Plan

CDN/ID S4100AH717907

Oil Pollution Emergency Plan

Offshore Victoria – Otway Basin

In the event of an oil pollution emergency refer directly to Section 4 (Response Actions)

Revision	Date	Reason for issue	Reviewer/s	Consolidator	Approver
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Review due	Review frequency
Annually from date of acceptance	1 year

THE THREE WHATS

What can go wrong?

What could cause it to go wrong?

What can I do to prevent it?

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1 Purpose

The purpose of this Oil Pollution Emergency Plan (OPEP or 'the Plan') is to:

- Describe the arrangements regarding Beach Energy's access to resources and appropriately trained response personnel in order to effectively respond to and manage an emergency oil spill response in a timely manner
- Provide a timely implementation of the pre-determined response strategies as outlined in this OPEP, based on credible worst-case hydrocarbon spill risks as presented within activity-specific Environment Plan (EPs)
- Ensure the processes and response structures are consistent with those used in applicable government and industry oil spill response plans, namely:
    - The National Plan for Maritime Environmental Emergencies ('NatPlan') (AMSA, 2019)
    - State Maritime Emergencies (non-Search and Rescue) Plan ('VicPlan') (EMV, 2016)
    - Tasmanian Marine Oil Spill Contingency Plan ('TasPlan') (DPIPWE, 2011)
    - The AMOSPlan (AMOSC, 2017)
- Ensure effective integration and use of industry and government response efforts and resources
- Meet the following regulatory requirements:
    - Commonwealth - Regulation 14(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (herein referred to as the OPGGS(E))
    - Victoria - Regulation 17 of the Offshore Petroleum and Greenhouse Gas Storage Regulations 2011 (herein referred to as the OPGGS Regulations)
    - Tasmania – Regulation 20 of the Petroleum (Submerged Lands) (Management of Environment) Regulations 2012 (herein referred to as the P(SL) (MoE) Regulations).

This OPEP supersedes the Origin Energy Integrated Gas Otway Offshore Oil Pollution Emergency Plan (TAS 9100 SAF PLN, CDN/ID 3973983)

2 The Proponent

The proponent, Lattice Energy Limited (Lattice), is wholly owned by Beach Energy Limited (Beach).

Lattice is the majority owner and the nominated operator for the offshore facilities and infrastructure presented in Figure 3.1 and located within the petroleum titles relevant to the scope of this OPEP (Table 3.1).

Given Lattice is the proponent for this project, as a member of the Beach group, it may be referred to in this application as 'Beach'. There may also be references to 'Origin' in material relevant to this document because that material was prepared before Lattice's change of name, or before Lattice was acquired by Beach.

3 Scope

This OPEP covers potential oil pollution emergencies that may result from Beach petroleum activities within State and Commonwealth waters of the Otway Basin off the west coast of Victoria. Spills within the Otway Basin may impact both Victorian and/or Tasmanian jurisdictions

The plan recognises the divisions of responsibility as defined under the terms of the "NatPlan", which have been incorporated into this plan.

3.1 Interface with Emergency Response Documents

This OPEP interfaces with the follow emergency response documents:

- Beach Crisis Management Plan (CMP)
- Beach Emergency Management Plan (EMP)
- Vessel-specific Shipboard Oil Pollution Emergency Plan (SOPEP) / Shipboard Marine Pollution Emergency Plan (SMPEP), or equivalent
- Beach Well Operations Management Plan (WOMP)
- Beach Otway Offshore Blow-out Contingency Plan (BCP) and/or Source Control Contingency Plan (SCCP)
- Beach Otway Offshore Drilling Emergency Response Plan (ERP)
- Otway Offshore Drilling Well Control Bridging Document
- Beach Well-specific Relief Well Plan
- Beach Offshore Victoria Operational and Scientific Monitoring Program (OSMP).

3.2 Beach Offshore Facilities and Activities within the Otway Basin

This OPEP covers petroleum activities in Commonwealth waters, Victorian State waters off the west coast of Victoria and Tasmanian State waters north west of the Tasmanian coastline, collectively within the Otway Basin.

Beach facilities and activities within the Otway Basin covered by this OPEP are summarised in Table 3.1. A detailed description of offshore facilities and petroleum activities is available within activity-specific Environment Plans (EPs).

The locations of facilities, infrastructure and petroleum titles covered by this OPEP are presented in Figure 3.1.

Table 3.1: Summary of Beach facilities and activities within the Otway Basin

Facility / Activity	Description	Title	Hydrocarbon type	Minimum distance from shore	Water Depth (approx.)	Flight Time (approx.)	Vessel Steaming Time (approx.)
Geographe production wells	Producing Geographe gas wells and two plugged and suspended Geographe wells (GEO-1 and GEO-3),	VIC/L23	Geographe gas condensate	45 km	80 m	20 min (Warrnambool)	16 hrs (Port Anthony)
Thylacine production wells	Producing Thylacine gas wells and the plugged and suspended Thylacine 1 exploration well	TL/2 TL/3	Thylacine gas condensate	70 km	100 m	25 min (Warrnambool)	20 hrs (Port Anthony)
Thylacine Platform-A (unmanned)	Unmanned Thylacine-A production platform, supporting the wellheads and topsides facilities required for production metering from the combined Thylacine wells	T/L2	Thylacine gas condensate	70 km	100 m	25 min (Warrnambool)	20 hrs (Port Anthony)
Thylacine / Geographe Pipeline	Offshore pipeline system consisting of a 500mm (20 inch) production pipeline and a 100mm mono ethylene glycol (MEG) piggyback service pipeline from the platform to the shore crossing at the Port Campbell Rifle Range, situated to the west of Port Campbell	VIC/PL36(V) VIC/PL36 T/PL3	Co-mingled gas condensate	0-70 km	Shallow to 100 m	Varies	Varies
Offshore Drilling	Exploration & production drilling	VIC/P43 T/30P	Thylacine gas condensate	32 km	70 m to 110 m	15 min (Warrnambool)	10 hrs (Port Anthony)
	La Bella production drilling	VIC/P73	Gas condensate	45 km	90 m	20 min (Warrnambool)	16 hrs (Port Anthony)
	Geographe production drilling	VIC/L23	Geographe gas condensate	45 km	80 m	20 min (Warrnambool)	16 hrs (Port Anthony)
	Thylacine production drilling	T/L2 T/L3	Thylacine Gas condensate	70 km	100 m	25 min (Warrnambool)	20 hrs (Port Anthony)
Vessel-based activities	Site surveys & project support	All petroleum titles in Figure 1	Marine Diesel	0-70 km	Shallow to 100 m		

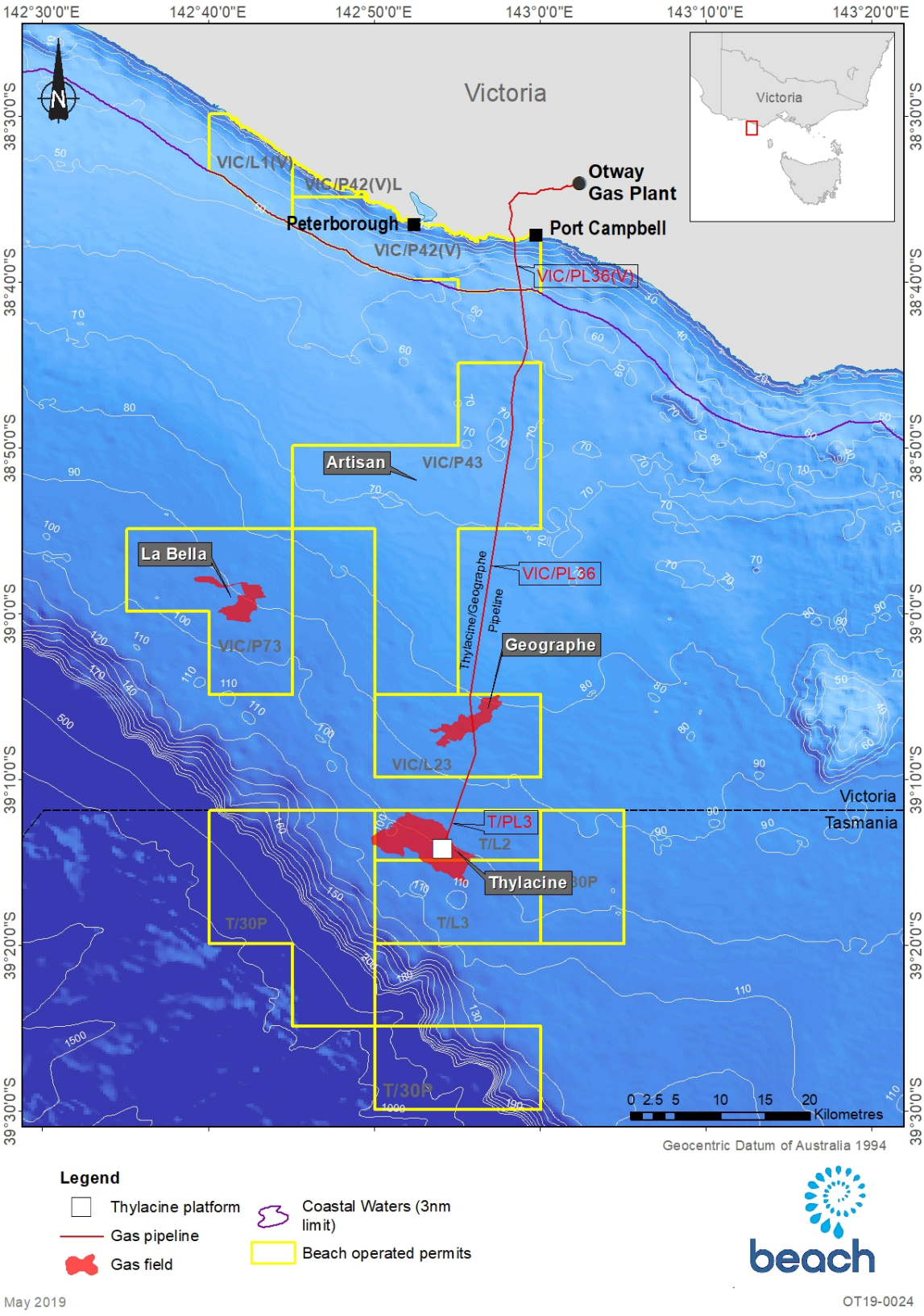


Figure 3.1: Locations of facilities, infrastructure and petroleum titles

3.3 Hydrocarbon Types

There are two types of hydrocarbon covered in this OPEP that are associated with the Otway offshore activities;

- Marine Diesel
- Gas Condensate (Geographe and Thylacine).

3.3.1 Marine Diesel

Marine diesel (DMA blend) is a light petroleum distillate. At the environmental conditions experienced in Otway Basin, marine diesel is predicted to undergo rapid evaporative loss and slicks are expected to break up rapidly. Characteristics of the DMA blend diesel are detailed in Table 3.2 and Table 3.3.

Table 3.2: Marine diesel physical characteristics

Parameter	MDA Blend
Density (kg/m^3)	829 at 15°C
API	37.6
Dynamic viscosity (cP)	4.0 at 25°C
Pour point (°C)	-14
Oil category	Group II
Oil persistence classification	Light-persistent oil

Table 3.3: Marine diesel boiling point ranges

Parameter	Volatiles (%)	Semi-volatiles (%)	Low-volatiles (%)	Residual (%)
Boiling point (°C)	<180	180-265	265-380	>380
DMA Blend Diesel	6.0	34.6	54.4	5
	⇦	Non-Persistent	⇨ ⇦	Persistent ⇨

3.3.2 Gas Condensate

The target reservoirs within the Otway Basin are gas condensate. As a result, no heavy oil will be present during extraction or drilling activities. The fields of the Otway Basin have slightly different condensate characteristics and potential flow rates (pressures). Characteristics of the two types of condensate are detailed in Table 3.4 and Table 3.5.

Condensate characteristics indicate that spills of these fluids are likely to spread rapidly, and residual hydrocarbons potentially distributed over a large area. Any slicks will break up readily as a result of weathering processes.

Table 3.4: Condensate physical characteristics

Parameter	Geographe Condensate	Thylacine Condensate
Density (kg/m^3)	751 at 15°C	805 at 15°C
API	56.9	44.3
Dynamic viscosity (cP)	0,500 at 25°C	0.875 at 20°C
Pour point (°C)	-50	-50
Oil category	Group I	Group I
Oil persistence classification	Non-persistent oil	Non-persistent oil

Table 3.5: Condensate boiling point ranges

Parameter	Volatiles (%)	Semi-volatiles (%)	Low-volatiles (%)	Residual (%)
Boiling point (°C)	<180	180-265	265-380	>380
Geographe Condensate	78.4	13.4	7.2	1
Thylacine Condensate	64.0	19.0	16.0	1
	⇦	Non-Persistent	⇨ ⇦	Persistent ⇨

3.4 Potential Worst-Case Spill Scenarios

The potential worst-case hydrocarbon spill scenarios relating to the Otway offshore activities are:

- for drilling an open-hole and unrestricted well release from the Artisan-1 location representing the overall worst-case loss of well control (LOWC) within the Otway Basin given its proximity to shore, noting other wells within the area may have similar flow rates and reservoir properties but are in deeper water and located further from shore
- an uncontrolled well release from the Geographe production well location
- an uncontrolled well release from the Thylacine production well location
- a pipeline rupture
- a release of marine diesel from a vessel involved in the Otway offshore activities, either near-shore or in deep water.

These hypothetical worst-case discharges (WCD) have been subject to modelling via an OILMAP stochastic module used to quantify the probability of sea surface exposure, contact to shorelines, largest shoreline loading, time to shoreline loading, in-water dissolved aromatic and entrained hydrocarbon concentrations. This involved simulating multiple spill trajectories with randomly varying metocean conditions to represent varying annual conditions.

An analysis of the modelling results for visual and actionable surface and shoreline exposure, minimum time to shoreline contact and maximum shoreline loading is presented in Table 3.6. Further detail relating to spill modelling results and potential environmental impacts can be found within activity-specific Environment Plans (EPs).

3.5 Spill Modelling Analysis

Table 3.6: Analysis of spill modelling

Spill Scenario	Drilling 8-1/2" open hole	Producing Wells		Pipeline Rupture	Vessel Spill	
Location	Artisan-1	Geographe	Thylacine	3nm from shore – State / Commonwealth boundary	Artisan-1	3nm from shore – State / Commonwealth boundary
Product	Thylacine condensate	Geographe Condensate	Thylacine Condensate	Co-mingled Condensate	DMA Blend Diesel	
Release Volume	2,584 bbl/day	750 bbl/day	1,010 bbl/day	1,175 bbl	300m^3	300m^3
Duration	86 days	86 days	86 days	14.4 min	6 hours	6 hours
Sea Surface 0.5g/m^2 (Barely Visible)	Up to 52 km and 53 km from the release site under summer and winter conditions, respectively Dissipates in <2 days	Up to 6 km and 7 km from the release site under summer and winter conditions, respectively	Up to 15 km and 17 km from the release site under summer and winter conditions, respectively	Up to 14.1 km and 19.6 km from the release site under summer and winter conditions, respectively Dissipates in <2 days	Up to 68 km and 93 km from the release site under summer and winter conditions, respectively Dissipates in <2 days	Up to 31.5 km and 45.8 km from the release site under summer and winter conditions, respectively Dissipates in <2 days
Sea Surface >10g/m^2 (Actionable)	Up to 4 km and 3 km from the release site under summer and winter conditions, respectively Dissipates in <1 day	Nil	Nil	Up to 4.9 km and 5.2 km from the release site under summer and winter conditions, respectively Dissipates in <1 day	Up to 12 km and 10 km from the release site under summer and winter conditions, respectively Dissipates in <2days	Up to 26.1 km and 33.9 km from the release site under summer and winter conditions, respectively Dissipates in <2days
Shoreline >100g/m^2 (Actionable)	Up to 4 km summer & 8 km winter	Nil	Nil	Up to 3 km summer & 4 km winter	Nil	Up to 10 km summer & 9.5 km winter
Shoreline >1000g/m^2 (High loading)	Nil	Nil	Nil	Nil	Nil	Up to 4km summer & 4.5 km winter
Shoreline Minimum Time to Contact	3 days summer & 5 days winter	N/A	N/A	7 hours summer & winter	N/A	5 hours summer & winter
Shoreline Maximum Loading m^3	15 m^3 summer and 33 m^3 winter	Nil	Nil	5.0 m^3 summer and 6.5 m^3 winter	Nil	142 m^3 summer and 110 m^3 winter

3.6 Actionable Response Areas

Figure 3.2. Figure 3.3, Figure 3.4 and Figure 3.5 represent the areas where a spill response could be undertaken to; protect, deflect, or mount a shoreline clean-up operation.

To identify areas where a response may be actionable the following oil exposures were used from NP–GUI–025: National Plan response, assessment and termination of cleaning for oil contaminated foreshores (AMSA 2015):

- A sea surface oil exposure of 10 g/m^2 as this represents the practical limit for surface response options; below this thickness, oil containment, recovery and chemical treatment (dispersant) become ineffective
- A shoreline contact exposure of 100 g/m^2 as this represents the minimum thickness that does not inhibit the potential for recovery and is best remediated by natural coastal processes alone.

