



# BassGas Offshore Environment Plan Summary

for

## Yolla MLE Construction Campaign

OEUP-T5100-PLN-ENV-006

December 2011



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## 1. Executive Summary

Origin Energy Resources Ltd (Origin Energy) is the majority owner and operator of the BassGas Project. The BassGas project includes the 'Yolla' offshore platform, located in Bass Strait 147 kilometres south of Kilcunda, a gas pipeline and an onshore gas plant near Lang Lang in Victoria.

Commercial production of gas commenced in June 2006 and is currently produced from the Yolla platform via two production wells, Yolla-3 and Yolla-4. The offshore facilities have been designed to incorporate additional production wells from the Yolla field and also to tie-in other gas discoveries in the region.

The Yolla Mid-Life Extension (MLE) project Stage 1 Construction is adding compression facilities to the platform to maintain production levels and is also converting the platform, with the addition of an accommodation block, to a normally manned facility.

Construction activities are scheduled to start offshore in December 2011 and will last approximately six months. A construction support vessel, the Jascon 25, operated by the Sea Trucks Group (STG) will provide construction accommodation and heavy lift facilities during the campaign.

The MLE project Stage 2 Drilling will drill, install and tie-in two additional production wells; the details surrounding this campaign are yet to be fully resolved and are not part of this document.

The Yolla platform and pipeline have a government-approved Environment Plan (EP) in place (approved in February 2011, the BassGas Offshore EP [OEUP-T5100-PLN-ENV-005]). It has been updated in draft to reflect the future operation of the facility (i.e. as a manned facility) and was submitted along with this EP for review and will be re-submitted to government for approval.

This document covers the construction activities and offshore work associated with the MLE project.

Origin Energy is committed to all aspects of environmental protection and biodiversity conservation as it relates to its business. This commitment is expressed in the company's Health, Safety and Environment (HSE) Policy and Standards, which form the foundation of its management practices, and the performance that must be attained by all operations and associated contractors. A vital part of the implementation of the HSE Policy and Standards is the Origin Energy HSE Management System (HSEMS). The Yolla MLE project is being implemented under Origin Energy's HSE Policy, Standards and the HSEMS.

The ongoing compliance monitoring, auditing and reporting against legislative and Origin Energy operational criteria is an integral part of the planning and operation of the BassGas project and Origin Energy's commitment to ensure that all adverse effects on the environment resulting from Origin Energy activities (associates and sub-contractors) are identified, assessed and as far as reasonably practicable, eliminated or minimised.

### 1.1 Marine Environment

The BassGas Environment Effects Statement/Environmental Impact Statement (EES/EIS) document (Origin Energy, 2002), provides an extensive description of the marine environment and biodiversity within Bass Strait that is proximal to the Yolla Platform and associated pipeline infrastructure.

Seabed surveys have been conducted at the Yolla A Platform (the platform) location and along the pipeline route. Bathymetric maps indicate that the seafloor is gently sloping, dropping gradually to water depths of about 80 metres at the platform location. Survey data collected by Thales GeoSolutions (2001) indicates that the seabed is comprised of sandy, silty and clayey sediments, with rocky outcrops in one or two locations.

Benthic sampling in Bass Strait has consistently shown a highly diverse array of invertebrate fauna, with several polychaete families, pycnogonids, pericardid crustaceans, opisthobranch molluscs, bryozoans and brachiopods being the most prolific species. There were no significant seabed features identified, such as active shelves, or edge reef systems within the direct vicinity of the platform, or along the pipeline route.



There are no marine reserves, World Heritage properties, or areas listed or nominated on the Register of the National Estate, or listed Ramsar wetlands near the offshore facilities. Species that are listed under the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999 may migrate or move through the project area, including the blue whale, southern right whale, fin whale, humpback whale, grey nurse shark (eastern), great white shark and southern elephant seal. However, none of the species listed are dependent upon the area for food or reproduction.

The operation of the platform is considered unlikely to have any significant impact on the movements of migratory species. A noise assessment was undertaken in 2004, with the intention of monitoring noise during construction and operational activities (Curtin University, 2005). Noise was only monitored during construction due to delays in commissioning. Several whale species were evident in the recordings, where true and pygmy blue whales were recorded and at least one whale was in close vicinity to the receiver (based on high signal levels received) on one occasion (Curtin University, 2005). The identified movement of vessels to and from the project area was identified as the main potential impact on migrating whales. The movement of vessels was a minor risk and was considered unlikely to have any ongoing significant impact on whale migrating behaviour.

