criteria

Response Strategy	Termination Criteria
Monitor and Evaluate	No visible sheen (in daylight) i.e. no observed rainbow or metallic sheen, discontinuous or continuous true oil colour can be seen as defined by the Bonn Agreement Oil Appearance Code (BOAC) and no visible tar balls on the sea surface
Dispersant Application	Not relevant as dispersants are not effective for any of the scenarios
Contain and Recover	Recovery efficiency achieving <10% hydrocarbons by volume Hydrocarbons not being contained within the boom because of sea state Trajectory indicates hydrocarbons are moving away from environmental sensitivities and coastlines or there is no risk to sensitive resources
Protect and Deflect	The oil slick has dissipated (broken up) All oil has impacted shorelines and is unlikely to be re-floated Trajectory indicates hydrocarbons are moving away from environmental sensitivities and coastlines or there is no risk to sensitive resources/the oil slick has gone out to sea and is beyond the range of response options and is unlikely to return Site characteristics preclude safe or effective deployment of protection and deflection strategies Slick thickness and characteristics mean that protection/deflection booms will not be effective as determined by the NEBA NEBA concludes that continued activity will produce no net environmental benefit, NEBA and signed off by IMTL and informed of termination by consultation with relevant authorities

Response Strategy	Termination Criteria
Shoreline Clean-up	Site characteristics preclude safe or effective clean-up operations using available technologies All accessible shorelines are signed off as being clean to the determined standard established in the NEBA for that site and segment The extent and degree of oiling is judged to be acceptable or having little or no adverse effects NEBA concludes that continued activity will produce no net environmental benefit and/or clean-up is having detrimental effects on the shoreline or associated plants or animals
Oiled Wildlife	Will only cease when all affected/recovered animals are cleaned and rehabilitated, as advised through relevant expert bodies
Operational and Scientific Monitoring	The IMTL will consult with the relevant Statutory Authority for protection of marine flora and fauna (e.g. DBCA) during the initiation, implementation and termination process

Note These conditions may not occur at the same time for all components of the response and some responses will be reduced in size, or demobilised, earlier than others. The IMTL and key IMT personnel will remain active until the entire response is terminated.

5.2.1 Incident Control

The response will be terminated when all field spill response operations have ceased and all equipment is recovered, cleaned and returned to its source.

Support personnel, undertaking functions such as finance, may continue until all claims are processed and costs are determined.

5.2.2 Planning

The size and composition of the planning section will vary in accordance with the needs of the response, and planning personnel will stand-down as the operations cease activity.

After the cessation of the response, some planning personnel may still be required to:

- Assist in the post-response compilation of data
- Assist the IMTL in any post-spill reporting
- Coordinate post-spill monitoring, if required. This will usually be the HSES Advisor or delegate.

5.2.3 Operations

Field operations will cease upon announcement of response termination. However, individual components may be terminated at different times. The conditions under which this may occur are summarised in Table 5-1.

5.2.4 Logistics

Logistics function will continue until all equipment is recovered, cleaned and returned to its source and transport of waste to its final destination has been arranged.

5.2.5 Finance and Administration

Most units of this section will terminate at the same time as Logistics, Operations and Planning. The Finance Unit will continue, at a reduced level, until all claims are processed and costs are determined.

5.3 Stand-down Procedures

5.3.1 Incident Control

Upon conclusion of the spill response activity, the following tasks will be undertaken by the IMTL and delegates:

- Advise all relevant contractors and TEO personnel
- Advise all relevant government authorities

- Prepare detailed reports on the response activities and outcomes and collate all documents for secure storage and/or submission to regulators
- Undertake an inventory of consumables and prepare accounts
- Arrange for the return of equipment
- Arrange for the refurbishment of equipment
- Conduct an investigation into the cause of the incident and report to relevant authorities
- Assess environmental monitoring requirements.

5.3.2 Return of Equipment

- Upon completion of the oil pollution response operation, the IMTL (or delegate) will
- Arrange recovery of all equipment and unused materials
- Ensure that all equipment is cleaned, to the extent that available facilities allow
- Ensure that all equipment is returned to the owner by the quickest possible means (having regard to costs).

5.3.3 Servicing of Equipment

Upon its return to the owner, TEO equipment shall be thoroughly serviced or replaced in accordance with equipment maintenance schedules prior to being stored.

5.3.4 Debrief

The IMTL will hold a post-spill debriefing for any spill for which a response was activated. The debrief should address:

- Spill causes (if known)
- Speed of response activation
- Effectiveness of tactics and strategies
- Equipment suitability
- Health and safety issues (if any)
- Communications
- Integration of OPEP and procedures with other agencies
- Lessons learned for implementation in future responses.

5.3.5 Incident Report

The IMTL, Statutory Agency or Control Agency/Hazard Management Agency may request the preparation of a formal Incident Report. The contents of this should follow the outline of the debriefing, or another format as specified.

NOPSEMA requires verbal notification of a spill within 2 hours and a written report within three days.

5.3.6 Review of OPEP

Following any activation of this OPEP it will be fully reviewed and updated in accordance with the lessons learned from the response and any deficiencies identified in the plan.

5.3.7 Marine Response

Upon receipt of response termination, the TRT Leader will ensure that:

- All equipment is recovered and cleaned
- All vessels return to their respective berths
- All personnel are accounted for
- Equipment is safely offloaded and transported to a site for cleaning or repair
- All equipment returned is logged
- All equipment is returned to the correct owner/ location.

5.3.8 Shoreline Response

The TRT Leader or nominated Shoreline Coordinator will ensure that:

- All equipment is retrieved and stowed away
- All equipment is retrieved and returned to the relevant location for cleaning and redistribution
- Any equipment not collected is secured
- All clean-up team members are transported back to the contractor's base for demobilisation
- All shorelines are left free of litter or other refuse.

6 Resources

6.1 TRT, IMT and BIMT Contacts

Refer to the Cliff Head IMT and BIMT Duty Roster, which is issued weekly. The contact list includes key contact details for:

- TRT members
- IMT members
- BIMT members
- Support Personnel
- TEO offices/facilities
- Alternative offices / facilities.

6.2 POLREP/SITREP Form

This form is to be completed by the TRT Leader with as much information as possible (regardless of the size of the spill) and emailed as required to (contact details in Appendix A):

- AMSA RCC
- AMOSC
- DPIRD
- DoT
- NOPSEMA.

6.2.1 POLREP Form

The Department of Transport website should be checked for the most recent version of the form. The link to the current form is provided in Appendix B.

6.2.2 SITREP Form

The Department of Transport website should be checked for the most recent version of the form. The link to the current form is provided in Appendix C.

6.3 OPEP Resourcing Strategy

6.3.1 IMT Resourcing Matrix

Manning of the IMT for spills for Level 2 and Level 3 spills requires specialist skills for an extended period of time.

Role	First Response Fill	Surge	Potential Advisor to this role
Incident Management Team Leader (IMTL)	TEO	TEO BIMT	AMOSC AMSA DoT
Planning Coordinator	TEO	TEO BIMT, AMOSC, AMSA, DoT	AMOSC AMSA DoT
Facilities/Operations Advisor	TEO	TEO BIMT, AMOSC, AMSA, DoT	AMOSC AMSA DoT

Role	First Response Fill	Surge	Potential Advisor to this role
HSES Advisor	TEO	TEO BIMT, AMOSC, AMSA, DoT	AMOSC AMSA DoT
Finance and Administration	TEO	TEO BIMT, AMOSC, AMSA, DoT	AMOSC AMSA DoT
Logistics Officer	TEO	TEO BIMT, AMOSC, AMSA, DoT	AMOSC AMSA
Oiled Wildlife/Shoreline Clean Up Officer	AMOSC / TEO	AMOSC, AMSA, DoT	AMOSC NGO networks DoT networks

6.3.2 Field Services Resourcing

Level 2 and Level 3 spills may require deployment of significant resources for an extended period of time. These resources will be obtained from Government support agencies and third-party contractors as indicated in Figure 6-1.

These resources will be obtained through the contact lists in Appendix A. The number of personnel and capability is checked during OPEP testing as described in Section 13.1.

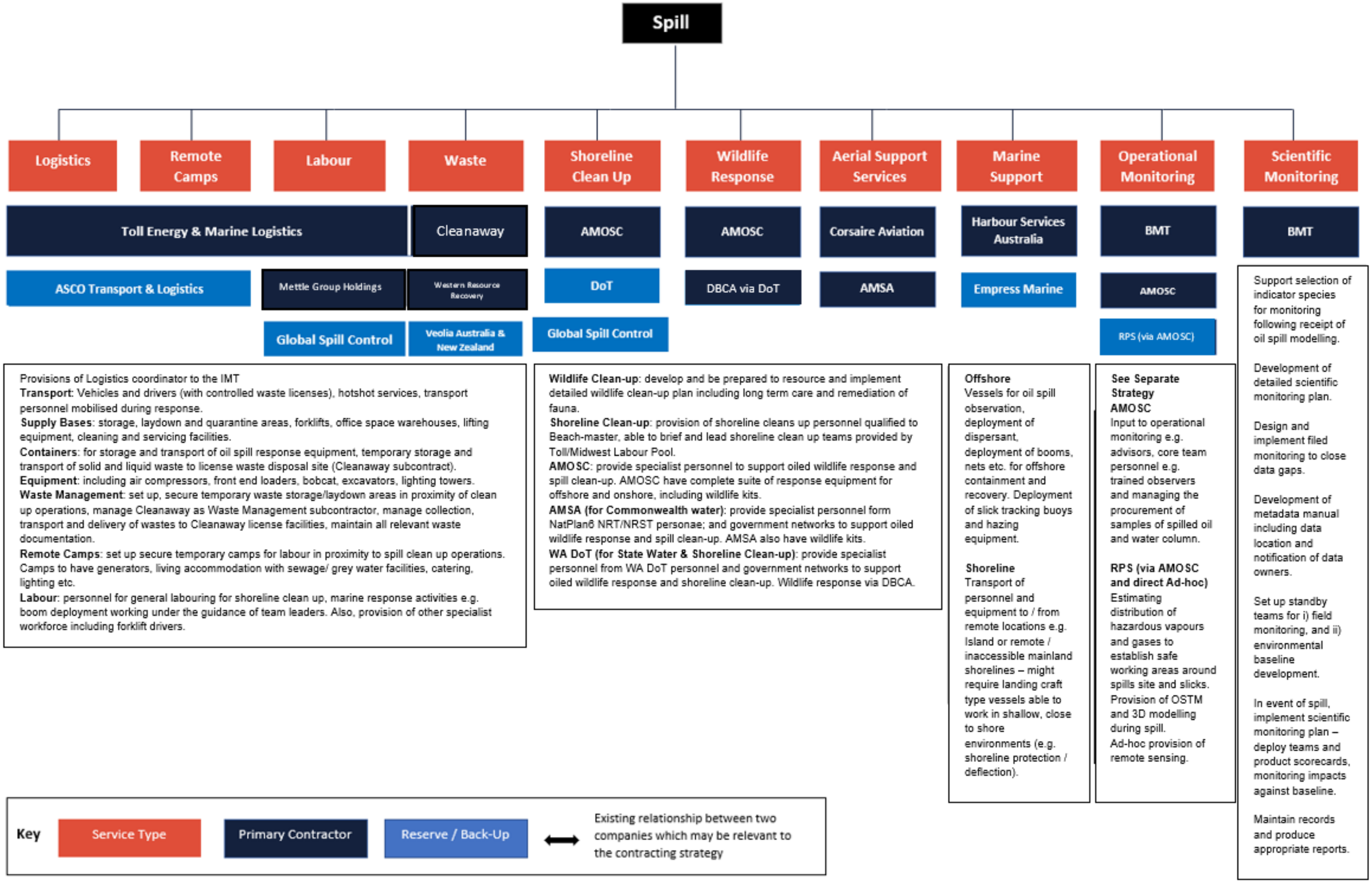


Figure 6-1: Contracting Strategy for Provision of OPEP Resources

Table 6-1: Organisational Agreement, Personnel/Equipment and resourcing summary

Organisation	Form of agreement with TEO	Personnel/Equipment Resource & Role Summary
ASCO	TEO hold a current MOU with ASCO	Local provider of transport, laydown, camp facilities, tank hire and personnel.
AMOSC	TEO is an associate member of AMOSC providing access to personnel and equipment and resources	Approximately 16 staff and 80-100 Core Team members able to fulfil field duties including team leader/coordinator roles. AMOSC staff will provide liaison officer to the IMT. Oil spill response equipment supplied under AMOSPlan. AMOSC will also provide induction (including health and safety) to incoming shoreline clean-up labour.
AMSA	TEO hold a current MOU with AMSA. Resources accessed through NatPlan, TEO has access to NatPlan resources as AMSA is a controlling agency in the event of a vessel-based spill in Commonwealth waters	National Response Team (NRT) and additional National Response Support Team members able to fulfil field IMT and field duties including coordinator and team leader roles. IMT duties can potentially include all roles except the IMTL role. NatPlan equipment is available to TEO.
RPS	Sub-contracted via AMOSC. AMOSC obtains the appropriate OSTM input data form for submission to RPS. TEO can also contract RPS directly if required	24/7 emergency cover providing specialist service for oil spill trajectory modelling. Results can be delivered within 4hrs of being commissioned. RPS can also deliver Hazardous and Noxious vapour plume modelling to inform safety assessments when developing oil spill response strategies.
Cleanaway	TEO hold a current MOU with Cleanaway	Waste management services
Harbour Services Australia	TEO has an operational contract in place with Harbour Services Australia for the use of the Southern Spirit Vessel and personnel. The contract allows for use of these resources as and when required. In addition, a MOU is in place to provide additional support marine resources, e.g. shallow water boats, additional vessels, etc.as required e.g. in the event of a spill	Southern Spirit Vessel and personnel available with oil spill training These resources are regularly used during operations for TEO and would be readily available within 48 hours in the event of a spill incident.
Empress Marine	TEO hold a current MOU with Empress Marine.	Support vessels, shallow water/beach capable vessels and Response Planning.
Corsaire Aviation	TEO has an operational contract in place with Corsaire to use the dedicated helicopter, as and when required (including additional pilots).	Single helicopter based in Dongara with pilot on 24hr standby.
BMT	TEO has a current MoU in place with BMT to support TEO in the execution of the SMPs in the event of a spill, in particular: • Identification of the SMPs and scope • Timeframes for mobilisation of personnel • Conditions of mobilisation • Likely personnel qualifications • Requirement for annual testing of capabilities and qualifications	The tasks detailed within this OPEP in relation to operational and scientific monitoring are based on the capability of BMT personnel. BMT are also familiar with the EP, OPEP and OSMP requirements allowing for rapid implementation
RMD	TEO hold a current MOU with RMD.	Provide service for liquid and soils heavily contaminated with oil.

Organisation	Form of agreement with TEO	Personnel/Equipment Resource & Role Summary

Global Spill Control	TEO hold a current MOU with Global Spill Control.	Global Spill Control can provide a Perth based spill equipment coordinator specifically for equipment mobilisation to the area of shoreline clean-up operations.
		During the spill, Global Spill Control can:
		• provide regular updates on the inventory and inventory movements,
		• provide an onsite coordinator to establish on-site storage at the base camp for shoreline response equipment plus smaller onsite storage areas at forward staging areas,
		• provide equipment including, but not limited to:
		  • Shoreline manual handling equipment,
		  • Adsorbents and
		  • PPE for personnel
		Global Spill Control can also provide induction training for labour (e.g. sourced by Toll) prior to transport to the spill clean-up site.

Toll Energy and Marine Logistics	TEO hold a current MOU with Toll Energy and Marine Logistics for provision of logistics and waste management as well as labour.	Waste Management: Toll is a substantial organisation and will be able to supply sufficient personnel on rotation to both the field and IMT for extended spill response operations. Labour: Toll will be able to provide Ad-hoc personnel to resource ongoing response in the field once induction training has been completed.
Veolia Australia and New Zealand	TEO hold a current MOU with Veolia for the provision of waste management services	Provide licenced facilities for transport, storage and disposal of hazardous and non hazardous solid and quid wastes.
WA DoT	TEO has access to these resources as DoT is a controlling agency in the event of a level 2 or 3 spill in State waters	Approximately 30 State Response Team members and 20 State Response Support Team members potentially able to fulfil IMT and field duty roles including coordinator and team leader roles.
Western Resource Recovery	TEO hold a current MOU with Western Resource Recovery	Provide service for liquid and soils heavily contaminated with oil. There are 4 Class 1 Landfill sites in the Perth area for heavily contaminated soils with more sites available for less contaminated soils. Western Resource Recovery provide sampling and testing facilities to determine the most appropriate end point.
Mettle Group Holdings	TEO hold a current MOU with Mettle Group Holdings.	Provide on call support in a major emergency. Mettle will provide one Crisis Practitioner as the TEO Incident Commander to supplement the head office in West Perth within 24 hours or much less of any request.

An up to date equipment inventory list will be made available by their respective equipment owners (AMOSC/AMSA etc.) upon actual spill notification.

As described above, the response personnel will be resourced from existing TEO personnel and third-party contractors e.g. AMOSC staff and core group. As part of a staged escalation to maintain a response (e.g. shoreline clean-up), several deployments of clean-up teams will be required and would be sourced through industry arrangements e.g. NatPlan.

Primary service providers (as identified in Table 6-1 above) have agreements in place with TEO to ensure resources are available in the event of an incident, as detailed in the table above. Secondary service providers are "back-up" options that may be required, therefore only contact details are provided. Primary services include helicopters, vessels, waste management and monitoring, and are considered sufficient for first strike resources. Following an incident, additional resources can be procured through industry arrangements and TEO working agreements are not considered necessary given the low likelihood of the resources being required and the administrative burden of maintaining multiple generic contracts with service providers. In addition, some service providers charge a fee for providing standby services which is not considered ALARP given the primary service provider agreements already in place.

6.4 Personal Log

Personal logs will be completed throughout the response by IMT members. An example is provided in Appendix D.

6.5 AMOSC Call Out

Call AMOSC DO – 0438 379 328 for a level 2/3 hydrocarbon spill:

(1) AMOSC 'Service Contract' is detailed in the AMOSPlan
(2) Give spill details and hydrocarbon properties.
(3) AMOSC will contact RPS for Oil Spill Trajectory Modelling (OSTM) to be commissioned for modelling and predictions of the hydrocarbon spill if necessary. AMOSC will obtain the appropriate OSTM input data form and assist in completing the form for submission to RPS via AMOSC.

6.6 Oil Spill Trajectory Modelling

AMOSC has a contract with RPS for surface modelling of oil spills and activation of this service is described in Section 6.5. In the event that modelling of entrained hydrocarbons, dissolved aromatics and hazardous vapours is required, then RPS should be contacted to provide an Ad-Hoc service.

TEO commissioned RPS to undertake a quantitative hydrocarbon spill risk assessment. The hydrocarbon spill scenarios identified included an uncontrolled subsea pipeline discharge of gas and Cliff Head crude at a location within Commonwealth waters and in State Waters (of 97m^3), a Topside Process leak of 84.3m^3 (CHA Platform in Commonwealth waters) and a 500 m^3 spill of diesel onto the water surface over 3 hours (average discharge rate of 167 m^3/hr) representing the loss of fuel due to a support vessel collision.

6.7 Surveillance Forms

An aerial surveillance form is provided in Appendix E.

6.8 Shoreline Oiling Assessment Form

An example form is provided in Appendix F.

6.9 NOPSEMA and DMIRS Reporting

6.9.1 NOPSEMA Accident, Dangerous Occurrence or Environmental Incident Form

A link to the current form is provided in Appendix G.

6.9.2 NOPSEMA Recordable Environmental Incident Monthly Report

A link to the current form is provided in **Appendix H**.

6.9.3 DMIRS Reportable Incident Report Form (Reportable Incident)

A link to the current form is provided in Appendix J.

6.9.4 DMIRS Environmental Incident Report Form (Recordable Incident)

A link to the current form is provided in Appendix K.

6.10 Equipment List

Equipment can be sourced from AMOSC, AMSA and TEO.

6.10.1 AMOSC Oil Spill Response Equipment

AMOSC equipment is located at a number of sites. The primary stockpile is maintained at the Centre in Geelong VIC, and Fremantle WA with a range of equipment pre-deployed to Exmouth and Broome, WA. Up to date details of equipment held by AMOSC can be accessed via the member's login on the AMOSC website. A summary of equipment currently held by AMOSC is available via https://amosc.com.au/member-login/

6.10.2 AMSA Oil Spill Response Equipment

AMSA equipment lists are available on the AMSA website via the following links:

Equipment:

https://amsa-forms.nogginoca.com/public/equipment.html?loc=%2Fapi%2Fv1%2Fasset%2F2547301

Fixed wing aircraft: Aircraft avilability (nogginoca.com)

6.10.3 TEO Oil Spill Response Equipment

Equipment (& contents)	Site Location
CHA	
Tracking buoy	CHA Mezzanine Deck
PPE including: • 2 pairs chemical resistant boots • 2 pairs chemical resistant gloves • 2 pairs chemical resistant goggles • Dust Masks Heavy Duty plastic garbage bags	CHA Mezzanine Deck
Mobile Hydrocarbon Spill kit including: 170L Booms, absorbent pads and material	CHA Mezzanine Deck
Two (2) eye wash stations (chemical store/drum shed	CHA Main deck CHA Mezzanine Deck
(2) Safety Shower & Eye-wash Stations	As required

Equipment (& contents)	Site Location
Hangar	
Tracking buoy	
Helicopter	
TEO Warehouse Facilities	
Oil only absorbent boom (water -repellent) (2 containers) (Each container has 8x3m sections 48m)	TEO Warehouse Facilities
High Density Landing Nets [Econets] (6)	
IBCs 1,000ltr (4)	
IBC Funnel (4)	

6.11 SMP Resources

6.11.1 Type II SMP Methodologies

Table 6-2: Monitoring methods available to monitor the impact of an oil spill on specific identified high biodiversity value

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
SHORELINE HABITATS AND ASSOCIATED BENTHOS							
Reef platforms	Abundance (% cover or no. individuals per m^2) Mortality (% cover affected) Mortality of grazing fauna Water and sediment quality	Ground/marine survey via snorkel or intertidal walking teams Collection of water and sediment samples for analysis	AMSA (2003a) Bancroft (2003) Duke et al. (2010)	I	**TEO** • Implement OPEP and IMT actions • Collect water and sediment samples **OSMT** • Access existing data from DBCA and DPIRD	**TEO** • Field personnel trained in water and sediment collection	**TEO** • Helicopter or available vessel and tender in operation • Refuelling facilities • Sample containers and preservative solution • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Handheld digital cameras and video cameras (high definition with GPS) • Sample containers and preservative solution
				II	**TEO** • Provide logistical and resource and resource support for monitoring teams **OSMT** • Conduct pre-exposure surveys of high priority protection areas and areas with data gaps** • Post-impact monitoring to be conducted in collaboration with DBCA and DPIRD	**OSMT** • Senior Marine Scientist with knowledge of shoreline assessments x 1 • Marine Scientist x 1 • GIS personnel • Field personnel x 2 trained in water and sediment collection • NATA accredited laboratory for sample analysis	
Invertebrate communities	Abundance (% cover or no. individuals per m^2) Mortality Individual health and condition Water and sediment quality	Ground survey using transects or random/regular quadrat assessment Collection of water and sediment samples for analysis Collection of samples for assay for individual health and condition assessment	AMSA (2003a) Duke et al. (2010)	I	**TEO** • Implement OPEP and IMT actions • Collect water and sediment samples **OSMT** • Access existing data from DBCA and DPIRD	**TEO** • Field personnel trained in water and sediment collection	**TEO** • Helicopter or available vessel and tender in operation • Refuelling facilities • Sample containers and preservative solution • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Handheld digital still cameras and video cameras (high definition with GPS)
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Conduct pre-exposure surveys of high priority	**OSMT** • Senior Marine Scientist with knowledge of marine invertebrates x 1 • Marine Scientist x 1 • GIS personnel	

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
					protection areas and areas with data gaps** • Post-impact monitoring to be conducted in collaboration with DBCA and DPIRD	• Field personnel x 2 trained in water and sediment collection • NATA accredited laboratory for sample analysis	• Sample containers and preservative solution
SUBTIDAL HABITATS AND ASSOCIATED BENTHOS							
Inshore lagoons	Diversity of species Abundance (% cover or density) Mortality of grazing fauna Water and sediment quality	Marine survey via snorkel or surface supply using transects or random/regular quadrat assessment Collection of water and sediment samples for analysis	AMSA (2003a) van Kuelen & Langdon (2011)	I	**TEO** • Implement OPEP and IMT actions • Collect water and sediment samples **OSMT** • Access existing data from DBCA and DPIRD	**TEO** • Field personnel trained in water and sediment collection	**TEO** • Available vessel in operation (equipped for diving operations) • Sample containers and preservative solution • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby • Satellite imagery **OSMT** • Diving equipment • Sample containers and preservative solution • Waterproof digital still cameras and video cameras (high definition with GPS) • Sample containers and preservative solution
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Conduct pre-exposure surveys of high priority protection areas and areas with data gaps** • Post-impact monitoring to be conducted in collaboration with DBCA and DPIRD	**OSMT** • Senior Marine Scientist with knowledge of benthic habitat assessment x 1 • Marine Scientist x 1 • GIS personnel • Field personnel x 2 trained in water and sediment collection • NATA accredited laboratory for sample analysis	
Macroalgal communities	Abundance (spatial extent) Abundance (% cover) Biomass Diversity of species	Remote sensing for spatial extent Towed video or diver survey via snorkel or surface supply using transects or random/regular	AMSA (2003a) RPS (2009) English et al. (1997) Hochberg (2011)	I	**TEO** • Implement OPEP and IMT actions • Collect water and sediment samples **OSMT** • Access existing data from DBCA and DPIRD • Access remote sensed data	**TEO** • Field personnel trained in water and sediment collection	**TEO** • Available vessel in operation (equipped for diving operations) • Sample containers and preservative solution. • Decontamination/washing facilities

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
	Water and sediment quality	quadrat assessment Collection of water and sediment samples for analysis	Andréfouët et al. (2005) van Kuelen & Langdon (2011) Colquhoun et al. (2007)	II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Post-impact monitoring to be conducted in collaboration with DBCA	**OSMT** • Senior Marine Scientist with experience in macroalgae identification x 1 • Marine Scientist x 1 • GIS personnel • Field personnel trained in water and sediment collection • NATA accredited laboratory for sample analysis	• Safety aircraft/rescue vessels on standby • Satellite imagery **OSMT** • Diving equipment • Sample containers and preservative solution • Waterproof digital still cameras and video cameras (high definition with GPS)
Seagrass communities	Abundance (spatial extent) Abundance (% cover) Diversity of species Habitat recruitment and recovery Individual health and condition Water and sediment quality	Remote sensing for spatial extent Towed video or diver survey via snorkel or surface supply using transects or random/regular quadrat assessment Collection of samples for assay for individual health and condition assessment Collection of water and sediment samples for analysis	AMSA (2003a) English et al. (1997) Hochberg (2011) Andréfouët et al. (2005) van Kuelen & Langdon (2011) Colquhoun et al. (2007)	I	**TEO** • Implement OPEP and IMT actions • Collect water and sediment samples **OSMT** • Access existing data from DBCA and DPIRD • Access remote sensed data	**TEO** • Field personnel trained in water and sediment collection	**TEO** • Available vessel in operation (equipped for diving operations) • Sample containers and preservative solution • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby • Satellite imagery **OSMT** • Diving equipment • Waterproof digital still cameras and video cameras (high definition with GPS) • Sample containers and preservative solution
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Post-impact monitoring to be conducted in collaboration with DBCA	**OSMT** • Senior Marine Scientist with experience in seagrass identification x 1 • Marine Scientist x 1 • Field personnel trained in water and sediment collection • NATA accredited laboratory for sample analysis	
MARINE MAMMALS, REPTILES AND SEABIRDS							
Marine turtles	Abundance (number or density)	Aerial surveys along strip-transect lines	AMSA (2003a)	I	**TEO** • Implement OPEP and IMT actions	**OSMT** *Aerial-based Survey* • Trained marine wildlife observers x 2	**TEO** • Aircraft (incl. pilot/s) • Refuelling facilities