N.B. There are no identified actionable response areas within Tasmanian State waters or lands

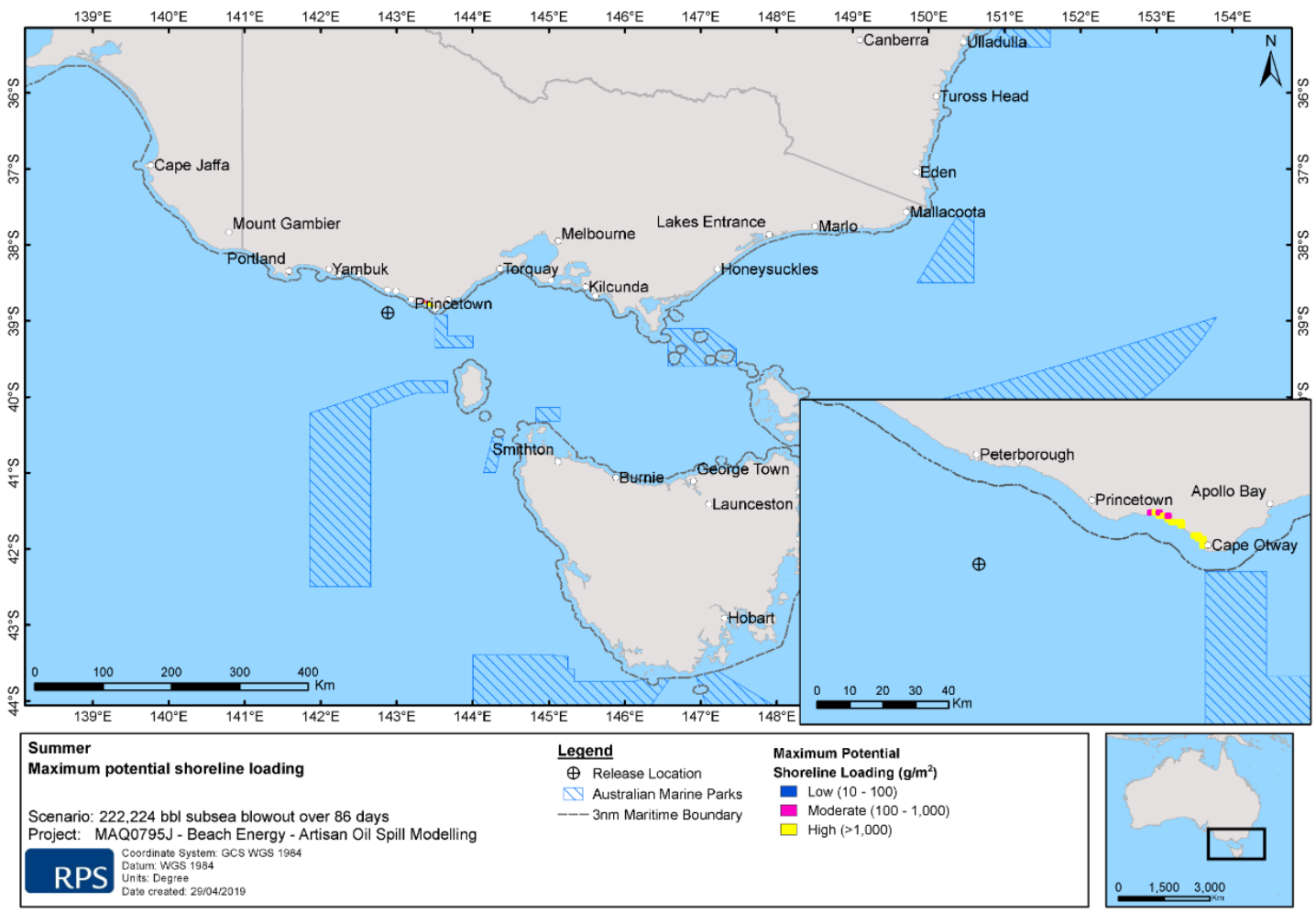


Figure 3.2: Condensate spill (LOWC) actionable response areas – Summer (RPS APASA, 2019)

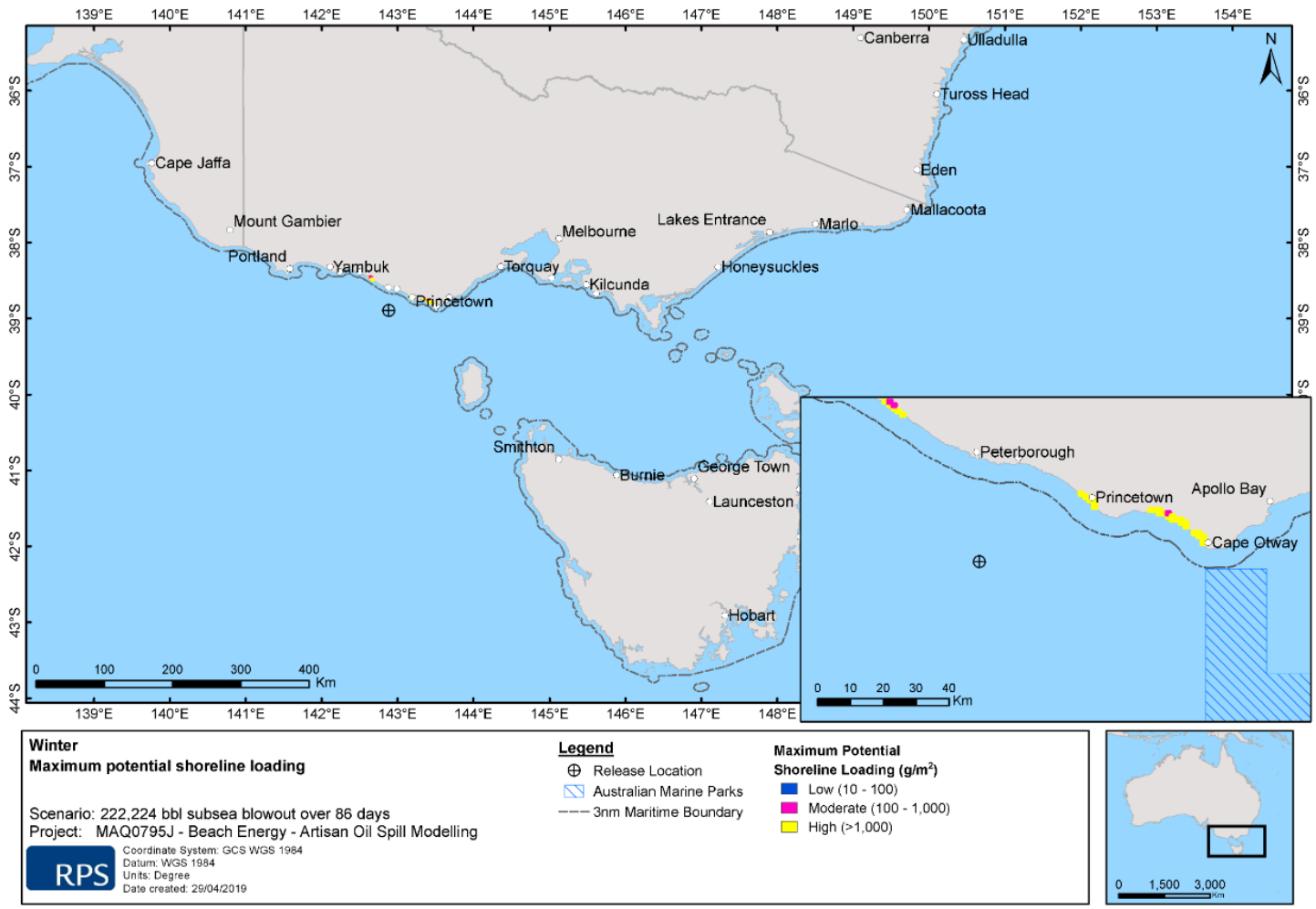


Figure 3.3: Condensate spill (LOWC) actionable response areas – Winter (RPS APASA, 2019)

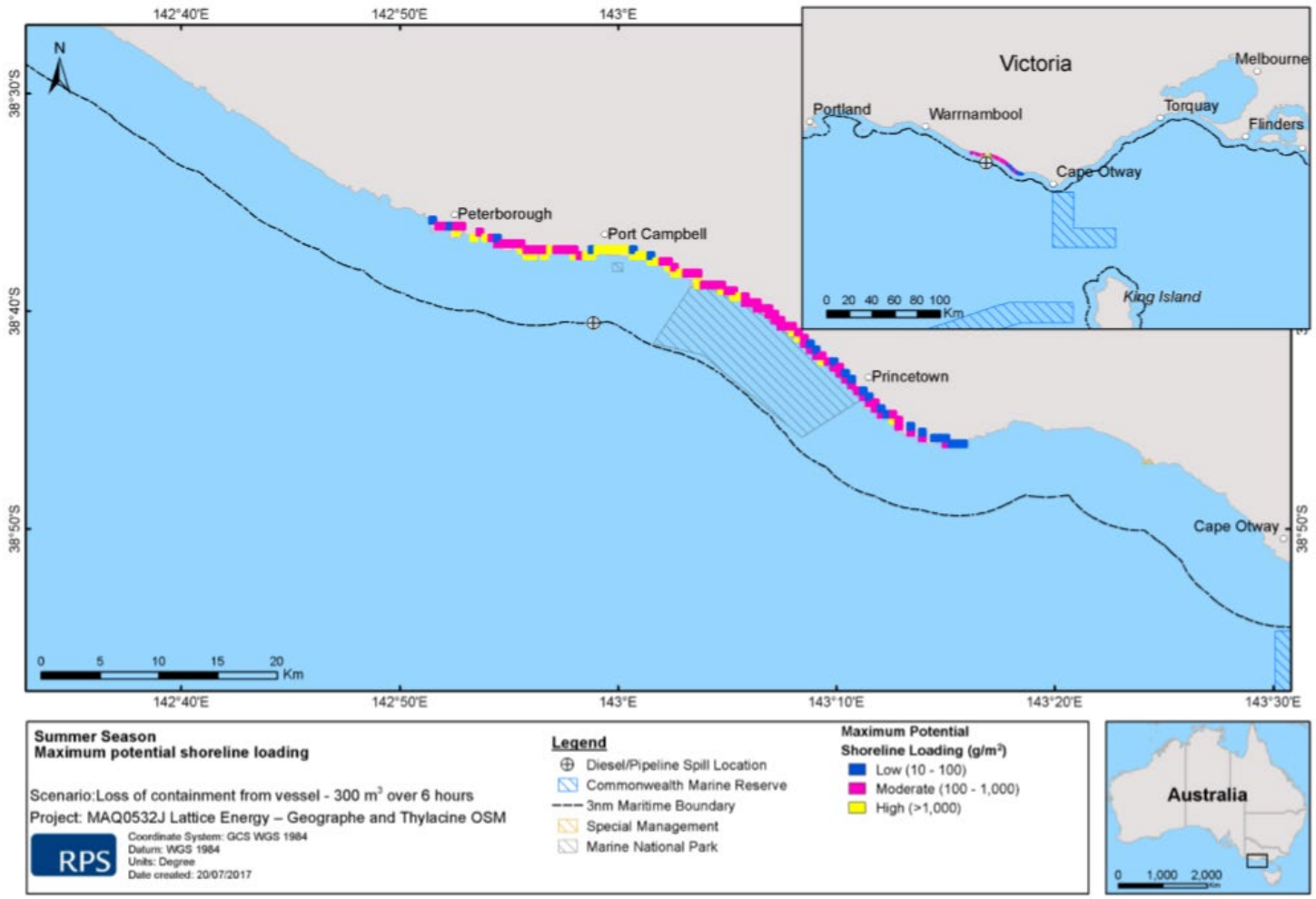


Figure 3.4: Marine diesel spill actionable response areas – Summer (RPS APASA, 2017)

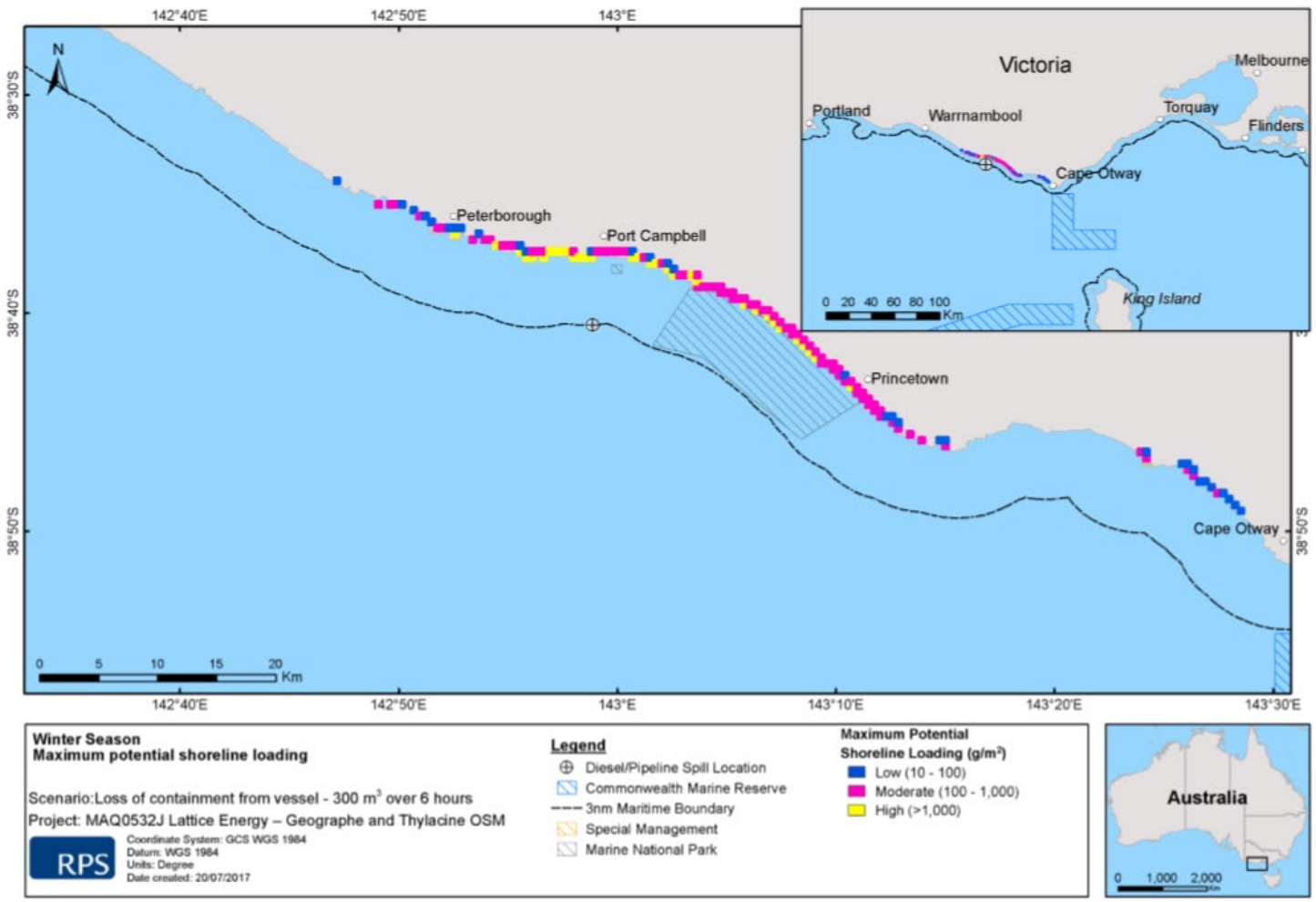


Figure 3.5: Marine diesel spill actionable response areas – Winter (RPS APASA, 2017)

4 Response Actions

4.1 Response Levels and Control Agencies

4.1.1 Level of Spill

In line with the National Plan and for the purpose of response planning, marine oil spills are divided into three categories. Depending on the spill size, the level structure allows for escalation of the response according to the risk of impacts, appropriate response actions and resources required for the response.

The level response concept adopted by Beach and the NatPlan is:

Level 1 Spills able to be resolved through the application of local or initial resources only.

Level 2 Spills more complex in size, duration, resource management and risk and may require deployment of jurisdiction resources beyond the initial response.

Level 3 Spills requiring support of national, and potentially international, resources to respond.

4.1.2 Statutory and Control Agencies

This plan recognises that under existing Commonwealth and State Intergovernmental Agreements, Authorities have been nominated with statutory and control responsibility for spills within harbours, State waters and Commonwealth waters around Australia.

While Beach remains accountable for spills relating to its petroleum operations, the nominated Control Agency will vary depending on source, size and location of the spill as defined in Table 4.1.

It should also be noted that state agencies such as the Victorian Department of Jobs, Precincts and Regions (DJPR) or the Tasmanian Department of Primary Industries, Parks, Water and Environment (DPIPWE), may assume Incident Control in state waters under the following circumstances:

- the incident is greater than a Level 1 spill in state waters and requires immediate escalation
- the incident occurred in Commonwealth waters, but has impacted on State waters
- the Control Agency has requested State assistance
- the State believes that Beach is not implementing an appropriate response to the incident.

4.1.2.1 Victorian State Arrangements

In the event that an incident in Commonwealth waters has impacted on Victorian State waters, DJPR will only assume Incident Control over the impacted area in State waters while Beach (or other Control Agency) will remain responsible for managing the spill outside Victorian coastal waters in consultation with the State.

Whilst DJPR is the Control Agency for marine pollution in Victorian State waters, Beach shall conduct initial necessary response actions in State waters, in accordance with this OPEP and continue to manage those operations until formal incident control can be established by DJPR.

Upon establishment of incident control by DJPR, Beach shall continue to provide planning and resources in accordance with this OPEP. This includes response assets and contracts specified in this OPEP, such as those pertaining to equipment, waste management, transport and personnel (operational and EMT staff) as well as arrangements with third-party response service providers. For response in State waters, DJPR will use the accepted OPEP as a starting point for a response. DJPR reserves the right to deviate from this OPEP in circumstances where there is a justifiable cause, in consultation with Beach. In this instance, Beach shall consult with NOPSEMA and DJPR Earth Resources Regulation (ERR) on any possible compliance ramifications.

If an incident affecting wildlife occurs in Commonwealth waters close to Victorian State waters, AMSA will request support from Department of Environment, Land, Water and Planning (DELWP) to assess and lead a wildlife response if required. DELWP may also place a DELWP Liaison officer in an Oil Spill Incident Management Team (IMT).

Where DJPR is leading an oil spill response within Victorian State waters, a joint IMT will be established. The joint IMT is to ensure a coordinated response between lead agencies.

DELWP will lead the wildlife response within the IMT under guidance from its own response plans and arrangements.

Additional detail on the management of a cross-jurisdiction marine pollution incident that originates in Commonwealth waters and results in DJPR exercising its control agency obligations in State waters is provided in Section 5.6.

4.1.2.2 Tasmanian State Arrangements

Under the *Pollution of Water by Oil and Other Noxious Substances Act 1987*, the Tasmanian Environmental Protection Authority (EPA) Division (DPIPWE) is responsible for preparedness for and responding to oil and chemical spills in Tasmania. Activities that the EPA Division undertakes to ensure Tasmania is prepared in the event of an oil spill include:

- Developing and managing oil spill response capabilities in Tasmania
- Providing resources and support during marine oil spill response operations in Tasmania
- Developing and delivering appropriate training programs for marine oil spill response around the State
- Assisting ports and industry in developing marine oil spill contingency plans in line with Tasmanian Marine Oil Spill Contingency Plan (TasPlan)
- Providing 24 hour on call support for marine oil spills
- Developing national networks to ensure Tasmania is up to date in oil spill response techniques
- Maintaining the Oil Spill Response Atlas (OSRA)
- Raising community awareness about the impact of marine oil spills.

In the event that an incident in Commonwealth waters has impacted on Tasmanian State waters, DPIPWE will only assume Incident Control over the impacted area in State waters while Beach (or other Control Agency) will remain responsible for managing the spill outside Tasmanian coastal waters in consultation with the State.

When under direction of DPIPWE, a Beach Emergency Management Liaison Officer (EMLO) trained in AIIMS and conversant with DPIPWE's processes and expectations shall be allocated to DPIPWE.

The Tasmanian Oiled Wildlife Response Plan (WildPlan) is administered by the Resource Management and Conservation Division of the DPIPWE and outlines priorities and procedures for the rescue and rehabilitation of oiled wildlife.