Great white sharks are uncommon and are not known to specifically breed, or be resident in the area, but are generally known to frequent waters around seal colonies. Grey nurse sharks have been reported from around most of the southern half of the continent, but are uncommon in Tasmanian waters.

Four species of turtles (loggerhead, green, hawksbill and leatherback), which are listed as endangered or vulnerable under the EPBC Act, have been observed in Bass Strait. These are primarily at risk from entanglement in fishing nets, incidental by-catch and ingesting marine debris. The waste management program (including adherence to the International Convention for the Prevention of Pollution from Ships (MARPOL 1973/78) on the platform will avoid increasing marine debris.

Migratory seabirds protected by international agreements such as the Bonn Convention, Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA) may pass through or near to the well location on route to islands in Bass Strait and/or Tasmania. Foraging groups of seabirds were also sporadically sighted in the area. There are however, no seabird breeding colonies located in the permit area.

Disturbance to the Commonwealth marine area is limited to a potential hydrocarbon spill and the disposal of produced formation water for the platform location. In the event of an oil spill, the BassGas Oil Spill Contingency Plan (OSCP) [OEUP-T5100-PLN-PFM-004] will be implemented.

Additionally, there are considered to be no impacts from activities associated with the BassGas Project on World Heritage property, Ramsar wetlands, listed migratory species, their habitats or threatened ecological communities, or Commonwealth land, and it is considered highly unlikely that any threatened species have been or will be impacted by drilling or platform activities. Conservation areas are located outside the permit area as are known historic shipwreck sites.

## 2. Yolla and MLE Construction Activity Description

### 2.1 Location

The Yolla field lies in Production Licence T/L1, located in the Bass Basin. The T/L1 Production Licence comprises four whole acreage blocks (blocks 3262, 3334, 3335 and 3467). Figure 2-1 illustrates the location with respect to the Victorian and Tasmanian coastline. The location of the Yolla A Platform is Latitude 39° 50' 40.5", Longitude 145° 49' 06.3" or 5,588,824 North, 398,910 East (GDA94, Zone 55).

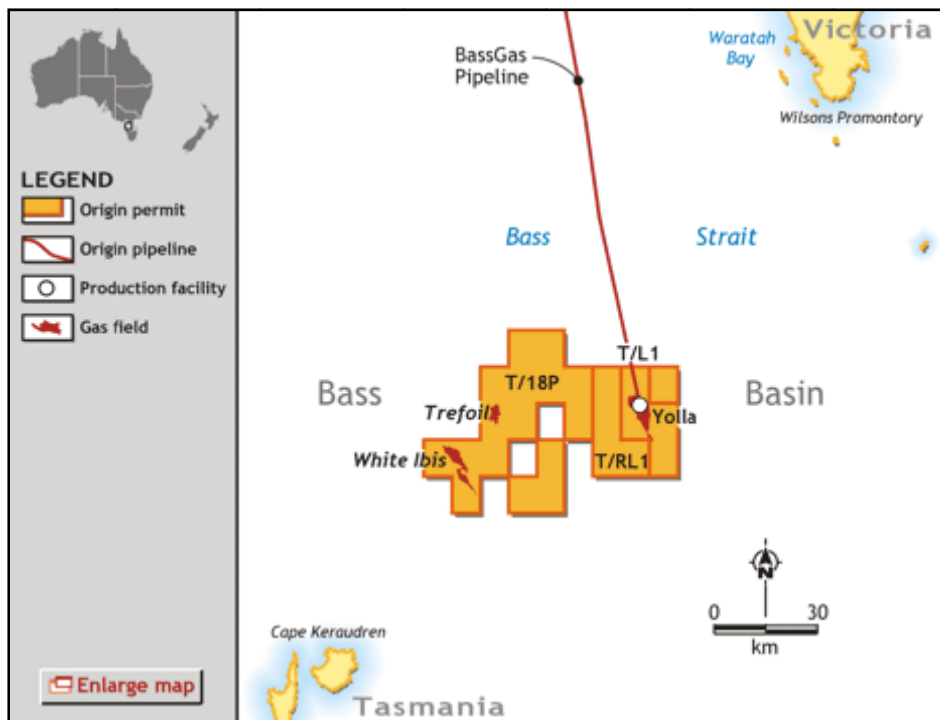


Figure 2-1 Location of Yolla Gas Field, T/L1 Production Licence, Bass Basin

The raw gas pipeline runs from the Yolla A Platform in Central Bass Strait to the gas plant in Victoria and has a total length of 180 km. The offshore section of the pipeline is 147.5 km in length.