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
	Species Mortality	Vessel-based surveys along transects including collection of tissues from carcasses	Eckert et al. (1999) Marsh & Sinclair (1989)	II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Conduct pre-exposure surveys of high priority protection areas using aerial surveys** • Post-impact monitoring to be conducted in collaboration with DBCA and DPIRD using aerial and vessel-based surveys	**OSMT** *Aerial-based Survey* • Senior Marine Scientist to assist with design • Trained marine wildlife observers x 2 *Vessel-based Survey* • Senior Marine Scientist to assist with design • Trained marine wildlife observers x 2 • Personnel with pathology or veterinary skills to determine cause death/injury • NATA accredited laboratory for sample analysis and necropsy	• Available vessel in operation • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Sample containers and preservative solution • Recording equipment
Cetaceans	Abundance (number or density) Species Mortality	Aerial surveys along strip-transect lines Vessel-based surveys along transects including collection of tissues from carcasses Passive Acoustic Monitoring (PAM)*	AMSA (2003a) Marsh & Sinclair (1989) OTSOPA (2003)	I	**TEO** Implement OPEP and IMT actions **OSMT** Access existing data from DBCA and DPIRD	**OSMT** *Aerial-based Survey* • Trained marine wildlife observers x 2	**TEO** • Aircraft (incl. pilot/s) • Refuelling facilities • Available vessel in operation • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Sample containers and preservative solution • Recording equipment
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Conduct pre-exposure surveys of high priority protection areas using aerial surveys** • Post-impact monitoring using repeat-measures aerial and vessel-based surveys	**OSMT** *Aerial-based Survey* • Senior Marine Scientist to assist with design • Trained marine wildlife observers x 2 *Vessel-based Survey* • Senior Marine Scientist to assist with design • Trained marine wildlife observers x 2 • Personnel with pathology or veterinary skills to determine cause death/injury • NATA accredited laboratory for sample analysis and necropsy	
Australian sea lion	Abundance (number or density) Mortality	Aerial surveys along strip-transect lines	Campbell (2005) Gales et al. (1994)	I	**TEO** Implement OPEP and IMT actions **OSMT** • Access existing data from DBCA and DPIRD	**OSMT** • Trained marine wildlife observers x 2	**TEO** • Aircraft (incl. pilot/s) • Refuelling facilities

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
	Breeding effort (number of pups)	Ground surveys during breeding season including collection of tissues from carcasses Commercial fisheries by-catch records			**OSMT** • Type I impact monitoring using repeat-measures aerial transects**		• Available vessel and tender in operation • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Sample containers and preservative solution • Recording equipment
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Post-impact monitoring using ground-based repeat-measures at identified sites	**OSMT** • Experienced sea lion biologist x 1 • Field assistance x 1 • Personnel with pathology or veterinary skills to determine cause death/injury • NATA accredited laboratory for sample analysis and necropsy	
Seabirds	Abundance (number or density) Species Breeding effort (proportion of breeding attempts) and output (proportion of breeding attempts resulting in fledglings)	Vessel-based surveys along transects including collection of tissues from carcasses Ground surveys during breeding season including collection of tissues from carcasses	Surman & Nicholson (2009) Dunlop et al. (2001) Ronconi & Burger (2009)	I	**TEO** Implement OPEP and IMT actions **OSMT** • Access existing data from DBCA and other custodians • Type I impact monitoring using repeat-measures vessel-based transects**	**OSMT** • Experienced seabird biologist x 1 • Experienced ornithologist x 1 • Personnel with pathology or veterinary skills to determine cause death/injury • NATA accredited laboratory for sample analysis and necropsy	**TEO** • Available vessel and tender in operation • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Specialist equipment, i.e. burrow scope, video goggles • Sample containers and preservative solution
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Post-impact monitoring using ground-based repeat-measures at identified sites	**OSMT** • Experienced seabird biologist x 1 • Experienced ornithologist x 1 • Personnel with pathology or veterinary skills to determine cause death/injury • NATA accredited laboratory for sample analysis and necropsy	
FISH ASSEMBLAGES							
White shark	Abundance (number or density) Mortality	Aerial surveys along strip-transect lines Commercial fisheries by-catch records	No reference	I	**TEO** Implement OPEP and IMT actions **OSMT** • Access existing data from DPIRD **OSMT** • Type I impact monitoring using repeat-measures aerial transects**	**OSMT** • Trained marine wildlife observers x 2	**TEO** • Aircraft (incl. pilot/s) • Refuelling facilities • Safety aircraft/rescue vessels on standby **OSMT** • Recording equipment

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
				II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Post-impact monitoring using repeat-measures aerial transects	**OSMT** • Senior Marine Scientist to assist with design • Trained marine wildlife observers x 2	
Fish assemblages	Abundance (number or density) Species Mortality Exposure and health	Towed video survey using line transects for reef fish and baited remote underwater video (BRUV) for pelagic species Commercial and charter fisheries records Recreational fishing catch and effort survey records Western rock lobster fishery by-catch records Collection and analysis of muscle tissue and gut samples of indicator species	Babcock et al. (2008) Fitzpatrick & Harvey (2008) Gagnon & Rawson (2012) Burns et al. (2011)	II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Access existing data from DPIRD and other custodians • Post-impact monitoring; use 2-stage cluster sampling to select repeat-measures data	**OSMT** • Senior Marine Scientist to assist with design • Marine Scientists trained in fish identification and necropsy and ROV/BRUV operations x 2 • NATA accredited laboratory for sample analysis and necropsy	**TEO** • Available vessel and tender in operation (equipped for diving operations) • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby **OSMT** • Commercial diving equipment if required • Stereo BRUV arrays and necessary equipment on vessel for deployment • Sample containers and preservative solution
Western rock lobster	Abundance (of adults and puerulus) Mortality Exposure and health	Deployment of standard commercial-sized pots along transect lines to determine abundance of adults Placement of puerulus collectors in inshore reefs to determine	Bellchambers (2010) DoF (2013)	II	**TEO** • Provide logistical and resource support for monitoring teams **OSMT** • Access existing data from DPIRD • Post-impact monitoring; use 2-stage cluster sampling to select repeat-measures data	**OSMT** • Senior Marine Scientist to assist with design • Marine Scientist experienced with western rock lobster x 1 • Field assistance x 1 • NATA accredited laboratory for sample analysis and necropsy	**TEO** • Available vessel and tender in operation (equipped for diving operations) • Decontamination/washing facilities • Safety aircraft/rescue vessels on standby • Available vessel and tender in operation

Habitat or species	Performance measures	Monitoring methods available	References	Monitoring type	Response	Personnel resource requirements	Equipment requirements
		puerulus settlement index Western rock lobster fishery records Processors return records Data from voluntary logbook scheme Collection and analysis of tissue samples					• Commercial craypots and puerulus collectors **OSMT** • Sample containers and preservative solution • Recording equipment

6.11.2 Summary of Current State of High Biodiversity Values

Species	Conservation status
Southern right whale *Eubalaena australis*	EPBC Act Endangered, Migratory WA BC Act Vulnerable
Blue whale *Balaenoptera musculus*	EPBC Act Endangered, Migratory WA BC Act Endangered
Sei whale *Balaenoptera borealis*	EPBC Act Vulnerable, Migratory WA BC Act Endangered
Fin whale *Balaenoptera physalus*	EPBC Act Vulnerable, Migratory WA BC Act Endangered
Humpback whale *Megaptera novaeangliae*	EPBC Act Migratory WA BC Act Conservation Dependent
Bryde's whale *Balaenoptera edeni*	EPBC Act Migratory
Pygmy right whale *Caperea marignata*	EPBC Act Migratory
Killer whale, orca *Orcinus orca*	EPBC Act Migratory
Sperm whale *Physeter macrocephalus*	EPBC Act Migratory WA BC Act Vulnerable

Table 6-3: Environmental sensitivity target states

Habitat/species	Current state	Target state	Baseline/monitoring data	References
SHORELINE HABITATS AND ASSOCIATED BENTHOS				
Reef platforms	**Jurien Bay Marine Park (JBMP)** – relatively good condition but with some high use areas likely to have been impacted by human use.	**JBMP** 1. That the diversity of flora and fauna on intertidal reef platforms of the marine park is not significantly altered from baseline levels (to be determined) as a result of human activities. 2. That the abundance of protected flora and fauna on intertidal reef platforms is not significantly different to levels within sanctuary zones in comparable habitats. 3. That the abundance of targeted flora and fauna species on intertidal reef platforms is maintained at sustainable levels (to be determined).	Baseline surveys of shallow water habitats at Jurien Bay between 1999 and 2007.	DEC (2005) Radford et al. (2008) Edgar et al. (2009)
Invertebrate communities	**JBMP** - Non target invertebrate species are likely to be in a close to "natural state"; however, the abundance and state of all targeted invertebrates is not known.	**JBMP** 1. No loss of invertebrate diversity as a result of human activity in the marine park. 2. No loss in protected invertebrate species abundance as a result of human activities in the marine park. 3. Abundance and size composition of invertebrate species in sanctuary zones to be at natural levels.	Research focusing on key habitats and their associated fish and invertebrate assemblages at the Houtman Abrolhos Islands (outside ZPI). Baseline surveys of shallow water habitats at Jurien Bay between 1999 and 2007.	Fletcher & Santoro (2012) Radford et al. (2008) DEC (2005) Edgar et al. (2009)
SUBTIDAL HABITATS AND ASSOCIATED BENTHOS				
Inshore lagoons	Not known.	Not known.	Biological survey of the major benthic habitats of Jurien Bay and surrounding waters. Broad-scale map and biological data of the major benthic habitats off the central west coast.	Burt (1997) Burt et al. (1997) Radford et al. (2008) Edgar et al. (2009)
Seagrass communities	**JBMP** – apart from localised mooring damage, extent and condition is as close to pristine.	**JBMP** - No permanent loss in the aboveground biomass of perennial seagrass from 2004 levels as a result of human activities in the marine park.	Biological survey of the major benthic habitats of Jurien Bay and surrounding waters. Broad-scale map and biological data of the major benthic habitats off the central west coast. Long-term seagrass monitoring	DEC (2005) Burt (1997) Burt et al. (1997) Radford et al. (2008) Edgar et al. (2009) MPRA (2008)
Macroalgal communities	**JBMP** – very good condition.	**JBMP** - No reduction in macroalgal species diversity or macroalgal habitat below 2004 levels as a result of human activities in the marine park.	Biological survey of the major benthic habitats of Jurien Bay and surrounding waters. Broad-scale map and biological data of the major benthic habitats off the central west coast.	DEC (2005) Burt (1997) Burt et al. (1997) Radford et al. (2008) Edgar et al. (2009)

Habitat/species	Current state	Target state	Baseline/monitoring data	References
MARINE MAMMALS, REPTILES AND SEABIRDS				
Marine turtles	Numbers are unknown but the species is threatened on a global scale. **DoF 2011/12** – no interactions with turtles reported.	No significant disturbance to marine turtles in JBMP from human activities. **DoF 2011/12** – no increase in interactions with turtles reported (incident rate is 2-5 entanglements per season).	Annual monitoring of protected species interactions with fisheries.	Fletcher & Santoro (2012)
Cetaceans	Stable or increasing populations of cetaceans.	No significant disturbance to cetaceans in JBMP from human activities.	DBCA Cetacean Database reporting on whale entanglements. Humpback whale aerial surveys off Geraldton 2002 Records from seismic surveys conducted by other oil and gas operators in the area.	DoF (2013) Jenner & Jenner (2013)
Australian sea lion	**JBMP** - The small West Coast population is stable, approx. 150 pups born every 17-18 month breeding cycle. **DoF 2011/12** – no sea lion captures reported.	**JBMP** - No decline in pup production as a consequence of human activities in the JBMP. Increase in pup production in the JBMP from 1998 (last survey) levels. **DoF 2011/12** – no increase in the rate of capture of sea lions (incident rate is 3 sea lions per season).	Sea lion and pup counts from 1989 onwards. Annual monitoring of protected species interactions with fisheries.	DEC (2005) Gales (1990) Gales et al. (1994) Campbell (2005) McAuley & Simpfendorfer (2003) Fletcher & Santoro (2012)
Seabirds	**JBMP** – very good condition.	Continuation of successful breeding	DBCA seabird breeding island database. Long-term monitoring of seabirds at Houtman Abrolhos Islands (outside ZPI).	DEC (2005) CALM (2004) Burbidge & Fuller (2002) Atlas of Living Australia (2013)

Habitat/species	Current state	Target state	Baseline/monitoring data	References
FISH ASSEMBLAGES				
White shark	**DoE 2013** – Unknown.	**DoE 2013** - Improve population status and ensure that anthropogenic activities do not impact on the conservation status and recover of the species.	DoF validated white shark records (1994-2012) derived from commercial catches (monthly and daily logbook returns), metropolitan Shark Monitoring Network/OTN acoustic receivers, ASAF shark attach records and aerial surveillance sightings.	DoF (2012) DoE (2013)
Fish assemblages	**JBMP** - Non target finfish species are likely to be in a close to "natural state". However, the abundance and state of all targeted finfish species is not known.	**JBMP** 1. No loss of finfish diversity as a result of human activity in the marine park. 2. No loss in protected finfish species abundance as a result of human activities in the marine park. 3. Abundance and size composition of finfish in sanctuary zones and special purpose (scientific reference) zones to be at natural levels.	Survey of nearshore reef fish fauna (1994). Bathymetric and towed video surveys at Jurien Bay as part of WAMSI Node 4 project 4.2. An assessment of the community structure and trophic level of all commercially caught fish species over the past 30 years found no evidence of systematic changes that could be evidence of an unacceptable impact on this ecosystem (Hall and Wise 2011). Further ecological research in shallow (ECU) and deep waters, supported by funding from the Western Australian Marine Science Institution (WAMSI) and the latter by Fisheries Research and Development Corporation (FRDC). Monitoring of fisheries by-catch for non-target species. Monitoring of targeted fish species based on commercial catch and effort statistics (CAES) from compulsory monthly returns, recreational catch and effort data from voluntary recreational fisher log books (Research Angler Program) and recreational fishing surveys, fishery independent surveys using beach seine nets to monitor annual juvenile recruitment by various fish species and research angling to monitor annual juvenile tailor recruitment.	Hutchins (1994) Edgar et al. (2009) Hall & Wise (2011) Fletcher and Santoro (2012) Smith et al. (2012) Sporer et al. (2012) Flairclough et al. (2011) Radford et al. (2008) Smallwood et al. (2013)
Western rock lobster			Fishery-dependent and independent monitoring of breeding stock levels and puerulus settlement. Industry performance is monitored through compulsory catch and effort records from both fishers and processors, comprehensive data from the voluntary logbook scheme, and a commercial monitoring program, all of which are used for modelling and stock assessment. Significant amount of research on this species funded by FRDC.	de Lestang et al. (2012)

NON-OPERATIONAL SECTION

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7 Environmental Scope

7.1 OPEP Aims & Objectives

7.1.1 Aim

To secure the safety impacts to personnel and public and protect the environment from any marine oil pollution incident, resulting from TEO Cliff Head A platform offshore operations, through the implementation of rapid, effective and appropriate response procedures consistent with the TEO HSEQ Policies.

7.1.2 Purpose & Objectives

The purpose of this OPEP is to ensure a rapid and effective response, in order to mitigate the effect of any spill event that may occur at, or impact on, the operational assets. The objectives of this OPEP are to:

- ensure that TEO responds according to the priorities set in Section 7.2 and by the IMTL during a response
- ensure that the procedures used by TEO are consistent with those used by WA and Commonwealth agencies as detailed in the State Hazard Plan - MEE and the National Marine Oil Spill Contingency Plan
- ensure a full and effective integration and utilisation of industry and government response efforts and resources
- identify protection and clean-up priorities
- protect the interests of TEO (through the above points).

7.2 Response Priorities

The oil spill response priorities are as follows, in descending order of priority:

1. Human health and safety
2. Habitat and cultural resources
3. Rare and/or endangered flora and fauna
4. Commercial resources
5. Amenities.

Protection priorities consider relevant policies, guidelines, threatened species recovery plans, plans of management, management principles and other documents published on the DCCEEW web site in relation to matters protected under Part 3 of the EPBC Act and NOPSEMA Guidance Note: *Oil Pollution Risk Management (GN1488, Rev 2).*

8 Scope of the OPEP

This OPEP has been developed to cover all hydrocarbon spills or leaks associated with offshore activities undertaken by or on behalf of TEO.

8.1 Activities Covered by the Plan

The activities covered by the current OPEP include:

- Offshore pipeline operation in Commonwealth and State waters
- CHA offshore platform operation
- All associated marine vessel activities engaged for CHA (including IMR) activities operating within the 500m zone
- Subsea production system operation.

Note that the scope of this OPEP includes pipeline spill scenarios located in both Commonwealth and State waters for practical reasons.

8.2 Excluded Activities

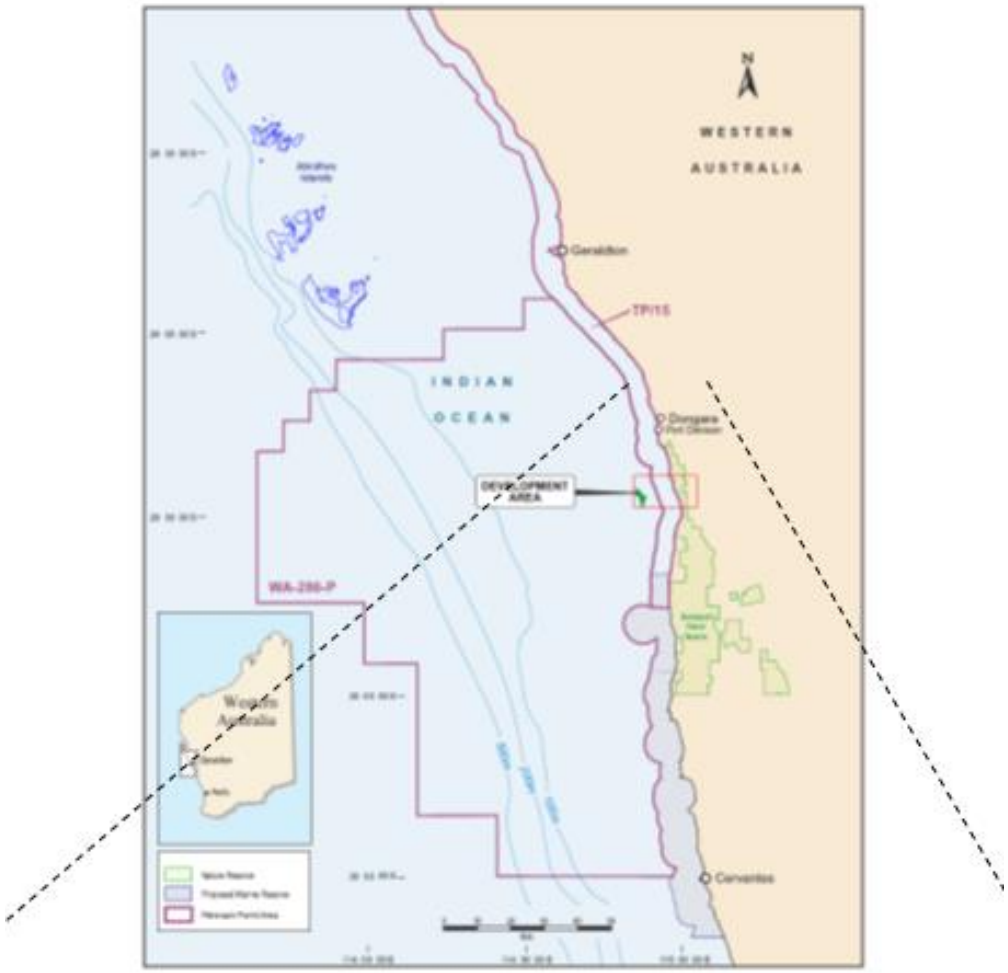
Additional campaign specific OPEPs and bridging documentation will be developed and submitted for approval should activities be proposed to occur that are outside the scope of this OPEP.

Activities that are outside the scope of this OPEP include:

- Marine vessel activities under the jurisdiction of the *Navigation Act* outside of the 500 m zone
- Drilling and completions campaigns will require a new EP
- Tie-back construction or other activities relating to significant modifications to the facility or activity will require a new EP
- Seismic surveys will require a new EP
- Decommissioning and abandonment will require a new EP
- Terrestrial spills which are covered by the Cliff Head Development Onshore Oil Spill Contingency Plan (10HSEQENVPL08).

8.3 Location

This OPEP covers all activities undertaken by TEO within the permit area (Figure 8-1).



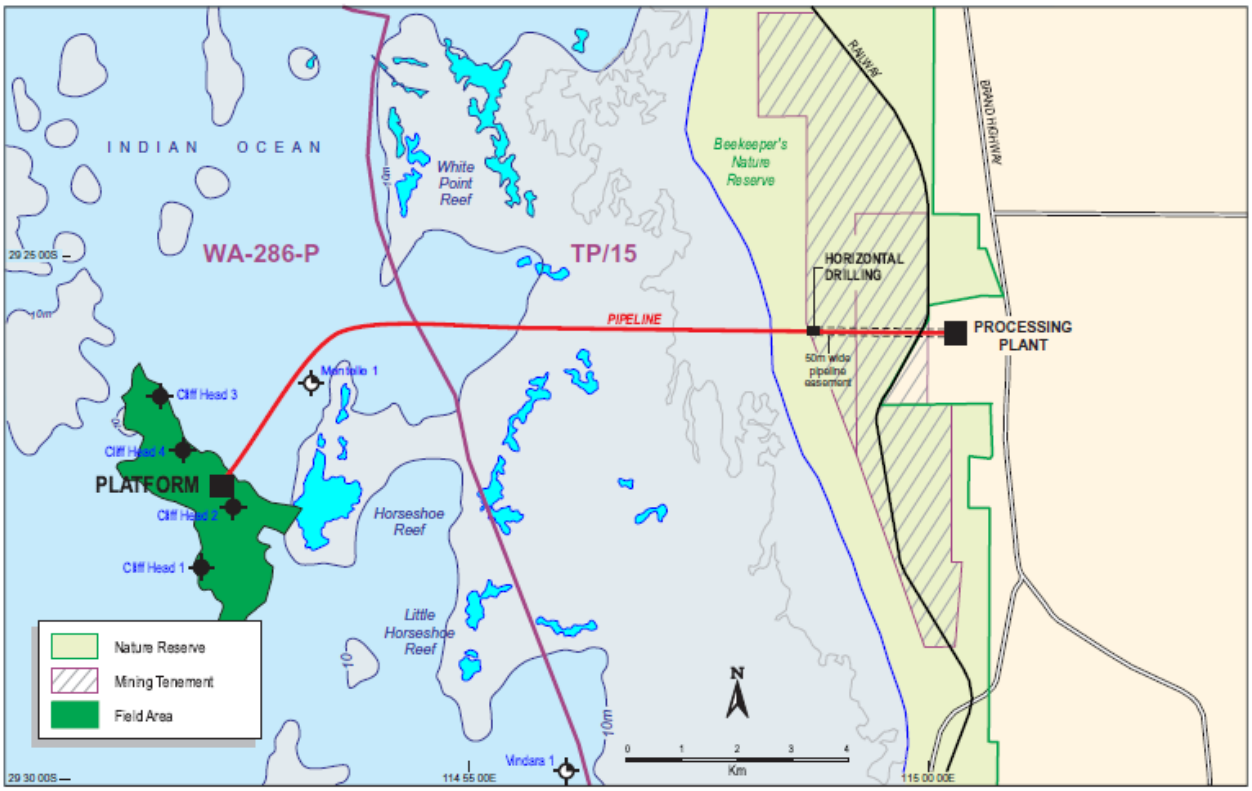


Figure 8-1: Development Location

8.4 Cliff Head Facilities

The Cliff Head reservoir is approximately 1260m below sea level with the closest landfall 11km due East. Infrastructure associated with the Cliff Head operational facilities consist of the following:

Cliff Head A (CHA)

Production from the Cliff Head Oil Field Development (Figure 8-2) involves transferring oil and PFW from the offshore wellhead to the ASP via the offshore and onshore pipeline. At the ASP the PFW is removed from the product stream, the crude oil is stabilised and then transferred to road tankers and transported for refining.

This OPEP considers spills from: sources beyond Commonwealth-State boundaries at 3nm from the coastline and from the pipeline within State waters. The spill sources are therefore as follows:

- Five production wells with ESP's at the Cliff Head oil field location;
- Three water injection wells;
- An offshore well head platform (CHA);
- An insulated offshore subsea pipeline to transport the produced fluids towards the shoreline where it enters the seabed at the Horizontally Directionally Drilled (HDD) shoreline crossing in State waters;
- A subsea water injection pipeline from the onshore plant to the three injection wells at the Cliff Head Oil field locations; and
- Umbilical power, control and chemical supply lines running from the onshore stabilisation plant to the wellhead platform.

Figure 8-2: Cliff Head Alpha Platform

8.4.1 Cliff Head Pipeline

An insulated subsea pipeline transports the produced fluids from CHA to the Arrowsmith Stabilisation Facility (ASP), crossing beneath the dune system by the means of horizontally drilled directional (HDD) holes and remaining buried until arriving at ASP.

Parallel to the production pipeline is an insulated subsea water injection pipeline from ASP to the two water injection wells at CHA. A High Voltage power cable, flat pack chemical umbilical and fibre optic cable are buried alongside the pipelines in order to provide power, chemical transfer and communications to CHA from ASP.

The ASP Plant Site (Figure 8-3) is located approximately 3km West of the shoreline. The facility receives full well stream fluids, separates, treats and stores produce formation water, stabilises and stores crude and redirects treated water offshore for re-injection. Four main storage tanks (Crude Settling Tank, Crude Storage Tank, Produced Water Storage Tank and Injection Water Storage Tank) are available at the site, each with a capacity of 1600m^3. The ASP also generates power and pumps chemicals offshore to the CHA Platform. The ASP site remotely controls processing activities on CHA from the Central Control Room (CCR). There is a normal manning at the facility of 4-6 persons (daylight) and 1 person (night). Response to terrestrial oil spills is covered by the Cliff Head Development Onshore Oil Spill Contingency Plan (10HSEQENVPL08).

Figure 8-3: Arrowsmith Stabilisation Plant

8.4.2 ASP Central Control Room

The ASP Central Control Room (CCR), located at the ASP, is the designated primary emergency co-ordination centre for all operations in the area and all emergency communications (including hydrocarbon spills) are directed to the CCR.

8.5 Legislation

This OPEP has been developed to meet the requirements of the Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGS Act) and Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (E) Regulations) administered by NOPSEMA, but also meets the requirements of other relevant Commonwealth (Cth) and state legislation including:

- *Protection of the Sea (Prevention of Pollution by Ships) Act 1983* (Cth) administered by AMSA;
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) administered by DCCEEW;
- *Petroleum (Submerged Lands) Act 1982* (WA); and
- Petroleum (Submerged Lands) (Environment) Regulation 2012

The requirements for an OPEP under the Petroleum (Submerged Lands) (Environment) Regulations 2012 are:

- Preparations to be made for the possibility of an oil spill
- Emergency Response arrangements or arrangements to be implemented if an oil spill occurs
- Recovery arrangements to be implemented if an oil spill occurs
- Current oil spill trajectory modelling that applies to the petroleum activity
- Tests of emergency response

Other key statutory requirements relevant to the protection of the marine environment and spill response framework are outlined in Tables 2 and 4 of the Australian Maritime Safety Authority (AMSA) – Technical Guideline for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities (AMSA 2015). Section 3 of the EP details the applicable environmental legislation applicable to the Cliff Head offshore operations and associated activities.