Table 4.1: Statutory and Control Agencies

Spill Source	Level of Spill	Impact to State Waters (<3nm)	Impact to Commonwealth Waters (>3nm)	Statutory Agency	Control Agency
Condensate release from platform, sub-sea wells / installation or pipeline	1	✓		Vic DJPR Tas DPIPWE	Beach
			✓	NOPSEMA	Beach
	2	✓		Vic DJPR Tas DPIPWE	Vic DJPR Tas DPIPWE
			✓	NOPSEMA	Beach
	3	✓		Vic DJPR Tas DPIPWE	Vic DJPR Tas DPIPWE
			✓	NOPSEMA	Beach
Diesel release from vessel	1	✓		Vic DJPR Tas DPIPWE	Vessel Owner / Operator
			✓	AMSA	Vessel Owner / Operator
			✓ (within 500m platform exclusion zone)	NOPSEMA	Vessel Owner / Operator
	2 and 3	✓		Vic DJPR Tas DPIPWE	Vic DJPR Tas DPIPWE
			✓	AMSA	AMSA

4.2 Immediate Actions and Notification Requirements (Contacts correct as of 19 June 2019)

4.2.1 Vessel Spill / Collision (L1 / L2 / L3)

Table 4.2: Immediate Actions – Vessel Spill / Collisions

Item	Action	Responsibility	Timing
1.	**Initial Emergency Actions**		
1.1	Implement the relevant emergency response procedures to protect human life and the environment in accordance with the vessel SOPEP / SMPEP	Vessel Master	ASAP
1.2	Identify any potential fire risks and attempt to isolate the supply of oil to the spillage	Vessel Master	ASAP
1.3	Identify the extent of spillage and the weather/sea conditions in the area	Vessel Master	ASAP
1.4	Notify Otway Production Manager / MODU OIM / Drill Site Manager	Vessel Master	ASAP
1.5	Notify Operations Manager / Drilling Manager	Otway PM / MODU OIM / Drill Site Manager	ASAP
2.	**Level 1 Notifications**		
2.1	Any vessel collision with a facility or MODU within Commonwealth waters (>3nm) and / or any hydrocarbon spill >80L AMSA: Ph: 1800 641 792 Email: mdo@amsa.gov.au NOPSEMA: Ph: 08 6461 7090 Email: submissions@nopsema.gov.au	Vessel Master / Operations Manager / Drilling Manager	ASAP but not later than 2 hours after collision / spill
2.2	Within or potential for moderate to significant environmental damage to Victorian State waters (<3nm) – refer to activity-specific EP for clarification DJPR EMB: Ph: 0409 858 715 (24/7) and Email: semdincidentroom@ecodev.vic.gov.au	Vessel Master / Operations Manager / Drilling Manager	ASAP
2.3	Within or potential for release to cause, or may cause, environmental harm or environmental nuisance in Tasmanian State waters (<3nm) – refer to activity-specific EP for clarification DPIPWE: Ph: +61 (0)3 6165 4599 or 1800 005 171 (within Tasmania only) Radio: TasPorts Vessel Traffic Services VHF radio channel 16/14/12 Call sign "relevant port name VTS" Email: incidentresponse@epa.tas.gov.au	Vessel Master / Operations Manager / Drilling Manager	ASAP
2.4	Within port boundary or potential impact to Port boundary – notify relevant Port Authority	Vessel Master	ASAP
2.5	Notify and escalate to the EMT if available response resources are inadequate	Operations Manager / Drilling Manager	ASAP
3.	**Level 2 / 3 Notifications**		
3.1	Notify and escalate to the EMT	Operations Manager / Drilling Manager	ASAP
3.2	Any vessel collision with a facility or MODU within Commonwealth waters and / or any Level 2 / 3 vessel spill AMSA: Ph: 1800 641 792 Email: mdo@amsa.gov.au NOPSEMA: Ph: 08 6461 7090	Emergency Management Liaison Officer (EMLO)	ASAP but not later than 2 hours after becoming

Item	Action	Responsibility	Timing
	Email: submissions@nopsema.gov.au		aware of spill
3.3	Within Commonwealth waters (>3nm) – written report to NOPSEMA: Email: submissions@nopsema.gov.au and NOPTA: Email: info@nopta.gov.au	Emergency Management Liaison Officer (EMLO)	Within 3 days of spill
3.4	Spill with potential to impact Australian Marine Park(s) Director of National Parks: Ph: 02 6274 2220	Emergency Management Liaison Officer (EMLO)	ASAP
3.5	Within or potential for moderate to significant environmental damage to Victorian State waters (<3nm) – refer to activity-specific EP for clarification or the impact of wildlife (including cetaceans) DJPR EMB: Ph: 0409 858 715 (24/7) and Email: semdincidentroom@ecodev.vic.gov.au and DELWP: Ph: 1300 134 444 Email: sscviv.scmdr.delwp@scc.vic.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP
3.6	Within or potential for release to cause, or may cause, environmental harm or environmental nuisance in Tasmanian State waters (<3nm) – refer to activity-specific EP for clarification DPIPWE: Ph: +61 (0)3 6165 4599 or 1800 005 171 (within Tasmania only) Radio: TasPorts Vessel Traffic Services VHF radio channel 16/14/12 Call sign "relevant port name VTS" Email: incidentresponse@epa.tas.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP (first instance of oil on/in water)
3.7	Within port boundary or potential impact to Port boundary – notify relevant Port Authority	Vessel Master	ASAP
3.8	Complete Level 2/3 Incident Report (Appendix C. 4)	Emergency Management Liaison Officer (EMLO)	ASAP
3.9	Confirm takeover of incident control by AMSA (>3nm) or State agency as the Control Agency (<3nm)	EMT Operations Lead	ASAP
4.	**Level 2 / 3 Monitoring, Evaluation & Surveillance**		
4.1	Request assistance from AMOSC via execution of Service Contract/Service Note as directed by Control Agency	EMT Lead	ASAP
4.2	Mobilise surveillance by aircraft via service provider as directed by Control Agency	EMT Logistics Lead	ASAP
4.3	Deploy oil spill tracking buoy	EMT Logistics Lead	ASAP
4.4	Initiate oil spill trajectory modelling via service provider as directed by Control Agency	Health, Safety & Environment	ASAP
5.	**Level 2 / 3 Oil Spill Response**		
5.1	Provide support and information to the Control Agency as directed	EMT Lead	As directed
5.2	Determine and implement offshore and onshore response options for oil spill tracking, dispersion, containment, collection, treatment, oiled wildlife response & shoreline clean-up in consultation with and as directed by Control Agency	EMT Operations Lead / Health, Safety & Environment	As directed
5.3	Monitor shoreline and intertidal zones to identify areas affected by the oil spill and to determine the nature of the impact as directed by Control Agency	Health, Safety & Environment	As directed
5.4	Complete role-specific ongoing actions as outlined in Appendix B of ERP	All EMT	ASAP

Item	Action	Responsibility	Timing
6.	**Ongoing Monitoring**		
6.1	Implement Beach Offshore Victoria OSMP	Health, Safety & Environment	As required

4.2.2 Loss of Integrity – Platform or Pipeline (L2 / L3)

Table 4.3: Immediate Actions – Loss of Integrity from Platform or Pipeline

Item	Action	Responsibility	Timing
1.	**Initial Emergency Actions**		
1.1	Implement the relevant emergency response procedures to protect human life and the environment and in particular, those procedures focused at reducing the risk of fire or explosion	Thylacine PIC	ASAP
1.2	Identify any potential fire risks and attempt to isolate the supply of oil to the spillage	Thylacine PIC	ASAP
1.3	Identify the extent of spillage and the weather/sea conditions in the area	Thylacine PIC	ASAP
1.4	Notify Otway Production Manager	Thylacine PIC	ASAP
1.5	Notify Operations Manager	Otway PM	ASAP
2.	**Level 1 Notifications**		
2.1	Within Commonwealth waters (>3nm) and / or any hydrocarbon spill >80L NOPSEMA: Ph: 08 6461 7090 Email: submissions@nopsema.gov.au	Operations Manager	ASAP but not later than 2 hours after spill
2.2	Within or potential for moderate to significant environmental damage to Victorian State waters (<3nm) – refer to activity-specific EP for clarification DJPR EMB: Ph: 0409 858 715 (24/7) and Email: semdincidentroom@ecodev.vic.gov.au	Operations Manager	ASAP
2.3	A release or potential release from pipeline within 3nm DJPR ERR: Ph: 0419 597 010 (ERR Duty Officer) and Email: Compliance.Southwest@ecodev.vic.gov.au	Operations Manager	ASAP
2.4	Complete Level 1 Incident Report (Appendix C. 3)	Operations Manager	ASAP
2.5	Notify and escalate to the EMT if available response resources are inadequate	Operations Manager	ASAP
3.	**Level 2 / 3 Notifications**		
3.1	Notify and escalate to the EMT	Operations Manager	
3.2	Within Commonwealth waters (>3nm) NOPSEMA: Ph: 08 6461 7090 Email: submissions@nopsema.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP but not later than 2 hours after becoming aware of spill
3.3	Within Commonwealth waters (>3nm) – written report to NOPSEMA: Email: submissions@nopsema.gov.au and NOPTA: Email: info@nopta.gov.au	Emergency Management Liaison Officer (EMLO)	Within 3 days of spill

Item	Action	Responsibility	Timing
3.4	Spill with potential to impact Australian Marine Park(s) Director of National Parks: Ph: 02 6274 2220	Emergency Management Liaison Officer (EMLO)	ASAP
3.5	Within or potential for moderate to significant environmental damage to Victorian State waters (<3nm) – refer to activity-specific EP for clarification or the impact of wildlife (including cetaceans) DJPR EMB: Ph: 0409 858 715 (24/7) and Email: semdincidentroom@ecodev.vic.gov.au DELWP: Ph: 1300 134 444 Email: sscviv.scmdr.delwp@scc.vic.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP
3.6	Within or potential for release to cause, or may cause, environmental harm or environmental nuisance in Tasmanian State waters (<3nm) – refer to activity-specific EP for clarification DPIPWE: Ph: +61 (0)3 6165 4599 or 1800 005 171 (within Tasmania only) Radio: TasPorts Vessel Traffic Services VHF radio channel 16/14/12 Call sign "relevant port name VTS" Email: incidentresponse@epa.tas.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP (first instance of oil on/in water)
3.7	Confirm takeover of incident by State agency (DJPR) as the Control Agency (<3nm)	EMT Operations Lead	ASAP
3.8	Notify AMSA and request 500m exclusion zone from location of the spill AMSA: Ph: 1800 641 792 Email: mdo@amsa.gov.au	EMT Operations Lead	ASAP
3.9	Complete Level 2/3 Incident Report (Appendix C. 4)	Emergency Management Liaison Officer (EMLO)	ASAP
3.10	Notify and escalate to CMT if Level 3 response required	EMT Lead	ASAP
4.	**Level 2 / 3 Monitoring, Evaluation & Surveillance**		
4.1	Request assistance from AMOSC via execution of Service Contract/Service Note or as requested by Control Agency	EMT Lead	ASAP
4.2	Mobilise surveillance by aircraft via service provider or as requested by Control Agency	EMT Logistics Lead	ASAP
4.3	Deploy oil spill tracking buoy	EMT Logistics Lead	ASAP
4.4	Initiate oil spill trajectory modelling via service provider or as requested by Control Agency	EMT Planning Lead	ASAP
5.	**Level 2 / 3 Oil Spill Response**		
5.1	Assess the feasibility and safety risks to implement source control. Develop source control strategy and implement when safe to do so.	EMT Lead	ASAP
5.2	For loss of integrity from subsea wells, inform Beach Emergency Management Team – see Table 4.4 below for immediate actions.	EMT Lead	ASAP
5.3	Determine and implement offshore and onshore response options for oil spill tracking, collection, treatment and clean-up as directed by Control Agency.	EMT Operations Lead / Health, Safety & Environment	As directed
5.4	Determine the likelihood for an oil slick to reach a shoreline and take necessary action as directed by Control Agency	Health, Safety & Environment	ASAP & As directed
5.5	Monitor shoreline and intertidal zones to identify areas affected by the oil spill and to determine the nature of the impact as directed by Control Agency	Health, Safety & Environment	ASAP & As directed

Item	Action	Responsibility	Timing
5.6	Complete role-specific ongoing actions as outlined in Appendix B of ERP	All EMT	ASAP
6.	**Ongoing Monitoring**		
6.1	Implement Beach Offshore Victoria OSMP	Health, Safety & Environment	As required

4.2.3 Loss of Well Control (L2 / L3)

Table 4.4: Immediate Actions – Loss of Well Control

Item	Action	Responsibility	Timing
1.	**Initial Emergency Actions**		
1.1	Implement Otway Offshore Well Control Bridging document	MODU OIM	ASAP
1.2	Notify and escalate to Beach Drilling Superintendent / Otway Offshore Drilling Manager	Beach Senior Wellsite Representative	ASAP
1.3	Initiate Wells Emergency Team (WET)	Wells Superintendent or Manager	ASAP
1.4	Notify EMT Leader	WET Leader	ASAP
1.5	In alignment with NOPSEMA accepted WOMP, implement: • Otway Offshore Blow-out contingency Plan (BCP); • Otway Offshore Drilling Emergency Response Plan (ERP); • Otway Offshore Drilling Well Control Bridging Document; • Well-specific Relief Well Plan	EMT Leader and WET	ASAP
1.6	Notify Otway Production Manager	EMT Lead	ASAP
1.7	Notify Operations Manager	EMT Lead	ASAP
2.	**Level 2 / 3 Notifications**		
2.1	For all LOWC incidents NOPSEMA: Ph: 08 6461 7090 Email: submissions@nopsema.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP but not later than 2 hours after becoming aware of spill
2.2	Within Commonwealth waters (>3nm) – written report to NOPSEMA: Email: submissions@nopsema.gov.au and NOPTA: Email: info@nopta.gov.au	Emergency Management Liaison Officer (EMLO)	Within 3 days of spill
2.3	For all LOWC incidents with potential to impact Australian Marine Park(s) Director of National Parks: Ph: 02 6274 2220	Emergency Management Liaison Officer (EMLO)	ASAP
2.4	For all LOWC incidents with potential for moderate to significant environmental damage to Victorian State waters (<3nm) or the impact of wildlife (including cetaceans) DJPR EMB: Ph: 0409 858 715 (24/7) and Email: semdincidentroom@ecodev.vic.gov.au DELWP: Ph: 1300 134 444 Email: sscviv.scmdr.delwp@scc.vic.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP

Item	Action	Responsibility	Timing
2.5	For all LOWC incidents with potential to cause, or may cause, environmental harm or environmental nuisance in Tasmanian State waters (<3nm) – refer to activity-specific EP for clarification DPIPWE: Ph: +61 (0)3 6165 4599 or 1800 005 171 (within Tasmania only) Radio: TasPorts Vessel Traffic Services VHF radio channel 16/14/12 Call sign "relevant port name VTS" Email: incidentresponse@epa.tas.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP (first instance of oil on/in water)
2.6	Confirm takeover of incident by State agency as the Control Agency (<3nm)	EMT Lead	ASAP
2.7	Notify AMSA and request 2 km exclusion zone from the well location AMSA: Ph: 1800 641 792 Email: mdo@amsa.gov.au	Emergency Management Liaison Officer (EMLO)	ASAP
2.8	Complete Level 2/3 Incident Report (Appendix C. 4)	Emergency Management Liaison Officer (EMLO)	ASAP
2.9	Notify and escalate to CMT should well flow remain uncontrolled	EMT Lead	ASAP
3.	**Level 2 / 3 Monitoring, Evaluation & Surveillance**		
3.1	Request assistance from AMOSC via execution of Service Contract/Service Note	EMT Lead	ASAP
3.2	Mobilise surveillance by aircraft via service provider	EMT Logistics Lead	ASAP
3.3	Deploy oil spill tracking buoy	EMT Logistics Lead	ASAP
3.4	Initiate oil spill trajectory modelling via service provider	Health, Safety & Environment	ASAP
4.	**Level 2 / 3 Oil Spill Response**		
4.1	Request assistance from well control service provider	WET Lead	ASAP
4.2	Engage vessel broker and commission response vessels	EMT Logistics Lead	Within 2 weeks
4.3	Request assistance from AMOSC via execution of Service Contract/Service Note	EMT Lead	If required
4.4	Request assistance from AMOSC and deploy subsea first response toolkit	WET Operations	Within 2 weeks
4.5	Deploy MODU and commence drilling relief well	WET Operations	Within 8 weeks
4.6	Determine and implement offshore and onshore response options for oil spill tracking, dispersion, containment, collection, treatment and clean-up or as directed by Control Agency	Health, Safety & Environment	ASAP & As directed
4.7	Determine the likelihood for an oil slick to reach a shoreline and take necessary action as directed by Control Agency	Health, Safety & Environment	ASAP & As directed
4.8	Monitor shoreline and intertidal zones to identify areas affected by the oil spill and to determine the nature of the impact	Health, Safety & Environment	ASAP & As directed
4.9	Complete ongoing actions as outlined in Appendix B of ERP	All EMT	ASAP
5.	**Ongoing Monitoring**		
5.1	Implement Beach Offshore Victoria OSMP	Health, Safety & Environment	ASAP

5 Crisis and Emergency Management (CEM) Framework

The Beach emergency management structure consists of a three-tiered approach. With teams that have specific roles regarding response to and management of emergency and crisis events. This visual overview clearly depicts this framework and associated protocols for the effective management and coordination of all levels of emergency and crisis events impacting on the Beach organisation. The framework is depicted in Figure 5.1.

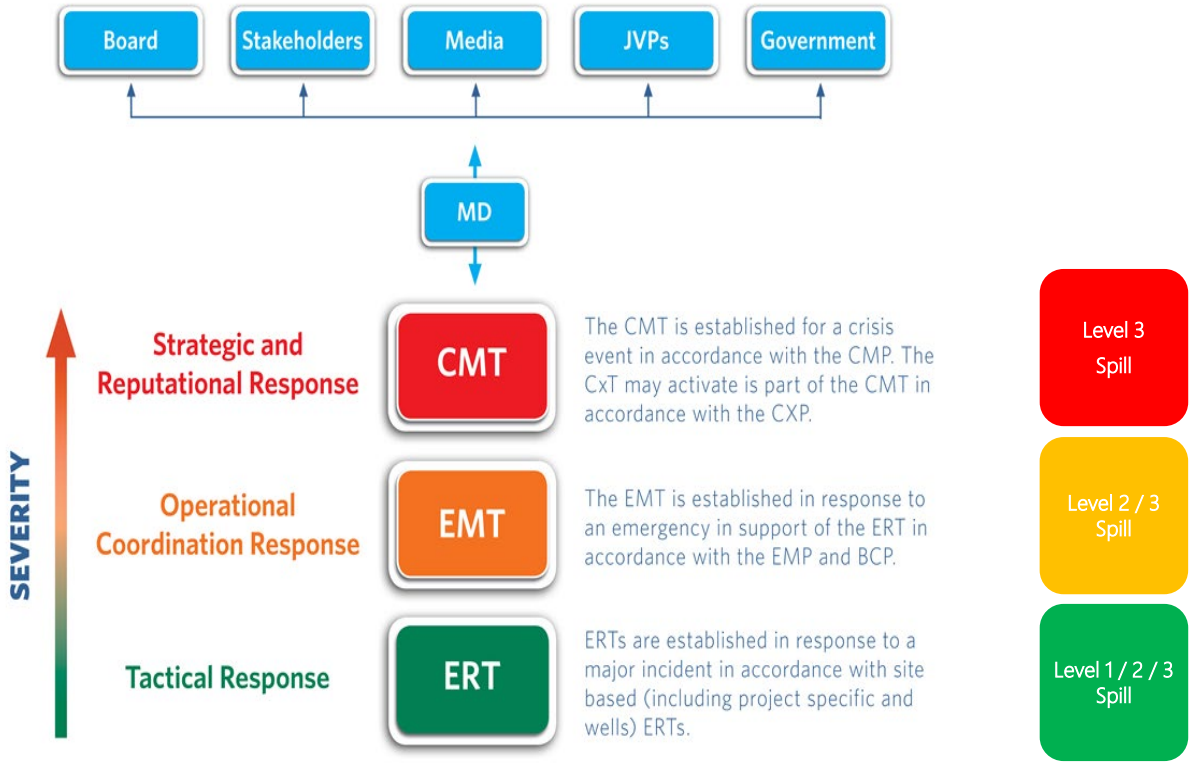


Figure 5.1: Beach Energy Crisis and Emergency Management Framework

In summary:

- Site-based ERTs carry out emergency response activities at the site of the emergency
- Adelaide and Melbourne based EMTs – provide operational management support to the site-based ERT, facilitate planning and liaise with external parties
- The Adelaide-based WET interface with the MODU and implement Beach source control procedures in the event of a LOWC
- The Adelaide-based CMT undertakes crisis management operations and direct strategic actions at the corporate level, addresses implications of the crisis on the employees, is concerned with the company's reputation, relationships with external parties and joint venture partners
- The CMT is activated for a crisis event or as directed by the MD or the CMT Leader.

The extent of the response structure will be dictated by the size of the incident and the required response.

5.1 Managing Director (MD)

The Beach Managing Director (MD) will be the critical interface between the CMT and senior external stakeholders, including, but not limited to the Beach Energy Board of Directors, the media and government.

The CMT Leader will keep the MD apprised of the incident and will discuss decisions of the CMT with the MD and render advice as required. However, the MD may assume the role of CMT Leader.