The pipeline horizontal directional drill (HDD) shore crossing entry point is approximately 1 km east of the town of Kilcunda at 368,270 East and 573,1120 North.

#### 2.1.1 System Overview

The Yolla A Platform is a self-installing 'Drill-Ace' platform (designed by Arup) with a stiction type skirted jacket foundation design to account for the geotechnical conditions at the platform location.

Following the MLE project, the offshore platform facilities will comprise the following:

- Yolla A Platform in 80.5 m water depth;
- Accommodation facilities for up to 37, normally only 5-8;
- 8 conductors (2 installed for existing production wells);
- Two production wells, trees and chokes;



- Production manifold;
- Production facilities for separation and dehydration of gas and liquids;
- Compression facilities;
- Condensate pumping;
- Drains;
- Produced Water facilities and Dump Caisson;
- Flare System;
- Diesel Storage;
- Chemical Storage and Injection; and
- Power Generation.

Following the MLE project the offshore platform will be a normally manned facility. During un-manned periods, it will be controlled via the telemetry link from the onshore gas plant.

The Yolla platform facility is self sufficient, in terms of power generation, fuel gas conditioning and instrument air facilities. It also has a full safety shutdown system including a flare, closed and open drain systems and provision for reprocessing of liquids.

Chemical injection facilities are provided on the platform for times of upset conditions or abnormal operation where methanol may be required to mitigate against hydrate formation or used as a preventative measure during startup. Other chemicals including demulsifier, reverse demulsifier and corrosion inhibitor are also provided.

## 2.2 MLE Construction Overview

This section provides an overview of the major activities to be performed as a part of the Yolla MLE project. A general overview of the construction campaign steps are as follows:

- Jascon 25 undertakes dynamic positioning (DP) trials prior to entering the Yolla field 500 m exclusion zone;
- Jascon 25 enters the Yolla field and gangway connection to Yolla;
- Platform preparation/pre-construction activities, gangway connected;
- Construction/modification works commence, gangway connected;
- Jascon 25 moves to the north face of Yolla to perform heavy lifts of accommodation module, gangway disconnected;
- Accommodation hook-up and commissioning (HUC), preparation for compressor and condensate module installation, gangway connected;
- Jascon 25 leaves platform to pick up compressor module (from Bell Bay in Tasmania, Dumb Barge in the field or other suitable location);
- Jascon 25 moves to the west face of Yolla to lift on the compression and condensate pump modules, gangway disconnected;
- Ongoing construction (brownfield) and hook up activities with the Jascon 25 on east face of platform, gangway connected;
- Platform producing with ongoing construction/commissioning activity, Jascon 25 gangway connected;
- Accommodation fully commissioned, Jascon 25 departure; and
- Commissioning and handover of compressor and condensate pumps to operations, personnel accommodated on Yolla.



### 3. Environmental Impact Assessment

The main environmental impacts that could occur during the Yolla MLE construction campaign relate to the following activities/sources:

- Overboard loss of construction materials and waste;
- Routine and minor waste discharges:
  - Effluent discharges including treated sewage and domestic food wastes from the construction support vessel;
  - Gaseous emissions from construction support vessel and Yolla construction; and
  - Bilge water and deck washdown; and
- Physical presence of vessels:
  - Noise;
  - Light emissions;
  - Seabed disturbance;
  - Interference with commercial shipping and fishing vessels; and
  - Introduction and spread of invasive marine species.
- Overboard spill of diesel or hazardous wastes during equipment fuel transfers and/or vessel bunkering.

Table 3-1 details the environmental hazards and controls associated with the Yolla platform operations and MLE construction campaign.



### 3.1 Risk Assessment Outcomes

Table 3-1 provides a summary of the findings from the construction campaign Environment Risk Assessment (ERA) conducted on the 8<sup>th</sup> of June 2011. The risk assessment workshop involved a multi disciplinary team including representatives from Origin Management, Operations (Supervisors, Technicians and Health and Safety Representatives), HSE and Sea Trucks Group, the operator of the Jascon 25. The risk assessment workshop findings were recorded into the BassGas Environment Risk Register [OEUP-V5000-REG-ENV-001], which is based on the Origin Energy Corporate Risk Register template. All risks identified were assessed and in some cases, additional controls implemented in order to demonstrate that the risk is ALARP. Please note the risks summarised below reflect the Risk Register records at the time of submission of this EP. As the Risk Register is a live system, refer to OEUP-V5000-REG-ENV-001 for the most up to date environmental risks associated with the construction operations.