Table 8-1 details the key OPGGS (E) Regulations applicable to this OPEP. Table 8-2 details the key P(SL)(E)R.

Table 8-1: Key OPEP OPGGS (E) Regulations

Regulation	Requirement	Addressed
14 (8)	The implementation strategy must contain an oil pollution emergency plan and provide for the updating of the plan.	Section 8 of the EP discusses the implementation and maintenance requirements of the OPEP. This document contains the OPEP itself.
14 (8AA)	The oil pollution emergency plan must include adequate arrangements for responding to and monitoring oil pollution, including the following: a) The control measures necessary for timely response to an emergency that results or may result I oil pollution b) The arrangements and capability that will be in place, for the duration of the activity, to ensure timely implementation of control measures, inducing arrangements for ongoing maintenance of response capability c) The arrangements and capability that will be in place for monitoring the effectiveness if the control measures and ensuring that the environmental performance standards for the control measures are met d) The arrangements and capability in place for monitoring oil pollution to inform response activities	Section 10 of the OPEP details oil spill response arrangements. The OPEP has been specifically developed for the activity and will be reviewed as necessary if new information comes to light or changes are made to the activity/environmental risks posed (Section 13).
14(8A)	• The implementation strategy must include arrangements for testing the response arrangements in the oil pollution emergency plan that are appropriate to the response arrangements and to the nature and scale of the risk of pollution for the activity	Section 13 states that the plan will be tested once this latest amendment is approved. The testing program meets the requirement to test not later than 12 months after the most recent test. TEO does not intend to add a new location or facility to the EP therefore no further testing would be required. Section 13 requires that the OPEP will be reviewed in the event of any significant change to the activity (i.e. which introduced a new significant environmental risk) and re-tested if necessary.
14(8B)	The arrangements for testing the response arrangements must include: a) A statement of the objectives of testing b) A proposed schedule of tests c) Mechanisms to examine the effectiveness of response arrangements against the objectives of testing d) Mechanisms to address recommendations arising from tests	Testing arrangements are provided in Section 13

Regulation	Requirement	Addressed
14(8C)	The proposed schedule of tests must provide for the following: a) Testing the response arrangements when they are introduced b) Testing the response arrangements when they are significantly amended c) Testing the response arrangements not later than 12 months after the most recent test d) If a new location for the activity is added to the environment plan after the response arrangements have been tested and before the next test is conducted – testing the response arrangements in relation to the new location as soon as practicable after it is added to the plan e) If a facility becomes operational after the response arrangements have been tested and before the next test is conducted – testing the response arrangements in relation to the facility when it becomes operational	Testing arrangements are provided in Section 13
14 (8D)	The implementation strategy must provide for monitoring of impacts to the environment from oil pollution and response activities that: • is appropriate to the nature and scale of the risk of environmental impacts for the activity; and is sufficient to inform any remediation activities.	Section 4 of the OPEP details the Operational and Scientific Monitoring Plan (OSMP) that would be implemented in the event of a spill to monitor impacts to the environment.
14 8(E)	The implementation strategy must include information demonstrating that the response arrangements in the oil pollution emergency plan are consistent with the national system for oil pollution preparedness and response.	Section 8.6 of the OPEP details how the OPEP integrates with national, state and industry plans.
26	Oral or written notification of a reportable incident must be given to the Regulator (NOPSEMA) as soon as practicable, but not later than 2 hours after the first occurrence of the incident, or after the time the operator becomes aware of the incident. The notification must contain: • All material facts and circumstances concerning the incident, that is known, or is able to find out; • Details of any action taken to avoid or mitigate any adverse environmental impacts from the incident; and • Details of the corrective action that has been taken, or is proposed, to prevent a similar reportable incident.	Section 9.3 of the EP defines the reporting requirements of reportable and recordable incidents as well as routine reporting. Section 1.4 of the OPEP defines the reporting requirements.

Regulation	Requirement	Addressed
26A	A written report of a reportable incident must be given to the Regulator (NOPSEMA) as soon as practicable, but not later than 3 days after the first occurrence of the incident, or after the time the operator becomes aware of the incident. The notification must contain: • All material facts and circumstances concerning the incident, that is known, or is able to find out; • Details of any action taken to avoid or mitigate any adverse environmental impacts from the incident; and • Details of the corrective action that has been taken, or is proposed, to prevent a similar reportable incident.	Section 9.3 of the EP defines the notification requirements for reportable incidents. Section 1.4 of the OPEP defines the reporting requirements and Appendix G provides the link to NOPSEMA report form FM0831.

Table 8-2: Key OPEP P(SL)(E) Regulations

Regulation	Requirement	Addressed
15(10) (a)(i)	Preparations to be made for the possibility of an oil spill	Details within this OPEP
15(10) (a)(ii)	Emergency response arrangements to be implemented if an oil spill occurs	
15(10) (a)(iii)	Recovery arrangements to be implemented if an oil spill occurs	
15(10) (a)(iv)	Current oil spill trajectory modelling that applies to the petroleum activity	Trajectory modelling has been summarised in Section 12.3
15(10) (b)	Tests of emergency response	Section 13.1 outlines emergency exercises and testing
Part 3	Incidents, reports and records	Section 6.9 outlines the required reporting of incidents
28	Reportable incidents	DMIRS to be notified of a reportable state waters incident to the Minister as soon as practicable, and in any case within 2 hours after the first occurrence of the reportable incident; or if the reportable incident is not detected by the operator at the time of the first occurrence — the time the operator becomes aware of the reportable incident; The number to contact is 0419 960 621 See the EP for further details on reportable incidents.

Under the OPGGS Act NOPSEMA has authority to issue a direction to a petroleum titleholder, in the event of an incident which has or may cause an escape of petroleum, which would require the titleholder to take action to prevent or eliminate the escape, and to mitigate, manage or remediate the effects of the escape.

8.6 Integration with Other Plans

8.6.1 Environmental Plans

This OPEP interfaces with the Commonwealth and State Waters Environment Plans (EP) [10HSEQENVPL01] and [10HSEQENVPL09] respectively. These EPs provide detailed information regarding operational activities, the existing environment and risks to environmental values. These EPs also demonstrate that appropriate management controls are in place to reduce the potential for environmental impacts to occur as a result of the project to a level as low as reasonably practicable (ALARP) and acceptable. This includes an assessment of response strategies that will reduce impacts and risks to ALARP levels and also evaluates the potential impact and risks of the response strategies.

8.6.2 Operational and Scientific Monitoring

The overarching Operational and Scientific Monitoring Plan (OSMP) (4716-HS-0114) consists of five Operational Monitoring Plans (OMPs) and seven Scientific Monitoring Plans (SMPs). Refer to Section 4 for further details.

8.6.3 Emergency Management Plan

The Cliff Head Emergency Management Plan (EMP) (10HSEQGENPL01) provides an overview of the Emergency Management Plan to be used by TEO at the Cliff Head operation. The EMP defines how the Perth technical support team and the field-based team will respond to an emergency situation either at the ASP facility or on the CHA platform to minimise impact on the environment and to ensure the safety of company personnel and the integrity of the facilities. Further details of the EMP can be found in Section 8.5 of the Commonwealth Environment Plan (10HSEQENVPL01).

8.6.4 National and State Plans

This OPEP provides components of the implementation strategy for the Commonwealth EP of the OPGGS (Environment) Regulations, ensuring that TEO has in place adequate arrangements for responding to and monitoring oil pollution. This OPEP is consistent with, and supports, (while not relying upon) the procedures and resources provided in the TEO documents listed in Section 8.6 and the external plans and documents below:

- Western Australian Oiled Wildlife Response Plan (DBCA and AMOSC 2022, see Section 2.8)
- The National Plan for Maritime Environmental Emergencies (the National Plan) (AMSA 2014): contains the National Plan to Combat Pollution of the Sea by Oil and Other Noxious and Hazardous Substances,
- State Hazard Plan – Maritime Environmental Emergencies (MEE) (DoT, 2018)
- Australian Marine Oil Spill Centre (AMOSC) Australian Industry Cooperative Oil Spill Response Arrangements (AMOSPlan) (AMOSC 2021)

Commonwealth and State response arrangements are outlined in Section 9.3.2 and 9.3.3 respectively.

Table 8-3: Key interfacing TEO documents

Document title	Document description	Relevant sections to this OPEP
Commonwealth and State EPs	Provide a detailed description of the activity, the existing environment, environmental impacts and risks, and prescribes environmental outcomes and standards (i.e. management and mitigation measures) to reduce potential impacts of response strategy implementation to ALARP. The environment plan also details roles and responsibilities of personnel (including competencies, training, drills and exercises); management of non-conformance and change; internal and external reporting arrangements; and stakeholder consultation undertaken. The plan also provides details of the legislation applicable to oil spills and the stakeholder engagement process that has informed the development of this OPEP.	Entire document

Document title	Document description	Relevant sections to this OPEP
Cliff Head EMP (10HSEQGENPL01)	The EMP details the Cliff Head procedures for responding to an emergency incident, including a hydrocarbon spill event. The EMP contains procedures for the activation of the TRT, IMT and BIMT, the roles and responsibilities of the IMT and BIMT, and procedures for post-incident reporting and investigation	Entire document
Cliff Head Hazard and Incident Investigation Procedure (10HSEQGENPC23)	Identifies business rules and processes to be implemented to confirm that reporting, recording and investigation of incidents (including near misses) are undertaken, documented and communicated.	Entire document
Cliff Head Prescribed Waste Management Procedure (10HSEQENVPC04)	Defines TEO's business rules for eliminating or minimising the environmental impacts resulting from production, storage, handling, transport, recycling and disposal of all waste generated during Cliff Head operations and activities.	Entire document
Cliff Head Project Operations Overarching Oil Spill Monitoring Plan (4716-HS-H0114)	Provides an overview of the OMPs and SMPs (provided separately below) including initiation and termination criteria in addition to reporting requirements (see Section 8.6.2 for more details)	Entire document
OMP-01 (4716-HS-H0114-01)	OMP01 - Oil Distribution Monitoring – Sea surface, shorelines and water column.	Discrete initiation and termination criteria. OMP's are intended to support the operational response to an oil spill.
OMP-02 (4716-HS-H0114-02)	OMP-02 – Oil Character and Fate Modelling	
OMP-03 (4716-HS-H0114-03)	OMP-03 – Shoreline Assessment	
OMP-04 (4716-HS-H0114-04)	OMP-04 – Wildlife Impact Monitoring	
OMP-05 (4716-HS-H0114-05)	OMP-05 – Response strategy monitoring	
SMP-01 (4716-HS-H0114-11)	SMP-01 – Scientific monitoring of hydrocarbons in marine waters	Discrete initiation and termination criteria. SMP's are intended to quantify the changes to the environment (both short and longer term) due to, and the recovery following, an oil spill.
SMP-02 (4716-HS-H0114-12)	SMP-02 – Scientific monitoring of hydrocarbons in marine sediments	
SMP-03 (4716-HS-H0114-13)	SMP-03 – Scientific monitoring of shoreline and intertidal benthos	
SMP-04 (4716-HS-H0114-14)	SMP-04 - Scientific monitoring of subtidal benthos	
SMP-05 (4716-HS-H0114-15)	SMP-05 – Scientific monitoring of seabirds and shorebirds	
SMP-06 (4716-HS-H0114-16)	SMP-06 – Scientific monitoring of sea lions, cetaceans and turtles	
SMP-07 (4716-HS-H0114-17)	SMP-07 – Scientific monitoring of fisheries and tourism resources	

8.6.5 Industry Plans

Industry support arrangements are documented in the Australian Marine Oil Spill Centre Plan (AMOSPlan). Industry support is summarised in Section 11.6.

9 Response Planning

9.1 TEO and Contractor Plans

To achieve rapid and effective response, this OPEP shall be read in conjunction with the Cliff Head Emergency Management Plan (10HSEQGENPL01):

- Defines the organisational framework and resource requirements;
- Assigns, in advance, personnel to be responsible for taking actions within the Tactical Response Team (TRT), the Perth-based Incident Management Team (IMT) and the Business Management Team (BIMT);
- Details the necessary communication links during an emergency situation;
- Identifies conceivable emergency events associated with operation of the Facility and defines a list of actions and checks which must be undertaken in response to them; and
- Provides relevant, easily referenced and up-to-date information to enable tasks to be carried out quickly and efficiently.
- For vessel-based incidents, this OPEP should also be read in conjunction with the vessel's Shipboard Oil Pollution Emergency Plan (SOPEP) or SMPEP (depending on vessel class).

9.2 Tiered Responses

Under the NatPlan arrangements, definition of spill level based on response requirements are summarised in Section 1.6.

9.3 Western Australian and National Plan Arrangements

9.3.1 Division of Responsibility

Table 1-1 outlines the expected jurisdictional and control agencies during an oil spill in different marine jurisdictions.

9.3.2 Commonwealth Waters

9.3.2.1 Australian Maritime Safety Authority (AMSA): National Plan

AMSA manages the NatPlan and is responsible for a range of services that are directly relevant to oil spill response operations, including coordination of National Response Team resources and the provision and coordination of personnel, equipment and aerial surveillance resources.

TEO has an MOU in place with AMSA outlining respective roles and responsibilities when responding to vessel-sourced marine pollution incidents and petroleum activity related marine pollution incidents.

When TEO is acting as Controlling Agency for non-vessel Commonwealth waters spills, TEO spill arrangements as identified in this OPEP will apply and AMSA, as managers of the National Plan, may provide support such as equipment, people and liaison. AMSA will coordinate the resources of the National Plan on the formal request of the TEO Incident Commander

Resources available to TEO under the AMSA National Plan are detailed in Section 6.10.2.

9.3.3 Western Australian State Organisation

9.3.3.1 DoT: State Hazard Plan – Maritime Environmental Emergencies (MEE)

If a Marine Oil Pollution Incident enters, or has potential to enter, State waters, the DoT is the Hazard Management Agency (HMA) (DoT Chief Executive Officer (CEO) or proxy). A proxy of the CEO will be nominated by the HMA to perform the role of State Marine Pollution Coordinator (SMPC) and DoT will take on the role as a Control Agency for State waters. The role of the SMPC is to provide strategic management of the incident response on behalf of the HMA.

TEO will notify the DoT Maritime Environmental Emergency Response (MEER) unit as soon as reasonably practicable (within 2 hours of spill occurring). On notification, the HMA will activate their Maritime Environmental Emergency Coordination Centre (MEECC) and the DoT Incident Management Team (IMT).

TEO is required to work in partnership with DoT during such instances, as outlined within the DoT's Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements. The coordinated response may occur within a single jurisdiction (spill within State waters) or cross-jurisdiction (spill crossing from Commonwealth to State waters)

The DoT is custodian of the States oil spill response equipment and the State Response Team. This is made available to TEO in the event of a spill impacting State waters.

Resources available to TEO under the DoT Oil Spill Contingency plan are detailed in Section 11.8.

9.3.3.2 Single Jurisdiction Arrangements

For Level 2/3 spills originating within State waters, DoT will assume control as the Controlling Agency with the exception of source control activities which will remain under the control of TEO's IMT.

The initial first strike response will be undertaken by TEO; formal protocols for the transfer of Controlling Agency responsibility from TEO to DoT are outlined within Section 6.4.2 of DoT's Offshore Petroleum Industry Guidance Note - MOP: Response and Consultation Arrangements.

At the request of the SMPC, TEO will be required to provide all necessary resources, including personnel and equipment, to assist the DoT's IMT in performing duties as the Controlling Agency for State waters response. This includes providing an initial 5 x personnel to work within the DoT IMT located at Marine House, Fremantle, no later than 8 am following the day of the request. It also includes providing 1x personnel to serve in DoT's Forward Operating Base no later than 24 hours following formal request by the SMPC.

Two DoT personnel will be provided from DoT's command structure into TEO's IMT as Media Liaison Officers.

In addition to these incident management roles, TEO, at the request of the SMPC, will be required to provide an appropriate number of operational field personnel to assist with field response activities, such as shoreline protection and clean-up and oiled wildlife response, with the required number determined based on the nature and scale of the spill and response requirements. DoT may also stand-up field response capability through the State Response Team and request National Response Team support.

Any matters of contention between TEO and DoT, with respect to the partitioning of resources and responsibilities between IMTs will be referred to the SMPC for resolution.

9.3.3.3 Cross Jurisdictional Arrangements

For Level 2/3 spills that crosses from Commonwealth waters to State waters, both DoT and TEO will be Controlling Agencies. For a cross-jurisdictional response, there will be a Lead IMT (DoT or TEO) for each spill response activity, with DoT's control resting primarily for State waters activities.

Annex 2 within DoT's MOP: Response and Consultation Arrangements (Initial DoT IMT Personnel Requirements Upon Petroleum Titleholder) is provided in Appendix I detailing the allocation of a Lead IMT to response activities for a cross jurisdictional spill.

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

As with a single jurisdiction response TEO will be responsible for ensuring adequate resources are provided to DoT as Controlling Agency, including 5 x personnel to fill roles in the DoT IMT or FOB and operational personnel to assist with those response strategies where DoT is the Lead IMT.

9.3.3.4 WA Department of Biodiversity, Conservation and Attractions (DBCA)

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

For a Level 2/3 petroleum spill that originates within or moves into State waters, DoT will be the Controlling Agency responsible for overall command of an oiled wildlife response. TEO will provide appropriate resources (equipment and personnel) to DoT facilitated through an industry (AMOSC) Oiled Wildlife Advisor (OWA).

10 TEO Emergency Response Arrangements

10.1 TEO Response Organisation

Spill response is managed by a hierarchy of teams within TEO with supporting resources from other contractors and third-party specialists:

- Tactical Response Team (TRT): The response team located on site, and is comprised of both contractors and TEO personnel, under the leadership of a Tactical Response Team Leader (TRTL)
- Incident Management Team (IMT): A shore-based team with personnel which support on site operations or, in the case of larger responses, assumes control of the response, under the leadership of the Perth based Incident Management Team Leader (IMTL)
- Business Incident Management Team (BIMT): under the leadership of a Business Incident Management Team Leader (BIMTL), responsible for managing the wider business implications of an incident.

The teams are trained in emergency and incident management in line with the Cliff Head Emergency Management Plan (10HSEQGENPL01) and TEO Training Plan (10SPTRNPL01).

For Level 1 spills, the response will be managed by the SEC (i.e. Cliff Head - Person in Charge (PIC) for production pipeline-based spills and vessel master for vessel-based spills until responsibilities are transferred to AMSA) and TRT. For Level 2 and Level 3 spills, the TEO IMT, in consultation with the BIMT Business Incident Management Team Leader, will determine the need to mobilise the BIMT.

The roles and responsibilities of the BIMT, IMT and TRT are listed in detail in the TEO Cliff Head EMP (10HSEQGENPL01). The function of each team and key individual roles are summarised in Table 10-1.

The IMT & BIMT duty roster process is described in detail in the Cliff Head EMP (10HSEQGENPL01), which also indicates the minimum training required for each of the IMT roles. This process ensures that the duty roster is fulfilled by personnel with the required training.

10.1.1 Business Incident Management Team

The Business Incident Management Team (BIMT) manages the wider implications of a spill and will provide support to the IMT in aspects such as media, Government or community liaison (10HSEQGENPL01). The BIMT will manage the strategic issues described in Table 10-1.

BIMT personnel will operate from a separate room to the ICC in the TEO offices.

Table 10-1: Business Incident Management Team Strategic Role

Issue	Role
Management of Human Resources	Ensure that rapid, effective and compassionate support is given to personnel involved. Ensure that rapid, effective and compassionate support is given to relatives and colleagues, through the Employee and Relative Response Group (ERRG). Ensure all personnel are not exposed to health and safety hazards arising from the incident. Ensure that all employees, contractors and consultants are kept informed.
Management of Environmental Impact	Ensure that rapid containment and clean-up is affected. Ensure immediate and long-term monitoring of affected/potentially affected areas are implemented. Cooperate with government and relevant regulatory authorities. Consider how environmental agencies/ pressure groups might react and implement plans to manage their response. Long term clean-up.
Liability Issues	Assess incident details and agree on the interim basis upon which TEO will respond. Clarify legal obligations and relationships and ensure TEO discharges all contracted agreements. Decide whether to recommend to IMT the immediate shutdown of operations pending incident investigation. Ensure accurate logging of responses.
Internal/External Investigation	Review composition of investigation team - consider use of independent third party. Gather facts and evidence (e.g. photographs, diagrams, and witness statements) while fresh.
Management of Reputation	Consider the likely reactions from pressure groups and relevant regulatory authorities. Ensure company spokespeople are thoroughly briefed. Ensure that the targeted media, and key personnel that media approach for comment, are regularly briefed. Proactively brief politicians - preferably using TEO personnel who have pre-existing relationships. Review incident impact on pre-existing relationships and implications for future projects. Monitor the response from media, other outside sources and employees. Consider the implications of current issues and prevailing public sentiment for management of the incident. Consider the impact of new information on each key stakeholder prior to its release.
Resumption of Operation	Consider the impact of shut down of facility - need for strategies to mitigate.
Claims for Compensation	Publicise guidelines as early as possible, especially on how to claim compensation without prejudicing ultimate liability. Commit resources to processing claims quickly. Prepare and issue a public statement on compensation matters.
Joint Venture Partners, Customer and Supplier Impacts	Ensure there is timely and adequate communication about incident impacts, likely outcomes and recovery plans. Decide on the ability to assist with alternate supply to customers. Consider the inability to accept forward ordered or contracted supplies and equipment in the short and/or long term.
Business Impacts	Estimate forgone revenue from lost production. Consider internal advice requirements. Review the impact of expenditure to repair damaged incident site on other TEO projects. Review internal budgets and financing arrangements. Assess the likelihood of penalty or fine. Review insurance claim options - ensure compliance. Consider the impact on operations (e.g. impact on equipment and property, denial of use, consequential loss, and inability to meet demand).
BIMT Response Operations	Ensure that the BIMT is supportively managing the strategic response - assisting and not hampering the IMT's primarily tactical response. Ensure that information flow between IMT, BIMT, BIMT Leadership, Support Groups and other key stakeholders is satisfactory. Ensure that unaffected parts of TEO operations are receiving management resources for continued unimpeded operation. Decide whether the BIMT could deal with some issues more effectively by breaking into subgroups. Review the requirement of the BIMT to remain convened. Review the requirement for additional resources for the BIMT.

10.1.2 Incident Management Team

The role of the Incident Management Team (IMT) is to support the site-based Incident Response Team for all Levels of spills from CHA platform, sub-sea and pipeline activities and coordinate the interface with stake holders and external agencies and spill response support agencies.

The IMT will link into AMOSPlan and NatPlan through the relevant Liaison Officers seconded from AMOSC and/or AMSA. The IMTL will have full financial authority to activate these resources.

The IMT will operate from the TEO board room (West Perth). The oil spill roles and responsibilities of the IMT are summarised in Table 10-2.

In the event of a Level 1 oil spill, the IMT personnel may fulfil more than one role, however in the event of a spill requiring Level 2 or Level 3 response, surge capability is provided in Section 10.1.4

In the event of DoT being the HMA for spills, the personnel requirements outlined in Annex 2 of the DoT Offshore Petroleum Industry Guidance Note – Marine Oil pollution: Response and Consultation Arrangements are also provided in Table 10-3. This was specifically requested by DoT following discussion of the guidance note. Roles may be delegated to other personnel within the IMT as appropriate to ensure the resources can be provided to DoT. If personnel are unable to be resourced from the trained personnel within TEO, personnel from AMOSC may be utilised to fill IMT roles within TEO and/or DoT.

Table 10-2: Summary of IMT Responsibilities

Team Role	Location	Key Responsibilities
TEO IMT		
Scribe	Perth ICC	Records initial actions then tracks and records ongoing actions (personnel and equipment), key communications and updates during the course of the response.
Finance and Admin	Perth ICC	Ensures implementation of the Administration and Finance strategies.
IMT Leader	Perth ICC	Responsible for ensuring that an effective immediate response and ongoing response is mounted. The IMTL will direct all oil spill response activity.
Deputy IMT Leader	Perth ICC	Responsible for assisting the IMT Leader
Planning	Perth ICC	Provide a focal point for developing the Incident Action Plan (IAP) for sign off by the IMTL Monitor the IAP progress against the strategy objectives Work with HSES who will coordinate the environmental and scientific input to the IAP.
Facilities/Operations	Perth ICC	Responsible to the IMTL for all response operational activities.
Logistics	Perth ICC	Act as focal point for materials and logistics requirements Organise the supply and transportation of contractor personnel, materials and equipment required for oil spill response as required by the IMTL.
AMOSC Liaison Officer	Perth ICC	Support the IMT and HSES during the oil spill response providing technical expertise Work with the Planning and Logistics in developing the incident action plan Support HSES in carrying out the NEBA assessments Coordinate the deployment of AMOSC resources and liaise with the AMSA liaison officer as required Provide technical and oil spill response expertise to the IMT in general
HSES	Perth ICC	Responsible for coordinating the provision of up-to-date and balanced assessment of the likely environmental effects of an oil spill. Advising on the environmental priorities and thorough implementation of the NEBA assessment, the preferred response options taking into account the significance, sensitivity and possible recovery of the resources likely to be affected. To implement the Oil Spill Monitoring Plan (operational and scientific)

Team Role	Location	Key Responsibilities
Onsite Tactical Response Team (TRT)		
Tactical Response Team Leader (TEO PIC or vessel master)	Offshore (Support vessel)	Ensures the safety of personnel and the management of the vessel. Notifies the TEO onsite representative of the incident. Implements SOPEP/SMPEP/emergency response plans. Has overall responsibility for the response and all notifications. Undertakes roles as assigned in relevant checklists, e.g. initial notification, completion of POLREP
TEO onsite representative	Offshore (Support vessel)	Represents TEO and point of contact between TEO IMT and TRTL. Assists TRTL to ensure the safety of personnel, the necessary actions to limit the spill and restrict its spread and to mount an immediate on-scene response.
Vessel master	Offshore (support vessels)	Ensures the safety of crew and vessel. Provides support to the AMSA IC (once responsibilities are transferred) and directs crew to begin spill containment or monitoring if directed. Implements the vessel SOPEP/SMPEP.

Table 10-3: Summary of DoT personnel requirements and TEO personnel to be provided

Area	DoT Role	TEO Personnel	Alternate support
DoT MEECC	CMT Liaison Officer	HSEQ Manager/Asset & Integrity Manager	N/A – must be TEO
DoT IMT: Incident Control	PT IMT Liaison Officer	Well Engineering Manager/Asset & Integrity Manager	N/A – must be TEO
DoT IMT: Planning – Intelligence/Mapping	Intelligence support officer	Operations Engineer/Senior Commercial Officer	N/A – must be TEO
DoT IMT: Planning – Plans/Resources	Planning support officer	Facilities Engineer/Petroleum Engineer	N/A – must be TEO
DoT IMT: Planning – Environment	Environmental Support Officer	Senior Environmental Advisor	N/A – must be TEO
DoT IMT: Public Information – Media/Community Engagement	Public Information Support and Media Liaison Officer	HR Advisor/ Human resources manager/ Commercial Services Officer	TEO nominated (trained personnel)
DoT IMT: Logistics – Supply	Supply Support Officer	Lead Asset Integrity Engineer	AMOSC/ Alternate contractor
DoT IMT: Logistics – Waste	Waste Support Officer	Senior Environmental Advisor to support Lead Asset Integrity Engineer	AMOSC/ Alternate contractor
DoT IMT: Finance – Accounts/Financial Monitoring/time keeping	Finance Support Officer	Accounts and Payables Officer	TEO nominated (trained personnel)
DoT FoB: Operations command	PT FOB Liaison Officer	Asset Integrity & Maintenance Engineer	AMOSC/ Alternate contractor

Note (*) roles not interchangeable with contracted support;
AMOSC/ Alternate contractor will still engage with TEO personnel for guidance.