5.2 Crisis Management Team (CMT)

Leadership of the CMT (Figure 5.2) is empowered by the Beach MD to assume responsibility for providing strategic support to emergency or crisis events impacting Beach operations or commercial viability.

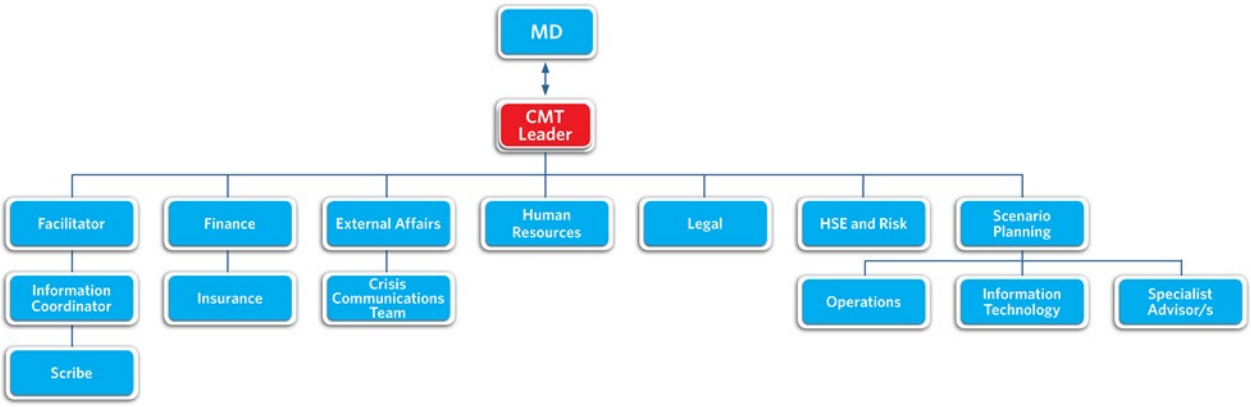


Figure 5.2: Composition of the Crisis Management Team

5.3 Emergency Management Team (EMT)

The EMT (Figure 5.3) is led by the EMT Leader and assumes responsibility for providing and coordinating operational emergency management activities in support of site/facility response activities during any emergency or crisis event. An Emergency Management Liaison Officer (EMLO) is embedded within the Oil Spill Response function of the EMT and acts as the key interface between the Beach EMT and State Control Agency Incident Management Teams (IMT).

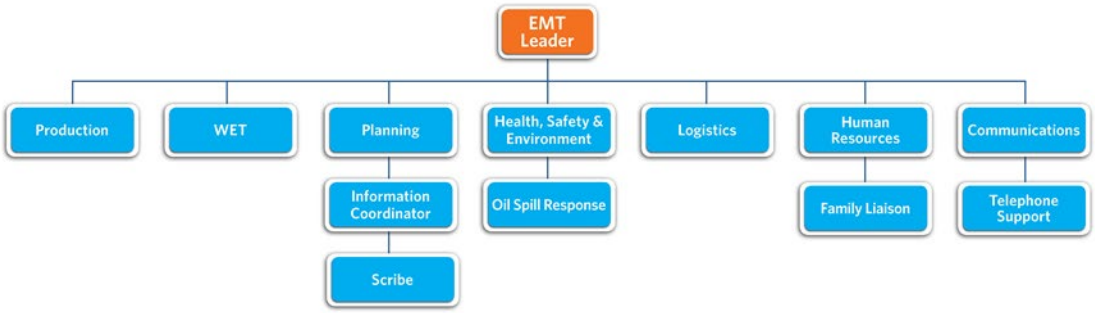


Figure 5.3: Composition of the Emergency Management Team

5.4 Emergency Response Team (ERT)

Each site has a site, project or area-specific ERP and an ERT that is typically a Beach team led by the ERT Leader. The site may also have Incident Controller/s reporting to them.

This role assumes responsibility for coordinating a site's tactical response to an emergency at a Beach site and for communicating with the Beach EMT and Emergency Services as required.

The ERT has responsibility for controlling the immediate response to a site emergency and providing direction, advice and support to the Incident Controller/s as required.

5.5 Wells Emergency Team (WET)

In the event of an emergency at Wells/Drilling site, the ERP of the Drilling Contractor is activated along-side that of the Beach Well Control Bridging document. All Beach personnel on site will have a role in an emergency and the senior Beach representative will be responsible for communicating with the on-call Well Emergency Team (WET) Leader.

In the event of an offshore well control incident, The WET will form and be the conduit of information to the EMT Leader. The WET's primary function is to bring the well under control.

The WET team consists of the WET Leader, WET Operations, WET Planning, WET Information Coordinator, HSE Advisor, WET Logistics and a Scribe. This team is the first line of communication from the Beach senior site representative (on site) to escalate the major incident or emergency event. The WET Leader will commence providing the site with additional resources and technical expertise. Additional resources may be called in, such as additional Technical/specialist engineers as required, and these personnel will constitute the WET. The WET Leader must inform the EMT Leader that the WET will be activating and will receive and assess the initial reports from the affected site. The WET will monitor rosters and resources of the site during a declared event and has oversight of company resources to the response and at the scene in coordination with the EMT and associated response strategy.

The WET will provide the EMT with updates from the affected Beach assets. The EMT will be able to support the response through the provision of additional resources (HR, HSE, Comms etc.) as well as being the conduit of information to the CMT. Together, the WET and the EMT work to resolve all issues including supply management and may involve system modelling, ongoing intelligence, risk exposures, engineering and technical issues, supply status and forecasting, alternate response strategies and overall assessment of the impacts that the event and any planned response may have on the system and supply situation.

5.6 Joint Strategic Coordination Committee (Victoria)

The following section has been adapted from DJPR guidance.

Transboundary arrangements from state to state is covered by the National Plan. Where Victorian State waters are impacted by cross-jurisdictional marine pollution incidents, DJPR will only assume the role of control agency for response activities occurring in Victorian State waters, in accordance with the State Maritime Emergencies (non-search and rescue) Plan. In this instance, Beach and DJPR shall work collaboratively, sharing response resources and providing qualified personnel to the DJPR IMT. To facilitate effective coordination between the two control agencies and their respective IMT, a Joint Strategic Coordination Committee (JSCC) shall be established. The control and coordination arrangements for cross-jurisdictional maritime emergencies is outlined in Figure 9.

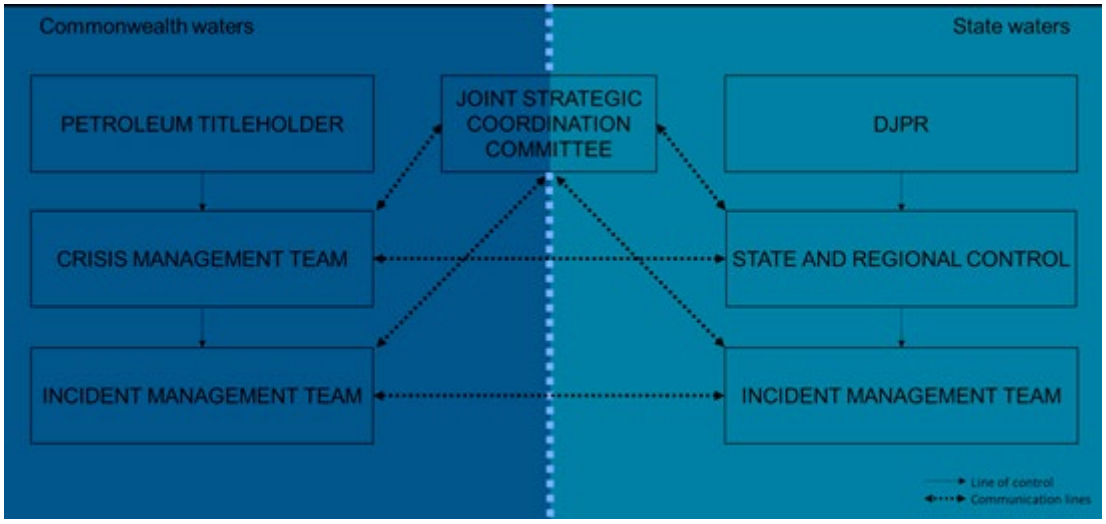


Figure 5.4: Joint Strategic Coordination Committee (Victoria) structure (DJPR, 2019).

The role of the JSCC is to ensure appropriate coordination between the respective IMTs established by multiple control agencies. The key functions of the JSCC include:

- Ensuring key objectives set by multiple IMTs in relation to the marine pollution incident are consistent and focused on achieving an effective coordinated response
- Resolving competing priorities between multiple IMTs
- Resolving competing requests for resources between the multiple IMTs, including those managed by Australian Maritime Safety Authority (AMSA), such as national stockpile equipment, dispersant aircraft and the National Response Team
- Resolution of significant strategic issues as they arise during the incident response
- Ensuring that there is a shared understanding of the incident situation and its meaning amongst all key stakeholders
- Ensuring there is agreement on how information is communicated to the public, particularly those issues that have actual or perceived public health implications
- Ensuring adequate coordination and consistency is achieved in relation to access and interpretation of intelligence, information and spill modelling to promote a common operating picture.

The JSCC will be administered by DJPR and the inaugural JSCC meeting will be convened by the State Controller Maritime Emergencies (SCME) once both Beach and DJPR formally assume the role of control agency in respective jurisdictions.

The JSCC will be jointly chaired by the SCME and the Beach CMT/EMT Leader, who will determine whom will sit in the committee for a coordinated response. As the relevant jurisdictional authority in Commonwealth waters, NOPSEMA may opt to participate in the JSCC as they see fit.

In a cross-jurisdictional marine pollution incident, DJPR and Beach shall each deploy an EMLO to corresponding IMTs for effective communication between DJPR and Beach. The role of the DJPR EMLO includes, but is not limited to:

- Represent DJPR and provide the primary contact for Beach, inter-agency and/or inter-State coordination
- Facilitate effective communications between DJPR's SCME and Incident Controller and the Beach CMT / EMT Leader
- Provide enhanced situational awareness to DJPR of the incident and the potential impact on State waters
- Facilitate the delivery of technical advice from DJPR to the Beach EMT Leader as required.

5.7 Roster

A roster is maintained for CMT Leaders and for full EMTs (inclusive of the WET). The roster is promulgated each Friday morning for the next twelve weeks and is kept on the Beach Energy Intranet 'Umbrella' in the 'Emergency Management' site. See link: Weekly EMT and CMT on-call roster [1]

All CMT, EMT and WET members (both primary and secondary) will make themselves available to the extent possible, acknowledging that alternates will be called if the primary is not contactable. Primary members will advise their alternate when they will not be available to respond.

CMT leaders, in the absence of either the primary or the secondary being available, must contact suitable persons within the organisation with the required subject matter expertise.

[1] https://hse.beachenergy.com.au/Weekly%20EMT%20oncall%20roster/Forms/AllItems.aspx

6 Responsibilities/Accountabilities

For Level 1 spills, the site ERT has responsibility for oil spill response and implementation of this OPEP.

For Level 2/3 spills, the Beach EMT Leader has responsibility for oil spill response and implementation of this OPEP in parallel with the Emergency Management Plan (EMP) (INT 1000 SAF PLN, CDN/ID 18025990).

Individual role and responsibility checklists for the EMT can be found in Appendix B of the EMP.

In the event of loss of containment/spill, the EMT Health, Safety & Environment (HSE) Leader becomes the 2nd In Command (2IC). (Appendix B. 2 of EMP)

Role-specific responsibilities for an offshore oil pollution emergency are detailed in the immediate actions and notifications (Section 3) of this OPEP.

For Level 3 spills, the CMT has responsibility for implementation of the Crisis Management Plan (CMP)

For Level Individual role and responsibility checklists for the CMT can be found in Appendix B of the CMP.

7 Net Environmental Benefit Analysis (NEBA)

The NEBA process is used to compare the likely positive and negative outcomes of various oil spill response options with respect to environmental sensitivities at risk from the spill or response activities. NEBA recognises that certain clean-up options may cause a net negative environmental impact in comparison to the impact of leaving the spill to disperse and weather naturally or alternative response options. The key objective is to identify the response options that will result in minimal impacts and maximum recovery of the environment, considering the specific sensitivities of the resources that have been prioritised for protection. The NEBA will be undertaken by the Control Agency.

A NEBA may be either 'strategic' (pre-spill event) or 'operational' (post-spill event).

The following steps allow for an effective NEBA to be conducted:

Step 1

a. Identify potential spill impact area based on incident specifics, trajectory modelling and observations. Within the predicted impact area, identify the key characteristics of the habitats. This can be based on field observation, aerial photos and local knowledge.

Step 2

a. Identify resources (human, ecological, economic etc) at risk at each of the different habitats within the impact area.

Step 3

a. Assess the potential impact from the spill on each of the resources at risk based on severity of impact and predicted recovery time. This is assuming no response to the spill.

b. A precautionary approach should be adopted, assuming that the entire site will be covered by oil and that this will persist at the site for at least 24 hours. However, in certain situations the behaviour of the spill may be more accurately predicted, and this information can be used when assessing potential impacts. The second assumption that must be agreed is whether the percentage of a species or resource impacted relates to the local (site), regional or even global (in the case of endangered species) population. This does not necessarily need to be consistently applied to all resources at the site. For example, it may be considered that if a resource is very abundant regionally then it is not significant enough at a particular site to warrant a high level of concern even though it may be seriously impacted at that site.

Step 4

a. Review the site-specific advantages and disadvantages of the different response options available, using natural recovery as a baseline. The predicted effect, likely impact and recovery time of the various response options on each of the resources must be assessed.

b. In the case of a hydrocarbon spill from Beach activities or operations within the Otway Basin impacting Victorian State waters and/or lands, it is expected that the Control Agency (DJPR) would undertake an operational NEBA, with support from Beach as requested, in determining the most appropriate response actions in accordance with the NatPlan or the VicPlan as applicable. Under the NatPlan, Environmental Science Coordinators contribute advice on likely environmental outcomes of each response option to the spill planning team based on a NEBA approach.

c. As part of the response planning process, Beach has conducted strategic NEBA (Table 10.2). As part of the due diligence process, Beach may also conduct an operational NEBA and would engage with the Control Agency regarding the results of that assessment and recommendations for response activities. Additionally, information from the NEBA may be used to help inform requirements for environmental monitoring relating to anticipated impacts from the spill and any response activities. Beach's operational NEBA assessment would be conducted by an environmental professional with experience in oil spill planning and response.

8 Response Areas and Onshore Priority Planning Areas

8.1 Response areas

To identify the response planning areas the following oil exposures were used adopted based on AMSA guidance:

- Offshore: A sea surface oil exposure of >25 g/m^2 as this represents the practical limit for surface response options; below this thickness, oil containment, recovery and chemical treatment (dispersant) become ineffective
- Onshore: A shoreline contact exposure of >100 g/m^2 as this represents the minimum thickness that does not inhibit the potential for recovery and is best remediated by natural coastal processes alone.

It is noted that within NOPSEMA Bulletin #1 Oil spill modelling (A652993) (NOPSEMA 2019) refers to >50 g/m^2 as a level to inform response planning, and therefore the use of >25 g/m^2 from stochastic modelling results is considered conservative.

For the spill scenarios as identified in Section 3.4, the response areas have been defined based on the outcomes of stochastic modelling (Figure 8.1).

Note there is no offshore response areas associated with the LOWC scenarios for the drilling or producing wells (i.e. there was no surface exposure above the >25 g/m^2 threshold predicted). Similarly, there is no onshore response area associated with the producing LOWC scenarios.

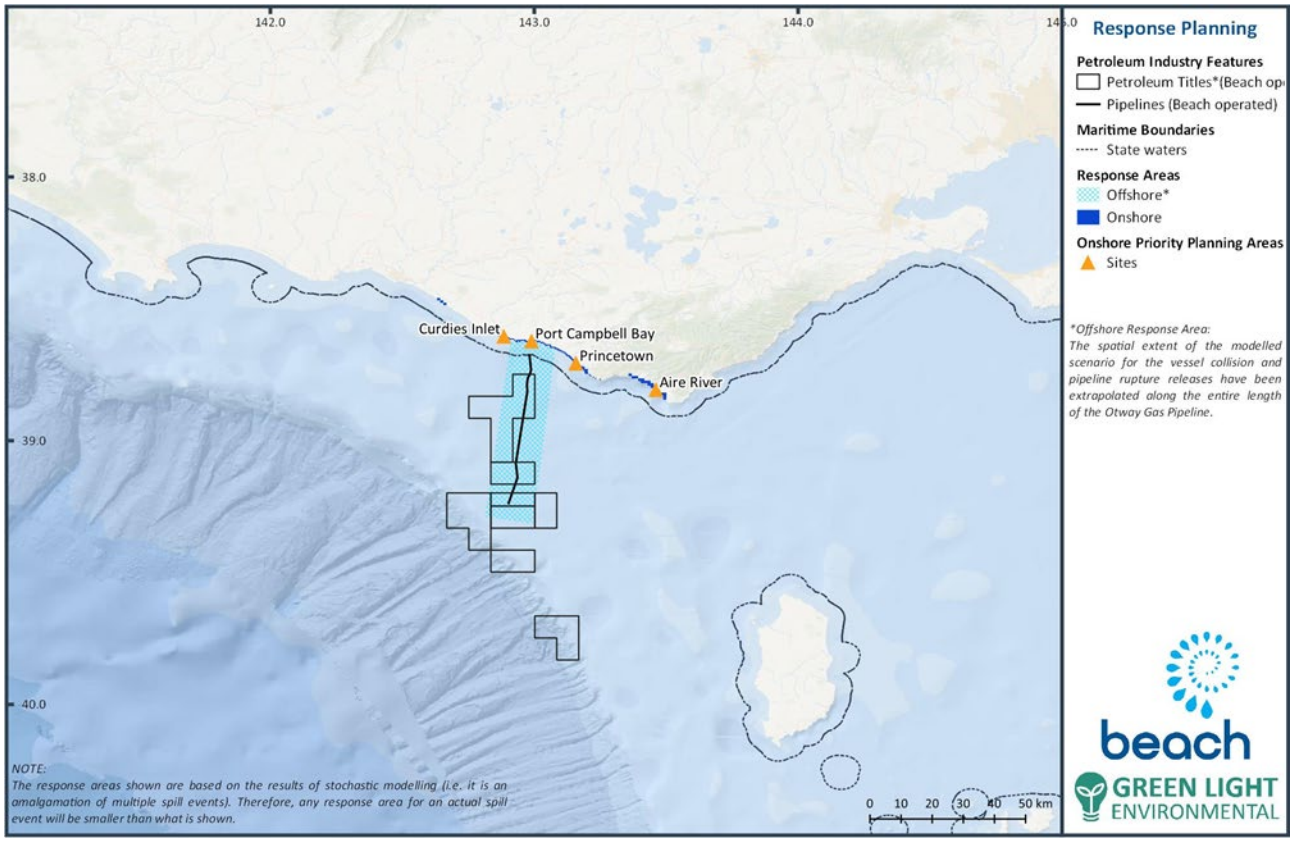


Figure 8.1: Response areas and onshore priority planning areas

8.2 Onshore priority planning areas

Within the onshore response areas, priority planning areas have been identified where the following two criteria are met:

- Predicted time to exposure is less than 7-days
- Sensitive environmental receptors are present in the intertidal/coastal zone:
  - National or internally important wetlands
  - Sheltered tidal flats
  - Mangrove or saltmarsh habitat
  - Known breeding/calving/nesting aggregation areas for protected fauna
  - Known breeding/haul-out areas for pinnipeds
  - Threatened ecological communities.

Note, the requirement for time to exposure is based upon the time required to plan and implement a response in this area, i.e. it is estimated to take approximately 5 days to develop and ground-truth a tactical response plan (TRP) and 24-48 hours to mobilise equipment and personnel to location.