10.1.3 Tactical Response Team

The Tactical Response Team (TRT) is responsible for the initial site-based response. They will initiate the other emergency response groups if needed as per the Cliff Head Emergency Management Plan (10HSEQGENPL01).

TRT Size

The TRT structure is flexible and will reflect the scale of the response. The Tactical Response Team Leader (TRTL) will appoint staff to the TRT, and allocate functions, as required.

Location

TRT members will be on site, at the Shore Base. Perth-based personnel will operate from the designated Incident Command Centre (ICC) in the Perth offices (Board Room).

10.1.4 Surge Capability for Level 2 and Level 3 Spills

In the event of a spill requiring resources exceeding those of the TEO organisation, additional personnel and resources will be obtained from:

- Industry organisations e.g. AMOSC
- Government support organisations e.g. AMSA & DoT
- Third party contract services and spot hire

AMOSC will provide personnel and resources through AMOSPlan. Personnel can be provided from this source to fulfil any of the organisational positions shown in Table 10-4 except the role of IMT Leader. Each unit is headed by a coordinator reporting to their relevant IMT Officers. The coordinator roles and responsibilities are summarised in Table 10-4.

Section 10.1.4 details how personnel and the associated resources are obtained to enable a Level 2 or Level 3 response.

Table 10-4: Coordinator roles and responsibilities

Coordinator Function	Responsibility
Planning Officer	
Situation / Response Planning	Incident analysis Predictions Options Ground and Air Observers Weather service Situation information and reports mapping Technical advice
Resource	Resource management Resource tracking Handovers Demobilisations
Communication Planning	Communications planning
Management Support	Administration support ICC record management Communications operators
Information / Consultation	Community Media liaison Other agencies

Coordinator Function	Responsibility
Operations Officer	
Marine	Marine sub-plan Marine response equipment Monitor exclusion zone Coordinate vessel operations Task and brief marine response teams
Air Operations	Aviation sub-plan Aviation response equipment Coordinate aerial transport Coordinate aerial surveillance Coordinate aerial ops
Shoreline	Shoreline sub-plan Shoreline response equipment Coordinate land transport for shoreline teams Task and brief shoreline assessment teams Task and brief shoreline clean-up teams
Wildlife	Wildlife response sub-plan Wildlife response equipment Coordinate wildlife capture operations Coordinate wildlife cleaning operations Coordinate wildlife recovery program
Waste Management	Waste management sub-plan Calculate waste volumes Coordinate waste transport Coordinate waste storage Coordinate waste disposal
Logistics Officer	
Supply / Procurement	Acquisition Storage Distribution
Communications Support	Communications equipment Technical advice Communication support
Facilities	Temporary facilities establishment Facilities maintenance Facilities security Base camp
Medical	Medical support First aid Medical transport
Catering	Catering support
Finance	Accounts Insurance/Compensation Costs analysis and recovery
Ground Support	Transport Water support Fuel Mechanical service & vehicle security Traffic management
Staging Area	Field crew muster point Induction centre Field kit issue (PPE) Equipment and fuel storage

11 Operational Preparations

11.1 Source Control

Spills from the export line will be halted by shutting down the pipeline either using the automatic systems or manually.

Source control of vessel-based spills will be achieved by implementation of the relevant SOPEP (where applicable) and the EMP.

11.2 Level 1 Response Equipment

TEO level 1 response equipment is available on site and listed in Section 6.10.3.

11.3 Communication Services

The TRTL will maintain contact with the IMTL to ensure effective communication. This will be undertaken via land-line or satellite phone.

Personnel in the field will communicate with VHF/UHF radios on land and marine frequencies. Additional radios required for an oil spill response incident will be sourced from suppliers provided in Section 6.3.

11.4 Medical Services

All site personnel are trained in Senior First Aid.

Medical and Ambulance facilities are located at Dongara. The nearest hospital is located in Geraldton. Medical services will be contacted as per the Cliff Head Development Emergency Management Plan (10HSEQGENPL01).

11.5 Weather Forecasting Services

Weather conditions and predictions are available from the Duty Officer of the Bureau of Meteorology (BoM):

PO Box 1370

West Perth WA 6872

1100 Hay Street

Tel (08) 9263 2222 (24-hour contact)

11.6 Industry Arrangements

11.6.1 AMOSC Services

Industry assistance is available through the Australian Marine Oil Spill Centre (AMOSC), an industry funded response facility based at Corio Quay, Geelong, Victoria and North Fremantle, Western Australia. AMOSC resources include:

- AMOSC spill response equipment.
- Oil company equipment based at various locations.
- Trained industry response ("Core Group") personnel.

Services available through AMOSC are provided in Section 6.5 and Section 6.10.1.

Response equipment and personnel are allocated on a first-come-first-served basis, with the intent, under best efforts, to address any short-fall through AMOSC. Further support can be gained through AMOC to access the resources of the Global Response network (GRN).

AMOSC has contracts with all its member companies to enable the immediate release of Core Group personnel to be made available for any TEO requirements, as outlined in the Master Service *Contract and Principle and Agency Agreement* with AMOSC.

The mutual aid arrangements that AMOSC operates under are documented in the AMOSPlan. This provides the mechanism for members of AMOSC to access oil spill response resources of other members.

As an associate member of AMOSC, TEO has access to AMOSC's oil spill recovery and response equipment, and technical (human) capabilities along with those resources held by member companies as outlined in the AMOSPlan on a 24-hour, 7 day a week basis. This includes access to AMOSC equipment stockpiles in Fremantle, Geelong, Exmouth and Broome as well as other operating members' local resources. In addition to support from 16 AMOSC staff, TEO has access to the industry Core Group (trained response personnel employed by AMOSC member companies 80-100 trained personnel).

The Core Group re-validates through additional training and exercising at AMOSC and relies on competence-based training for its skill base.

Procedures for accessing oil industry assistance for a spill response, through AMOSC, are documented in "AMOSPlan". As a member of AMOSC, resources are available to TEO at the request of one of the TEO "Authorising Officers" (see Section 6.5 and 6.10.1).

AMOSC will also provide a liaison officer within the IMT, whose role will be to coordinate AMOSPlan resources and manage deployment in cooperation with AMSA liaison officer (for Level 2 and 3 spills). The AMOSC liaison officer will also provide oil spill response technical expertise to the TEO spill response and coordinate availability of AMOSC resources.

AMOSC support is facilitated through the AMOSPlan using the various legal instruments signed by all members (e.g., Master Service Contract, Principal and Agency Agreement). TEO's primary interface with the AMOSPlan during an oil spill response is via AMOSC's 24/7 Duty Officer, who provides the initial point of contact for oil spill responses that require AMOSC assistance. The Duty Officer will evaluate TEO's request, provide technical advice, and if needed provide resources that best meet TEO's needs, using AMOSC's own, or members' resources. Upon TEO's request, and as soon as practicable, AMOSC will deploy Technical / Liaison Officers to the TEO IMT and provide a direct interface with AMOSC.

If AMSA has not assigned a Liaison Officer, the AMOSC Liaison Officer, delegated by the TEO IMTL, will work with AMSA on TEO's behalf (i.e. with an AMOSC representative acting as Technical Liaison Officer within the TEO IMT) during an oil spill to enable deployment of national resources without compromising regional capability.

The AMOSPlan is available on the AMOSC website at: http://www.amosc.com.au/amosc.php

11.7 AMSA Resources

In the event of a spill, TEO will send a Pollution Report (Form) (POLREP) to AMSA and if required the TEO Incident Controller will negotiate the use of NatPlan resources with the AMSA liaison officer. AMSA will provide support in a cooperative manner under the National Plan arrangements. AMSA may provide a liaison officer to the TEO Incident Response Team to enable this cooperative support role. These resources that can be deployed under the National Plan include oil spill trajectory modelling, fixed wing aerial support and the movement and hire of AMSA owned oil spill response equipment. This may also include NatPlan human resources (National Response Team (NRT)) members and National Response Support Team (NRST) members.

The NatPlan is available on the AMSA website. AMSA will provide a support role (as detailed in Table 11-2) and will not act as a control agency and will not assume the role of Incident Commander/Incident Management Team Leader.

11.7.1 AMSA National Response Team (NRT)

AMSA National Response Team (NRT) is available through the AMSA Liaison Officer. There are 63 personnel in total. The numbers and distribution of the AMSA NRT are provided in Table 11-1.

Table 11-1: AMSA National Response Team

Role	Positions (State/NT)	Total
Planning officer	1	7
Operations Officer	1	7
Logistics Officer	1	7
Aerial Observer	1	7
Response Team Leader	5	35
	Total	63

11.7.2 AMSA National Response Support Team (NRST)

The National Response Support Team (NRST) is available via the National Plan to support an incident response: Environmental Advisers, Finance & Administration Officers, Wildlife Officer, Equipment Operators, Marco Operators, Offshore Containment/Recovery, Inshore Containment/Recovery, Marine Qualifications, Shoreline Assessment and Shoreline Clean-up.

AMSA can provide personnel to fulfil all roles within the IMT if required e.g. for extended Level 3 incidents. The personnel include: Planning Officer, Operations Officer, Liaison officer, plus if requested a Liaison officer to the TRT.

11.8 DoT (Support Agency)

Where a spill enters or threatens to enter State waters, DoT will provide the same support as defined by AMSA and summarised in Table 11-2.

Where State waters are impacted by a Level 2/3 MOP emergency resulting from an offshore petroleum activity in Australian Government waters, DoT will only assume the role of Controlling Agency for that portion of the response activity that occurs within State waters.

DoT will provide Liaison officers to the IMT if requested by the IMTL.

This will provide access to DoT personnel and resources.

Equipment resources is limited e.g. equipment held in Ports for their own first strike response capability so access may be restricted to what they consider reasonable at the time arrangements with operators are agreed by consultation with DoT

DoT has State Response Team and State Response Support Team

- State Response Team = 30 personnel (approx.)
- State Response Support Team = approx. 20 personnel.

Note that some of the State Response Support Team may also be in the National Plan Support Team

Numbers/availability are not guaranteed.

Personnel can fulfil all roles in the emergency response arrangements - except TEO Incident Commander/IMT Leader e.g. operations, logistics and planning officers

Advisors can also be provided to the IMT Leader as well as to all other functions within the Incident Response Team.

DoT can also provide a Wildlife Liaison officer to inform response procedures and techniques - this person may be made available to the IMT either in person or by phone via DoT.

Table 11-2: TEO's spill response support overview

Organisation	Relevant level	Services provided	Relevant plan (if applicable)	Contact details
Australian Marine Oil Spill Centre (AMOSC)	Level 2 and Level 3	Contracted oil spill response equipment and personnel appropriate to the required level. Also mobilise mutual aid contracts – note also for oiled wildlife response	AMOSPlan	0438 379 328
	Mobilisation authority and response time	Mobilisation of AMOSC resources will be undertaken via the TEO IMTL or technical delegate under the AMOSPlan through the AMOSC 24-hour emergency number. E-mail confirmation and a telephone call to AMOSC will be required for mobilisation of response personnel and equipment, and call-out authorities will be required to supply their credentials to AMOSC. A signed contract NOTE must also be completed by a call out authority and returned to AMOSC prior to mobilisation. Contracts have been implemented between TEO and AMOSC to reduce response lead times to a minimum. In line with AMOSC recommendations of membership, TEO is required to provide an industry advisor and a mutual aid contact to act as the primary liaison between government and industry in the event of a significant oil spill. The TEO nominee is the IMTL who can delegate this task to an appropriately trained person, such as the TEO IMT Logistics officer. (03) 5272 1555 (office) Duty Officer - 0438 379 328 (24/7) (03) 5272 1839 amosc@amosc.com.au		
AMSA	Level 2 or 3	AMSA manage the National Plan and can provide both oil spill response equipment and personnel as appropriate to the required level. Available equipment can be found at https://amsa-forms.nogginoca.com/public/equipment.html?loc=%2Fapi%2Fv1%2Fasset%2F2547301	The National Plan	NA
	Mobilisation	Through Duty Manager Emergency: 1800 815 257 Rescue Coordination Centre (RCC): +61 2 62306811 (free call 24/7) rccaus@amsa.gov.au		
RPS	All levels	Spill modelling to determine real-time predictions at the time of the spill. The spill trajectory and probability information is used in planning and implementing response strategies as part of a monitoring and evaluation response strategy.	NA	Subcontracted via AMOSC – Contactable via: 0438 379 328

Organisation	Relevant level	Services provided	Relevant plan (if applicable)	Contact details
	Mobilisation	AMOSC holds a contract on behalf of TEO, with RPS for 24/7 oil spill modelling services.		
DoT	Level 2 and 3	Contracted oil spill response equipment and personnel appropriate to the required level. Control Agency in the event of MOP in State waters	State Hazard Plan - MEE	(08) 9480 9924
	Mobilisation	IMTL would activate beyond a Level 1 response in accordance with the relevant plan within 2 hours of notification. (08) 9480 9924 (WA Oil Spill Response Coordinator) Marine.pollution@transport.wa.gov.au		
Spill response marine contractors	All levels	Supply vessels and trained personnel to implement and undertake the relevant First Strike Response The following contractors may be mobilised by the IMTL: Contracts and/or MOUs for Marine Vessels (of opportunity) and crew, such as: • Harbour Services Australia (operational contract in-place)	NA	NA
	Mobilisation	IMTL mobilise as per contract arrangements		
Aerial surveillance contractors	Level 2 and 3	Aerial logistic support for Aerial surveillance and spill assessment.	NA	NA
	Mobilisation	Helicopter aerial surveillance aircraft will be contracted through, Corsaire Aviation (contracted helicopter) Additional aviation support may be provided through AMSA. The following contractors may be mobilised by the IMTL: • Corsaire Aviation (operational contract in-place)		
Australian Maritime Safety Authority (AMSA) aerial response services (fixed-wing aircraft)	All levels	Aerial surveillance and spill assessment	The National Plan	NA
	Mobilisation	Through Duty Manager Emergency: 1800 815 257 Rescue Coordination Centre (RCC): +61 2 62306811 (free call 24/7) rccaus@amsa.gov.au		

Organisation	Relevant level	Services provided	Relevant plan (if applicable)	Contact details
Waste management contractor	All levels	Waste and hazardous waste collection and disposal, including oily water.	Prescribed Waste Management Procedure (10HSEQENVPC04)	NA
	Mobilisation	The following contractors may be mobilised by the IMTL as per MOU arrangements: • Toll • Cleanaway		
Oiled Wildlife Contractor (AMOSC)	All levels	Coordinating the wildlife response including, managing the clean-up, care and rehabilitation of oiled wildlife is the responsibility of DBCA and TEO will source specialists from AMOSC if requested. Equipment can be sourced from AMOSC and/or AMSA.	Western Australian Oiled Wildlife Response Plan and Oiled Wildlife Response Manual	
	Mobilisation	IMTL to mobilise Oiled Wildlife Contractor as per MOU/contract arrangements with AMOSC		
Environmental Service Provider(s) BMT	Level 2 and 3	Provide personnel and equipment for the monitor and evaluate response strategy. Deliver the activated OMPs and SMPs for the duration of the Project. The services will include operational readiness to enable fast deployment of personnel and resources during a response. The environmental service provider(s) contract and contractual arrangements will be in place prior to the commencement of the project	NA	NA
	Mobilisation	IMTL to mobilise Environmental Service Provider as per contract arrangements		

11.9 Logistics

The Logistics function is responsible for the provision of equipment, personnel, services and support materials for the TRT.

11.9.1 Level 1

For small-scale responses, the Logistics function is the responsibility of the field superintendent.

The field superintendent is responsible for locating and obtaining local and non-local equipment and services.

11.9.2 Level 2/3

In larger scale responses, resources will be allocated by the IMTL.

11.9.3 Logistics Timeframes

Table 11-3 provides approximate timeframes for transport of equipment to Dongara.

Table 11-3: Equipment Response Logistical Timeframes

Location	Road Transport	Sea Transport
Broome	24 hr	4 days 8 hrs
Exmouth	11 hr	2 days 4hrs
Fremantle	6 hrs	21 hrs
Geelong	1 day 18hrs	7 days 15 hrs
Geraldton	1 hr	4 hrs

12 Credible Hydrocarbon Spills

This section summarizes:

- Credible spill scenarios in which hydrocarbons may be released to the marine environment as identified through the ENVID process;
- Types of hydrocarbons that may be encountered and their weathering characteristics on release to the sea;
- Oil spill modelling which was carried out to determine the spill extent and identify the environmental sensitivities which might be impacted in the event of a spill;
- The size and extent of the spill derived from the oil spill modelling and defined by the thresholds of environmental significance. This informs the prioritisation of environmental sensitivities for protection and selection of the most appropriate response strategies; and
- Environmental sensitivities within the area that might be impacted which is used to inform the net environmental benefit (NEBA) assessment for the response strategies.

12.1 Hydrocarbon Characteristics

The four types of oil involved in the Cliff Head Oil Field are crude oils, diesel oils, lubricating and hydraulic oils which are used on the CHA offshore platform and associated support vessels.

The data below provides a summary of the likely behaviour of spilled hydrocarbons from the CHA platform, sub-sea infrastructure and export pipelines. The information is predicted from spill scenarios modelled in preparation of the oil spill contingency plan.

Behaviours of the different hydrocarbons are provided along with the likely shoreline contact, shoreline accumulations of hydrocarbons, entrained oil concentrations and dissolved aromatic concentrations above thresholds of significance.

In the event of an actual spill, the behaviour of the hydrocarbons must be confirmed by field observations and oil spill trajectory modelling.

Table 12-1: Behaviour of Oil at Sea

Property	Description of behaviour at sea
Cliff Head Crude Oil	
Solidification on discharge to surface	Likely to cool and solidify on discharge onto the water surface so that it would not spread as a film in the way that low viscosity, low pour-point oils would behave.
Solidification on subsea discharge	Likely to solidify within a few minutes of discharge to particles with the following size distribution: < 2 – ≤ 5 mm = 43% > 5 – 10 mm = 47%
Emulsification	Spills will tend to lose little volume through evaporation or other weathering processes and are unlikely to form emulsions. The oil should be closely monitored if spilled during hot conditions as some separation of the oil may occur. Liquefied fractions may then form a more fluid slick. Recovery of spilt material using dip-nets into IBCs (small spills) should be considered on marine waters.
Weathering at sea	Highly or moderately volatile components (B.P < 265^{o}C), representing approximately 24% of the whole oil volume and this component is likely to evaporate over the first day if the oil is exposed to the atmosphere at local temperatures, leaving a more viscous residue that will progressively evaporate more slowly until a residue representing approximately 50-55% of the spilled volume remains. The wax content of this residue is likely to rise to >30% over the first 1-2 days and over 50% of the oil would not evaporate at ambient temperatures.
Aromatic hydrocarbon in water column	Cliff Head Crude contains relatively low proportion of aromatic hydrocarbons (<1% of the whole oil). Low concentrations of soluble aromatic hydrocarbons are present in the whole oil and when floating on the water surface, these are forecasted to preferentially evaporate from the floating oil.

Property	Description of behaviour at sea
Entrained hydrocarbons	The semi-solid to solid parcels of oil will resist entrainment. Modelling low probability that entrained oil concentrations will occur above the threshold of environmental significance of 100 ppb.
Stranded/Accumulated oil on shorelines	Oil stranded on shorelines under these conditions may warm sufficiently to liquefy and may percolate into sands. A rapid shoreline response is needed to prevent this. In any case the more viscous cool oil will be more easily removed from the surface.
Marine Diesel Fuel Oil	
Composition	Diesel is a mixture of volatile and persistent hydrocarbons with a low percentage of volatile hydrocarbons and with the greater proportion having moderate to very low volatility. The aromatic content is approximately 3%.
Spreading on sea surface	Diesel oils, although classed as 'persistent oils', rapidly spread at sea and so slicks tend to break up quickly and are generally dispersible.
Weathering at sea	Over 40% by mass is predicted to evaporate over the first two days, depending upon the prevailing conditions, with further evaporation slowing over time.
Entrainment into water column	The heavier (low volatility) components of diesel have a tendency to entrain into the upper water column due to wind-generated waves, but this residue can subsequently resurface if wind waves abate.
Hydraulic oil	
General behaviour	These are light to medium oils that rapidly spread. This, with the small volumes that could be spilled, results in rapidly dissipation.
Lubricating oils	
General behaviour	These are rapidly spreading oils and tend to emulsify at sea resulting in increased slick volumes. However, they have a tendency to become water-miscible and enter the water column.

12.2 Spill Scenarios

Through the ENVID a number of risks and potential spill scenarios were identified. The scenarios presented in this section of the OPEP are the identified credible scenarios, and the worst-case scenario for crude oil and diesel. Table 12-2 below provides a summary of the identified spill scenarios.

Figure 12-1 shows the location of modelled spill scenarios along with the key environmental sensitivities.

Table 12-2: Potential oil types and spill volumes for credible spill scenarios

Scenario ID	Incident	Source/Location	Oil Type	Total Credible Volume Released (m^3)	Spill Duration	Release Depth (m)	Level
S2*	Uncontrolled subsea pipeline discharge	29° 27' 00.4" S 114° 52' 12.1" E (CHA Platform /Commonwealth)	Cliff Head Crude	97	21 days	18 m (subsea)	2
S3*	Uncontrolled subsea pipeline discharge	29° 25' 34.2" S 114° 57' 58.7" E (HDD Exit /State)	Cliff Head Crude	97	21 days	6 m (subsea)	2
S4*	Vessel collision	29° 27' 00.4" S 114° 52' 12.1" E (CHA Platform /Commonwealth)	Marine Diesel	500	3 hours	0 m (surface)	2

Scenario ID	Incident	Source/Location	Oil Type	Total Credible Volume Released (m^3)	Spill Duration	Release Depth (m)	Level
S5	Deck spill	29° 27’ 00.4” S 114° 52’ 12.1” E (CHA Platform Commonwealth)	Lubricating and hydraulic oils	0.05	1 hour	0 m (surface)	1
S6	Topside Process Leak	29° 27’ 00.4” S 114° 52’ 12.1” E (CHA Platform Commonwealth)	Cliff Head Crude	84.3	21 days (0.136 m^3/hour over 21 days)	0 m (surface)	2

Note *****Scenarios with RPS modeling

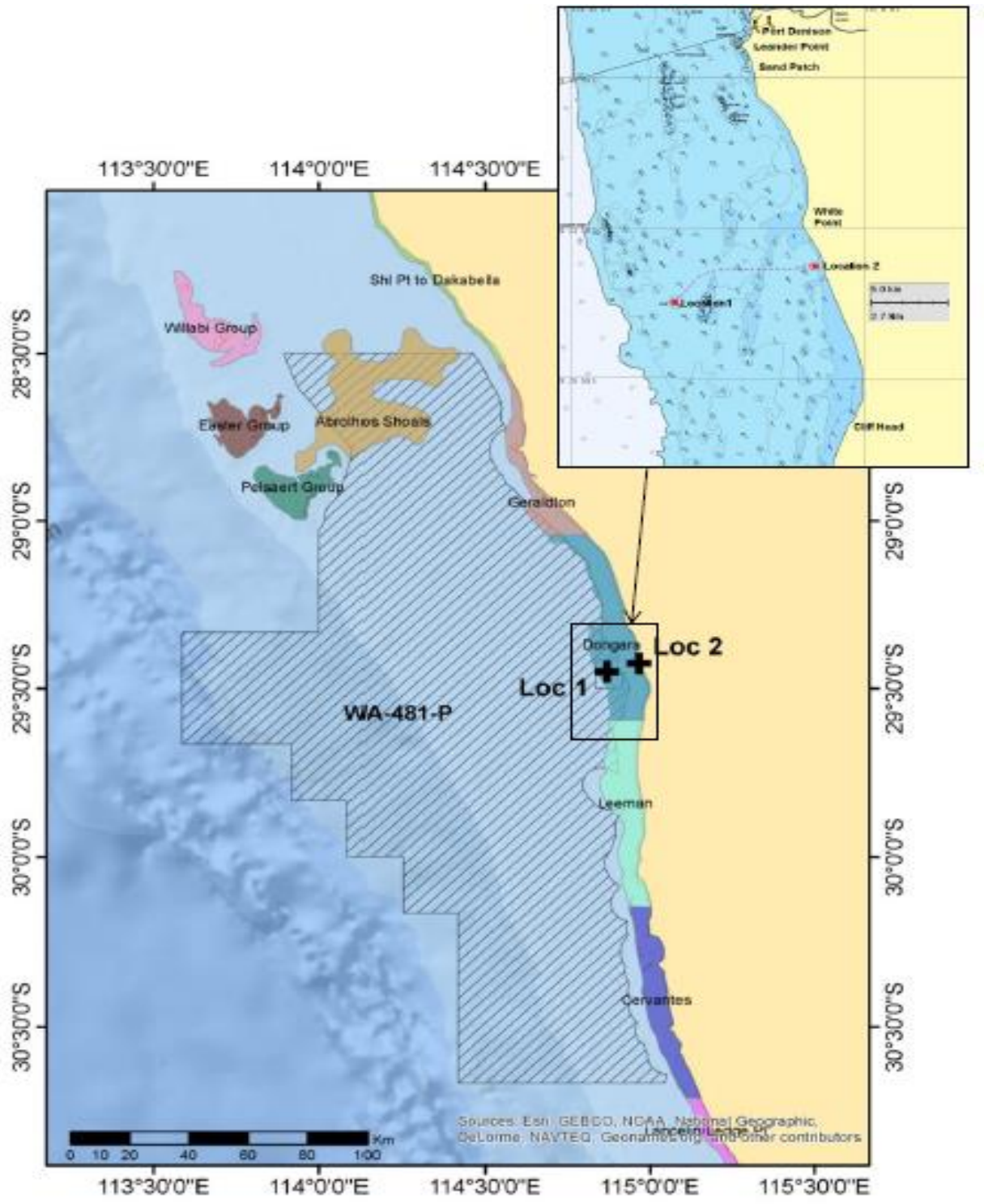


Figure 12-1: Location of modelled spill scenarios and key environmental sensitivities

12.3 RPS Modelling

Out of the 3 the hydrocarbon types used during CHA activities, the two hydrocarbons which have the potential for the greatest spill magnitude in terms of volume, extent and have the potential for shoreline contact are Cliff Head Crude and marine diesel. Therefore, these two hydrocarbon types (Cliff Head Crude and marine diesel) have been modelled by RPS, as it is assumed that any other hydrocarbon spills (lubricating and hydraulic oils) will remain within the worst-case spill trajectory. Scenarios 2 and 3 (pipeline leak in Commonwealth and State waters) as outlined in Table 12-2 were selected for modelling of crude as they have the highest potential spill volume. A topsides process leak at the CHA (Scenario 6) is expected to fall within the larger footprint of the pipeline leak in Commonwealth waters.

Details of the modelling study are provided in Section 7.3 of the Commonwealth EP [10HSEQENVPL01].

Indicative volumes, release locations (State and Commonwealth) and incidents of Cliff Head Crude and marine diesel are shown in Table 12-2 (S2 – S5). Scenarios S2 – S4 have subsequently been modelled by RPS, as a result of their magnitude and extent, to predict their spill trajectory and shoreline contact over a defined time period.

12.3.1 Contract Thresholds

The following contact threshold concentrations for surface hydrocarbons, entrained hydrocarbons and dissolved aromatic hydrocarbon dosage used in the modelling study and relevant for OPEP development are summarised in Table 12-3 below.

Table 12-3: Summary of the relevant thresholds applied in the RPS modelling studies

		Environmental thresholds			
Hydrocarbon	**Floating oil Concentration (g/m^2) (Socio-economic threshold)**	**Floating oil Concentration (g/m^2) (ecological threshold)**	**Entrained Oil Concentration (ppb)**	**Dissolved Aromatic Hydrocarbon Concentration (ppb)**	**Shoreline accumulation (g/m^2)**
Cliff Head Crude	1	10	100	50	100
Marine Diesel	1	10	100	50	100

The socio-economic threshold for impacts associated with oil spills occurs at $1g/m^2$ of floating oil, which is the concentration above which surface oil is generally visible on the sea surface.

Environmental contact thresholds occur at $10g/m^2$ for floating oil, which is also the concentration below which offshore containment and recovery systems are ineffective. The thresholds for entrained oil (100 ppb) and dissolved aromatic hydrocarbons (50 ppb) are the thresholds of environmental significance. The contact threshold for shoreline oil accumulation is 100 g/m^2; concentrations below this threshold cannot be effectively cleaned up using shoreline cleaning methods.

Details on the contact thresholds and how they have been derived is provided in Section 7.3.2 of the Commonwealth EP [10HSEQENPL01].

12.4 Spill Volume and Extent

The largest surface extent modelled was S2 with 97 m^3 of Cliff Head Crude in Commonwealth waters (31.6 km from the release location), whereas S3 with 97 m^3 of Cliff Head Crude in State waters has a lesser spill trajectory surface extent (15.2 km from the release location). No floating oil exposure was predicted at the moderate (≥10 g/m^2) or high (≥50 g/m^2) thresholds. Both S2 and S3 were predicted to have a 100% probability of floating oil contacting shoreline at or above the low threshold (≥1 g/m^2).

The properties of Cliff Head Crude ensure that the crude is less likely to entrain and dissolve into the water column. However, as a result of the properties of marine diesel, after the initial evaporation of the floating oil, the diesel will readily entrain and dissolve into the water column. Thus, a marine diesel spill of 500 m^3 (S4) has the greatest entrained and dissolved aromatic hydrocarbon extent; with a 68% and 38% probability for shoreline contact in summer and winter respectively. The marine diesel spill trajectory slick was the smallest in extent, with a high shoreline contact probability of 93%.

For the two seasons modelled, winter (May – September) has the greatest surface hydrocarbon spill trajectory in comparison to the summer months (October – April) with calmer weather conditions.

Shoreline contact and hydrocarbon accumulation for each modelled scenario (S1-S4) are summarised in Table 12-4 to Table 12-6.

Only positive results, i.e. predicted shoreline contact and accumulation are highlighted in the CHA Operations OPEP, the full results for both positive and negative values (Floating oil > 1 g/m^2, accumulated hydrocarbons (m^3), entrained oil > 100 ppb, dissolved aromatics > 50 ppb, in both summer and winter are presented in the corresponding EP.

Table 12-4: Modelling results for Pipeline leak at the CHA Platform – 97.0 m^3 subsea (18 m depth) release of Cliff Head Crude over 21 days

Sensitive Receptor Location	Spill Trajectory Area – Potential for shoreline contact at defined impact thresholds		
	Hydrocarbon Component	Summer (October – April)	Winter (May – September)
		Shoreline Contact (Yes/No) (and if Yes, travel time in hours and accumulated volume)	
Pelsaert Group	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	7 m^3/ 484 hours
Wallabi Group	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Easter Group	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Abrolhos Shoals	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Shoal Point to Oakabella Creek	Accumulated hydrocarbons >100 g/m^2	No	15.9 m^3/ 548 hours
Around Geraldton	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	27.5 m^3/ 100 hours	20.8 m^3/ 174 hours
Around Dongara	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	36.3 m^3/ 47 hours	35.4 m^3/ 54 hours
Around Leeman	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	12.5 m^3/ 60 hours	24.6 m^3/ 50 hours
Around Cervantes	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No

Sensitive Receptor Location	Spill Trajectory Area – Potential for shoreline contact at defined impact thresholds		
	Hydrocarbon Component	Summer (October – April)	Winter (May – September)
		Shoreline Contact (Yes/No) (and if Yes, travel time in hours and accumulated volume)	
Lancelin/Ledge Point	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	5.5 m^3/ 132 hours

Table 12-5: Modelling results for Pipeline leak close to shore – 97 m^3 subsea (6 m depth) release of Cliff Head Crude over 21 days

Sensitive Receptor Location	Spill Trajectory Area – Potential for shoreline contact at defined impact thresholds		
	Hydrocarbon Component	Summer (October – April)	Winter (May – September)
		Shoreline Contact (Yes/No) (and if Yes, travel time in hours and accumulated volume)	
Pelsaert Group	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Wallabi Group	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Easter Group	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Abrolhos Shoals	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Shoal Point to Oakabella Creek	Accumulated hydrocarbons >100 g/m^2	No	No
Around Geraldton	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No
Around Dongara	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	24 m^3/ 5 hours	27.5 m^3/ 5 hours
Around Leeman	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	9.2 m^3/ 166 hours	17.4 m^3/ 412 hours
Around Cervantes	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	9.4 m^3/ 536 hours
Lancelin/Ledge Point	Floating oil > 10 g/m^2	No	No
	Accumulated hydrocarbons >100 g/m^2	No	No

Table 12-6: Modelling results for Vessel Collision at the CHA Platform – 500 m^3 surface release of Marine Diesel

Sensitive Receptor Location	Spill Trajectory Area – Potential for shoreline contact at defined impact thresholds		
	Hydrocarbon Component	Summer (October – April)	Winter (May – September)
		Shoreline Contact (Yes/No) (and if Yes, travel time in hours*)	
Pelsaert Group	Accumulated volume (m^3)	No	No
Wallabi Group	Accumulated volume (m^3)	No	No
	Entrained oil > 100 ppb	No	No
Easter Group	Accumulated volume (m^3)	No	No
Abrolhos Shoals	Entrained oil > 100 ppb	99 hours	No
Shoal Point to Oakabella Creek	Accumulated volume (m^3)	No	No
	Entrained oil > 100 ppb	191 hours	No
Around Geraldton	Accumulated volume (m^3)	No	5
	Entrained oil > 100 ppb	39 hours	60 hours

Sensitive Receptor Location	Spill Trajectory Area – Potential for shoreline contact at defined impact thresholds		
	Hydrocarbon Component	Summer (October – April)	Winter (May – September)
		Shoreline Contact (Yes/No) (and if Yes, travel time in hours*)	
Around Dongara	Floating oil > 1 g/m^2	1 hour	1 hour
	Accumulated volume (m^3)	166	195
	Entrained oil > 100 ppb	1 hour	1 hour
	% Probability for dissolved aromatics > 50 ppb	4	1
Around Leeman	Floating oil > 1 g/m^2	17 hours	12 hours
	Accumulated volume (m^3)	154	93
	Entrained oil > 100 ppb	25 hours	12 hours
Around Cervantes	Accumulated volume (m^3)	No	18
	Entrained oil > 100 ppb	194 hours	53 hours
Lancelin/Ledge Point	Accumulated volume (m^3)	no	2
	Entrained oil > 100 ppb	No	130

Note * Dissolved aromatics are expressed as % probability for > 50 ppb threshold

12.5 Environmental Sensitivities

12.5.1 Environmental Sensitivities

TEO's response priorities are consistent with State Oil Spill Contingency Plans and the National Plan, which mandate spill response protection priorities in the following hierarchal order:

(1) Human health and safety
(2) Habitat and cultural resources
(3) Rare and/or endangered flora and fauna
(4) Commercial resources
(5) Amenities.

Results from hydrocarbon spill modelling were compared against the location of key sensitive receptors with high conservation valued habitat or species or important socio-economic / heritage value, commercial/industrial resources and recreational and human amenity resources. Depending on the spill scenario (i.e. volume, hydrocarbon type and location), the priority protection areas could be contacted by surface, entrained/dissolved aromatic hydrocarbons or accumulated hydrocarbons at or above threshold concentrations.

The locations in order of most to least sensitivity (based on NOPSEMA guidance) are provided in Table 12-7.

Table 12-7: Location sensitivity table

Priority	Location
	Surface
1 (Most sensitive)	Abrolhos
2	Cervantes
3	Geraldton
4	Dongara
5	Lancelin

Priority	Location
	Surface
6 (least sensitive)	Leeman

In the preparation of this OPEP, spill modelling was carried out to provide a preliminary assessment of location priorities in the event of different potential Level 2 spill scenarios. This information is presented in Table 12-8. The information will assist in the early planning of oil spill response prior to obtaining sufficient monitoring and evaluation data to carry out an operational NEBA assessment and prioritisation using the procedure outlined in **Appendix L**.

Table 12-8: Location response priority, winter (W) and summer (S) based on preliminary NEBA assessment

Sensitive Location	Sensitive receptors	Order of priority	
		W	S
Level 2: Pipeline leak – 97.0 m^3 Cliff Head crude			
Dongara	Sandy beaches Intertidal reefs Foraging/nesting shorebirds	1	1
Leeman	Sandy beaches Foraging/nesting shorebirds	2	2
Cervantes	Sandy beaches Intertidal reefs Marine mammal breeding (sea lion) Foraging/nesting shorebirds and seabirds	3	4
Shoal Point to Oakabella	Sandy beaches Rocky shore Submerged reefs Foraging/nesting shorebirds	4	3
Abrolhos - Pelsaert Group	Sandy beaches Intertidal reefs Mangroves Foraging/nesting shorebirds and seabirds Marine mammal breeding (sea lion)	5	5
Abrolhos - Easter Group		7	7
Abrolhos - Wallabi Group		6	6
Geraldton	Sandy beaches Intertidal reefs Foraging/nesting shorebirds	4	3
Lancelin	Sandy beaches Submerged reefs Foraging/nesting shorebirds	8	8
Level 2: Diesel spill - 500 m^3 marine diesel*			
Dongara	Sandy beaches Intertidal reefs Foraging/nesting shorebirds	1	1
Leeman	Sandy beaches Foraging/nesting shorebirds	2	2
Cervantes	Sandy beaches Intertidal reefs Marine mammal breeding (sea lion) Foraging/nesting shorebirds and seabirds	3	4
Abrolhos - Pelsaert Group	Sandy beaches Intertidal reefs Mangroves Foraging/nesting shorebirds and seabirds Marine mammal breeding (sea lion)	6	5
Abrolhos - Easter Group		7	6
Abrolhos - Wallabi Group		8	7
Geraldton	Sandy beaches Intertidal reefs Foraging/nesting shorebirds	5	3
Lancelin	Sandy beaches Submerged reefs Foraging/nesting shorebirds	4	8

Note *The Level 2 spill scenario refers to a vessel collision for which AMSA will be the Control Agency

12.6 Environmental Sensitivities: Priority Protection Areas

Using the spill trajectory modelling results for potential shoreline contact and hydrocarbon accumulation (as shown in Section 12.4, areas of priority for protection have been determined and are provided in Appendix L.

12.7 Oil Spill Monitoring Preparation

Under the Australian National Plan, two levels of spill monitoring have been defined based on the primary objectives of the monitoring program:

- Type I monitoring (operational monitoring) is undertaken during a spill response to support response planning and operations. The focus of Type I monitoring is to obtain and process information regarding the nature and scale of the spill and the resources at risk so it can be acted upon as quickly as possible.
- In most cases, Type I monitoring will only continue for the duration of the spill response or while physical response options are under consideration.
- Type II monitoring (scientific monitoring) does not have response objectives, and includes short term environmental damage assessments, longer term damage assessments (including recovery), and purely scientific studies.

12.7.1 Operational (Type I)

The Planning Officer identifies the Type I OMP studies that may be applicable to the operations if the trigger criteria are met, the basis for study initiation, and an indication of the required personnel qualifications for implementation of the study. The selection of these studies is based on the nature of the proposed operations and identified spill risk, including the results of predictive trajectory modelling.

The implementation overview and strategy is provided in the operational section of this OPEP in Section 4.4.

12.7.2 Scientific (Type II)

TEO has developed a comprehensive scientific monitoring program (SMP) for hydrocarbon spills arising from their operations. This program covers the expected range of monitoring that may be required for different spill scenarios. The overall objectives of the Type II SMP are to support the implementation of any spill response and evaluate short- and long-term impacts to sensitive receptors (ecological and socio-economic) that may have been impacted by the spill.

The approach being adopted by TEO is the ‘state-pressure-response’ framework. An example of the application of this process is provided in Table 12-9.

Table 12-9: Example demonstrating application of the Monitoring Strategy S-P-R Framework Summary of Type II SMP (SPR) for evaluation of spill response effectiveness

Geographical area determined from RPS Modelling	Biodiversity Values (State) – example only	Primary Biodiversity Threat (Pressure)	Oil Spill Management Effectiveness Evaluation	Comment
Jurien Bay to Kalbarri including Houtman Abrolhos Islands	Terrestrial biodiversity of the Houtman Abrolhos – long-term baseline monitoring data currently in public domain (e.g. Surman & Nicholson 2009)	Oil (Hydrocarbon) – water quality monitoring required by 2012 Houtman Abrolhos Islands Management Plan (WA Fisheries Paper 260)	• Assessment of seabird population estimates within numerical control limits • Assessment of water/sediment hydrocarbon within numerical control limits	In event of incident, data compiled and summarised as environmental report card for site, treatment (island) and regional summaries. Cause-effect analysis options include application of mixed-effects models or

Geographical area determined from RPS Modelling	Biodiversity Values (State) – example only	Primary Biodiversity Threat (Pressure)	Oil Spill Management Effectiveness Evaluation	Comment
	Corals of the Houtman Abrolhos – substantial research publications provide historical and baseline record in the public domain (e.g. Kuhnert et al. 1999)	Oil (Hydrocarbon)	• Assessment of changes in coral community or community health indices within numerical control limits • Assessment of water/sediment hydrocarbon within numerical control limits	information theoretic approaches to understand interactions between multiple pressures (threatening processes)

The OSMT Type II SMP team is held on Standby mode i.e. personnel with the required expertise and experience will be 'on-call' in the event of an incident when requested by the Perth IMT. While on standby mode, SMP documents and baseline environmental data will be maintained up-to-date, this includes maintaining the augmentation of environmental data where existing information needs to be improved. The activities undertaken during the standby phase are summarised in Figure 12-3. It is important to note that the OSMT will only go into a standby/readiness mode when the IMT has been activated in the event of a spill and further advised the OSMT of the spill event and need for scientific monitoring. To validate the readiness to deploy resources as planned in accordance with this OPEP, the MoU's and contracts in place with service providers are tested annually to ensure providers are aware of their potential responsibilities in a spill event. No active baseline monitoring is undertaken during normal operations.

12.7.2.1 Base Line Data

Where baseline (i.e. "before") data are incorporated into the monitoring program design, the monitoring program should undertake monitoring in accordance with the baseline methodology and design (i.e. sites) to minimise variability due to sampling methodology.

Baseline data for a monitoring parameter collected using a different methodology than that used during SMP implementation may lead to variability in the data due to the differing methodologies, potentially resulting in a less powerful statistical analysis. Where practicable, baseline and post-impact data should be collected using the same methods.

Given the uncertainty associated with the nature and scale of oil spills, having an adequate baseline data set prior to the spill is prohibitively expensive in relation to the nature and scale of the environmental risk. Where suitable baseline data are not available, TEO will prioritise collecting pre-impact data from locations that lie within the spill trajectory to serve as pre-impact data following activation of the SMP. This approach provides useful baseline data for use in statistical analyses while avoiding the need for extensive baseline data collection. Where baseline data is not available, and obtaining pre-impact data is not feasible (e.g. spill will reach receptor before monitoring team arrive), alternatives to a Before-After Control-Impact (BACI) type design may be considered, such as comparison of reference sites and impact sites (without the consideration of the before-after component). Guidance on selecting suitable reference sites is provided in the OSMP. It is important to reliably identify impact sites that may have been exposed to spilled oil and reference sites that have not been exposed. The results of operational monitoring will be of use in this.

Figure 12-2 indicates the process for site selection inside and outside the spill zone to ensure that impact and control samples are obtained. Control and impact sites for monitoring should be stratified along environmental gradients, such as depth, wave energy / exposure and substrate type gradients. In particular, functionally equivalent habitats should be sampled within impact and control sites where practicable (i.e. impact seagrass site(s) should be compared to seagrass control site(s) in studies examining benthic habitats more broadly). Following an oil spill, impact sites should be selected first,

followed by the selection of matched reference sites. The matching of sites within strata reduces variability and increases the power of the analysis.

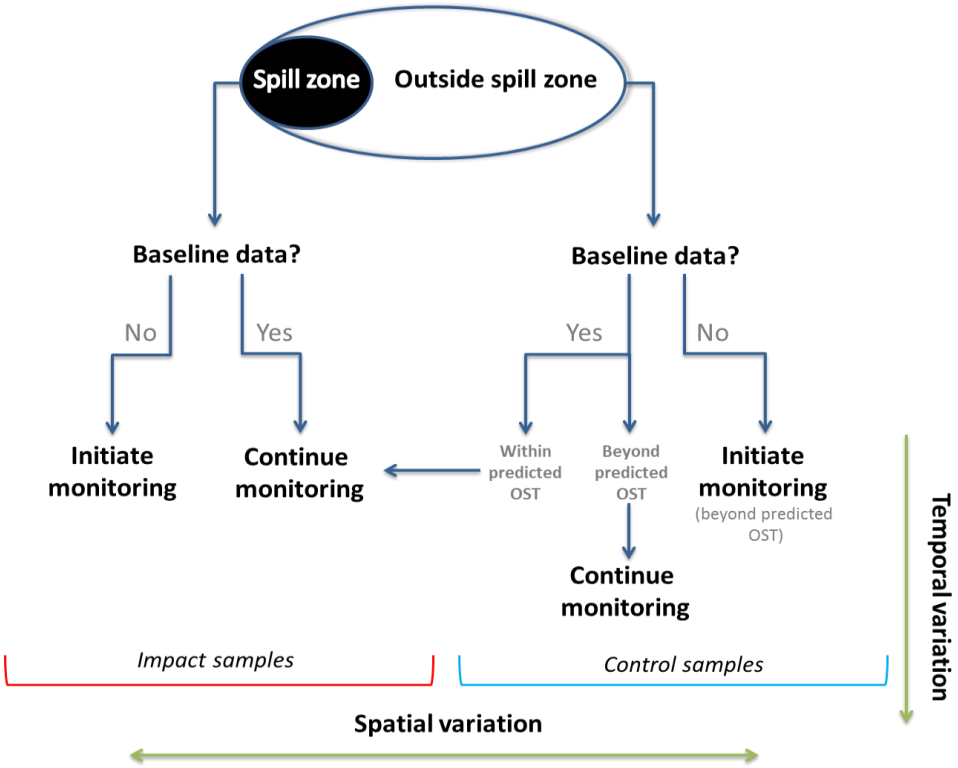


Figure 12-2: Monitoring site selection process

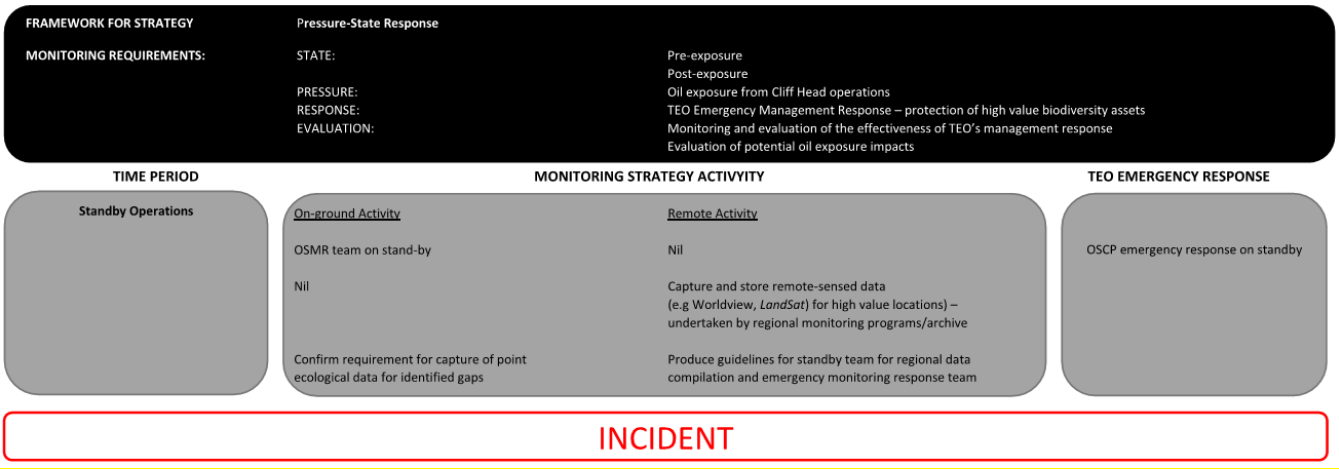


Figure 12-3: OSMP Standby Activities following an incident

The environmental sensitivities within the area of potential hydrocarbon impact identified by the hydrocarbon spill risk assessments are summarised in the EP. The EPs which are supported by this OSMP and associated OMPs and SMPs identify a series of environmental sensitivities, including:

- Species of conservation significance, including:
  - Matters of national environmental significance (MNES) as identified under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - Specially protected fauna or flora gazetted under the *Biodiversity Conservation Act 2016* (BC Act)
- Protected areas, including:

  - Commonwealth marine reserves
  - State marine protected areas
- Socio-economic resources, including:
  - Commonwealth managed fisheries
  - State managed fisheries.

TEO maintains an environmental data directory which contains information on the environmental sensitivities that may be affected in the event of a spill. The data directory is located on the TEO server.

TEO also has access to the Oil Spill Response Atlas (OSRA), which is maintained by AMSA with support from the Western Australian Department of Transport (DoT). The log-in details for the ORSA are attached to the inside cover of the hardcopy OPEP kept in the TEO Office (Havelock Street) Incident Command Centre. A digital copy of the ORSA login details is also saved in the environmental data directory.

Equipment required to implement OMPs and SMPs will be sourced primarily by the scientific service providers, which will also facilitate laboratory analysis of samples using NATA accredited laboratories.

Additionally, refer to the Cliff Head Field Offshore Operations Environmental Plan (10HSEQENVPL01) for information on the environmental sensitivities within the potential area of impact for the credible spill scenarios assessed.

12.7.2.2 Mobilisation in the event of a spill

In the event of a spill triggering the requirement for activation of the OSMP (Section 4) field and desk based teams will be deployed as detailed in Section 4.

An operational NEBA assessment will be undertaken to identify the response strategies to be deployed and the scientific OSMP methodologies to be used in monitoring the effectiveness of the spill response.

The preliminary NEBA (Section 8 of the EP) forms the basis for the operational NEBA analysis which the IMT will carry out in accordance with Section 2.2.1 and Appendix L. The NEBA table in Appendix L allows the IMT to cross reference the threatened sensitivity/locations with spill response strategies identified as candidates to undergo NEBA analysis selected from Table 2-1. Appendix L also identifies the recommended Type II OSTM methodologies which will be used to evaluate the effectiveness of the spill response strategies deployed.

Two OSMP teams will be deployed following activation of an SMP, the first being the field team to the locations prioritised during the operational NEBA assessment. Shortly after mobilisation of the field team (or at the same time), the desk-based team is deployed (desk based) to collate baseline environmental data from the owners identified in the meta-data manual in the OSMP.

The data and information management team (desk team) will source, collate, process and analyse the baseline and post incident field study data for the evaluation of the effectiveness of TEO's oil spill response in accordance with pre-determined procedures defined in the meta-data manual. The meta-data manual identifies the location and owners of environmental baseline data. The sophisticated statistical analysis output of the data (environmental control charts, non-parametric and mixed effects analyses) will be in the form of report cards which will provide the post spill field data in the context of trigger values i.e. values which if exceeded indicate an environmental impact as a result of the spill. A simplified example of a control chart and a summary report card is provided in Figure 12-4 and Figure 12-5 respectively.

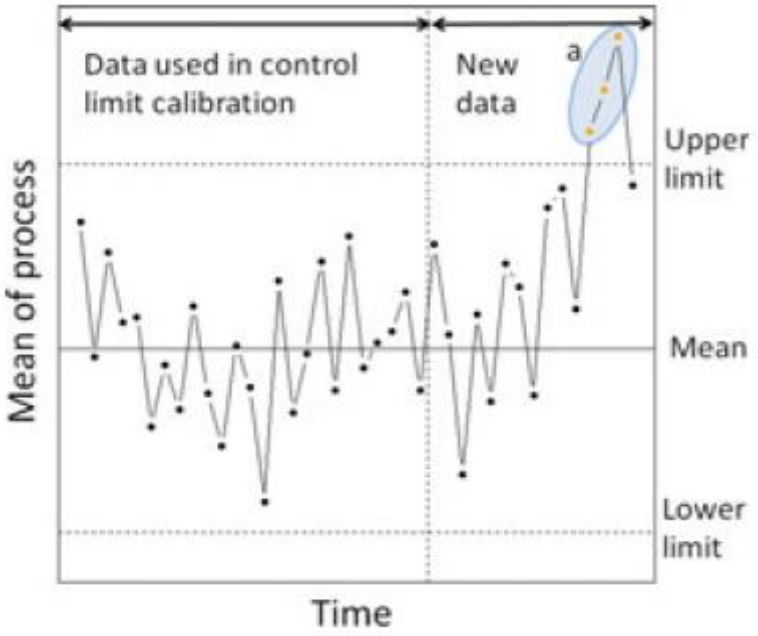


Figure 12-4: Example of an X-bar control chart[3]

Evaluation of the effectiveness of the spill response strategies will utilise the environmental baseline targets identified within management plans listed in Appendix L for the high biodiversity values within the area of potential influence suggested by the oil spill modelling discussed in Section 8 of the EP. Where targets do not currently exist under environmental or management plans, targets can be summarised as:

- no (or positive) change in condition of the defined value
- no (or positive) change in the area or abundance of the defined value.

The data output in the form of report cards will allow the IMT to evaluate the effectiveness of the spill response strategies against:

- the desired state for each sensitivity and
- the environmental performance objective for spill response strategies e.g. reduce impacts to high priority sensitivities such that the baseline environmental values remain unchanged following a spill event and that if the values do change (i.e. an impact is experienced) then the change is as low as practicable to achieve and the environment recovers in as short a time as reasonably possible.

Where post spill field study data for a specific high value biodiversity exceeds the trigger values then an environmental impact is indicated. If this trigger point is identified within the time period of the spill response, then adjustments to the spill response may be made. This is more likely where the scientific monitoring is in the early stages and therefore provides input to the Type I operational monitoring.

Where post spill field study data exceeds the trigger values in the longer term, then ongoing monitoring to determine the recovery of the environment will be continued in consultation with the relevant stakeholders including DoT and DBCA. Once the data indicates that the biodiversity values have returned to the desired state the monitoring can be terminated on consultation with the relevant stakeholders.