The priority planning areas identified for spill scenarios that are relevant to the Otway Basin assets and activities are detailed in Table 8.1. A series of TRPs have been developed for these priority protection areas to assist in implementing a rapid response.

Table 8.1: Priority response planning areas

Priority response planning area	Sensitive environmental receptors
Aire River	• Wetland of national importance • Saltmarsh habitat
Princetown	• Wetland of national importance • Saltmarsh habitat • Nearshore TEC (Giant Kelp)
Port Campbell Bay	• Nearshore TEC (Giant Kelp)
Curdies Inlet	• Saltmarsh habitat

9 Environmental Monitoring

The Offshore Victoria Operational and Scientific Monitoring Plan (OSMP) provides a framework for Beach's environmental monitoring response to Level 2 and Level 3 offshore hydrocarbon spills from their petroleum activities undertaken in the Otway and Bass Basins.

Oil spill monitoring has been divided into two types:

- Operational monitoring which collects information about the spill and associated response activities to aid planning and decision making during the response or clean-up operations. Operational monitoring typically finishes when the spill response is terminated.

- Scientific monitoring (also known as Type II or recovery phase monitoring) which is focussed on non-response objectives and evaluating environmental impact and recovery from the spill and response activities. Scientific monitoring may continue for extended periods after a spill response is terminated.

Operational monitoring studies may be implemented in conjunction with relevant response strategies as described in this OPEP (e.g. Monitoring and Evaluation, Chemical Dispersants, Shoreline Clean-up and oiled wildlife response (OWR)).

10 Response Strategies

There are a number of response strategies which can be utilised in response to hydrocarbon spills, including:

- Source control
- Monitoring and evaluation
- Assisted natural dispersion
- Chemical dispersants
- Containment and recovery
- Protection and deflection
- Shoreline assessment and clean-up
- Oiled wildlife response.

Table 10.1 summarises the response options that are feasible and effective in response to the hydrocarbon types associated with the Otway Offshore activities.

Table 10.1: Response option feasibility and effectiveness by hydrocarbon type

Response Strategy	Hydrocarbon Type	Feasibility / Effectiveness	Implement	Justification
Source control	Gas Condensate & DMA	Feasible & effective	Yes	Always primary spill response strategy. Reduction in release volume has direct environmental benefit.
Monitor & evaluate	Gas Condensate & DMA	Feasible & effective	Yes	Both gas condensate and DMA will largely evaporate and disperse rapidly, a residual fraction of the hydrocarbon may spread to sensitive receptors. Monitoring and evaluation of the spill trajectory will provide information to inform other response strategies and monitoring requirements.
Assisted natural dispersion	Gas Condensate	Not feasible & not effective	No	Gas condensate will evaporate and disperse rapidly, therefore assisted natural dispersion will present no net environment benefit.
	DMA	Feasible but partially effective	Pending NEBA	DMA will evaporate and disperse rapidly. Depending on weather conditions, thickness of surface slick proximity to sensitive receptors this response may present a net environmental benefit.
Chemical dispersants	Gas Condensate & DMA	Feasible but not effective	Pending NEBA & only for VOC reduction	Not recommended for Group I oils such as condensate due to the very low viscosity and high volatility – generally no environmental benefit gained by the application of dispersant on Group I oils. Subsea dispersant injection (SSDI) may reduce volatile organic compounds (VOCs) at sea surface within the response area, therefore creating a safer work environment for responders.
	DMA	Feasible but not effective	No	Although "conditional" for Group II oil, the size of potential spill volume and the natural tendency of spreading into very thin films is evidence that dispersant application will be an ineffective

Response Strategy	Hydrocarbon Type	Feasibility / Effectiveness	Implement	Justification
				response. The dispersant droplets will penetrate through the thin oil layer and cause 'herding' of the oil which creates areas of clear water and should not be mistaken for successful dispersion (see ITOPF – Technical Information Paper No. 4: The Use of Chemical Dispersants to Treat Oil Spills).
Containment & recovery	Gas Condensate	Not feasible & not effective	No	High volatility of condensate creates inherent safety risks when attempting to recover mechanically. Logistically, gas condensate will evaporate faster than the collection rate of a thin surface film present. To be of value, contain and recover techniques are dependent on adequate oil thickness (generally in excess of 10 g/m^2)
	DMA	Not feasible & not effective	No	Low viscosity property allows for efficient containment by boom and recovery by oleophilic skimmers (i.e. komara disc skimmer) with ~90% hydrocarbon to water recovery rate. To be of value, contain and recover techniques are dependent on adequate oil thickness (generally in excess of 10 g/m^2), The normal sea state of the Otway basin does not provide significant opportunities to utilise this equipment.
Protection & deflection	Gas Condensate	Potentially feasible & partially effective	Pending NEBA	High volatility of condensate creates inherent safety risks when attempting to deflect mechanically. The normal sea state of the Otway Basin does not provide significant opportunities to utilise this equipment efficiently.
	DMA	Potentially feasible & partially effective	Pending NEBA	Low viscosity property allows for efficient protection and deflection with boom such as absorbent, zoom boom and beach guardian. The normal sea state of the Otway basin does not provide significant opportunities to utilise this equipment efficiently.
Shoreline assessment & clean-up	Gas Condensate	Potentially feasible & partially effective	Pending NEBA	Condensate is highly volatile and will evaporate naturally even if shoreline impact occurred. Potentially, more environmental impact would occur during clean-up operations depending on the shoreline type and sensitivities present. Shoreline assessment activities would occur if shoreline impact occurred.
	DMA	Potentially feasible & partially effective	Pending NEBA	The normal sea state of the Otway basin encourages natural processes with high energy wave action, wind and regular storm events. Potentially, more environmental impact would occur during clean-up operations depending on the shoreline type and sensitivities present. Shoreline assessment activities would occur if shoreline impact occurred.
Oiled wildlife response	Gas Condensate	Potentially feasible & partially effective	Yes	If oiling occurs in areas above the conservative environmental exposure threshold of >10g/m^2 for surface & >100g/m^2 for shoreline, oiled wildlife response may be effective. At the direction of State Control Agency, impacts to wildlife shall be monitored and oiled wildlife response implemented to affected wildlife as appropriate. Effectiveness of response option depends on affected species and habitat type.
	DMA	Potentially feasible & partially effective	Yes	

10.1 Strategic NEBA and Response Strategy Implementation

Table 10.2 summarises the response strategies that are relevant (based upon the extent of hydrocarbon exposure) and feasible or potentially feasible to implement for hypothetical spill scenarios associated with the Otway Offshore activities and a strategic pre-spill NEBA.

Table 10.2 : Response feasibility and strategic NEBA

Scenario	Hydrocarbon Type	Response	Strategic NEBA
Vessel Spill	DMA	Source Control	Yes, source control always considered to provide net environmental benefit by virtue of reducing the overall spill volume.
		Monitor & Evaluate	No direct net environmental benefit. Indirect benefit by informing response strategies.
		Assisted Natural Dispersion	Site-specific operational NEBA required prior to undertaking response option given variability in potential impact depending on location of spill in relation to marine ecology and habitats.
		Protect & Deflect	Yes, potential net environmental benefit to coastal habitats, coastal ecology and socio-economic receptors. Site-specific operational NEBA required prior to undertaking response option.
		Shoreline Clean-up	Yes, potential net environmental benefit to coastal habitats: sandy beaches & intertidal rocky platforms. Potential net benefit to shoreline birds and socio-economic receptors. Potential negative impact for coastal habitats: saltmarsh / seagrass & wetlands. Site-specific operational NEBA required prior to undertaking response option.
		Oiled Wildlife Response	Will occur (at the direction of State Control Agency) for all impacted species: cetaceans, pinnipeds, turtles & sea birds. Coastal ecology: shoreline birds, pinniped haul-out sites & penguin colonies.
Loss of Integrity Platform or Pipeline	Gas Condensate	Source Control	Yes, source control always considered to provide net environmental benefit by virtue of reducing the overall spill volume.
		Monitor & Evaluate	No direct net environmental benefit. Indirect benefit by informing response strategies.
Loss of Well Control	Gas Condensate	Source Control	Yes. Source control always considered to provide net environmental benefit by virtue of reducing the overall spill volume.
		Monitor & Evaluate	No direct net environmental benefit. Indirect benefit by informing response strategies.
		Chemical Dispersants	No direct net environmental benefit. Indirect benefit by potentially enabling a more effective source control operation and reducing safety risks for responders. Dispersant efficacy & VOC monitoring determines overall net benefit of applying dispersants.
		Protect & Deflect	Yes, potential net environmental benefit to coastal habitats, coastal ecology and socio-economic receptors. Site-specific operational NEBA required prior to undertaking response option.
		Shoreline Clean-up	Yes, potential net environmental benefit to coastal habitats: sandy beaches & intertidal rocky platforms. Potential net benefit to shoreline birds and socio-economic receptors. Potential negative impact for coastal habitats: saltmarsh / seagrass & wetlands. Site-specific operational NEBA required prior to undertaking response option.

Scenario	Hydrocarbon Type	Response	Strategic NEBA
		Oiled Wildlife Response	Will occur (at the direction of State Control Agency) for all impacted species: cetaceans, pinnipeds, turtles & sea birds. Coastal ecology: shoreline birds, pinniped haul-out sites & penguin colonies.

10.1.1 Source Control

Source control is the primary and most effective form of spill response. In the event of an offshore hydrocarbon spill, the feasibility of controlling the spill from the source should always be considered, giving due consideration to logistical constraints and safety implications.

Source control equipment and resources available to Beach in the event of a LOWC are detailed in Appendix B. 1.

10.1.1.1 Vessel

For a vessel spill at sea, the Vessel Master shall implement the Shipboard Marine Pollution Emergency Plan (SMPEP) or Shipboard Oil Pollution Emergency Plan (SOPEP) (equivalent to class).

10.1.1.2 Pipeline / Platform

System pressures are monitored via the distributed control system (DCS) onshore, and the platform and pipeline can be shut down via the DCS or emergency shut down (ESD) can be implemented from the platform.

10.1.1.3 Well Control

Restoring well control is the primary objective under a loss of well control scenario. The primary method of well control is via a dynamic well kill by intersecting the well bore below the release location via a relief well and circulating kill weight drilling fluid into the well bore, thus controlling the flow of hydrocarbons from the reservoir.

A summary of the primary source control strategies considered is described below. Prior to spud of the first well, Artisan-1, Beach energy will complete its feasibility assessment of feasible source control method including capping stacks (CSS) and offset installation equipment (OIE) and detail the recommended method as part of the well-specific Source Control Contingency Plans (SCCP):

- Artisan-1 Source Control Contingency Plan (SCCP) CDN/ID: S4810RD718250;
- Thylacine North-1 Source Control Contingency Plan (SCCP) CDN/ID: S4110AV718255;
- Thylacine West-1 Source Control Contingency Plan (SCCP) CDN/ID: S4110AD718258;
- Geographe-5 Source Control Contingency Plan (SCCP) CDN/ID: S4110AD718256
- Geographe-4 Source Control Contingency Plan (SCCP) CDN/ID: S4210AD718257
- Thylacine North-2 Source Control Contingency Plan (SCCP) CDN/ID: S4110AD718259
- Thylacine West-2 Source Control Contingency Plan (SCCP) CDN/ID: S4110AD718260

Capping stack systems have not proven to be effective in water depths less than 100m. This is due to the hazards relating to the deployment of a cap on a free flowing well. Alternative techniques like offset installation equipment (OIE) have been developed for wells at water depths of greater than 75m; however, these may still not be effective in the Otway Basin. Prior to the drilling of any well a Source Control Contingency Plan (SCCP), inclusive of the Relief Well Plan, will be developed. The SCCP will provide details of all realistic well control scenarios and will review the potential use of

capping stack and OIE technology on a case by case basis. If capping stack or OIE technology is shown to be a viable option, then it will form part of the SCCP.

Relief Well

Drilling a relief well is the primary source control strategy for wells in the Otway Basin. Each well, or group of similar wells, has a Relief Well Plan detailing: the relief well strategy for each well or group of similar wells, anticipated timeframes to drill a relief well and resources available to implement the relief well strategy.

Beach anticipate the mobilisation of an alternate MODU to the Otway Basin and the successful intersection of a flowing well would take approximately 86 days. Details of the source control methods applicable to the specific wells will be detailed in well-specific SCCP.

Capping

Drilling a relief well is considered the most feasible and safest response option to an uncontrolled hydrocarbon release scenario associated with Artisan-1 and the Thylacine wells. In the event of a LOWC, the deployment of a capping stack system may be done simultaneously with the drilling of a relief well.

Capping stack deployment is not the primary source control option for wells in the Otway Basin, however, a capping stack system (CSS) may be deployed vertically or from a location offset from the well when deployment conditions are suitable.

Capping stacks are stored in globally strategic locations, with the closest suitable stacks being in Singapore and South Africa. These conventional capping stacks have not been designed to operate in water depths of less than 100 m. To address this, OSRL have developed Offset Installation Equipment that assists in removing debris and installing capping stacks at depths of between 75 – 600 m. This specific offset installation equipment is deployable from Italy.

If deemed suitable, preparatory site work, mobilisation (from Singapore) to well site in the Otway Basin and deployment readiness is likely to take approximately 45 days for a conventional capping stack. Suitability of specific source control equipment will be detailed in the site-specific SCCP.

A Source Control Contingency Plan, inclusive of the well specific relief well plan and well kill modelling, will be developed using the International Oil and Gas Producers (IOGP) Report 594 guidance to ensure that Beach has considered the response requirements in order to:

- Reduce the time required to initiate relief well drilling operations in the event of a LOWC; and
- Allow the relief well to be completed in the shortest time practicable.

The Source Control Contingency Plan includes a detailed schedule with estimated times to:

- Source, mobilise and position a rig;
- Drill and intercept the well; and
- Complete the well kill successfully.

Debris Clearance

In order to install a capping stack, it may be necessary to clear debris away from the well site to enable access to subsea infrastructure. Debris clearance requires the deployment of ROVs with specialist cutting tools.

Chemical Dispersant Application

Whilst ineffective as a response option for dispersing gas condensate or diesel oil from the sea surface, subsea dispersant injection (SSDI) within the column of flowing hydrocarbons and/or the application of dispersants at surface may act to reduce volatile organic compounds (VOCs) within the response area, thereby enabling the implementation of well control strategies.

Potentially suitable chemical dispersants can be found on the Register of Oil Spill Control Agents (OSCA).

Monitoring dispersant efficacy to achieve the desired outcome is essential to ensure dispersant application is providing a net environmental benefit during a response.

10.1.2 Monitoring and Evaluation

Understanding the behaviour and trajectory of hydrocarbon slicks is required for L2 and L3 spill scenarios to confirm the potential for environmental harm from the spill. There are a number of methods that can be used to monitor and evaluate hydrocarbon spills including direct observation (surveillance by air, vessel or tracking buoys), manual calculations, or computer modelling. Each of these methods, including the triggers for their use, is discussed in the following sections.

10.1.2.1 Predicting spill trajectory

Manual calculations for estimation of spill trajectory will be used for an initial calculation in parallel with oil spill trajectory modelling (OSTM) to provide an accurate spill trajectory for the current weather conditions and type/volume of hydrocarbon spill.

For a L2 or L3 spill, trajectory modelling would be conducted based on real time spill and metocean data and this information would be used to refine the spill response planning and execution.

10.1.2.2 Aerial / Vessel surveillance

Estimation of hydrocarbon volume can be estimated using the Bonn Agreement Oil Appearance Code (BAOAC – Refer to Appendix D).

Aircraft provide a better platform than vessels for surveillance, and Beach would utilise this option in the event of a Level 2 or 3 spill to provide information on the location, extent, trajectory and spill volume estimate.

Fixed-wing aviation support available to Beach in the event of a L2/L3 spill is detailed in Appendix B. 3. Trained oil spill observers would be engaged from AMOSC to undertake the observations.

Aerial observations would be discontinued (with only shoreline surveillance remaining) once no areas of metallic sheen or true oil colour were observed as this would indicate that the slick thickness was less than 5 microns throughout and therefore poses little risk of environmental harm and is not amenable for any on-water or shoreline clean-up techniques.

10.1.2.3 Satellite Tracking Buoys

These units can be used to track the movement and extent of a spill. Beach will obtain these units from AMOSC if deemed required during a response and may be used in parallel with aerial surveillance to track the extent of a spill.

10.1.3 Protection and Deflection

Deflection equipment such as booms can be deployed to deflect slicks from encroaching on environmentally sensitive areas. Absorbent type booms are a suitable secondary protection measures at environmental sensitive sites. The feasibility and effectiveness of these measures is largely dependent on calm sea conditions allowing for the deployment of booms and this response option is only warranted where shoreline resources or offshore infrastructure are at risk.

Priority response areas are identified in Section 8.2.

Detailed Tactical Response Plans (TRPs) have been developed for priority protection areas.

All protection and deflection operations within State waters shall be under the direction of the State Control Agency. Beach will support protection and deflection operations as direct by State Control Agency.

10.1.4 Shoreline Clean-Up

Shoreline clean-up strategies must be developed in consideration of the shoreline character, resources at risk, and nature and degree of oiling. In general, other strategies are considered prior to shoreline clean-up due to the immediate environmental impact, heavy resource requirement, health and safety concerns (i.e. manual handling, heat stress, fatigue, etc), logistical complexities and waste management.

Shoreline clean-up of diesel or condensate is not generally feasible or beneficial in the high energy environments typical of the Victorian south coast, and any diesel would be highly weathered before it could make landfall and would be expected to have minimal environmental impacts.

The coastline of the Otway Basin is dominated by sheer sandstone cliffs with small and remote beaches which experience frequent heavy surf and swell. These locations rarely have vehicle that would allow for the deployment of clean-up equipment and teams. Any hydrocarbons on these shorelines will likely weather rapidly and be broken down by natural processes.

In the event shoreline impact, DJPR would be the State Control Agency for the response within Sate waters or lands. Beach would support the response option as directed.

10.1.5 Oiled Wildlife Response (OWR)

10.1.5.1 Victorian State waters

DELWP is the agency responsible for responding to wildlife affected by a marine pollution emergency in Victorian State waters. If an incident which affects or could potentially affect wildlife occurs in Commonwealth waters close to Victorian State waters, AMSA will request support from DELWP to assess and lead a response if required. DELWP's response to oiled wildlife is undertaken in accordance with the Wildlife Response Plan for Marine Pollution Emergencies (draft).

Beach will provide support for the response through provision of resources as requested by DELWP utilising existing contracts such as AMOSC.

AMOSC maintains oiled fauna kits.

Both DELWP and AMSA have local and regional oiled wildlife response capability that may be activated under the direction of DELWP.

Personnel may also be deployed under the direction of DELWP to undertake wildlife response activities in State jurisdiction.

DELWP responds to oiled wildlife notifications and has identified the following steps which must be taken when reporting wildlife affected by an oil spill:

1. Notify the DJPR State Duty Officer on 0409 858 715 and the DELWP State Agency Commander on 1300 13 4444 immediately.
2. Notify AMSA (02 6230 6811) if the oil spill occurs in Commonwealth waters and wildlife is affected.
3. Determine the exact location of the animal and provide accurate directions. Maintain observation until DELWP can deploy staff to the site.
4. Take response actions only as advised by DELWP or AMSA:
    - Determine the exact location of the animal for accurate directions for appropriately trained wildlife response personnel. Maintain observation and keep people, dogs and wildlife scavengers away until trained rescuers have arrived.
    - Avoid handling or treating injured wildlife as this may cause further stress and poses a safety risk to untrained handlers.

10.1.5.2 Tasmanian State Waters

The Tasmanian Oiled Wildlife Response Plan (WildPlan) is administered by the Resource Management and Conservation Division of the DPIPWE and outlines priorities and procedures for the rescue and rehabilitation of oiled wildlife.