[3] Sourced from *Control charts for improved decisions in environmental management: a case study of catchment water supply in south-west Western Australia*, Gove et al, 2013

Scale		Management Zone Species	Variables (State) Variable 1	Var #2	Var #3	Var #4	Var # 5	Comments	Attach	Figure
Species	Zone 1	*e.g. Seabird spps*	↗	↗	↙	-	↗		A	3
			-	↙	↙	-	-			
			-	-	↙	-	-			
	Zone 2	*e.g. Mangrove spp*	↙	-	↙	-	-			
			-	-	↙	-	↗			
			-	-	↙	-	↗			
	Zone 3				↙	↙	-		A	5
					-	-	-			
					-	-	↗			
	Reference		-	-	↙	↙	-		A	6
			-	-	↗	-	-			
			-	-	↗	-	↗			

Ecosystem - Coral, coastal, rocky platfor etc.	Management Zone	Condition	Vegetation	Comments	Attach	Figure
	Zone 1	↙	↙		A	10
	Zone 2	↗	↙			
	Zone 3	-	↙			
	Reference	-	↙			

Seascape	Management Zone	Condition	Comments	Attach	Figure
		-			
		↗			

Environmental Factors (Pressures)	Value	Trend	Comments	Attach	Figure
Climate		↗		B	1
		↗			
Oceanographic		↙			
		↗			
		-			
Water/sedmiment quality: Zone 1		-			
Water /sediment quality: Zone 2		↙			
Water / sediment quality Zone 3		↙			

REF Water/Sed

Key						
Trigger		Trend		Management Zone		Species
	Impact (exceeds control limit 2)	↙	Decrease (significant trend)	Zone 1	High value - vertebrates	*TBA*
	Threat (exceeds control limit 1)	↗	Increase (significant trend)	Zone 2	High value coastal	*TBA*
	No impact or threat	-	Stable (non significant trend)	Zone 3	High value benthic	*TBA*
	Not measured			Ref	Regionally different sites if available	TBA

Figure 12-5: Example report card

12.7.2.3 Development of the SMP

The planning phase is during development of this OPEP. Standby phase is the phase where the IMT has been activated and OMST has been informed they may be required to mobilise to site. Once IMT request SMP to be implemented, pre-exposure monitoring will be commenced at sites that may be impacted by the spill (as determined through the OSTM). Post incident monitoring will continue as described in the OSMP. Monitoring may also be required at reference sites in the event that relevant baseline data is not available as determined by the desk based OMST.

Activity	Planning	INCIDENT	Standby	Incident Pre-exposure	Post-Incident
1. Biodiversity values inventory and gap analysis					
2. Scientific monitoring standby and mobilisation					
3. Data standard, governance and metadata manual compiled and completed using Darwin Core international standards					
4. Data inventory validation through data custodians (including DBCA and DPIRD)					
5. Scientific monitoring data storage, retrieval, analysis and reporting structure – Phase 1 using MIKE 2.0 framework					
6. Review TEO SMP procedures and procure equipment					
7. Address any gaps in baseline data by undertaking surveys where necessary at pre-impact sites and reference sites					
8. Mobilisation of additional scientific monitoring					
9. Scientific monitoring data storage, retrieval, analysis and reporting system construction – Phase 2 using MIKE 2.0 framework (3 weeks then repeat for life of incident)					
10. Management effectiveness report card (Time 1 – 6 weeks post incident; pre-exposure state)					
11. Management effectiveness report card (Time 2 – 6 weeks post incident)					
12. Management effectiveness report card (Time 3 – 12 weeks post incident)					
13. Scientific monitoring data storage, retrieval, analysis and reporting structure – Phase 2 using MIKE 2.0 framework (12 weeks then repeat)					
14. Management effectiveness report card (Time 4 – 18 weeks then repeat)					

The following has been undertaken to assist in the development of the SMP to be implemented as described in Section 4.5.

12.7.2.4 Biodiversity Values Inventory and Gaps Analysis

The following tasks have been completed in preparation of the SMP.

- Identify high biodiversity values present within the area of interest based on the OSTM
- Identify the current state of the high biodiversity values including:
  - identification of baseline data measuring the condition of biodiversity values in the region currently being obtained as part of the management planning process (See Appendix L)
  - identification of gaps in the management planning for areas of high value biodiversity
  - Identification of monitoring data currently held by resource companies as part of environmental compliance that would assist in assessing cause-effect relationships with regard to a Level 3 incident and the effectiveness of management response – this data is listed in the public domain or indicated as required monitoring as part of existing environmental management plans (see Appendix L).
  - Identify the target or desired state of the biodiversity in the future (typically no change in condition). Targets for biodiversity conditions are defined within the existing planning framework. These will be adopted for this OPEP (See Appendix L)
- listing the threats or pressures that degrade the condition of biodiversity within the area of interest and, in the event of cause-effect analysis, quantifying their likely effect (through direct monitoring or quantitative modelling (See Section 7 of the EP, providing hydrocarbon spill risk assessment and spill modelling output)
  - planning and implementing the response to manage the pressures degrading the biodiversity – the primary threat in this instance is released oil (or hydrocarbon) (See operational section of this OPEP)
- implementing a monitoring strategy to determine whether the management response was effective in maintaining biodiversity to the target or desired state (Table 12-8), including:
  - listing the activities and summarising the methodologies to be implemented to capture data that will be required pre- and post-exposure
  - summarising the technical specialists required to coordinate activities, undertake the monitoring, complete the analyses and interpretation or review activities undertaken by TEO if an adverse event occurs

The steps above have been completed using published management plans which identify numerous marine and terrestrial biodiversity that overlap significant portions of the habitats discussed in Section 5 of the EP and summarised in Section 6.11.2 of this OPEP. These published management plans identify the:

- current state of the biodiversity value
- management authority's management goal for the value
- anthropogenic threat or pressure which they must manage to achieve the desired biodiversity management goal.

These areas of biodiversity (Section 6.11.2) are covered by the following endorsed management plans, draft management plans or operation environmental management plans that, following appropriate planning processes identify the current condition of the biodiversity being managed for protection. These plans are summarised below:

- Jurien Bay Marine Park Management Plan 2005-2015 (DEC 2005)
- Turquoise Coast Island Nature Reserves Management Plan 2004 (CALM 2004)
- Plan of Management for the Kalbarri Blue Holes Fish Habitat Protection Area (Department of Fisheries 2007)

In addition, the Department of Primary Industries and Regional Development (DPIRD) conducts monitoring and research on the western rock lobster and commercial fish species. A number of organisations such as WAMSI, CSIRO, UWA and Murdoch University have also conducted research on some aspects of the identified high biodiversity values within the area of potential impact from a hydrocarbon spill.

Section 6.11.2 summarises the available baseline and/or monitoring data identified through searches of published literature. Any information identified during the life of the OPEP are incorporated into the SMP as required.

This ongoing work will be developed into an inventory of custodians (responsible officers) of biodiversity and environmental data sets and the form of biodiversity and environmental data within the area of interest identified by the oil spill modelling. This manual will be developed in the event of an incident assessed as > Level 2.

12.7.2.5 Data standard, governance and metadata manual and Data inventory validation through data custodians

Data within this data governance framework will use the DARWIN CORE data standard (Wieczorek, et al. 2012. See http://rs.tdwg.org/dwc/). This is an internationally recognized data standard applied within Australia (e.g. Terrestrial Ecosystem Research Network and Atlas of Living Australia) and internationally. It provides a reliable and standardized procedure for publishing and integrating biodiversity information. In simple terms, Darwin Core is a standard for sharing data about biodiversity and the meta-data guidelines applied in Darwin Core are the standard that will be adopted for the TEO SMP.

Report cards that allow an assessment of management effectiveness will be derived from numerous data sets held within an information system developed by OSMT and owned and managed by TEO. The Data and information management team will begin construction of the system at the time of an incident and with direction from the Incident Controller. Development of the data governance manual will use the Method for an Integrated Knowledge Environment (MIKE 2.0) open source delivery framework for TEO's emergency environmental information management.

This work includes:

- Setting Darwin Core Data Standard and the governance procedures that will be required to update and deliver control charts and report cards to appropriate level of precision. This includes links to individual standards at http://rs.tdwg.org/dwc/ (see also background to Taxonomic Databases Working Group, TDWG and Metadata Management Architecture within Mike 2.0 http://mike2.openmethodology.org/wiki/SAFE_Architecture
- Identification of the core data sets and associated meta-data
- Establishing contact details for the custodians of the data
- Contacting the owners of the data and alerting them that in the event of an incident, this information will be formally requested as part of the emergency response

In the event of an incident, these procedures include:

- Sourcing and accessing the data
- Processing the data once obtained from the custodians, including QA/QC
- Data warehousing within the Emergency Incident Information System
- Calculations of univariate and multivariate environmental control charts (for repeat measures)
- Numerical modelling as part of cause-effect analyses (may include mixed effects models or other non-parametric analyses such as Random Forest (where applicable)

12.7.2.6 Scientific monitoring data storage, retrieval, analysis and reporting structure

In the event of a spill, regional data held by a number of different custodians covering point-based to seascape/landscape scales, as well as data collected during the response will need to be collated, compiled to a database (warehouse) and analysed to demonstrate cause-effect.

Evaluation of management performance for biodiversity values or exposure impact will require complex analysis of the data. This will be undertaken following guidelines for data compilation and management developed as part of the Data Compilation Procedures and Data Analysis Manual.

Compilation of actual data sets is not reasonable given the low likelihood of an incident, the relatively small scale of the modelled area of potential influence of the spill scenarios and the significant cost of undertaking such an exercise. This task will be commenced in the event of an incident.

Data reporting will be in the form of Environmental Report Cards, with attached univariate and multivariate control charts and numerical analyses (see Figure 12-4 and Figure 12-5 for examples of a control chart and report card respectively).

12.7.2.7 Develop comprehensive scientific monitoring procedures (OSMP project plan activity 6)

Monitoring methodologies for the different environmental sensitivities have been summarised in Table 6-7 to determine the potential oil spill impacts on habitats or species within the marine and shoreline environments. Comprehensive methodologies are provided in the OSMP.

Consistent time series (sic. repeat measures) monitoring will be used to make an assessment of the effects related to oil exposure or to identify those variance effects due to natural environmental factors.

Securing data that measures the state of an environmental value prior to exposure improves the power of a statistical model to detect significant impacts after exposure. This would provide Type II monitoring outcomes for:

- short term environmental damage assessments
- longer term damage assessments (including recovery).

12.7.2.8 Address any gaps in baseline data by undertaking surveys where necessary

The following section summarises the existing gaps in understanding of the current condition and level of threat to biodiversity and environmental values in the area that might be potentially impacted by a spill as determined by the oil spill modelling (NOPSEMA 2012a).

Review of the known regional data sets has identified that some gaps in pre-exposure data required delivering Type II monitoring standards for a number of high value biodiversity assets. This has important implications for the monitoring strategy as these gaps must be confirmed, captured in the standby period or captured in the pre-exposure period.

Repeat-measurements of condition and/or area in environmental monitoring are considered a longitudinal monitoring design (see for examples of long-term monitoring in Lindenmayer and Likens 2010). One-off or short-term monitoring surveys are referred to as cross-sectional monitoring. Most areas with a level of protection within or close vicinity to the area of potential influence of a spill have some form of longitudinal monitoring program (e.g. DPIRD monitoring of commercial fish species and western rock lobster, long-term monitoring of seabirds at Abrolhos Islands and sea lions within Jurien Bay Marine Park). It is unlikely that monitoring methods between sites are identical, even for identical biodiversity or environmental values. However, all longitudinal monitoring information is likely to be crucial in understanding cause-effect relationships between hydrocarbon exposure and biodiversity condition, and to evaluate the effectiveness of oil spill response by compiling the information as a report card. This will allow a quantitative risk approach to be implemented in assessing condition (Carey et al. 2004). Access to these data in the event of an incident will provide significant capability to identify causal relationships with hydrocarbon exposure and in evaluating the effectiveness of TEO's response.

Although baseline data exist for a number of ecological values, high spatial and temporal variance has been identified as a confounding issue and the establishment of baseline data sources is important in determining this inter-annual environmental variation. Benthic communities, seabirds, and marine turtles are examples of these highly variable values. White sharks are also problematic in that determining trends in population is difficult because the species is a widely dispersed, low density, highly mobile apex predator (DoE 2013). It is also difficult to distinguish population change from high rates of inter-variability in the movements of white sharks between areas (DoE 2013).

The gaps in knowledge for key biodiversity (species or habitat) within the area of interest, based on the published literature reviewed are considered to be:

- seabirds within the Jurien Bay Marine Park
- marine turtles
- cetaceans
- white shark
- some benthic habitats
- water and sediment quality.

TEO intends to plug these data gaps only in the event of a spill by undertaking sampling at reference sites or pre-impact sites as described in the OSMP. Identification of appropriate reference sites cannot be undertaken until results of operational monitoring have been completed following a spill. This will determine the types of studies that are required based on the potential receptors impacted. Reference sites must be outside the area of potential impact to ensure they can be compared to impacted sites and termination criteria can be met.

Given the immediate impact to water quality following a spill, TEO have undertaken baseline sampling around the CHA to ensure adequate baseline data is available pre-impact. Sediment sampling has also been undertaken in the vicinity (BMT Oceania 2015; BMT 2018).

13 Maintaining Preparedness and Exercises

13.1 Testing the OPEP

The arrangements in the OPEP will be tested in accordance with the CHA and ASP Emergency Response Exercise Schedule (10HSEQGENPL01RG01) and will include tests:

- upon being introduced
- when the arrangements in the OPEP are significantly amended,
- if significant changes have been made to the EP (e.g. location change), and
- at least annually

The process of making amendments to the OPEP will utilise TEO's management of change process (Cliff Head Management of Change Procedure (MoC) (10HSEQGENPC18)), which incorporates an assessment as to whether changes to the OPEP require testing of the response arrangements. Testing will involve exercises to practice the TEO response to a major emergency, based on a Major Accident Event (MAE) requiring an oil spill to be contained and reported in accordance with this OPEP and consists of a combination of the following:

- Review of contracts and MoUs with service providers
- Confirmation of the availability and accessibility of resources and services under the arrangements in the OPEP
- Staff training and drills of hydrocarbon spill responses consistent with the scenarios within the scope of the EP
- Review and confirm all contact details are up to date.

Tests will include, but not be limited to, onsite oil spill response, coordination by the management team in Perth and communication across all levels of the company's emergency response organisation and to external stakeholders.

Desktop testing of the OPEP is conducted every 3 months (quarterly), where specific components of the OPEP are tested to ensure it remains valid. This testing is intended to supplement annual oil spill exercises which test a much larger portion of the OPEP. Testing includes:

- Q1 – test Aerial surveillance and marine capabilities of contracts and MOUs
- Q2 - test Scientific monitoring resource availability and timeframes (i.e. equipment/personnel and timeframe for response
- Q3 - test IMT personnel availability and Training and Competency of personnel (both service providers and IMT members)
- Q4 - test Delegation of financial authority processes (include the amount of time to set up all necessary financial agreements to ensure delivery of services)

Scheduled frequencies of exercises are selected based on the need of the specific response strategy or tactic, which can be subjected to changing circumstances in risk, deployment capability, contractual arrangements, equipment, personnel and response methods.

The testing arrangements will be relevant for all levels of spill considered in this OPEP. Reports and recommendations from the exercises are recorded and retained. TEO will review the outcomes of the test against the objective(s) of the testing arrangements and determine any corrective actions or opportunities for improvement. Any such actions or opportunities will be tracked using the internal tools TEO utilise for health, safety and environmental management (e.g. MYOSH software suite).

TEO have a number of contracts and MoU's in place with providers who can be called upon in the event of an emergency. During testing of the OPEP the service providers are required to provide the following:

- Confirm capability to respond
- Number of personnel available to TEO
- Timeline of availability of personnel for spill response
- Qualifications of personnel available to assist in spill response.

Key providers identified will have been provided with the accepted EP and OPEP and any other relevant documentation (e.g. OSMP, SMPs) to inform their capability to assist TEO in the event of a spill. The purpose of the contracts/MoU is to provide a vehicle for relevant personnel to be used in the event of a spill as capabilities have been reviewed already, and there is no significant delay in setting up agreements and purchase orders before the resources can be provided.

Testing oil spill preparedness is carried out against defined oil spill preparedness performance outcome and standards, which are provided in Table 13-1 below along with relevant measurement criteria.

Table 13-1: Oil spill preparedness performance outcomes, standards and measurement criteria

Performance Outcome	Performance Standard	Measurement Criteria	Records
CHA and support vessels will demonstrate effective hydrocarbon spill preparedness by implementing the OPEP exercise/testing schedule	CHA and vessel personnel test and evaluate oil spill preparedness by: • Carrying out SOPEP/OPEP spill exercise at a frequency equal to or greater than once every 12 months • Record the details of the exercise in the exercise logs • Assessing personnel availability and accuracy of contact details • Undertake a "Lessons Learnt" evaluation discussion • Communicate lessons learnt at shift/communications meetings attended by all personnel	Exercise recorded in the CHA and support vessel log demonstrating testing of the response arrangements have been carried out no later than 12 months after the most recent test. Meeting records show outcomes and lessons learnt during the exercise, which are communicated to personnel at trip communications meetings	CHA log Support vessel log
Exercises/testings scheduled will be implemented and audited to demonstrate preparedness and that communication and notification procedures are in place and operating.	An OPEP exercise will be conducted: • within 12 months of last test Where applicable, the scope of the exercise will test the capability of the organisation to implement the OPEP.	Post-Exercise review meeting records demonstrating that the OPEP has been tested and effectiveness verified by the Manager - HSSE & Regulatory Assurance (or delegate) and that appropriate corrective actions have been developed and closed out.	Exercise scenario document used to test the new/amended OPEP signed and dated by the HSE Manager - (or delegate) prior to the exercise. Post-Exercise review meeting records and signed off close out actions.
	The HSE Manager (or delegate) verifies the exercise has been undertaken in accordance with this OPEP and the Emergency Management Plan requirements by: • Reviewing and signing off on the scenario and objectives prior to the exercise • Observing and evaluating the exercise and the performance of the IMT • Participating in the post-exercise review meeting and agreeing lessons learned and/or corrective actions required and appropriate timelines for close out of identified actions • Verifying and signing off on the Post-exercise Meeting Minutes.	Completed Exercise Log and Post-Exercise review meeting records demonstrating that a Level 2 oil spill exercised has been carried out and effectiveness verified by the HSE Manager (or delegate) and that appropriate corrective actions have been developed and closed out	Exercise Log Exercise scenario documentation signed and dated by the HSE Manager (or delegate) prior to the exercise. Post-Exercise review meeting records and signed off close out actions.

Performance Outcome	Performance Standard	Measurement Criteria	Records
	• Verifying and signing off on the closeout documentation for corrective/improvement actions		
Maintain capability to respond to oil spill for the life of the OPEP	Confirm potential capability for oil spill response as detailed in Section 6.3.2 by liaising with identified service providers to confirm availability of equipment and personnel annually	TEO vessel audit or third party inspection document indicate resources available in the event of a spill and confirmed through quarterly testing of the OPEP.	Phone records, incident response records, audit reports, exercise records
Maintain preparedness	NEBA for the worst-case scenarios have been completed and appropriate response strategies have been identified.	This OPEP	Preliminary NEBA and response strategy assessments
Vessel and aerial support available to TEO in event of incident	Vessel(s) and helicopter will be supplied for response activities through existing contracts	Contracts and MSAs	Valid contracts and MSAs
Maintain MoU with OSMT to assist in the event of a spill	Valid MoUs in place with environmental science consultants confirming capacity, capability and competency to assist TEO in the event of a spill	MoUs and confirmation through quarterly testing of the OPEP	Signed and valid MoUs

13.2 Revising the OPEP

The Senior Environmental Advisor will review the OPEP in line with all TEO HSEQ documents and relevant statutory requirements.

This OPEP is to be reviewed and revised as appropriate 5 years from date of issue to NOPSEMA of the most recent revision of the plan or earlier if significant changes are made to the operation. This OPEP will also be reviewed and revised as appropriate to incorporate one or more of the following:

- lessons learnt from spill response exercises, audits and inspections
- changes in external arrangements
- changes to the EP
- following routine testing of the OPEP
- technology advancement
- after an actual incident.

As Custodian for the OPEP, the TEO HSE Manager is responsible for:

- Distributing and tracking copies of the OPEP as per the distribution list;
- Monitoring National Plan or State Plan developments and ensuring these resources and plans meet potential spill scenarios;
- Accepting, assessing and collating requests for revision;
- Making authorised revisions to the OPEP:
- Maintaining an up-to-date digital version of the OPEP and a copy of the OPEP as currently issued (the “Master Copy”); and
- Issuing updates for revised sections.

The Custodian of this OPEP is also responsible for verifying that Facility or Project OPEPs are compliant with the requirements of this Plan.

13.3 Assigning Clear Roles and Responsibilities

Responsibilities are clearly defined in all OSR documents and emergency response plans. This includes actions such as reporting and notifications which reflect legal or regulatory requirements.

Each document identifies the individual or group for whom it has been developed. Roles and responsibilities are assigned, and the assigned personnel are provided with the appropriate training and exercising to ensure each person has a clear understanding of roles, responsibilities and how they are to be carried out.

Figure 13-1 illustrates the incident and training exercise program framework which is used to ensure clarity and competence in assigned roles and responsibilities.

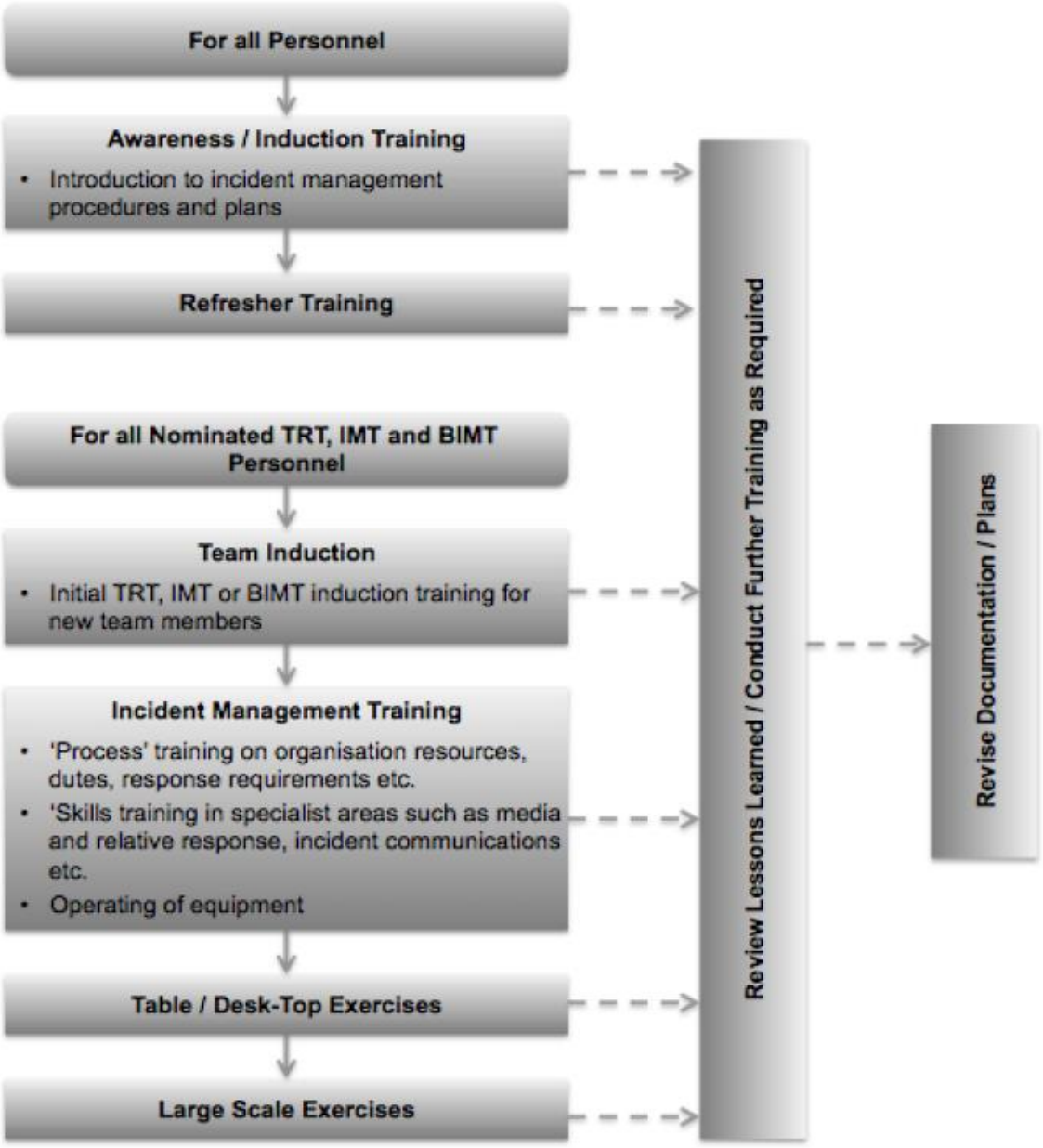


Figure 13-1: Incident and Training Exercise Program Framework

Personnel are assigned roles within the OPEP response organisation as detailed in Section 10. Each person nominated to the TRT or IMT is familiarised with their respective responsibilities through the training as detailed in Section 13.4.

13.4 Specific OPEP Training

All personnel nominated in this plan must be trained to an appropriate level and in procedures to allow them to undertake their role in the implementation of this OPEP. This includes IMT personnel, personnel from Site Teams and contractor personnel on Cliff Head facilities. Classroom training will be supported by regular drills and exercises to ensure that acquired competencies are maintained. Training requirements for each IMT & BIMT role are provided in the TEO Training Plan (10SPTRNPL01) and cross checked each week, when preparing the Duty Roster to ensure each role is fulfilled by a suitably competent person.

Cliff Head personnel receive training to commensurate with their individual roles within this OPEP as detailed in Table 13-2. In the event that the personnel nominated for these roles are not available, personnel from AMOSC will be utilised in accordance with the contracts in place ensuring support is provided in in the event of an emergency.

Table 13-2: Training requirements for Oil Spill Response Personnel

Team	OSR Position	Minimum Training Level
		Course
IMT	IMTL	Oil Spill Command and Control (IMO 3)
	Deputy IMTL	Oil Spill Management Course (IMO 2)
	Facilities/Operations	Oil Spill Management Course (IMO 2)
	Logistics	Oil Spill Management Course (IMO 2)
	Scribe/Communications	Oil Spill Response Familiarisation Workshop
	Planning	Oil Spill Management Course (IMO 2)
	HSES	Oil Spill Management Course (IMO 2) Oil Spill Wildlife Response – Introduction course
	Finance & Administration	Oil Spill Response Familiarisation Workshop
TRT	TRTL/PIC	Oil Spill Command and Control (IMO 2)
	Communications Coordinator	Oil Spill Response Familiarisation Workshop
	Aerial Observer	Aerial Observation

Appendix A Contact Details for Incident Response and Support

Organisation	Name	Contact Details
AMOSC	Duty Officer	0438 379 328 **amosc@amosc.com.au**
AMSA RCC	RCC Australia	rccaus@amsa.gov.au Tel:1800 641 792 fax: 02 6230 6868
ASCO	Damian Vinci	**damian.vinci@ascoworld.com** 08 6254 7410 0448 063 688
RPS	Sasha Zigic* *Contracted via AMOSC Trevor Gilbert / Scott Langtry	Direct: 07 3124 9454 Office: 08 9221 2911 sasha.zigic@rpsgroup.com
Bureau of Meteorology (BoM)	Bureau of Meteorology (BoM) Office: (08) 9263 2222 Fax: (08) 9263 2233	PO Box 1370 West Perth WA 6872 (1100 Hay Street)
BMT	Rob DeRoach	0410 660 655 08 6163 4900 1300 404 560 (24 Hr Oil Spill Response)
Department of Mines, Industry Regulation and Safety (DMIRS)		0419 960 621 **petroleum.environment@dmirs.wa.gov.au**
Department of Biodiversity, Conservation and Attractions (DBCA)	State Duty Officer (Oiled Wildlife Response)	(08) 9219 9108 E: fauna@dbca.wa.gov.au
Cleanaway	Robert and Melanie Baldwin	r.baldwin@toxfree.com.au melanie.baldwin@cleanaway.com.au 08 9938 4002 (Office) 0400 485 529 (Robert) 0418 665 923 (Melanie)
Corsaire Aviation	Luke Wyllie (Director)	9417 1325 / 0417 181 255
	Luke Wynne (Pilot)	0427 764 079 (Duty Phone)
Empress Marine	John Lanaway	0428 404 400
Harbour Services Australia	Matt Wardle (Managing Director)	0428 930 049 Matt@hsamarine.com.au
NOPSEMA	Office number and follow the prompts to speak to a representative out of hours: T: 1300 674 472 E: **submissions@nopsema.gov.au** F: Fax: 03 8866 5703	Link to forms: **http://www.nopsema.gov.au/environmental-management/notification-and-reporting/**
Mettle Group Holdings	Ben Pronk	ben@mettle.global

Organisation	Name	Contact Details
Global Spill Control	Kevin Lampard / Brad Lowson	08 9258 5877 klampard@globalspill.com.au
Toll Energy & Marine Logistics	Michael Hays	08 9258 5877 0466 734 194 michael.hays@tollgroup.com
RMD	Robert O'Connell	0418 590 544 roc@rmdis.com.au
DPIRD		Office:+61 8 9482 7200 Tel: 0419 907 780 (24 hr) environment@fish.wa.gov.au
DoT MEER		(08) 9480 9924 (24 hr) Marine.pollution@transport.wa.gov.au
Veolia Australia and New Zealand	Wayne Mann Lorna Wixted	08 9138 3047 0417 837 136 wayne.mann@veolia.com
Western Resource Recovery	Joe Algeri:	1800 SPILLS 0427 857 248 joe.algeri@transpac.com.au

Appendix B POLREP Form

This can also be submitted via online forms: https://amsa-forms.nogginoca.com/public/

Department of **Transport**

BEFORE completing this form please contact the MEER duty officer on (08) 9480 9924 (24hrs). Immediate reporting will enable a rapid response.

Marine Pollution Report (POLREP)

Return completed form to:
Maritime Environmental Emergency Response
Department of Transport
Email: marine.pollution@transport.wa.gov.au and rccaus@amsa.gov.au
Phone (08) 94809924
Fax: (08) 94357807

INCIDENT DETAILS

Date of Incident:_____ Time of Incident *(24 hr format)*: _____

Location name/description: _____

Incident Coordinates Latitude of spill_____ Longitude of spill _____

Format of coordinates used *(select one)* ☐ *Degrees & decimal degrees* ☐ *Degrees, minutes & decimal minutes* ☐ *Degrees, minutes & seconds*

Description of Incident: _____

POLLUTION SOURCE

☐ Vessel ☐ Land *(Specify)* _____ ☐ Other *(Specify)* _____ ☐ Unknown

Vessel type *(if known)* ☐ Tanker ☐ Container ☐ Bulk ☐ Cargo
☐ Fishing ☐ Defence ☐ Recreational ☐ Other *(Specify)*_____

Vessel name:_____ Flag State / Callsign:_____ Australian vessel? ☐ Yes ☐ No

POLLUTANT

☐ **Oil** *(type)* ☐ Bilge ☐ Diesel ☐ HFO bunker ☐ Crude ☐ Unknown ☐ Other *(Specify)*_____

☐ **Chemical** Name:_____ MARPOL cat / UN Nos: _____

☐ **Garbage** Details/description: _____

☐ **Packaged** Details/description: _____

☐ **Sewage** Details/description: _____

☐ **Other** Details/description: _____

EXTENT

Size of spill ***(length & width in metres):*** _____

Amount of pollutant, if known ***(litres):*** _____

Has the discharge stopped? ☐ Yes ☐ No ☐ Unknown

Weather conditions at site: _____

☐ **Photos taken** Details:_____ held by: _____

☐ **Video taken** Details:_____ held by: _____

☐ **Samples taken** Description:_____ held by: _____

☐ **Items retrieved** Description:_____ held by: _____

ADDITIONAL INFORMATION

Response action undertaken? ☐ Yes ☐ No If yes, provide details below, please include any environmental impact.

Equipment used? ☐ AMSA ☐ State / NT ☐ Industry

Is assistance for an investigation required from DoT ◯ Yes ◯ No

ORIGINAL REPORT SOURCE

Name:_____ Position:_____ Phone: _____

Combat agency:_____ Statutory agency: _____

SENDER DETAILS

Name:_____ Agency:_____ Date:_____

Phone: _____ Fax: _____ Email:_____

PRIVACY STATEMENT

The Department of Transport is collecting the information on this form to enable it to carry out its role as Jurisdictional Authority as per WestPlan - Marine Oil Pollution. The Department of Transport and/or AMSA may give some or all of this information to other government bodies, non-government organisations who have responsibilities under the National Plan, and law enforcement agencies.

Once you have completed the form please check that all relevant fields have been filled with accurate data.
Please email completed form to marine.pollution@transport.wa.gov.au

mep_polrep_0815

Appendix C SITREP Form

Department of Transport

Marine Pollution Situation Report (SITREP)

Send completed form to:
Maritime Environmental Emergency Response
Department of Transport
PO Box 402 Fremantle , 6159
Email: marine.pollution@transport.wa.gov.au
and rccaus@amsa.gov.au
Fax: (08) 9435 7807

MARINE POLLUTION SITUATION REPORT (SITREP)

This is advice from the Control Agency of the current status of the incident and the response.

This form is transmitted to all relevant agencies including:

- Jurisdictional Authority
- Support Agencies

Incident Name:_____ **Ref. No.**_____

Priority ☐ Urgent ☐ Immediate ☐ Standard

Final SITREP? ☐ Yes ☐ No Next SITREP on: _____

Date:_____ **Time:**_____

POLREP Reference: _____

Incident location Latitude_____ Longitude_____

Brief description of incident and impact:

Overall weather conditions:

Summary of response actions to date:

Current Strategies:

Summary of resources available/deployed:

Expected developments:

Other Information:

SITREP Prepared By		
	Name:	
	Agency:	
	Role:	
	Contact	Telephone
		Fax
		Mobile
	No of Pages Attached:	

To post the form please click on the "POST" button below

POST RESET

MEP_Sitrep_1114

Appendix D Personal Log

PERSONAL LOG OR SECTION/ UNIT LOG

Spill Incident		**Ref. No.**	
Name/ Section		**Unit**	

Date	Time	Details	Cost

Appendix E Aerial Surveillance Forms

Aerial SURVEILLANCE FORM			
INCIDENT:		REF. NO:	
DATE:		TIME:	(24HR)
ATTACHMENTS:		NO. OF PAGES:	

FROM :	OBSERVER'S NAME:	POSITION:	
	AIRCRAFT:	PILOT NAME:	

AREA/REGION:			TIME:		(24hr)
SLICK POSITION:	LATITUDE:		LONGITUDE:		
	OTHER:				
SLICK DESCRIPTION:	SLICK LENGTH:	m	SLICK WIDTH:	m AREA:	km^2
	PERCENTAGE COVER / COLOUR		CLEAN SURFACE		%
			SILVER SHEEN		%
			RAINBOW / IRIDESCENCE		%
			DULL COLOURS		%
			DARK BROWN / BLACK		%
			LIGHT BROWN (EMULSION)		%
	OTHER DESCRIPTION / NOTES				
MOVEMENT / BEHAVIOUR:					
VISIBILITY:	WEATHER		CLOUD COVER / HEIGHT		
OTHER NOTES:					
AREA / REGION:			TIME:		(24 HR)
SLICK POSITION:	LATITUDE		LONGITUDE		
	OTHER				
SLICK DESCRIPTION:	SLICK LENGTH	m	SLICK WIDTH	m AREA	km^2
	PERCENTAGE COVER / COLOUR		CLEAN SURFACE		%
			SILVER SHEEN		%
			RAINBOW / IRIDESCENCE		%
			DULL COLOURS		%
			DARK BROWN / BLACK		%
			LIGHT BROWN (EMULSION)		%
	OTHER DESCRIPTION / NOTES:				
MOVEMENT / BEHAVIOUR:					
VISIBILITY:	WEATHER		CLOUD COVER / HEIGHT		
RESOURCE	TYPE/SPECIES	Number	LOCATION	Behaviour /Comment	
CETACEANS		Adult _____ Juvenile ___ Calf _____	LAT _____ LON _____	Direction of movement. Proximity to oil. Proximity to vessels.	

				Identifying marks* Aversion or other behaviour*
TURTLES		Adult _____ Juvenile ___	LAT _____ LON _____	Direction of movement. Proximity to oil. Proximity to vessels. Aversion or other behaviour*
DUGONGS	-	Adult _____ Juvenile ___ Calf _____	LAT _____ LON _____	Direction of movement. Proximity to oil. Proximity to vessels. Aversion or other behaviour*
SHARKS	WHALE SHARK OTHER		LAT _____ LON _____	Direction of movement. Proximity to oil. Proximity to vessels.
SEA SNAKES			LAT _____ LON _____	Direction of movement. Proximity to oil. Proximity to vessels.
BIRDS			LAT _____ LON _____	Direction of movement. Proximity to oil. Proximity to vessels. In flight/ roosting/ nesting
VESSELS	FISHING/OTHER INDONESIAN / AUSTRALIAN		LAT _____ LON _____	Direction of movement. Proximity to oil. Activity (e.g. Fishing). Size (m length)

Other Details for each Observation Location			
Ambient Conditions at Each Location	Date	**Photographic Record**	Date and time of each photo
	Time		Photo/video clip number
	Weather conditions		Brief description
	Visibility (atmospheric)		Lat and Log of position
	Water turbidity		Direction of photograph

*Requires trained observers

Appendix F Shoreline Oiling Assessment Form

SHORELINE OILING ASSESSMENT FORM			
This Report should be submitted to the Site Emergency Controller (SEC) who will forward it to the IMTL.			
Incident		**Ref. No.**	
Date	_____ /_____ / _____	**Time**	_____ : _____ **(24 hr)**

SEGMENT NO:		**REPORTING DETAILS:**
Topo'/Other Map (No.):		Assessment By Name: _____ Position: _____ Date: _____/____/_____ Time: ____AM/PM
Map Reference:		
Name of Beach or Location Description:		Report To Name: _____ Position: _____ Date Rec'd: ___/___/__ Time: _____AM/PM
Access Via:_____ ❑Foot only ❑Road ❑4WD ❑Boat ❑Heli		
Hazards?		First Assessment for Segment? ❑ Yes ❑ No

OIL DISTRIBUTION AND CHARACTER												
PARAMETER	LITZ*			MITZ*			UITZ*			SUPRATIDAL		
Shoreline Type												
Substrate Type												
Width of Shoreline												
Oil Band Width (m)												
Cover in Oil Band (%)												
Length of Coast Oiled												
Surface Oil Thickness												
Appearance												
Debris Present												
Oiled Debris												
Depth of Oiling (From Surface)												
Buried Oil Bands (Min.-Max. in m/cm)												
Description of Buried Oil												

** LITZ=Lower Intertidal Zone, MITZ=Mid Intertidal Zone, UITZ=Upper Intertidal Zone.*

SEE OVERPAGE FOR PAGE 2 OF SHORELINE OILING ASSESSMENT FORM

PAGE 2 OF SHORELINE OILING ASSESSMENT FORM

SKETCH/MAP

Scale:

NOTES

Appendix G NOPSEMA Environmental Incident Reporting Form

Latest version available: http://www.nopsema.gov.au/environmental-management/notification-and-reporting/

Appendix H NOPSEMA Monthly Incident Reporting Form

Latest version available: http://www.nopsema.gov.au/environmental-management/notification-and-reporting/

Appendix I Dot MOP Response and Consultation Arrangements: Annex 2

Latest version available: http://www.dmp.wa.gov.au/Environment/Forms-19751.aspx

Appendix J DMIRS Reportable Incident Reporting Form (Reportable Incident)

Electronic copies of this form are available from: http://www.dmp.wa.gov.au/Environment/Forms-19751.aspx.

Appendix K DMIRS Environmental Incident Reporting Form (Recordable Incident)

Electronic copies of this form are available from: http://www.dmp.wa.gov.au/Environment/Forms-19751.aspx.

Appendix L Preliminary NEBA assessment from EP to provide worked example to inform the operational NEBA assessment in the event of a spill

Guidance for completing the operational NEBA analysis to determine the spill response strategies to be deployed is as follows:

(1) Receive data generated by monitoring and evaluation (Section 2.4) including OSTM and predict for surface hydrocarbons: contact times, contact concentrations and shoreline accumulation volumes

(2) Assess the predicted impact consequences at each location/sensitivity listed in Table A1-1 based on the predicted contact concentrations and shoreline accumulations i.e. sensitivity x concentration/accumulation (Figure A1-1). The oil spill response priorities are provided above along with the order of sensitivity for specific locations provided in (Table A1-1).

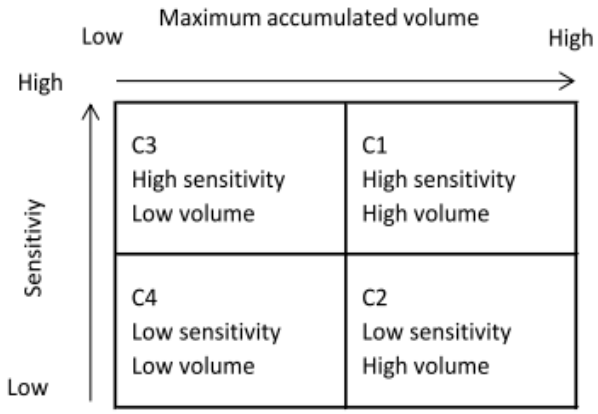


Figure A1-1: Location consequence matrix

The impact consequence is from in order of highest to lowest consequence:

C1 - high consequences: a high volume (approximately >50% of the largest predicted volume) of hydrocarbons is predicted to make contact with a highly sensitive location (e.g. Cervantes and the Abrolhos).

C2 – high consequence: a high volume (approximately >50% of the largest predicted volume) of hydrocarbons is predicted to make contact with a less sensitive location (e.g. Dongara, Leeman, Geraldton and Lancelin).

C3 – low consequence: a low volume (approximately <50% of the largest predicted volume) of hydrocarbons is predicted to make contact with a highly sensitive location e.g. Cervantes and the Abrolhos).

C4 – low consequence: a low volume (approximately <50% of the largest predicted volume) of hydrocarbons is predicted to make contact with a less sensitive location (e.g. Dongara, Leeman, Geraldton and Lancelin).

Consult the WA Environmental and Scientific Coordinator (ESC) via the DoT MEER for input. The ESC can also access the Oil Spill Response Atlas (OSRA).

(3) Prioritise locations based on impact consequence and predicted contact times obtained from the OSTM and field observations

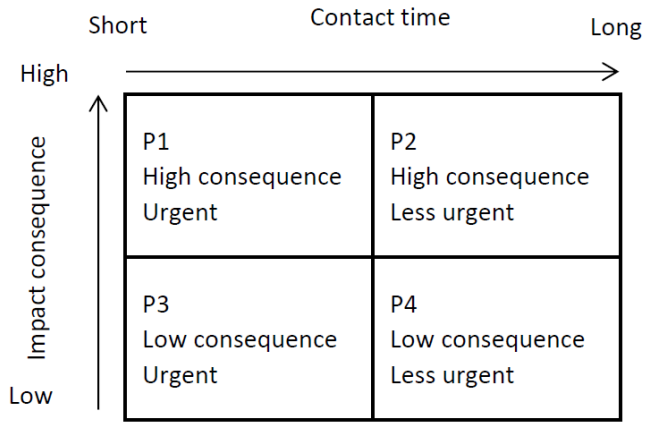


Figure A1-2: Location prioritisation matrix

P1: Contact with spill hydrocarbons at high consequence locations is predicted to occur within a very short time scale. Resources should be preferentially deployed to reduce potential contact as quickly as possible

P2: Contact with spilled hydrocarbon at high consequence locations is predicted to occur over a longer time scale than for P1 locations. This may provide time to address issues with P3 locations before needing to preferentially deploy resources to the P2 locations

P3: Contact with spilled hydrocarbons at low consequence locations is predicted to occur within a very short time scale. This does not mean those locations are not important but this prioritisation provides guidance in balancing the deployment of limited resources between competing priorities

P4: Contact with spilled hydrocarbons at low consequence locations over longer time scales. This does not mean those locations are not important but this prioritisation provides guidance in balancing the deployment of limited resources between competing priorities

(4) Complete the operational assessment NEBA analysis for the ongoing spill event, current operational circumstances, and predicted locations/sensitivities. The preliminary NEBA assessment from the Cliff Head Operations EP has been provided in (Table A1-2).

(5) Using the output of the NEBA analysis, confirm the priority response strategies to be deployed and those to be maintained as secondary options - prioritise actions in developing IAP accordingly

(6) Identify operational and scientific OSMP plans to be deployed (Table A1-1). Prioritisation of the OSMP should be consistent with the spill response strategies.

Table A1-1: OPEP environmental sensitivity table with OPEP responses and OSMP methods identified

Sensitivity receptor	Location								OPEP response*				OSMP (OPEP Section 4)	
	General offshore	Shoal point to Oakabella Creek	Around Geraldton	Around Dongara	Around Leeman	Around Cervantes	Lancelin to Ledge Point	Abrolhos Islands	Offshore containment and recovery	Shoreline protection and deflection	Shoreline clean-up	Oiled wildlife response	Scientific	Operational
General offshore														
Plankton	X	X	X	X	X	X	X	X	C	NA	NA	NA	1	1,2,5
Fish (including eggs and larvae)	X	X	X	X	X	X	X	X	C	NA	NA	NA	1,7	1,2,5
Turtles	X		X					X	C	NA	NA	R	1,6	1,2,3,4,5
Marine mammals	X	X	X	X	X	X	X	**XP**	C	NA	NA	C	1,6	1,2,3,4,5
Seabirds	X	X	X	X	X	X	X	**XP**	C	NA	NA	R	1,5	1,2,3,4,5
Subtidal zone														
Submerged reefs/shoals		X	X	X	X	X	X	X	NA	NR	NR	NA	1,2,	1,2,3,5
Seagrass	X	X	X	X	X	X	X	X	NA	NR	NR	NA	1,2,4	1,2,5
Intertidal zone														
Rockyshore, nearshore intertidal reefs		**XP**		**XP**		**XP**		**XP**	C	C	C	NA	1,3,4	1,3,5
Mangroves								**XP**	C	C	C	NA	1,2,3	1,3,5
Sandy shores/beaches		**XP**	**XP**	**XP**	**XP**	**XP**	**XP**	**XP**	C	C	R	NA	2,3	1,3,5
Sublittoral zone														
Seabird breeding, feeding and resting areas		**XP**	**XP**	**XP**	**XP**	**XP**	**XP**	**XP**	C	R	R	R	2,5	1,3,4,5
Sealion breeding and resting areas								**XP**	C	R	R	NR	2,6	1,3,4,5
Socioeconomic														
Fisheries	X		X	X		X		X	C	NA	NA	NA	1,7	1,5
Tourism and recreation	X	X	X	X	X	X	X	X	C	NA	NA	NA	None	1,3,5
Defence activities	X								C	NA	NA	NA	None	1,3,5
Shipping	X		X						C	NA	NA	NA	None	1,3,5
Protected areas						X		X	C	NA	NA	NA	As Required	1,3,5

Key:
X = receptor present
XP = priority receptor
R= recommended
C= considered
NR = not recommended
NA = not applicable

Table A1-2: Preliminary NEBA conducted for priority locations identified via stochastic modelling

Section A – Information to Inform NEBA					Section B – Preliminary NEBA Priority location Sensitive receptors				
Response strategy	Negative impacts	Positive impacts	Considerations	Level	Cervantes	Abrolhos	Dongara	Leeman	Geraldton
					Sandy beaches Intertidal reefs Marine mammal breeding (sea lion) Foraging/ nesting shorebirds and seabirds	Sandy beaches Intertidal reefs Mangroves Foraging/ nesting shorebirds and seabirds Marine mammal breeding (sea lion)	Sandy beaches Intertidal reefs Foraging/ nesting shorebirds	Sandy beaches Foraging/ nesting shorebirds	Sandy beaches Intertidal reefs Foraging/ nesting shorebirds
Source Control	Acute and chronic toxicity effects of surface oil on organisms Physical effects e.g. smothering Potential long-term impacts to water, water column and inter-tidal resources Increased vessel movement increase chance of disturbance/collision with marine fauna	No harm caused from potentially damaging clean up actions Identify and prevent emerging risks to sensitive areas	Once sensitive receptors are identified, i.e. cetacean spotted, follow stand down procedures EPBC Regulations 2000, Part 8 Division 8.1 interactions with cetaceans (see 6.2.3 of EP)	1 2 (crude) 2 (diesel)	Recommended This strategy is applicable to some extent to all oil spills scenarios. However, if environmental sensitivities are threatened then additional response strategies will need to be subjected to a NEBA assessment to determine whether the environmental costs of these additional strategies are outweighed by the environmental benefits.				
Monitor and Evaluate	Acute and chronic toxicity effects of surface oil on organisms Physical effects e.g. smothering Potential long-term impacts to water, water column and inter-tidal resources Increased vessel movement increase chance of disturbance/collision with marine fauna	No harm caused from potentially damaging clean up actions Identify and prevent emerging risks to sensitive areas	Once sensitive receptors are identified, i.e. cetacean spotted, follow stand down procedures EPBC Regulations 2000, Part 8 Division 8.1 interactions with cetaceans (see 6.2.3 of EP)	1 2 (crude) 2 (diesel)	Recommended This strategy is applicable to some extent to all oil spills scenarios. However, if environmental sensitivities are threatened then additional response strategies will need to be subjected to a NEBA assessment to determine whether the environmental costs of these additional strategies are outweighed by the environmental benefits.				
Chemical Dispersants	Can increased concentration of dissolved and entrained hydrocarbons in water column Can have toxic effects on organisms in upper water column Not effective against all types of crude May reduce effectiveness of oleophilic skimmers.	Prevents and reduces oiling of wildlife Enhances natural degradation process Rapid treatment over large areas if required Inhibits sedimentation of hydrocarbons Relatively unaffected by adverse weather	Dispersant can only be applied to surface slicks which are $\geq$ 10 g/m^2 threshold Dispersants should not be applied in water < 10 m depth Due to the behaviour of Cliff Head crude in the water, dispersants are unlikely to be effective	1	Not recommended Dispersant are ineffective as a result of the thin surface slick (dispersant 'punches' through a thin slick and corrals the oil) and volatile nature of the hydrocarbons.				
				2 (crude)	Not recommended Cliff Head crude is forecasted to cool and solidify on discharge onto the after surface so that it would not spread as a film. Due to the solid droplet nature of the crude in water, dispersants will not be effective. Further, water depths are a maximum of 18 m at the spill source. However, since the spill source is a pipeline leak, the exact location of the spill source may be in shallow waters.				
				2 (diesel)	Not recommended Dispersant are ineffective as a result of the thin surface slick (dispersant 'punches' through a thin slick and corrals the oil) and volatile nature of the hydrocarbons.				
Offshore Containment and Recovery	Increased vessel movement increase chance of disturbance/collision with marine fauna Dependent on weather Generation of oily waste requiring disposal.	Oil/spill materials recovered and stored until appropriate disposal can be arranged Can reduce volume of surface slick Prevent or reduce oiling of wildlife and shorelines	NEBA process is applied when preparing the IAP for the spill response strategies Containment and recovery operations require surface slicks of thresholds $\geq$ 10 g/m^2 Inductions to the persons using the strategy equipment Booms in shallow water monitored to prevent trapped wildlife EPBC Regulations 2000, Part 8 Division 8.1 interactions with cetaceans (see 6.2.3 of EP)	1	Considered/Not recommended Containment and recovery at the spill source will reduce the amount of hydrocarbons reaching sensitive receptors. However, concentration of surface crude is expected to reduce to <1 g/m^3 at 7-10 km from the release site by spreading of the floating fragments. Containment and recovery will only be effective at concentrations >10 g/m^3 and therefore assessment will be required to determine whether this strategy is appropriate.				
				2 (crude)	Considered Offshore containment and recovery will reduce the amount of hydrocarbons reaching sensitive receptors. However, may cause damage or disturbance to other receptors. Assessment is required to determine if disturbance outweighs benefits of hydrocarbon removal.				
				2 (diesel)	Considered Offshore containment and recovery will reduce the amount of hydrocarbons reaching this sensitive receptor. However, may cause damage or disturbance to other receptors. Assessment is required to determine if disturbance outweighs benefits of hydrocarbon removal.	Not Applicable Not enough time to deploy prior to contact	Considered Offshore containment and recovery will reduce the amount of hydrocarbons reaching this sensitive receptor. However, may cause damage or disturbance to other receptors. Assessment is required to determine if disturbance outweighs benefits of hydrocarbon removal.		