Wildlife rescue kits are held at the Hobart and Launceston DPIPWE offices.

To activate oiled wildlife response, contact Natural and Cultural Heritage Division (OWR) on (03) 6165 4396

10.2 Waste Management

10.2.1 Disposal of Waste

Of the modelled worst-case discharge scenarios, only a near-shore diesel spill from a vessel collision of a full LOWC from Artisan-1 well location is predicted to result in actionable thresholds of shoreline hydrocarbon exposure. Likewise, these scenarios also have the potential for waste generation from oiled wildlife response.

10.2.2 Waste Management Methodology

This section provides context for the potential scale of waste that may be generated during oil pollution response operations.

During clean-up and oil recovery operations, the type and amount of waste generated will depend on the location and recovery method (see Table 10.3).

Table 10.3: Waste volume calculation

Location	Hydrocarbon : Waste volume	Comments
Offshore recovery	1 : 3	Inefficiency of recovery systems causing higher levels of water to oil ratio intake
Shoreline clean-up	1 : 10-20	Significant increase in waste volume due to collection of surrounding environment

In the event of a clean-up operation, temporary waste handling bases will be set up at designated staging areas such as Port Welshpool. Beach in conjunction with its current waste management contractor will determine the suitability of temporary storage facilities for the collected hydrocarbons and oily debris. Table 10.4 summarises packing, storing and disposal of different types of waste that Beach's EPA licensed waste contractor, can support.

The transport of waste material may be required at sea, from sea to land and on land to on land, liquid transport trucks, flatbed trucks, dump trucks and gully suckers can be utilised to transport waste material through Beach's licensed waste contractor.

Table 10.4: Waste category, storage, disposal and treatment options

Waste category	Packing & temporary onsite storage	Disposal & treatment[5]
Oiled Liquids	Oil field tanks (fast tanks) IBC Tank trucks Livestock tanks Sealed oil drums Lined skips/pits[1]	Recovery and recycling Bioremediation/land farming[3] Incineration/land filling[2]
Oiled man-made materials	Lined skips Lined earthen pits or berms[1] Industrial waste bags Plastic trash bags Sealed-top drums	Recovery and recycling Incineration/land filling[2]
Oiled naturally occurring organic materials	Lined skips Lined earthen pits or berms[1] Industrial waste bags Plastic trash bags Sealed-Top drums	Recovery and recycling Bioremediation/land farming[3] Incineration/land filling[2]
Oiled dead wildlife/birds[4]	Industrial waste bags Plastic trash bags	Incineration/land filling[2]

1. Lined pits for the storage of oiled wastes cannot be constructed within a National Park due to the sensitivity of the location. The potential impacts on subterranean fauna and aquifers must be considered at all other locations.
2. Incineration and land filling will only occur at appropriately licensed waste disposal facilities
3. Suitable areas to be identified in consultation with local and state authorities.
4. Wildlife and birds are collected by those trained in wildlife recovery. All dead wildlife and birds must be segregated. Some wildlife carcasses may need to be retained for scientific purposes. DELWP and/or DPIPWE will provide direction if this is required.
5. Sorted by most preferred to least preferred method

11 Spill Response Environmental Performance Outcomes, Standards & Measurement Criteria

Table 11.1: Spill Response Environmental Performance Outcomes, Standards and Measurement Criteria

Environmental Performance Outcome	Environmental Performance Standard	Responsible Person	Measurement Criteria
Source Control			
Isolation of spill source & cessation of spill to sea from vessel spill	**SOPEP/SMPEP** Beach requires all vessels contracted within the Otway Basin to have an SOPEP / SMPEP (appropriate to class).	Vessel Owner / Operator	Vessel contracts Pre-mobilisation inspection records
Beach has source control plans in place	**Source Control Plans** Beach shall have: • A NOPSEMA accepted WOMP for all wells prior to drilling and throughout the production phase; • A Source Control Contingency Plan (SCCP) consistent with International Oil and Gas Producers (IOGP) Report 594 - Subsea Well Source Control Emergency Response Planning Guide for Subsea Wells (Jan, 2019). • A relief well plan for all wells, or groups of similar wells prior to drilling and throughout the production phase.	Offshore Wells Manager	Documented NOPSEMA accepted WOMP Documented SCCP Documented Relief Well Plans
Beach maintains capability to effectively implement well control	**Well Control Resources** Beach shall maintain contractual agreements with response organisations for direct or indirect access to: • Well control specialists (including capping stack capability); • ROV contractors; • Vessel broker for access to suitable response vessels; • Debris clearance equipment; • Chemical dispersants and application equipment; and • MODUs	Offshore Wells Manager	Well Control Bridging Document with Rig Contractor Well Control Specialist contract(s) in place AMOSC contract in place with option to access ORSL equipment Vessel / MODU Broker reports
Beach tests source control capability	**Spill Response Exercises** Beach shall undertake a desktop source control exercise at least annually.	Crisis, Emergency & Security Advisor	Exercise records including annual source control capability testing
Beach responds in a timely manner	**Response Timing** Beach shall: • Mobilise Well Control Specialists to Adelaide within 3 days of a L3 LOWC event; • Have a capping stack system (CSS) ready for deployment on site within 45 days if considered a feasible response option for the specific LOWC event; • Develop a mobilisation plan for the OIE prior to drilling and where the use of OIE could be required; and • Drill a successful relief well within 86 days of a L3 LOWC event occurring.	Wells Emergency Team	Records confirm Beach has developed a mobilisation plan for the OIE prior drilling activities where the use of OIE could be required. Mobilisation records confirm: • Well Control Specialist on site within 3 days; • CSS prepared for deployment within 45 days; • Well fully controlled within 86 days
Beach controls the use of chemical dispersants	**Dispersant Application** Beach shall: • Only use chemical dispersants to reduce VOCs within the source control response area; • Only use dispersants on the Register of Oil Spill Control Agents; • Monitor dispersant efficacy for reducing VOCs to below lower explosive limits (LVLs) within the response area; and • Cease dispersant application if dispersant found to be ineffective for reducing VOCs to below LVLs within the response area; when there is no health and safety risk to response personnel from VOCs; and when the well is controlled.	EMT Lead	Incident Action Plan (IAP) Monitoring records including VOC measurements Incident records including dispersant type & usage

Environmental Performance Outcome	Environmental Performance Standard	Responsible Person	Measurement Criteria
Beach monitors the effectiveness of dispersants	**Operational Monitoring** Beach will implement the following operational monitoring in alignment with the Offshore Victoria Operational and Scientific Monitoring Plan: • Study O4: Dispersant efficacy	HSE Lead	Monitoring records
Monitoring and Evaluation			
Beach maintains capability to effectively implement monitoring & evaluation	**Monitoring & Evaluation Resources** Beach Energy shall maintain contractual agreements with response organisations for direct or indirect access to: • AMOSC trained observers; • AMOSC equipment; • Fixed-wing aircraft; • Surveillance vessels; and • OSTM Consultants	Crisis, Emergency & Security Advisor	AMOSC contract in place Aviation contracts in place OSTM contract in place Vessel / MODU Broker reports
Risks managed from monitoring & evaluation	**Risk Assessment** In consultation with State Control Agency and relevant stakeholders, and prior to undertaking monitoring & evaluation operations, Beach will undertake a risk assessment (Beach's Risk Assessment Process will be used unless otherwise directed) and mitigate potential impacts to: • Marine fauna including listed migratory species; • Commercial shipping; • Aviation; and • Socio-economic receptors	EMT Lead	Documented risk assessment Consultation records
Beach implements monitoring & evaluation to inform spill response for L2/3 spills	**Implement Monitoring & Evaluation** Beach will implement monitoring and evaluation (as per s10.1.2 or as directed by the Control Agency) during a L2/L3 oil pollution emergency or as requested by State Control Agency where state waters are, or have the potential to be, impacted.	EMT Lead	Incident records
Shoreline Clean-up			
Beach maintains capability to effectively assess shorelines and implement shoreline clean-up	**Shoreline Clean-up Resources** Beach Energy shall maintain contractual agreements with response organisations for direct or indirect access to: • AMOSC Core Group response personnel; • AMOSC equipment • Waste management contractors & licenced waste facilities; and • Scientific monitoring consultants	Crisis, Emergency & Security Advisor	AMOSC contract in place Waste Management contract in place Scientific monitoring consultant contract in place
Shoreline Assessment undertaken	**Shoreline Assessment** In consultation with State Control Agency, an assessment will be undertaken of affected and potentially affected shorelines.	HSE Lead	Shoreline assessment records
Operational monitoring undertaken	**Operational Monitoring** Beach will implement, via scientific monitoring consultants, the following operational monitoring in alignment with the Offshore Victoria Operational and Scientific Monitoring Plan: • Study O2: Hydrocarbon on shorelines; and • Study O3: Oiled wildlife surveillance	HSE Lead	Monitoring records indicate monitoring undertaken in accordance with NOPSEMA accepted OSMP.
Shoreline clean-up present net environmental benefit	**NEBA** Beach will jointly undertake a NEBA with State Control Agency and only implement shoreline clean-up where a net environmental benefit is agreed with the Control Agency.	HSE Lead	Documented NEBA Communications records

Environmental Performance Outcome	Environmental Performance Standard	Responsible Person	Measurement Criteria
Risks managed from shoreline clean-up operations	**Risk Assessment** In consultation with State Control Agency and relevant stakeholders, and prior to undertaking shoreline clean-up operations, Beach will undertake site-specific risk assessment and mitigate potential impacts to: • Shoreline habitats; • Shoreline communities; • Oiled wildlife; • Cultural heritage sites; and • Socio-economic receptors	EMT Lead	Documented risk assessment
Relevant access authority obtained	**Site Access** In consultation with State Control Agency, access authority from relevant stakeholders shall be obtained prior to undertaking shoreline clean-up operations.	EMT Lead	Records of access authority
Tactical Response Plans developed	**Tactical Response Plans** Tactical Response Plans shall be developed for all priority protection areas where predicted shoreline hydrocarbon loading exceeds 100 g/m^2 within 7 days.	Crisis, Emergency & Security Advisor	Documented TRPs for all priority protection areas
Scientific monitoring undertaken	**Scientific Monitoring** Beach will implement the following scientific monitoring in alignment with the Offshore Victoria Operational and Scientific Monitoring Plan: • Study S2: Shoreline sediments impact assessment; and • Study S5: Wildlife impact assessment	HSE Lead	Monitoring records indicate monitoring undertaken in accordance with NOPSEMA accepted OSMP.
Oiled Wildlife Response			
Beach maintains capability to effectively implement oiled wildlife response	**Oiled Wildlife Resources** Beach Energy shall maintain contractual agreements with response organisations for direct or indirect access to: • AMOSC Core Group response personnel; • AMOSC equipment (OWR kit) • Waste management contractors & licenced waste facilities; and • Scientific monitoring consultants	Crisis, Emergency & Security Advisor	AMOSC contract in place Waste Management contract in place Scientific monitoring consultant contract in place
Required notifications undertaken	**Notifications** Beach will notify Sate Control Agency (DJPR), DELWP and AMSA as soon as possible after a spill that has, or has the potential to, affect wildlife.	Communications Lead	Communications records
Operational monitoring undertaken	**Operational Monitoring** Beach will implement, via scientific monitoring consultants, the following operational monitoring in alignment with the Offshore Victoria Operational and Scientific Monitoring Plan: • Study O3: Oiled wildlife surveillance	HSE Lead	Monitoring records
Shoreline clean-up present net environmental benefit	**NEBA** Beach will jointly undertake a NEBA with State Control Agency (DJPR) and DELWP and only implement oiled wildlife response where a net environmental benefit is agreed with the DELWP.	HSE Lead	Documented NEBA Communications records
Risks managed from shoreline clean-up operations	**Risk Assessment** In consultation with State Control Agency, DELWP and relevant stakeholders, and prior to undertaking oiled wildlife response, Beach will undertake site-specific risk assessment and mitigate potential impacts to: • Shoreline habitats; • Shoreline communities; • Oiled wildlife;	EMT Lead	Documented risk assessment Consultation records

Environmental Performance Outcome	Environmental Performance Standard	Responsible Person	Measurement Criteria
	• Cultural heritage sites; and • Socio-economic receptors		
Authority to handle wildlife obtained	**Fauna Handling** In consultation with DELWP, only authorised responders shall handle and treat oiled wildlife.	HSE Lead	Consultation records Licencing records.
Scientific monitoring undertaken	**Scientific Monitoring** Beach will implement the following scientific monitoring in alignment with the Offshore Victoria Operational and Scientific Monitoring Plan: • Study S5: Wildlife impact assessment	HSE Lead	Monitoring records indicate monitoring undertaken in accordance with NOPSEMA accepted OSMP.
Waste Management			
Waste management appropriate	**Waste Management Plan** Site-specific waste management plans will be developed in consultation and agreement with the EPA, DJPR EMB and the land custodian / owner.	HSE Lead	Documented Waste Management Plan Consultation records
Waste storage appropriate	**Waste Storage** Waste storage arrangements will be agreed with the Beach Waste Management Contractor in consultation and agreement with the EPA, DJPR EMB and the custodian / owner and will be: • Fully bunded; • Secured; and • Supervised	HSE Lead	Documented Waste Management Plan Consultation records
Waste disposal appropriate	**Waste Facility** Wastes will be segregated and manifested to ensure they are sent to an appropriately licenced waste facility as agreed with the EPA.	HSE Lead	Documented waste manifest Licenced waste Contractors & waste facilities. Consultation records
Waste transport appropriate	**Waste Transport** Wastes will be transported by correctly permitted vehicles to licenced waste facilities in accordance with Victorian Environment Protection Authority (EPA) requirements.	HSE Lead	Documented waste manifest Licenced waste transporters Consultation records

12 On-Going Response Preparedness and Exercises

12.1 OPEP Review

The plan shall be reviewed and updated as necessary in response to one or more of the following:

- annually
- when major changes which may affect the Oil Spill Response coordination or capabilities have occurred
- routine testing of the plan if gaps are identified within the plan
- after an actual emergency
- if Beach's spill risk profile changes significantly due to additional activities or operations.

The review of the plan shall consider external influences including:

- change in any relevant legislation
- advice from the government relating to the conservation of listed species
- updates to State or Australian Marine Park management plans
- changes in fisheries management or other socio-economic features of the environment
- new knowledge about the receiving environment in bioregional profiles or published scientific literature that may contribute to environmental baselines or data collection methods
- change in State or Commonwealth oil spill response arrangements and resources.

12.2 Testing Arrangement

In accordance with Regulation 14 (8A) & (8C) of the OPGGS(E) Regulations the response arrangements within this OPEP will be tested:

- when they are introduced
- when they are significantly amended
- not later than 12 months after the most recent test
- if a new location for the activity is added to the EP after the response arrangements have been tested, and before the next test is conducted – testing the response arrangement in relation to the new location as soon as practicable after it is added to the plan
- 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.

The effectiveness of response arrangements will be measured by the performance standards detailed in Table 11.1 for each exercise type. Exercises will be documented, and corrective actions/recommendations tracked to closure.

A log shall be maintained during all oil pollution response exercises including a record of the effectiveness and timeliness of the response against the objectives of the exercise.

Where objectives are not met, or potential improvements have been identified during an exercise, these learnings shall be recorded and retained for inclusion into the subsequent revision of this OPEP.

Where significant deficiencies are identified in the effectiveness or timeliness of response arrangements as identified within this OPEP, this OPEP shall be updated within one month of the exercise to address the identified issues

As required by the Environment Regulation 14(8A), the testing must relate to the nature and scale of the risk of oil pollution relevant to the activity.

Testing arrangements appropriate to the nature and scale of each activity covered by this OPEP are included in Table 12.1. In accordance with Regulation 14 (8C) (d) and (e), these arrangements are also designed to provide for:

- the various locations of Beach facilities and activities in the Otway Basin.
- response arrangements in relation to each of the facilities and activities.

Not all spill preparedness and response testing environmental performance outcomes will be tested simultaneously. The frequency of testing will relate to the potential spill level, spill risk and complexity of response.

Table 12.1: Spill Preparedness and Response Testing Environmental Performance Outcome, Standards and Measurement Criteria

Environmental Performance Outcome	Environmental Performance Standard	Testing Frequency	Responsible Person	Measurement Criteria
Vessel Operations (Level 1 / 2 spill)				
Response systems functioning	Emergency communications with offshore vessels when new to field	Prior to arrival in field	Beach Contract Owner	Exercise records confirm effective communications
Procedures in place and appropriate	Validation of vessel SOPEP / SMPEP	Prior to arrival in field	Beach Contract Owner	Vessel inspection / audit records confirm SOPEP / SMPEP in place
	OPEP / OSMP Effectiveness of OPEP & OSMP in guiding spill response and remediation of vessel spill tested by EMT	Annually	Crisis, Emergency & Security Advisor	Exercise records confirm OPEP / OSMP effective
	ERP Effectiveness of ERP tested in guiding EMT to fulfil roles and responsibilities tested	Annually	Crisis, Emergency & Security Advisor	Exercise records conform all EMT able to fulfil allocated roles & responsibilities
Contractual arrangements in place to obtain equipment & people	Contractual arrangements with L2 service providers validated	Annually	Crisis, Emergency & Security Advisor	All required contracts in place

Environmental Performance Outcome	Environmental Performance Standard	Testing Frequency	Responsible Person	Measurement Criteria
Equipment available in a timely manner	Equipment stock levels and deployment times from AMOSC validated (desktop)	Annually	Crisis, Emergency & Security Advisor	Written confirmation of AMOSC capability
Appropriately trained people available	Validation environmental monitoring Specialists capability continues to meet Beach requirements based upon company spill risk profile (desktop)	Upon contract renewal	Crisis, Emergency & Security Advisor	Written confirmation of Environmental Consultant capability to implement OSMP / OSMPIP
	Internal and external training requirements for EMT validated (desktop)	Annually	Crisis, Emergency & Security Advisor	Training records in place and meet capability requirements
Pipeline and Platform Operations (Level 1 / 2 spill)				
Response systems functioning	Emergency communications will be tested between ERT and EMT	Annually	Crisis, Emergency & Security Advisor	Exercise records confirm effective communications
	Emergency notifications between EMT and Regulator(s) tested (including regulatory timeframes)	Annually	Crisis, Emergency & Security Advisor	Exercise records confirm effective communications and notification timeframes met
Procedures in place and appropriate	OPEP / OSMP Effectiveness of OPEP & OSMP in guiding spill response and monitoring of pipeline rupture or release from platform by EMT	Annually	Crisis, Emergency & Security Advisor	Exercise records confirm OPEP / OSMP effective
	ERP Effectiveness of ERP tested in guiding EMT to fulfil roles and responsibilities tested	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records conform all EMT able to fulfil allocated roles & responsibilities
Contractual arrangements in place to obtain equipment & people	Contractual arrangements with L2 service providers validated	Annually	Crisis, Emergency & Security Advisor	All required contracts in place
Equipment available in a timely manner	Equipment stock levels and deployment times from AMOSC validated (desktop)	Annually	Crisis, Emergency & Security Advisor	Written confirmation of AMOSC capability
Appropriately trained people available	Internal and external training requirements for EMT validated (desktop)	Annually	Crisis, Emergency & Security Advisor	Training records in place and meet capability requirements
Drilling (Level 2 / 3 LOWC)				
Response systems functioning	Emergency communications between the MODU and EMT tested	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records confirm effective communications
	Emergency notifications between EMT and Regulator(s) tested (including regulatory timeframes)	Prior to each offshore drilling campaign and annually	Crisis, Emergency & Security Advisor	Exercise records confirm effective communications and notification timeframes met

Environmental Performance Outcome	Environmental Performance Standard	Testing Frequency	Responsible Person	Measurement Criteria
	Communication systems and methods between CMT / EMT Leader / EMT members tested	Prior to each offshore drilling campaign and annually	Crisis, Emergency & Security Advisor	Exercise records confirm effective communications
	OSTM arrangements tested	Prior to each offshore drilling campaign and annually	Crisis, Emergency & Security Advisor	Exercise records confirm ability to initiate OSTM
Procedures in place and appropriate	OPEP / OSMP Effectiveness of OPEP & OSMP in guiding spill response and remediation of LOWC tested by EMT	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records confirm OPEP / OSMP effective
	ERP Effectiveness of ERP tested in guiding EMT to fulfil roles and responsibilities tested	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records conform all EMT able to fulfil allocated roles & responsibilities
	Relief Well Plan Relief well readiness tested as per arrangement in relief well plan.	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records confirm relief well plan in place & tested
Contractual arrangements in place to obtain equipment & people to respond to a L2 / L3 LOWC	Contractual arrangements with L2/L3 service providers validated	Prior to each offshore drilling campaign and annually	Crisis, Emergency & Security Advisor	All required contracts in place
Equipment available in a timely manner to respond to a L2 / L3 LOWC	L2 / L3 response equipment availability, condition and mobilisation readiness validated (desktop)	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records confirm equipment available, in serviceable condition & ready for mobilisation.
	Logistics pathways for mobilisation & deployment of L2 / L3 equipment, including support vessels and suitable MODUs validated (desktop)	Prior to each offshore drilling campaign	Crisis, Emergency & Security Advisor	Exercise records confirm logistics pathways open and likely to facilitate deployment within anticipated timeframes
Appropriately trained people available to respond to a L2 / L3 LOWC	Validation Well Control Specialists capability continues to meet Beach requirements based upon company spill risk profile (desktop)	Prior to each offshore drilling campaign & upon contract renewal	Crisis, Emergency & Security Advisor	Written confirmation of Well Control Specialists capability
	Validation environmental monitoring Specialists capability continues to meet Beach requirements based upon company spill risk profile (desktop)	Prior to each offshore drilling campaign & upon contract renewal	Crisis, Emergency & Security Advisor	Written confirmation of Environmental Consultant capability to implement OSMP / OSMPIP
	Internal and external training requirements for EMT validated (desktop)	Prior to each offshore drilling campaign and annually	Crisis, Emergency & Security Advisor	Training records in place and meet capability requirements

13 Training and Competency

All personnel who have been assigned Beach EMT roles (including Alternates) are required to be conversant with their roles and associated responsibilities as defined within the EMP.