Section A – Information to Inform NEBA					Section B – Preliminary NEBA Priority location Sensitive receptors				
Response strategy	Negative impacts	Positive impacts	Considerations	Level	Cervantes	Abrolhos	Dongara	Leeman	Geraldton
					Sandy beaches Intertidal reefs Marine mammal breeding (sea lion) Foraging/ nesting shorebirds and seabirds	Sandy beaches Intertidal reefs Mangroves Foraging/ nesting shorebirds and seabirds Marine mammal breeding (sea lion)	Sandy beaches Intertidal reefs Foraging/ nesting shorebirds	Sandy beaches Foraging/ nesting shorebirds	Sandy beaches Intertidal reefs Foraging/ nesting shorebirds
Shoreline Protection and Deflection	Increased vessel movement increase chance of disturbance/collision with marine fauna Potential damage/disturbance to intertidal and benthic habitats	Oil/spill materials recovered and stored until appropriate disposal can be arranged Can reduce volume of surface slick Prevent or reduce oiling of wildlife and shorelines	NEBA process is applied when preparing the IAP for the spill response strategies Inductions to the persons using the strategy equipment Booms in shallow water monitored to prevent trapped wildlife Flat bottom vessels, catamarans or vessels with tenders used to access shorelines to deploy booms and other protective equipment. Beach profile will be restored after installing barriers/berms where practicable. EPBC Regulations 2000, Part 8 Division 8.1 interactions with cetaceans (see 6.2.3 of EP)	1	Not recommended Small volumes with no or negligible shoreline contact or accumulations Rapid spreading, evaporation and natural processes will remove surface hydrocarbons before shoreline contact Little environmental benefit for shoreline disturbance				
				2 (crude)	Consider Not enough time to prevent contact at Dongara (contact within a minimum of <1 day) but may reduce maximum accumulations which are forecast to be up to 36.3 m^3 along the length of the receptor, but may be selected for use at specific receptors such as Port Denison Surface concentrations reaching are unlikely to reach >10 g/m^3 which is the threshold limit of effectiveness for protection booms				
				2 (diesel)	Not recommended Very low likelihood of surface hydrocarbons > 10 g/m^3 reaching shorelines so unlikely to be effective Accumulations could be up to 18m^3 at Cervantes over time, no contact or accumulation at Abrolhos Islands or shoals	Consider Potential for surface oil to make contact with waters around Dongara at concentrations > 10 g/m^2 within 1 hour Potential maximum accumulations at Dongara up to 195 m^3 so protection and deflection may be an option to mitigate accumulations at sensitive locations around Dongara	Not recommended Very low likelihood of surface hydrocarbons > 10 g/m^3 reaching Leeman or any other shoreline so unlikely to be effective Maximum accumulations of 154 m^3 at Leeman		
Shoreline Clean-up	Potential shoreline disturbance from landing vessels on shorelines to deploy SCAT crew and clean-up equipment. Dependent on weather Equipment and labour intensive, requires logistical support	Removes stranded hydrocarbons from shorelines Reduces impacts associated with smothering effects Reduces risk of animals contacting stranded hydrocarbons Reduces potential for remobilisation of stranded oil to other sensitive receptors Aids recovery	Induction and training of onshore team accessing to uninhabited islands. Induction to include that spill response teams should avoid disruption of environment and take practical tactical precautions to avoid contact with flora and fauna NEBA process is applied when preparing the IAP for the spill response strategies EMT to: Coordinate basic training to clean-up contractors; Oversee the clean-up process to ensure appropriate procedures are used to minimise the impact on the environment; Provide advice on practical precautions to minimise contact with flora and fauna; and Assist with the NEBA process when selecting spill response strategies and to evaluate the impact of strategies	1	Not recommended Small volumes with no or negligible shoreline contact or accumulations Rapid spreading, evaporation and natural processes will remove surface hydrocarbons before shoreline contact Little environmental benefit for shoreline disturbance				
				2 (crude)	Consider May reduce amount of hydrocarbons on shore and potential contamination of shorebird resting, nesting and foraging sites. Will reduce potential impact on tourism. May reduce amount of hydrocarbons on potentially stranding on mangroves and the resulting toxicity. However, accumulations forecasted to be low (< 13.8 m^3 at Cervantes and no contact at the Abrolhos above the 100 g/m^2 threshold – assessment is required to determine if disturbance outweighs benefits of hydrocarbon removal.	Consider May be applicable mitigate accumulations – maximum forecast to occur at Dongara –up to 36.3 m^3 in winter However assessment is required to determine if disturbance outweighs benefits of hydrocarbon removal.	Consider May reduce amount of hydrocarbons on shore and potential contamination of shorebird resting, nesting and foraging sites. Will reduce potential impact on tourism. May reduce amount of hydrocarbons on potentially stranding on mangroves and the resulting toxicity. However accumulations forecasted to be low (< 27.5 m^3) – assessment is required to determine if disturbance outweighs benefits of hydrocarbon removal.		
				2 (diesel)	Not recommended	Consider Potential maximum accumulations at	Not recommended		

Section A – Information to Inform NEBA					Section B – Preliminary NEBA Priority location Sensitive receptors				
					Cervantes	Abrolhos	Dongara	Leeman	Geraldton
Response strategy	Negative impacts	Positive impacts	Considerations	Level	Sandy beaches Intertidal reefs Marine mammal breeding (sea lion) Foraging/ nesting shorebirds and seabirds	Sandy beaches Intertidal reefs Mangroves Foraging/ nesting shorebirds and seabirds Marine mammal breeding (sea lion)	Sandy beaches Intertidal reefs Foraging/ nesting shorebirds	Sandy beaches Foraging/ nesting shorebirds	Sandy beaches Intertidal reefs Foraging/ nesting shorebirds
					Maximum accumulations are low (<64 m^3) so unlikely shoreline clean up would result in net environmental benefit.		Dongara up to 195^3 so light cleaning may result in net environmental benefit at some sites in this area e.g. hydrocarbon contaminated debris	Maximum accumulations are low (<154 m^3) so unlikely shoreline clean up would result in net environmental benefit.	
Oiled Wildlife Response	Increased vessel movement increase chance of disturbance/collision with marine fauna Approaching marine fauna could drive individuals towards/into spill	Prevent or reduce oiling of wildlife Aide recovery of oiled wildlife	Maximise the best achievable and practicable protection measures to wildlife and their habitats during marine pollution incidents, prioritising the Abrolhos Islands groups Minimise the risk of impacts to oiled wildlife and wildlife threatened by oil Minimise injuries to wildlife threatened or impacted by other operational activities associated with the response (e.g. containment and clean up, dispersant application, aviation) Provide achievable care for wildlife in line with best practices, to return as many rescued wildlife back to the wild	1	Not recommended Small volumes with little/no shoreline contact Very thin films of oil for very short period of time				
				2 (crude)	Recommend Accumulations at Cervantes forecast to be < 13.8 m^3 no impact at Abrolhos above the 100 g/m^2 threshold Concentration of surface crude predicted to be less than concentration of environmental significance (i.e. < 10 g/m^2)		Recommend Maximum accumulations are forecast to be 36.3 m^3 which is a low risk to marine fauna Concentration of surface crude predicted to be less than concentration of environmental significance (i.e. < 10 g/m^2).	Recommend Accumulations at these locations forecast to be < 27.5 m^3 Concentration of surface crude predicted to be less than concentration of environmental significance (i.e. < 10 g/m^2).k	
				2 (diesel)	Consider Less likely to be required for these locations where accumulated volume <18m^3 at no contact at Abrolhos. Low accumulated volumes and low probability of contact with surface hydrocarbons > 10g/m^2.		Yes Surface hydrocarbons potentially > 10 g/m^2 therefore greater potential for oiled wildlife Predicted accumulated volumes at Dongara of 195 m^3.	Consider Less likely to be required for these locations where accumulated volume <154 m^3 accumulated volumes and low probability of contact with surface hydrocarbons > 10g/m^2.	

Appendix M IMT and TRT Checklists

The TRTL:

- **Is responsible for ensuring the safety of personnel,**
- **has the authority to direct the actions of all personnel on CHA or ASP,**
- **will take all necessary action to limit the spillage of oil, to restrict its spread and to mount an immediate response, and**
- **will coordinate the on-scene response for spills from or near the CHA platform or pipeline.**

Tactical Response Team Leader (TRTL) (Site)

TRT 1	**TRT Leader (TRTL)**	
Response Phase	**Action**	**Time**
Notification and Reporting	Receive notification of the spill and take appropriate immediate actions in compliance with Emergency Management Plan, including actions to stop the spill if safe to do so.	
	Record details using POLREP as guide (Section 6.2)	
	Log all events and calls (Section 6.4)	
TRT Mobilisation and Initial Actions	Mobilise the site Tactical Response Team (TRT) as required to support the response. (Section 6.1)	
	Instruct Control Room operators to establish operational conditions of the platform to assist identification of spill sources.	
	Establish communications with vessels or aircraft of opportunity and direct to the spill location for initial observation.	
	Assess spill for Level (See Section 1.5.2, Table 1-8.)	
IMT Mobilisation	Notify and brief IMTL and Fax/email POLREP to listed recipients. (Section 6.2)	
	IMTL will confirm Level 2 or Level 3	
Initial Assessment	Provide update to the Operations Officer for input to IMT briefing as per POLREP form details (Section 6.2)	
	Assess requirements for spill source control and communicate to the Operations Coordinator	
Planning	Provide the IMT Operations Officer with resource requirements	
	Review relevant sections of IAP and provide input	
Ongoing Response	Implement IAP actions and directions from IMT	
Termination	When instructed by IMT stand the TRT down	
	Debrief TRT	
	Collate documentation, logs etc. and submit to TRT	
	Open incident investigation and gather relevant information and photographs	

Incident Management Team Leader (IMTL) (Perth)

IMT 01	IMT Leader (IMTL)	
Responsible for ensuring that an effective immediate response and ongoing response is mounted. The Perth Incident Management Team Leader will direct all oil spill response activity.		
Response Phase	**Action**	**Time**
Initial Reporting and Notification	Obtain details of spill and actions taken from the TRTL. (Section 6.2)	
	Log all events and calls. (Section 6.4)	
	Determine Level (i.e. Level 1 or Level 2/3) in consultation with TRTL. (Section 1.6)	
	If considered necessary e.g. to confirm Level 1 or if Level 2/Level 3 spill, arrange aerial surveillance. (Section 6.3) Consider using aircraft and vessels of opportunity.	
IMT Mobilisation	Mobilise additional IMT resources to the Incident Command Centre (ICC) (Section 6.3)	
	On arrival at the ICC check that contact has been made with all TEO IMT members or with alternates. Fill any necessary non-designated IMT roles (e.g. recorders). (Section 6.3)	
	Establish and maintain contact with key positions, as follows: • TRTL • Vessel Master or verify that TRTL is in contact with the vessel. • Supporting facilities/contractors. (Section 6.1)	
Initial Assessment	Determine trajectory: Manual estimate (from vessel observations or CHA) Aerial observation (from aircraft of opportunity or chartered aircraft e.g. Corsaire Aviation) (Section 2.4)	
	Commission trajectory modelling (Section 6.6)	
	Using output of spill trajectory estimates, determine environmental sensitivities at risk (Section 12.6)	
Planning	Arrange aerial surveillance or direct the Planning Coordinator.	
	Convene Planning/Time Out meeting to determine: Incident Response Priorities for Protection (Section 12.6) Identify response strategies for NEBA assessment (Section 2 and Appendix L) Determine response strategies and objectives (Section 2 and Appendix L)	
	Direct the HSES Advisor to carry out NEBA assessment of potential response strategies with assistance from relevant specialists. (Section 2.2.1 and Appendix L)	
	Direct Planning Coordinator to develop Incident Action Plan. (Section 1.7)	
	Once IAP completed confirm consensus for IAP and sign-off for implementation	
	Ensure submission of: Updated POLREP form SITREP Form (Section 6.2)	
Ongoing Response	Implement actions as per the IAP and update IAP as events progress. (Section 1.7)	
	Monitor the response by scheduling and undertaking regular briefings/debriefings of the IMT.	
	Monitor field activities through phone/email contact with TRT Leader or other PIC.	

IMT 01	IMT Leader (IMTL)	
	Continue to monitor slick (position/trajectory/behaviour) as described in Section 2.4 Aerial and Vessel observations OSTM results (Section 6.6)	
	Convene regular Planning/Time Out meetings to review status of IAP actions: Incident Response Priorities, Ongoing strategies development, Ongoing NEBA assessments, Changing response objectives.	
	Monitor OH&S performance through the HSES Advisor	
	Monitor waste management through the Operations Coordinator or Waste Management Coordinator. If necessary, arrange for the development of a Waste Management Plan.	
	Arrange for relief IMT members to avoid fatigue (Section 6.3).	
	Continue to monitor slick position, trajectory, and behaviour through the Planning Officer.	
Termination	Terminate response if response strategy objectives (Section 7.1) and termination conditions (Section 5) are met in consultation with regulatory agencies.	
	Ensure that all TRT, IMT and BIMT staff are informed of stand-down.	
	Monitor, and ensure a safe and complete demobilisation.	
	Debrief the IMT.	
	Ensure actions are initiated to ensure all records are retrieved, collated and stored.	
	Ensure actions are initiated to ensure schedule of costs and supporting documents are collated for cost recovery/insurance requirements.	

Deputy Incident Management Team Leader (IMTL) (Perth)

IMT 02	Deputy IMT Leader	
Responsible for assisting the IMT Leader.		
Response Phase	**Action**	**Time**
Initial Reporting and Notification	Contact the following agencies by radio or telephone and confirm that each has received a POLREP fax/e-mail: • AMSA, EPG. (within 30 mins) • DoT MEER • NOPSEMA within 2hrs of the spill if the volume to sea is greater than 80ltr (Section 6.2)	
	For spills from vessels (within 500m zone), verify that the Vessel Master has reported the spill to AMSA, and DoT MEER via the POLREP Form. (Section 6.2)	
	If Level 2 or Level 3 spill, notify the BIMT of Level assessment and provide copy of the completed POLREP Form. (Section 6.1)	
	If Level 2 or Level 3 spill, contact AMSA/AMOSC and DoT MEER and request Liaison Officers as required to locate to the TEO Perth IMT or DoT IMT. (Section 6.1)	
IMT Mobilisation	Advise BIMT of any escalation of the response.	
	Start Personal Log (Section 6.4)	
Initial Assessment	Confirm response Level in consultation with TRTL and BIMT with input from IMT personnel including as appropriate: AMSA, AMOSC and DoT Liaison Officers.	
Planning	Instruct Media Liaison to develop Media Plan.	
	Resource the IAP via TEO and support agency resources e.g. • AMSA NatPlan via AMSA Liaison Officer • AMOSC AMOSPlan via AMOSC Liaison Officer • DoT State Hazard Plan - MEE via DoT Liaison Officer obtained through contact with the DoT MEER • (Section 6.3)	
Ongoing Response	As necessary obtain additional resources from: • NatPlan via AMOSC/AMSA Liaison Officer, • State Hazard Plan - MEE via AMOSC/DoT Liaison Officer obtained through the DoT MEER, • AMOSPlan via AMOSC Liaison Officer. (Section 6.3)	
	Issue regular SITREPS to: • AMSA, • DoT MEER, NOPSEMA, DPIRD, • BIMT, • Other as required. Consider: SITREPs per day for days 1 – 2, Daily from day 3 onwards. (Section 6.2)	
	Provide regular briefing updates to BIMT	
	Liaise with Media Liaison.	
	Arrange for relief IMT members to avoid fatigue (Section 6.3).	
	Continue to assist IMT Leader as required.	

Planning Coordinator

IMT 03	Planning	
The Planning Coordinator is to: • provide a focal point for developing and implementing the Incident Action Plan (IAP) which will be signed off by the IMTL, • monitor the IAP progress against the strategy objectives, and • work with the HSES Advisor who will coordinate the environmental and scientific input to the IAP.		
Response Phase	Action	Time
Notification and Reporting	On call out, confirm availability to the IMTL	
IMT Mobilisation	Locate to the ICC and report to the Perth	
	Confirm that the POLREP reports have been sent out	
	Start Personal Log (Section 6.4)	
Initial Assessment	Attend initial briefing held by IMTL.	
	In consultation with the IMTL, determine level of response and personnel requirements	
	Call in the required TEO staff/contractor resources Note – the IMTL will activate AMSA, AMOSC and DoT MEER as required	
Planning	Attend initial planning/time out meeting held by IMTL and record: • Incident response priorities for protection (Section 12.6) • Strategies for NEBA assessment (Section 2.2.1 and Appendix L) • Response strategy objectives (Section 7.1)	
	Develop and distribute draft Incident Action Plan to HSES Advisor, IMTL and Logistics Coordinator	
	Obtain and collate Sub-Plans: • Logistics (Logistics Officer) • Marine Response (AMSA Liaison Officer) • Shoreline Protection/Deflection & Clean-up (DoT Liaison Officer)	
	Present Incident Action Plan to IMTL for approval and distribute as directed. (Section 1.7)	
Ongoing Response	Issue regular SITREPS to the IMTL for authorisation and despatch. (Section 6.2)	
	Monitor IAP progress against strategy objectives in consultation with Logistics Officer and HSES Advisor	
	Maintain Action Tracker spreadsheet	
Response Termination	On instruction from the IMTL: • Compile all data • Ensure return of equipment to owner organisations/locations • Assist IMTL compile records	

Logistics Officer

IMT 04	Logistics	
The Logistics Officer will: • act as a focal point for management of materials and logistics requirements, and • organise the supply and transportation of contractor personnel, equipment and materials required for oil spill response as directed by the IMTL and implementation of the IAP.		
Response Phase	**Action**	**Time**
Notification and Reporting	On call out, confirm availability to the IMTL	
IMT Mobilisation	Locate to the ICC and report to the IMTL	
	Start Personal Log (Section 6.4)	
	Attend Initial Briefing	
Initial Assessment	Attend initial briefing held by IMTL	
	In consultation with the IMTL, determine level of response and personnel requirements (Section 6.3 and Section 10.1.4)	
	Call in the required TEO staff/contractor resources Note – the IMTL will activate AMSA, AMOSC and DoT MEER as required	
Planning	Attend initial planning/time out meeting held by IMTL and record: • Incident response priorities for protection (Section 12.6 • Strategies for NEBA assessment (Section 2.2.1 and Appendix L) • Response strategy objectives (Section 7.1)	
	Develop a Logistics Sub-Plan to cover logistics requirements for the proposed strategies and submit to the Planning Coordinator	
Ongoing Response	Coordinate and process requests for resources	
	Prepare and record all procurement documents and service contracts	
	Liaise with: • Finance and Administration Officer to track equipment costs • Planning Coordinator to calculate future service and support requirements	
	Liaise with AMSA, AMOSC and DoT MEER to coordinate resources	
Termination	On instruction from IMTL inform Logistics personnel of response termination	
	Carry out debrief of Logistics personnel	
	Ensure all equipment is returned to respective suppliers in clean, repaired condition	
	Compile final list of consumed, lost and damaged equipment	
	Provide records to Finance and Administration Officer	

Facilities/Operations Advisor

IMT 05	Operations	
The Facility/Operations Advisor is responsible to the IMTL for all response operational activities including ensuring that: • the requirements of the IAP are passed on to the operational personnel in the field, and • the plans are implemented effectively.		
Response Phase	**Action**	**Time**
Notification and Reporting	On call out, confirm availability to the IMTL	
IMT Mobilisation	Locate to the ICC and report to the IMTL	
	Start Personal Log (Section 6.4)	
	Attend Initial Briefing	
Initial Assessment	Attend initial briefing held by IMTL	
	In consultation with the IMTL, determine level of response and personnel requirements (Section 6.3 and Section 10.1.4)	
	Call in the required TEO staff/contractor resources Note – the IMTL will make the initial activation of AMSA, AMOSC and DoT MEER as required – the Operations Coordinator will then establish communications with: • AMSA Liaison Officer to resource Marine, Aviation, Shoreline, Wildlife, OH&S and Waste Management resources	
Planning	Attend initial planning/time out meeting held by IMTL and record: • Incident response priorities for protection (Section 12.6) • Strategies for NEBA assessment (Section 2.2.1 and Appendix L) • Response strategy objectives (Section 7.1)	
	Liaise AMSA/AMOSC and DoT Liaison Officers to develop a Sub-Plan to cover requirements for the proposed strategies for submission to the Planning Coordinator: • Marine response • Aviation responses (e.g. aerial surveillance) • Shoreline – protection/deflection and clean-up • Wildlife • Waste Management (Section 6.3)	
	For each Sub-Plan, advise Logistics Officer and Planning Coordinator of: • Equipment requirements • Labour requirements • Transport requirements • Any other needs	
Ongoing Response	Coordinate and monitor performance and update the Planning Coordinator	
Termination	Inform Operations Section of response termination	
	Carry out debrief of operations personnel	
	Confirm that all Field Teams have returned safely	
	Ensure all equipment is returned to the Logistics section	
	Ensure all records are given to Finance and Administration Officer	

HSES Advisor

IMT 06	HSES	
The HSES Advisor is: • responsible for coordinating the provision of an up-to-date and balanced assessment of the likely environmental effects of an oil spill, • To advise on the environmental priorities and thorough implementation of the NEBA assessment, the preferred response options taking into account the significance, sensitivity and possible recovery of the resources likely to be affected, and • to implement the Oil Spill Monitoring Plan (Operational and Scientific).		
Response Phase	**Action**	**Time**
Notification and Reporting	On call out, confirm availability to the IMTL	
IMT Mobilisation	Locate to the ICC and report to the IMTL	
	Start Personal Log. (Section 6.4)	
Initial Assessment	Attend initial briefing held by IMTL	
	In consultation with the IMTL, determine level of response and personnel requirements (Section 6.3 and Section 10.1.4)	
	Call in the required TEO staff/contractor resources for the provision of environmental services for NEBA assessment and to inform OSMP implementation. Note – the IMTL will activate AMSA, AMOSC and DoT MEER as required	
Planning	Attend initial planning/time out meeting held by IMTL and record: • Incident response priorities for protection (Section 12.6) • Strategies for NEBA assessment (Section 2.2.1 and Appendix L) • Response strategy objectives (Section 7.1)	
	Manage the NEBA assessment of the proposed oil spill response strategies and liaise with the Planning Officer to input the outcome of the NEBA assessment into the IAP.	
	Provide advice on temporary and permanent waste management strategies	
	Provide advice on post spill monitoring and resource OSMP and rehabilitation programs	
	Support the IMTL in commissioning Oil Spill Trajectory Modelling (Section 6.5)	
	Identify and mobilise required environmental and scientific services to support oil spill response strategies (Section 6.3)	
Ongoing Response	Support IMTL and Planning to monitor ongoing Oil Spill Trajectory Modelling during the response Obtain weather reports from the Bureau of Metrology (Section 11.5) Track actual spill/slick using reports from field e.g. Aerial Surveillance for input to subsequent Oil Spill Trajectory Modelling (Section 2 and Section 6.6) as described in Section 2.3.	
	Coordinate advice from environmental specialists (Section 6.3)	
	Liaise with support organisations e.g. AMSA, AMOSC and DoT MEER	
	Implement Oil Spill Monitoring Plan – Operational & Scientific (Section 4)	
	Monitor IAP and track against oil spill response strategy objectives (Section 7.1)	
	Carry out NEBA assessment (Section 2.2.1 and Appendix L) with assistance from specialists and provide input to ongoing IAP (Section 1.7)	
Response Termination	Advise the IMTL (with input from specialist environmental support) on achievement of oil spill response and termination objectives.	

Finance and Administrations Officer

IMT 07	Finance & Admin	
The Finance and Administration Officer is to: • ensure the implementation of the Finance and Administration strategies.		
Response Phase	**Action**	**Time**
Notification and Reporting	On call out, confirm availability to the IMTL	
IMT Mobilisation	Locate to the ICC and report to the IMTL	
	Start Personal Log (Section 6.4)	
	Receive and record initial briefing	
Initial Assessment	Receive and record initial briefing held by IMTL	
	In consultation with the IMTL, determine level of response and personnel requirements (Section 6.3 and Section 10.1.4)	
	Call in the required TEO staff/contractor resources Note – the IMTL will activate AMSA, AMOSC and DoT MEER as required	
Planning	Attend initial planning/time out meeting held by IMTL and record: • Incident response priorities for protection (Section 12.6) • Strategies for NEBA assessment (Section 2.2.1 and Appendix L) • Response strategy objectives (Section 7.1)	
	Ensure the IMTL approves a POLREP if not already complete;	
Ongoing Response	Ensure IAP is communicated to all (focus on aims and objectives)	
	Liaise with logistics to ensure an appropriate process is put in place to advance who is providing resources	
	Ensure Logistics are communicated the cost of items to the finance role	
	Ensure a media holding statement is approved by the incident controller	
	Obtain regular updates from each of the functional roles and update spill logs and record keeping	
	Produce a plan for recording and facilitating payment for spill cost to providers	
	When notified by IMTL of response termination, inform all Finance & Administration Staff	
	Ensure completion of duties of the Finance & Administration Group	
	Debrief Finance and Administration Group	
Termination	Attend IMTL debrief;	
	Deactivate Finance & Administration Group Personnel;	
	Collect all records relating to the spill response from the Finance & Administration Group, and Group and pass onto IMTL.	

Scribe

IMT 08	SCRIBE	
One of the graduate engineers or available personnel with suitable scribing skills will be utilised in the first instance as the Scribe.		
Response Phase	**Action**	**Time**
Response	Responsible for maintaining a chronology list of all events as well as maintaining a situation status board. The chronology should be maintained as a running sheet on the electronic spreadsheet (Smartlog) saved in Sharepoint and displayed in the ICC.	
	Ensure the ICC computer is logged on to: • Username: chemt • Password: 100Havelock	
	Ensure regular updates (with attached running sheet) to the Emergency Contact List in the chemt outlook	
	The log sheets from individuals log pads will be passed to the scribe for recording	
	The log sheets should all have the name of the IMT personnel on them	
	An In-Tray should be established for placing the log sheets	
	Assist Planning Coordinator with Action Tracker	
	The scribe can also help with other Administrative tasks as directed.	
	Continue keeping spill log focusing on decisions made by the IMT Leader	
	Record stakeholder notifications completed by the IMT	
	Record minutes of all timeouts and meetings	
	Obtain regular updates from each of the functional roles and update spill logs and record keeping	

Person Taking Calls

IMT 09	PERSON TAKING CALLS / PHONE RESPONDERS (RECEPTIONIST)	
Responsibilities: This guideline applies to all persons delegated the task of telephone communications. At all times, the phones in the ICC are to be free of incoming calls via the switchboard.		
Response Phase	**Action**	**Time**
Response	Ensure all calls are taken away from the ICC room	
	Take all incoming calls as normal	
	Note and record all emergency related information/enquiries in accordance with the Information / Media Request Log and pass as soon as possible to Scribe in ICC.	
	Ensure return contact numbers and names are recorded	
	Do NOT volunteer information regarding the incident.	
	Do not confirm, deny or make statements on any aspect of the incident.	
	Do not divulge any IMT members' names, positions or organisations.	
	Try to determine if calls are related to the emergency, if not take a message for a return call ("as no-one is presently available to assist").	
	For emergency calls, put the caller through to the BIMT or Incident Management Team Leader or take a message for a return call.	
	For any media calls, ensure BIMT or IMTL is aware the media is on the phone when taking a "call back" message; do not discuss any matters with the media.	
	If relatives call, refer them to the BIMT or IMTL until a "Relatives Response" dedicated number is established.	
	Consider relief for your position for an extended incident response	
	Maintain personal log of incident events, actions, messages and decisions.	
Termination	Collate messages and records and present to BIMT or IMTL as pertinent.	
	Contribute to incident debrief (phone conference if necessary)	

BIMT Leader

BIMT 01	BIMT Leader	
Responsibilities: • Liaison between IMT and BIMT • Responsible for assisting the activities of the Perth based IMT Leader in order to provide corporate support, advice and information.		
Response Phase	**Action**	**Time**
Prior to Incident	Initiate the development and implementation of structured training for all personnel involved with emergency response roles.	
	In liaison with the IMT Leader, ensure appropriate emergency management resources and requirements are fully identified and allocated.	
During an Emergency	When advised of the situation, initiate the BIMT	
	Ensure a media holding statement is approved by the IMTL	
	Discuss and develop initial press release and media strategy	
	Authorise IMT Leader to request assistance from appropriate support Contractors, including those support/response agencies for Oil Pollution events	
	Ensure that all BIMT staff is informed of stand-down	
	Monitor, and ensure a safe and complete demobilisation	
	Obtain written report and/or verbal debrief from IMT Leader	
	Initial stakeholder notifications which are not the responsibility of the IMT (JV Partners, board, etc)	
	Control of legal and financial issues	

First Person in the Incident Command Centre (ICC)

ICC 01	Establishing the Incident Command Centre (Perth)
Responsibilities: The first person to arrive at the ICC should initiate this Procedure.	
Refer to 10HSEQGENPL01 Emergency Management Plan – Roles and Responsibilities	
Equipment Checklist	
Item	Status
Kick-off meeting checklist	
Emergency Management Plan wall prompts	
Large location wall maps and blow-up photographs of Permit Area and Coastline	
Site environmental wall map	
Each IMT Member has the following:	
• *1 x Emergency Management Plan (10HSEQGENPL01)*	
• *1 x Emergency Response Contact List*	
• *1 x Oil Pollution Emergency Plan (10HSEQENVPL15) (Commonwealth Waters)*	
• *1 x Oil Spill Contingency Plan (10HSEQENVPL02) (State Waters)*	
Each IMT Leader has the following:	
• *1 x Rotary Emergency Response Plan (Corsaire Aviation)*	
• *1 x Vessel Emergency Response Manual (Harbour Services Australia)*	
2 x Dedicated direct dial telephone lines or immediate vicinity access (minimum)	
1 x Dedicated speaker-phone - direct inside line from incident site	
Dedicated and labelled in/out communications trays and ring binders	
Mobile phone battery chargers or spare batteries	
1 x Location time clock	
White board(s) (electronic if possible)	
Computer with e-mail, ADIOS capability	
Close access to video recorder, television and AM/FM radio	
Close access to photocopy machine	
Close access to overhead projector and screen	
Operations facility description and associated drawings	
Incident Notification, Call and Activity “Live” Spreadsheet (Excel)	
Emergency Response Logbooks	
Stationery material (calculators, pens, pads, highlighters, staplers, punches etc.)	
Identification bibs (showing IMT Role)	
Personnel roster for monitoring relief timetables (for extended incidents)	
Refreshments (and contact details for ongoing replenishment)	
2 x Copies of IMT Duty Roster	
	Name: …….. **Signature:** ……..…
	Date: ……/……../……..