All personnel with specific roles or responsibilities within the Beach CEM Framework shall receive appropriate levels of training and ongoing development commensurate with the responsibility and associated accountabilities required of each EMT position.

A Crisis and Emergency Management Team Capability Matrix is updated by the Crisis, Emergency and Security (CES) Advisor and managed by the Senior Capability Advisor. A summary of oil spill training and competency requirements for CMT & EMT personnel is provided in Table 13.1.

Table 13.1: Training Requirements

Course Name	CMT– Specific Training	Individual OPEP / OSMP Awareness	Fundamentals of Emergency Management (EM), EMT role/responsibility training	Management (IMO L 2)	Command & Control (IMO L3)	AIIMS process
Internal / External	Internal / External	Internal	Internal	External	External	Internal
CMT Members	✓					
EMT Leader		✓	✓			✓
EMT Production		✓	✓			
EMT Wells		✓	✓			
WET		✓	✓			
EMT Planning		✓	✓			
EMT Information Coordinator		✓	✓			
EMT Scribe		✓	✓			
EMT Health, Safety & Environment		✓	✓	✓		
Oil Spill Response		✓	✓	✓	✓	
EMLO		✓	✓	✓	✓	✓
EMT Logistics		✓	✓			
EMT Human Resources		✓	✓			
EMT Communications		✓	✓			
Operations Manager			✓			
Otway Production Manager			✓			
Thylacine PIC			✓			

14 Record keeping

All consultation correspondence, written reports (including monitoring, audit and review reports) such as emergency exercise logs used to record the effectiveness and timeliness of the response against the objectives of the exercise, or any other record relating to the environmental performance of this OPEP must be retained for a minimum of 5 years following the cessation of activities within the scope of this OPEP.

All records must be stored in a way that makes retrieval of the document or record reasonably practicable.

15 List of Abbreviations

Definitions of terms used in this document:

Abbreviation	Definition
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
BCP	Blow-out Contingency Plan
CEM	Beach Emergency's Crisis and Emergency Management Framework
CMP	Crisis Management Plan
CMT	Crisis Management Team
CSS	Capping Stack System
CxT	Crisis Communications Team
DCS	Distributed Control System
DELWP	(Victorian) Department of Environment, Land, Water and Planning
DJPR EMB	(Victorian) Department of Jobs, Precincts and Regions – Emergency Management Branch
DJPR ERR	(Victorian) Department of Jobs, Precincts and Regions – Earth Resources Regulation
DPIPWE	(Tasmanian) Department of Primary Industries, Parks, Waters and Environment
EMBA	Environment that May be Affected
EMLO	(Beach) Emergency Management Liaison Officer
EMT	Emergency Management Team
EP	Environment Plan
EPA	Environmental Protection Authority
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESD	Emergency Shut Down
HSE	Health, Safety, and Environment
IMT	Incident Management Team
IT DR	Business Continuity and IT Disaster Recovery
JSCC	Joint Strategic Coordination Committee
LOWC	Loss of Well Control
MD	Managing Director
National Plan	National Plan for Maritime Environmental Emergencies
NEBA	Net Environmental Benefit Analysis
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
NRC	National Response Centre
OIE	Offset Installation Equipment
OSMP	Operational & Scientific Monitoring Plan

Abbreviation	Definition
OSMIP	Operational & Scientific Monitoring Implementation Plan
OSRL	Oil Spill Response Limited
OSTM	Oil Spill Trajectory Model
OWR	Oiled Wildlife Response
POLREP	Marine Pollution Report
SCCP	Source Control Contingency Plan
SCME	State Controller Maritime Emergencies
SIRT	Subsea Incident Response Toolkit
SITREP	Marine Pollution Situation Report
SMPEP	Shipboard Marine Pollution Emergency Plan
SOPEP	Shipboard Oil Spill Pollution Emergency Plan
SSDI	Subsea Dispersant Injection
VOC	Volatile Organic Compounds
WET	Wells Emergency Team
WOMP	Well Operations Management Plan

Appendix A Emergency Contacts Directory (Current 23rd July 2019)

A. 1. External Contacts

A. 1. 1 Regulatory Contacts

Regulator	Contact	Phone	E-Mail
AMSA	Marine oil pollution	1800 641 792	mdo@amsa.gov.au https://www.amsa.gov.au/about/contact-us
DoEE	Director of National Parks	02 6274 2220	
	Switchboard	02 6274 1111	
NOPSEMA	Emergency	08 6461 7090	submissions@nopsema.gov.au
NOPTA	Titles		titles@nopta.gov.au & info@nopta.gov.au
Tas DPIPWE	Pollution Hotline	+61 (0)3 6165 4599 or 1800 005 171 (within Tasmania only) Radio: TasPorts Vessel Traffic Services VHF radio channel 16/14/12 Call sign "relevant port name VTS"	incidentresponse@epa.tas.gov.au
	Whale Hotline	0427942537	
	Natural and Cultural Heritage (OWR) Division	(03) 6165 4396	Kathryn.Lambert@dpipwe.tas.gov.au
Vic DJPR	General	13 61 86	customer.service@ecodev.vic.gov.au
	State Duty Officer	0409 858 715 (24/7)	sccvic.sdo.dedjtr@scc.vic.gov.au & semdincidentroom@ecodev.vic.gov.au
	West of Cape Otway – Portland Region	(03) 5525 0900	
	East of Cape Otway – Port Philip Region	(03) 9644 9777	
	Compliance South West Team	0419 597 010 ERR Duty Officer	Compliance.Southwest@ecodev.vic.gov.au
Vic DELWP	State Control Centre	1300 134 444	sscviv.scmdr.delwp@scc.vic.gov.au
	Customer Service Centre	136186	
Vic Port of Portland	Duty Officer	(03) 5525 0999	
Vic Gippsland Ports	Duty Officer	(03) 5150 0500	

A. 1. 2 Responder Contacts

Responder	Function	Contact	Phone	E-Mail
Adagold Aviation Pty Ltd	Fixed-wing aviation support		1800 767 747	
AMOSC	Spill Response - all		0438 379 328	
AMSA	Spill Response - vessel		1 800 641 792	
Boots and Coots (Halliburton) (Australia, New Zealand, Papua New Guinea, Timor Leste)	Well Control Specialist	Level 27, 140 St. Georges Terrace Perth WA 6000 Australia	Perth: +61 8 9455 8300 or 24/7: +1-281-931-8884 or 1-800-BLOWOUT	
Bristow	Helicopter support		(03) 5991 9591	
Cudd Well Control (Houston)	Well Control Specialist	Headquarters: Cudd Well Control 2828 Technology Forest Blvd. The Woodlands, TX 77381	T: 713.849.2769 F: 713.849.3861	cwcinfo@cudd.com

A. 1. 3 Consultant Contacts

Consultant	Service	Contact	Phone	E-Mail
BMT	OSMP implementation	Level 4 20 Parkland Rd Osborne Park Western Australia 6017	+61 8 6163 4900	environment.env@bmtglobal.com
Cardno	OSMP implementation	Level 11 515 St Paul's Terrace Fortitude Valley QLD 4006	+61 (7) 3369 9822	
GHD	OSMP implementation	Level 10 999 Hay Street Perth, Western Australia 6000	+61 8 6222 8222	
RPS	Oil Spill Trajectory Modelling		0408 477 196	response@apasa.com.au
RPS Australia West	OSMP Implementation Plan	27 – 31 Troode Street, West Perth, WA, 6005	+61 8 9211 1111	

A. 2. Internal Beach Contacts

A. 2. 1 Internal Beach Contacts

Contact / Function	Phone	E-Mail
Otway Operations Manager	0437 841 193	
EMT Leader	(03) 9411 2147 (via the NRC)	
Well Emergency Team Leader	(03) 9411 2147 (via the NRC)	

Appendix B Spill Equipment and Resources (Current 23rd July 2019)

B. 1. Source Control Equipment – Well Control

A detailed description of available source control equipment and resources including deployment timeframes is detailed within the Beach Offshore Source Control Contingency Plan (SCCP) and well-specific relief well plans. A summary of these resources is provided below.

B. 1. 1 Well Control Specialists

Access to a range of source control equipment including equipment and personnel is available through 3rd party contracts with:

- Boots and Coots (Halliburton): https://www.halliburton.com/en-US/ps/project-management/well-control-prevention/well-control-prevention-services.html
- Cudd Well Control: http://www.cuddwellcontrol.com/

Contact details for these well control specialists are provided in Appendix A.

B. 1. 2 MODU

The Otway and Bass Fields are considered remote locations and therefore likely to have an impact on the time taken for a suitable rig to be mobilised to the relief well location. This timeframe has been built into the Oil Spill Modelling. Rig broker reports are used to monitor the rig market on a monthly basis and if required, assist in sourcing and contracting a suitable MODU. The rig broker can be contracted to identify and contract a suitably specified rig (including Australian Safety Case status) within 14 days. Note, a MODU mobilised from the NW Shelf or Singapore is likely to take 35 days. These periods have been factored into the relief well schedule within the well-specific relief well plans.

MODU selection for relief well drilling will be based on the following:

- Rating of well control equipment: Rigs considered shall have equipment rated to at least 10,000psi to perform the required well kill and pumping capacity to meet the well kill requirements.
- Water depth: Rig being considered for relief well drilling must be rated for the water depth of 60m-105m
- Seabed conditions.

B. 1. 3 Casing and Consumables

A detailed description of casing and consumable requirements based upon relief well design is detailed within the well-specific relief well plans.

B. 1. 4 AMOSC Subsea First Response Toolkit (SFRT) and Chemical Dispersants

The SFRT was engineered and built by Oceaneering Norway and bought by a number of AMOSC Member Companies in 2013. The equipment is located in Henderson WA and is currently stored and maintained by Oceaneering Australia. AMOSC owns this suite of equipment which includes 500m^3 of dispersant for Subsea Dispersant Injection (SSDI).

As an AMOSC member company, Beach has access to the SFRT upon request to membership of the SFRT.

There is a provision made by the Committee to provide up to 250m^3 of dispersant into a surface spill response given certain provisions are met in the first instance by AMOSC.

B. 1. 5 OSRL Subsea Incident Response Toolkit (SIRT), Capping Stack System (CSS) & Offset Installation Equipment (OIE)

Beach do not have a direct contract with Oil Spill Response Limited (OSRL). Access to OSRL equipment is via the AMOSC master contract.

The OSRL intervention package comprises 4 x Capping Stack Systems (CSS) and 2 x Subsea Incident Response Toolkits (SIRT).

OSRL also has Offset Installation Equipment (OIE) designed to support subsea well intervention operations in scenarios where conditions prohibit direct vertical access to a wellhead. OIE allows responding personnel to remove or install capping, containment or related equipment from a safe offset distance from an incident site. The suitability of this equipment for the specific Otway Development wells will be dependent on plume modelling for a loss of containment scenario, detailed in the well specific Source Control Contingency Plan.

OIE works through utilising a carrier comprised of; ballast tanks with air connection to topside compressors, a winch system to control the carrier position and lift payloads, a cardan joint for capping stack positioning and ROV interface for controlling all carrier functions from topside.

CSS details:

- Four capping systems, including 2x 18¾" 15k stacks and 2x 7$^{1}/_{16}$" 10k stacks (with ancillary equipment)
- Transportable by sea and/or air
- Available for a variety of international metocean conditions
- Designed for subsea use to a maximum of 3000m water depth
- Stored in four strategic locations – Brazil, Norway, Singapore and South Africa
- Maintained by Trendsetter Engineering on behalf of OSRL
- Adaptable to multiple wellhead, subsea tree and BOP connections

SIRT details:

- ROV-operated Blow Out Preventer Emergency Intervention System
- Subsea Dispersant System: dispersant equipment package to inject dispersant at multiple location
- Debris Clearing Equipment tool package
- Transportable by road, sea and air
- Stored in two strategic locations – Brazil and Norway
- Available for use in a variety of international metocean conditions
- Manufactured and maintained by Oceaneering

Each SIRT is stored in 20ft, 10ft offshore containers and skids, maintained response ready for air freight.

OIE details:

- Can be deployed up to 500m offset from an incident site
- Suitable for use a working depth range of 75-600m
- Compatible with OSRL's Capping Stack System
- Transportable by sea and/or air
- Available for a variety of international metocean conditions
- Stored in Trieste, Italy
- Maintained by Saipem on behalf of OSRL

Source: https://www.oilspillresponse.com/services/subsea-well-intervention-services/

If deemed suitable, preparatory site work, mobilisation (from Singapore) to well site in the Otway Basin and deployment readiness is likely to take approximately 45 days for a conventional capping stack.

B. 2. Maintenance Vessels & Vessels of Opportunity

Beach has existing contracts in place to support its maritime requirements.

The contracts for the Otway Basin currently reside with a number of service provides that have undertaken the Beach Contracts and procurement process.

Over time vessels and operating companies change in the region. Beach has a procurement process, contractor management process and contracting management system that is implemented prior to engagement of vessels.

A suitably capable capping stack transport and deployment vessel would be required to deploy the CSS. Specification of the vessels will be detailed in the Source Control Contingency Plan for the site.

Any vessels used on the project will carry a vessel SOPEP and Level 1 spill equipment on-board appropriate to the nature and scale of the vessel and vessel crew are fully trained and exercised in the application of the SOPEP.

Beach receives a monthly update of available vessels under an existing arrangement with a Vessel Broker. The availability and location of vessels capable of deploying the capping stack equipment, if suitable for the specific site, will be confirmed prior to spud of the wells.

B. 3. Fixed Wing Aviation Support

Beach may call upon fixed wing aircraft for aerial surveillance in the event of a Level 2 or Level 3 spill. The need for this service will be determined by the EMT Leader during the incident response and as per the OPEP Part 2 of this OPEP.

Beach will engage fixed wing aircraft through their preferred supplier Adagold Aviation Pty Ltd who will act as an aviation broker and engage the most appropriate aircraft available.

Beach will supply the aviation provider with the relevant flight pattern and log sheet for the surveillance and any additional trained oil spill observers via arrangements with AMOSC.

B. 4. Helicopter Support

During an incident response, Beach may call upon helicopter services to undertake aerial surveillance assistance or transport personnel in an event of a Level 2 or 3 spill, with the requirement determined by the EMT Leader at the time of the incident.

Bristow are the current contractor for the provision of helicopter services for Beach's Otway offshore activities. At least one helicopter will be available for use by Beach during a spill response. A helicopter will be located at either Warrnambool or Tooradin.

When drilling projects are in progress there may also be other Bristow helicopters located at Warrnambool or Essendon. Beach and Bristow have a working arrangement for this service and tests the call out process as part of its emergency response test plan and schedule.

A typical total mobilisation and flight time from:

- Essendon to site is about 1hr 45min (minimum)
- Tooradin to site is about 1hr 30min hours
- Warrnambool to site is about 50 min (20 min flight time)

Beach will supply the helicopter provider with the relevant flight pattern and log sheet for the surveillance and trained oil spill observers via arrangements with AMOSC.

B. 5. Oiled Wildlife Response

Under the National Plan, Maritime Emergencies Non-Search & Rescue (NSR) Plan and TasPlan, the response to oiled wildlife from a vessel spill where a government agency is the Control Agency is covered in terms of responsibilities and equipment.

In Victoria, DELWP is the lead agency for wildlife impacted by marine pollution. The response procedures are defined in the Wildlife Response Plan for Marine Pollution Emergencies. This plan is incorporated as part of State Maritime Emergencies (non-search and rescue) Plan where an oil spill has occurred.

The Tasmanian Oiled Wildlife Response Plan (WildPlan) is administered by the Resource Management and Conservation Division of the Department of Primary Industries, Parks, Water and Environment (DPIPWE) and outlines priorities and procedures for the rescue and rehabilitation of oiled wildlife.

Oiled wildlife kits are available through AMOSC, the national plan and state agencies. DELWP has a number of first strike kits as well as arrangements in place for triage and rehabilitation of small oiled seabirds. Wildlife rescue kits are held at the Hobart and Launceston DPIPWE offices.

AMOSC also has wildlife equipment which can be mobilised directly by Beach in the event of a spill where there is a likelihood of oiled wildlife requiring treatment. However, it is noted that the remoteness and typical sea conditions of the Otway offshore area and the logistic constraints associated with finding and collecting oiled wildlife at sea, will limit the feasibility of an offshore wildlife response effort.

Advice will be sought from AMOSC and regulatory agencies to guide any decisions regarding mounting a wildlife response will be based on the risks posed by the spill and safety and feasibility of a response.

B. 6. Government Resources

B. 6. 1 Australian Maritime Safety Authority

The Australian Maritime Safety Authority (AMSA) administers the National Plan which requires each State and Territory to produce its own contingency plans to support the national plan. If a spill occurs in Victorian or Tasmanian state waters the Maritime Emergencies (NSR) Plan or TasPlan is activated. If the spill is beyond the resources of the state agencies, then the additional resources can be sourced through agreements in the National plan for a marine pollution response.

B. 6. 2 Victorian Department of Jobs, Precincts and Regions (DJPR) Emergency Management Branch (EMB)

In the event of a diesel spill from a supply vessel near shore, the equipment within the respective port region will be utilised as per the Maritime Emergencies (NSR) Plan through Vic DJPR Emergency Management Branch (EMB).

In an event of a Level 2/3 incident, Vic DJPR, as per the Maritime Emergencies (NSR) Plan, may provide the following assistance as required:

- Provision of vessels and support to CFA/MFB for chemical spills in State Waters
- Coordinate the supply of State equipment and personnel resources in support of the Incident Management Team
- Coordinate provision of Victorian equipment and personnel for any interstate or Commonwealth response.

VIC DJPR EMB is updated with Beach's program changes as part of its consultation program and shall be provided a copy of the accepted OPEP.

B. 6. 3 Tasmanian Department of Primary Industry, Parks, Water and Environment (DPIPWE)

In the event of a spill from a vessel near shore, the equipment within the respective port will be utilised as per the TasPlan through Tas DPIPWE. This equipment may also be available to support a Level 2 or 3 spill where Beach is the Control Agency. Stockpiles of Level 1 equipment are located at Burnie, Devonport, Bell Bay and Hobart Ports and a current list of equipment is available from Tas DPIPWE.

B. 7. AMOSC Resources

AMOSC is supported by a core group of key personnel from oil industry members companies who are trained and regularly exercised in spill response. When called upon under arrangements established in AMOSPlan, Core Group Members are able to respond to an incident at short notice and provide a high level of expertise in leading teams on the ground responding to an incident. Actual timings and Core Group availability is updated monthly and can be obtained through AMOSC as required. AMOSC also holds large stockpiles of oil spill response equipment designed for both coastal and offshore use and has established contractual arrangements and processes for the mobilisation of equipment and personnel to assist with a spill anywhere in Australian waters. A list of the AMSOC available equipment can be obtained through the AMOSC or their website.

AMOSC assistance may be sought in the event of a Level 2 or 3 spill. Beach's EMT Leader shall determine when and whether AMOSC notification and assistance will be required.

Under AMOSPlan, should the spill response require equipment or personnel from another company, the request for assistance is made directly by Beach to that company. AMOSC can assist in this dialogue through the Mutual Aid Policy, and Beach will contact AMOSC to activate the relevant Principal & Agency Agreement (of the lending company) and Mutual Aid Policy if borrowing resources.

AMOSC headquarters and their major equipment base are located in Geelong, adjacent to the Port of Geelong Corio Quay Supply base.

Beach shall provide AMSOC a copy of the accepted OPEP.

B. 8. Environmental Monitoring Resources

Beach has a current Master Service Agreement in place with several recognised specialist environmental consultants capable of undertaking scientific monitoring. Beach will undertake audits / desk top reviews of the capabilities of these consultants to ensure that they are capable of meeting the requirements of this OPEP.

Annual reviews of contracts and service providers are completed by Beach to confirm they still meet the required standards and are able to provide the contracted services. If any existing contractors are deemed unsuitable, a like service provider will be appointed. Should it be required (as determined by EMT Leader and Health, Safety & Environment), the environmental consultant will undertake scientific sampling and analysis to fulfil the requirements of this monitoring program as detailed in Operational & Scientific Monitoring Plan (OSMP) / Operational and Scientific Monitoring Implementation Plan (OSMIP).

Appendix C Templates and Forms

Refer to the Australian Maritime Safety Authority website for the latest forms:

- https://www.amsa.gov.au/
- https://www.amsa.gov.au/forms-and-publications/environment/
- https://www.amsa.gov.au/forms-and-publications/environment/publications/NP-Reports/index.asp

Forms from AMSA include:

- Marine Pollution Report (POLREP)
  Marine Pollution Situation Report (SITREP)

C. 1. Marine Pollution Report (POLREP)

Online via https://amsa-forms.nogginoca.com/public/ or manual below:

Marine Pollution Report (POLREP)

NOTE: Incidents to be reported are outlined on page 3

Send completed form to: **AMSA Environment Protection**
Fax: **(02) 6230 6868** Email: **rccaus@amsa.gov.au**

Date of incident

C.C.

Time of incident

Location name / Description

Incident coordinates

Format of coordinates used (select one)	Latitude of spill	Longitude of spill
Degrees & decimal degrees	. °	. °
Degrees, minutes & decimal minutes	° ' . '	° ' . '
Degrees, minutes & seconds	° ' . "	° ' . "

Description of incident

POLLUTION SOURCE

☐ Vessel ☐ Land ☐ Other ☐ Unknown Details

Vessel Details: Type (if known): ☐ Tanker ☐ Container ☐ Bulk Cargo ☐ Fishing ☐ Defence ☐ Recreational

☐ Other vessel type (specify): _____

Vessel name | Flag state / callsign | Australian vessel? ☐ Yes ☐ No

POLLUTANT

☐ **Oil** → ☐ Bilge ☐ Diesel bunker ☐ HFO Bunker ☐ Crude ☐ Unknown
☐ Other — Specify

☐ **Chemical** → Name | MARPOL Cat. / UN Nos

☐ **Garbage** →
☐ **Packaged** →
☐ **Sewage** →
☐ **Other** →
Details / description

EXTENT

Size of spill (length & width in metres)

Amount of pollutant, if known (litres)

ADDITIONAL INFORMATION

Has the discharged stopped? ☐ Yes ☐ No ☐ Unknown

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

Weather conditions at site

☐ Photos taken ▶	Details	Held by
☐ Video taken ▶	Details	Held by
☐ Samples taken ▶	Description	Held by
☐ Items retrieved ▶	Description	Held by

Original report source

Name	Position	Phone

Combat agency

Statutory agency

Equipment used ☐ AMSA ☐ State / NT

Possible further action ☐ Legal ☐ AMSA assistance ☐ Other

SENDER DETAILS

Name	Agency	Date
Phone	Fax	Email

PRIVACY STATEMENT

The Australian Maritime Safety Authority (AMSA) is collecting the information on this form to enable it to carry out its role as managing agency of the National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances.

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.

SUMMARY OF INCIDENTS TO BE REPORTED

All slicks, including deck washings, that can be seen trailing a vessel should be reported. The type of substance contained in the slick may not be able to be determined until further investigation has been undertaken by enforcement agencies.

REPORTABLE	NON-REPORTABLE
Oil - All slicks trailing from a vessel. All spills in the marine environment (notwithstanding the size or amount of oil or sheen). All spills where National Plan equipment is used in a response. *Note: If oil or sheen is "visible" then it is an illegal discharge MARPOL permitted oily discharges are at 15 parts of oil to one million parts of water (15ppm). Oil discharges at sea cannot be visually observed until at least 50ppm and even that may not be readily discernable depending upon the observation platform, sea state, weather conditions etc.*	• Coral spawning. • Algal bloom. • Oil spills specifically known to be from land sources (eg drains, road tanker accidents) and where there is no response using National Plan equipment or resources used. • Exploration/production associated discharges where there is no response and National Plan equipment or resources used. (these are reportable to the relevant authority eg: Mines Department or Department of Science Industry and Resources).
Chemicals – All sightings of slicks/discolourations trailing vessels. All odorous discharges from a vessel.	
Harmful Packaged Substances - All packages associated with a vessel.	
Sewage – All slicks seen trailing from a vessel.	
Garbage – All sightings of garbage being disposed from a vessel. Any type of garbage found that can be specifically tied to a specific vessel such as garbage with printing showing a vessel name (eg Quarantine bonded plastic bags with identifier tag).	• Dumping at sea that requires a permit (EPA or EA) • Dumped dredge spoil. • Floating logs.

C. 2. Marine Pollution Situation Report (SITREP)

Marine Pollution Situation Report (SITREP)

Incident name / Description					
Date		Time		Sitrep No	
Priority	☐ Urgent	☐ Immediate			
Final Sitrep?	☐ Yes	☐ No	Next Sitrep on:		
Description of incident and impact					
Overall weather conditions					
Summary of response actions to date					
Current Strategies					
Summary of Resources available/ deployed					
Other information					

SITREP prepared by

Name	Agency	Role
Phone	Fax	Email

Attachments		No of pages attached	

C. 3. Oil Spill Incident Report – Level 1 Spill

Date:		
Spill observer:		
Report time:		
Reported to:		
Location of the spill:		
Material spilled:		
Estimate of spill quantity and description of appearance of the slick:		
Particulars of damage caused as a result:		
Apparent source/cause of the spill:		
Action taken to control spill:		
Has spill been contained? (Tick✓) ❑ **Yes**❑ **No**		
Comments:		
Location	**Reported by**	**Reported to**
Time	**Date**	**Phone No**
Are additional resources required to disperse/contain spill:❑**Yes**❑**No**		

C. 4. Oil Spill Incident Report – Level 2/3 Spill

Date:	Report time:	
Spill observer:	Reported to:	
Time spill occurred:	Date spill occurred:	
Material spilled:	API gravity:	
Apparent source/cause:		
Location of spill:	Latitude:	Longitude:
Is spill continuing?	Yes	No
If yes, estimated rate of release:	cubic metres/day:	bbl/day:
Volume of discharge: a) estimated	cubic metres:	bbls:
Volume of discharge: b) known	cubic metres:	bbls:
Size of spill: (plot on chart)		
Rate and direction of slick movement:		
Oil slick type:	Continuous:	Windows:
Estimated average thickness:		
Estimated time to nearest threatened resource:	(hrs)	
Meteorological and Ocean Data		
Temperature:	Air:o C	Water:o C
Wind speed:	knots	Direction:
Precipitation:		
Forecast:		
Oceanographic Data	Tide state:	Direction:
	Currents:	Speed:
Direction:Sea state:	1 2 3 4 5 6+	
Average wave height:	metres	
Period:	seconds	
Comments:		

C. 5. Oil Spill Trajectory Modelling Request Form (RPS APASA)

OIL SPILL TRAJECTORY MODELLING REQUEST	Email completed form to RPS APASA response staff response@apasa.com.au After sending this request, phone Duty Officer on telephone number provided.

Priority of Request: ☐ **Urgent** ☐ **Exercise** Date and Time of Request:

Incident Name	
Name of requesting person and position in response	Contact telephone number
Email address for model output (preferred method)	Fax number for receipt of model output

Surface or Subsurface spill?	If subsurface spill, describe the spill source.
Surface ☐ Subsurface ☐ Depth of spill (m)	☐ Low Turbulence (eg. Low Pressure Pipeline Leak) ☐ Medium Turbulence (eg. Intermediate Pressure Pipeline Leak) ☐ High Turbulence (eg. Well Blowout under pressure, or ruptured pipeline under pressure)

Spill Start Date			Spill start time (use 24 hour clock, state time zone – GMT or Local)	Requested Simulation Length (hrs)
Day	Month	Year		

Oil Name:	Oil Type: *Bunker C, Diesel Fuel, Crude, Condensate*

Spill location (select one format)	Latitude of spill (N)	Longitude of spill (E)
Degrees, minutes & seconds	° ' "	° ' "
Degrees, minutes & decimal minutes	° . '	° . '
Degrees, minutes & decimal minutes	. °	. °
Easting & Northing (Zone)	S/N	E/W

Instantaneous spill ☐	Amount	(select one)	☐ Tonnes	☐ Cubic Metres	☐ Litres	☐ Barrels		
Continuous spill ☐	Duration (hours)	Amount (per hour)	☐ Tonnes	☐ Cubic Metres	☐ Litres	☐ Barrels		

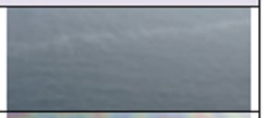
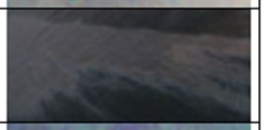
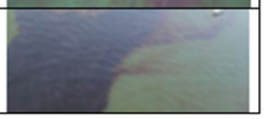
Present wind speed and directions, sea states and water temperatures (°C) at the site (if known):

NOTES (describe special details of the incident, special concerns, doubts about information etc.)

C. 6. Stand down of EMT Checklist

STAND DOWN CHECKLIST / ACTIONS	
KEY ACTIONS:	
The EMT Leader is responsible for assigning personnel to commence the collation of emergency data prior to the commencement of the investigation process. On-going resources for incident control and post incident recovery (if required) should also be considered by the EMT Leader, including current/potential business continuity aspects (per Beach Energy's Business Continuity Plan).	
Final information release and/or notification should occur to some, or all, of the following:	
• All Site ERT and support personnel	• All relevant EMT and support personnel
• Contractor Management	• Regulatory authorities
• Emergency Services	• Employees (off and on duty)
• Employees families/NOK	• Third Parties
• Suppliers and/or contractors	• Joint Venture Partners and customers
• Media	• Government support agencies
• Mutual aid	• Environmental agencies
• Trade unions	• Local community and pressure groups
Initial 'hot' debrief of all personnel to include:	
• A short report by all persons of the history of the incident and their responses; • Outstanding problems with health, safety and environment; • Recovery of production; • Technical information regarding Beach's ongoing operations; and • Emotional responses to what has happened.	
Then:	
• Close additional security arrangements • Finalise additional catering and other services • Continue counselling for those involved in the incident • Compile and file all documents relating to the response • Ensure that all log entries are signed and that all call records and Sit Rep's are signed off by the person who prepared the document • Arrange for full incident investigation and analysis • Approve/comment on incident debriefing reports and recommended actions	
Carry out an After-Action Review to ascertain effectiveness of:	
Incident callout	**Site ERT functions**
• Overall emergency response	• Interface with other EMT members
Recommend revision of Emergency Plans as required.	
Schedule time for After-Action Review and if required, full debrief on the incident.	

Appendix D Bonn Agreement Oil Appearance Code

Code	Description / Appearance	Layer Thickness Interval (Microns)	Litres per km^2	Typical Appearance
1	Sheen (silver / grey)	0.04-0.30	40-300	
2	Rainbow	0.30-5.0	300-5,000	
3	Metallic	5.0-50	5,000-50,000	
4	Discontinuous True Oil Colour	50-200	50,000-200,000	
5	Continuous True Oil Colour	>200	>200,000	

Appendix E Aerial Surveillance Observer Log – Oil Spill

Survey Details											
Date		Start time		End time		Observers					
Incident						Area of survey					
Aircraft Type		Call sign				Average altitude		Remote sensing used			
Weather Conditions											
Wind speed (knots)						Wind direction					
Cloud base (feet)						Visibility (Nm)					
Time high water						Current direction					
Time low water						Current speed (Nm)					
Slick Details											
Slick grid parameters by lat/long						Slick grid parameters by air speed			Slick grid dimensions		
Length Axis		Width Axis				Length Axis		Width Axis	Length	Nm	
Start Latitude		Start Latitude				Time (seconds)		Time (seconds)	Width	Nm	
Start Longitude		Start Longitude							Length	km	
End Latitude		End Latitude				Air Speed (Knots)		Air Speed (Knots)	Width	km	
End Longitude		End Longitude							Total Grid Area	km^2	

Code	Colour	%age cover observed		Total Grid Area		Area per oil code		Factor	Oil volume	
1	Silver		%		km^2		km^2	40 – 300L/km^2		L
2	Rainbow		%		km^2		km^2	300 – 5,000L/km^2		L
3	Metallic		%		km^2		km^2	5,000 – 50,000L/km^2		L
4	Discontinuous true oil colour		%		km^2		km^2	50,000 – 200,000L/km^2		L
5	Continuous true oil colour		%		km^2		km^2	>200,000L/km^2		L
Non shaded areas to be completed on flight. Shaded areas completed on return.								TOTAL		L

Appendix F Aerial Surveillance Observer Log – Marine Mammals

Date :	Survey #
Aircraft/Pilot:	Observers :
Blue Whale Study Contact:	Enquest Contact:
Survey Start Time:	Survey Finish Time:

Event#	Waypoint #	Event time [hh:mm]	Event Position [dd.mmm]	Description of sighting and marine mammal	No. of Marine Mammal(s)	Sterling Position [dd.mmm]
			. °S . °E			. °S . °E
			. °S . °E			. °S . °E
			. °S . °E			. °S . °E
			. °S . °E			. °S . °E
			. °S . °E			. °S . °E

Appendix G Shoreline Assessment

General Information			
Date	Dd/mm/yy:	Survey Time	From:To:
Weather	Sun / Cloud / Fog / Rain / Windy		
Location	Description:	LAT: LONG:	
Total Length	m		

Survey Team	
Name	Organisation

Shoreline Type			
Legend: P = PrimaryS = Secondary			
	Exposed Bedrock Cliff and Seawalls		Intertidal Mud/ Sand Flats
	Exposed Bedrock Platform or Reef		Mangroves
	Sheltered Bedrock Platform or Reef		Salt marshes
	Exposed Boulder/ Cobble and Rip rap		Seagrass (Shallow/Intertidal)
	Sheltered Boulder/ Cobble and Rip rap		Shallow/Intertidal Corals
	Pebble Beaches		Natural Inlets/ Channels
	Sand Beaches		Marinas/ Artificial Waterways

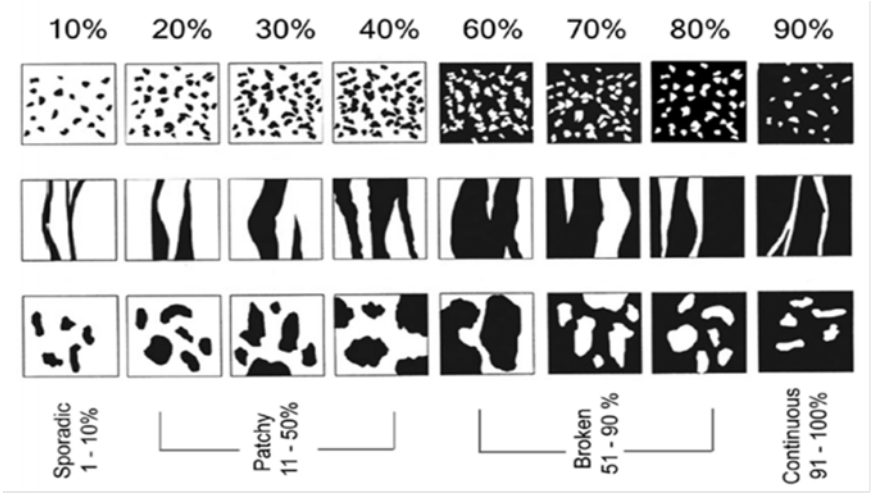
Operational Features	
Debris Present: Yes /No Amount: _____ m3	
Direct Backshore Access: Yes / No	Access Restrictions:
Backshore cliff: Yes / No Height _____m	Suitable Lay down Area:Yes / No

Surface Oiling Conditions

Place an X in the appropriate box

Zone #	Tidal Zone				Oil Cover			Oil Thickness					Oil Character					
	L	M	U	S	Length	Width	Cover (%)	PO	CV	CT	ST	FL	FR	MS	TB	TP	SR	AP

Legend:	
Tidal Zone L = Lower Tidal M = Middle Tidal U = Upper Tidal S = Super Tidal	
Surface Oiling Thickness PO = Pooled Oil (fresh oil or mousse > 1 cm thick) CV = Cover (oil or mousse from >0.1 cm to <1 cm on any surface) CT = Coat (visible oil <0.1 cm, which can be scraped off with fingernail) ST = Stain (visible oil, which cannot be scraped off with fingernail) FL = Film (transparent or iridescent sheen or oily film)	**Surface Oiling Character** FR = Fresh Oil (unweathered, liquid oil) MS = Mousse (emulsified oil occurring over broad areas) TB = Tar balls (discrete accumulations of oil <10 cm in diameter) TP = Tar Patties (highly weathered oil, of tarry, nearly solid consistency) SR = Surface Oil Residue (non-cohesive, oiled surface sediments) AP = Asphalt Pavements (cohesive, heavily oiled surface sediments)
Distribution Guide (% Oil Cover)	



Sketch	**Date:**

Checklist: (Place an X once completed)			
Oiled Area		Local Features	
Orientation (North)		Access	
Scale		Survey Area (Width/Length)	

End of document