Table 3-1 Environmental Risk Assessment Summary

Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
<b>Solid Material and Waste</b>					
Overboard disposal of solid wastes and litter, such as empty pails and sacks, bottles, drums, etc. <i>(Platform and vessel)</i>	<p><b>Cause:</b> Inadequate waste storage facilities, poor transfer procedures, inappropriate labelling.</p> <p><b>Consequence:</b> Marine Pollution, physical impact wildlife or toxic effects from any residual hazardous products on plankton, fish, etc.</p>	1/Minor	3/Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ BassGas Waste Management Plan [OEUP-V5100-PLN-SAF-005].</li> <li>➤ Vessel Waste Management Plan [STF-OPS-006-J25].</li> <li>➤ Use of approved and licensed waste contractors.</li> <li>➤ Contractor Management System.</li> <li>➤ Waste Tracking Records.</li> </ul>
<b>Liquid Wastes</b>					





Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
Deck drainage - storm water runoff, deck wash-down water, and the drainage from machinery and work areas. <i>(Platform and vessel)</i>	<p><b>Cause:</b> High concentrations of oil contamination in deck drainage from poor housekeeping, drips, leaks and spills.</p> <p><b>Consequence:</b> Potential impact on the marine environment. Regulatory non-compliance. Note: Deck wash-down water may contain small quantities of oil and detergents, but the volumes and concentrations in the water that would be discharged overboard would be very low. Temporary and localised reduction in water quality. Physiological damage to marine fauna ingesting contaminated water.</p>	1/Minor	4/Possible	Medium (ALARP)	<ul style="list-style-type: none"> <li>➤ Deck areas drain to open/closed drain system. System adequately sized to managed drainage.</li> <li>➤ Deck drainage on the platform and vessel routed to the oil-water separator for treatment (to &lt;30 ppm) prior to overboard discharge.</li> <li>➤ Bunding around process areas, chemical tanks and other chemical storage areas.</li> <li>➤ SOPEP oil spill bins onboard the platform and vessel for immediate clean up of spills.</li> <li>➤ Spills will not be washed overboard.</li> <li>➤ Minor deck spillages of oils or chemicals will be cleaned up by the use of absorbent materials. The contaminated sorbent materials would be stored in appropriate containers for transport to shore for disposal at an approved location in accordance with Origin's Waste Management Plan [OEUP-V5100-PLN-SAF-005].</li> </ul>



Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
Disposal of sewage and putrescible wastes. (Vessel only)  (see BassGas Offshore EP for disposal from platform)	<b>Cause:</b> Treated sewage disposed to sea.  <b>Consequence:</b> Temporary and localised decrease in water quality due to nutrient enrichment. Modification in feeding habits of pelagic fish species.	1/Minor	3/Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Food waste to be macerated to &lt;25 mm diameter prior to disposal.</li> <li>➤ Vessel has an IMO-compliant sewage treatment plant and holding tank.</li> <li>➤ Effluents will be discharged in accordance with MARPOL standards (regarding distance from shore).</li> <li>➤ Biodegradable detergents will be used on vessel.</li> <li>➤ Equipment will be maintained in accordance with the planned maintenance program (i.e., kitchen macerator, sewage treatment plant).</li> <li>➤ In the event of macerator malfunction, food waste will be bagged and sent to shore for disposal.</li> </ul>
Release of oil and grease from machine areas to marine environment. (Vessel only)	<b>Cause:</b> Bund overflow and release to marine environment.  <b>Consequence:</b> Water pollution leading to increase in nutrients with localised effect on plankton.	1/Minor	1/Remote	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Vessel Preventative Maintenance System (STAR IPS).</li> <li>➤ Oil, fuel and chemical storage areas banded.</li> <li>➤ Oily water directed to oily water separator prior to discharge overboard, meeting 15 ppm oil in water content. Captured oil to be contained and disposed of onshore using port facilities.</li> <li>➤ Oily water tank emptied prior to construction to ensure sufficient storage capacity.</li> <li>➤ Fully stocked SOPEP kits on board to clean deck spills.</li> <li>➤ No washing of deck spills overboard.</li> </ul>
<b>Air Emissions</b>					
Uncontrolled flaring during commissioning. (Platform only)	<b>Cause:</b> Flare ignition system failure / flare piping corrosion / low temperature embrittlement	1/Minor	4/Possible	Medium (ALARP)	<ul style="list-style-type: none"> <li>➤ Only minor volumes of flaring likely, due to blow-down system testing or plant trips.</li> <li>➤ Platform designed and approved for continuous flaring.</li> <li>➤ Flare rates continuously monitored.</li> <li>➤ Volume of flared gas minimised to lowest practical level.</li> <li>➤ Flared gas records included in daily production reports and reviewed regularly for any significant variations in fuel gas</li> </ul>



Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
	<b>Consequence:</b> Localised and minor reduction in air quality.				usage. ➤ Flare design and Asset Integrity System. ➤ Safety Instrumented System. ➤ Flare flame-out monitored via Closed Circuit Television (CCTV). ➤ Flaring rates to be within regulatory limits specified in operating procedures.
Excessive diesel combustion. (Vessel only)	<b>Cause:</b> Machinery or engine failure or malfunction.  <b>Consequence:</b> Localised and minor reduction in air quality - as the platform is remotely located (147 kms from shore), the impact is considered to be minor.	1/Minor	4/Unlikely	Low (ALARP)	➤ Maintenance system in place for all vessel equipment. ➤ Equipment fuel consumption monitored and assessed for performance requirements by the Barge Engineer. ➤ Marine diesel is low in sulphur content, minimising the generation of SOx. ➤ Diesel use and greenhouse gas emissions recorded by Origin and reported to government agencies for annual greenhouse gas emissions.
Other					



Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
Noise. (Vessel only)	<p><b>Cause:</b> Noise from vessel thrusters, helicopter overflights and general construction activities.</p> <p><b>Consequence:</b> Disturbance to noise-sensitive marine species (such as whales, most of which are listed as 'threatened').</p>	1/Minor	3/Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Helicopters are required to maintain a distance of 1,000 metres from whales in accordance with the EPBC Act.</li> <li>➤ Project is not located in a key breeding or feeding area for threatened whale species.</li> <li>➤ Vessel movements near the platform will generally be restricted.</li> </ul>
Collision with cetaceans. (Vessel only)	<p><b>Cause:</b> Vessel strike caused by Vessel Master inattention or whale approaching vessel.</p> <p><b>Consequence:</b> Cetacean injury or death.</p>	1/Minor	2/Highly Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Cetaceans will generally avoid approaching undesirable sources of noise.</li> <li>➤ The Masters of the supply vessels shall not knowingly interfere with the activities of whales, dolphins, and seals. When their presence is detected, all efforts, in keeping with the Master's responsibilities to the safety his crew, will be made to minimise any interference with their activities.</li> <li>➤ Should whales be sighted, the supply/support vessels shall not knowingly approach to within a distance of 500 metres.</li> </ul>



Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
Materials handling. <i>(Platform only)</i>	<p><b>Cause:</b> Spill of chemicals routinely stored on the platform (e.g., corrosion inhibitor, demulsifier, reverse-demulsifier and methanol).</p> <p><b>Consequence:</b> Marine pollution. Regulatory non-compliance.</p>	1/Minor	3/Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Bulk chemicals and fuels are transferred only in calm weather, during daylight hours. All transfers are carefully managed using JHA procedures.</li> <li>➤ Hazardous goods and chemicals are shipped to the platform in accordance with International Maritime Organisation (IMO) codes and requirements.</li> <li>➤ Discharges Overboard Procedure [OEUP-V5100-PRO-SAF-014].</li> <li>➤ SOPEP kits available on board.</li> </ul>
Diesel spill. <i>(Platform and vessel)</i>	<p><b>Cause:</b> Equipment failure, loss of hose control during at-sea refuelling, vessel collision resulting in fuel tank rupture.</p> <p><b>Consequence:</b> Sea pollution; birds most likely to be effected as well as pelagic fish, migratory species including cetaceans and plankton. Regulatory non-compliance. Temporary and localised reduction in surface water quality.</p>	1/Minor	3/Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Jascon 25 Refuelling Procedure [STF-PRO-J25-018].</li> <li>➤ Dry break connections are used on fuel transfer lines, minimising spillage.</li> <li>➤ Re-fuelling operations involving the transfer of fuels to the platform are managed in accordance with Bunkering Operations Procedure [OEUP-T5100-PRO-PFM-146].</li> <li>➤ Fuel transfers only occur during suitable weather conditions. Refer to Adverse Weather Management Procedure [OEUP-V5100-PRO-SAF-157].</li> <li>➤ Equipment inspection and maintenance schedule on the platform and vessel.</li> <li>➤ SOPEP kits available on board vessel and platform.</li> <li>➤ Origin OSCP in place [OEUP-T5100-PLN-PFM-004].</li> </ul>



Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
	Physiological damage to marine fauna ingesting contaminated water.				
Collision of vessels (freight, fishing or supply) with platform. (Vessels only)	<p><b>Cause:</b> Vessel loss of control. Failure of lighting on platform.</p> <p><b>Consequence:</b> Fuel oil Spillage - Sea pollution; birds most likely to be effected as well as pelagic fish, migratory species, and plankton. Regulatory non-compliance.</p>	4/Major	1/Remote	Medium (ALARP)	<ul style="list-style-type: none"> <li>➤ Platform is designed to withstand an accidental broadside impact from a 1,200 tonne vessel (typical supply vessel size).</li> <li>➤ The potential for accidental discharge arising from structural damage to the facility is lessened by the presence of hazard lighting and the presence of a 500 m exclusion zone around the platform marked on navigational charts.</li> <li>➤ OSCP in place [OEUP-T5100-PLN-PFM-004].</li> <li>➤ ERP in place [OEUP-V5100-PLN-ERS-002].</li> </ul>
Introduction of invasive marine species. (Vessel only)	<p><b>Cause:</b> Vessel biofouling.</p> <p><b>Consequence:</b> Establishment of introduced pests in Bass Strait. Displacement of native species.</p>	3/Serious	1/Remote	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Supply vessels to be preferentially sourced locally (from Bass Strait), thereby minimising risk of introducing invasive pests from foreign ballast water or from hull biofouling.</li> <li>➤ Where vessels are sourced from elsewhere, they will comply with AQIS requirements including ballast water management, assessments and inspections.</li> </ul>
Dropped objects. (Platform and vessel)	<p><b>Cause:</b> Crane operations/vessel unloading operations.</p>	1/Minor	3/Unlikely	Low (ALARP)	<ul style="list-style-type: none"> <li>➤ Procedure Cranes - Planning, Setup and Operation Of [OEUP-V5000-PRO-SAF-001].</li> <li>➤ Adverse Weather Management Procedure [OEUP-V5100-PRO-SAF-157].</li> </ul>



Risk Event	Causes / Consequences	Consequence Category	Likelihood Rating	Risk Level	Controls
	<b>Consequence:</b> Damage to equipment/pipeline asset. Pollution to sea floor.				<ul style="list-style-type: none"> <li>➤ Permit to Work System.</li> <li>➤ Job Hazard Analysis (JHA).</li> <li>➤ Jascon 25 Task Risk Assessments (TRAs).</li> <li>➤ Risk Assessment.</li> <li>➤ Crane Maintenance.</li> <li>➤ Certified and inspected rigging.</li> <li>➤ Competent Crane Operators.</li> </ul>
Third party influences. <i>(Platform only)</i>	<b>Cause:</b> Sabotage/equipment damage.  <b>Consequence:</b> Release of contaminants to marine environment. Impact on marine biodiversity.	3/Serious	2/Highly Unlikely	Medium (ALARP)	<ul style="list-style-type: none"> <li>➤ Designated exclusion zone (500m around platform).</li> <li>➤ Closed Circuit Television (CCTV) monitoring for access to platform.</li> <li>➤ Chained access gate to sea deck.</li> <li>➤ Emergency shutdown systems.</li> <li>➤ Plans to install a proximity switch alarm on access gate.</li> </ul>

## 4. Implementation Strategy

The primary goals of the implementation strategy is to direct, review and manage operations so that environmental impacts and risks are continually reduced to a level that is As Low As Reasonably Practicable (ALARP), and performance objectives and standards are met over the life of the activity.

### 4.1 BassGas Health Safety and Environment Management System (HSEMS)

All operations at Yolla are undertaken in accordance with the Origin HSEMS. The HSEMS documents the HSE policy, HSE Standards and the key HSE processes and requirements for all activities. It provides a management framework for achieving the requirements in a systematic way, but allows sufficient flexibility for the operating unit to achieve this in a manner that best suits the business, while maintaining high HSE standards.

The BassGas HSEMS addresses the Governance requirements set by Origin including the System Structure, Performance Standards as well as the Divisional and Asset Management Processes, Procedures and Accountabilities to meet those requirements and specific legislative requirements applicable to the Asset.

The BassGas HSEMS is an extension of that of the parent company, Origin Energy's HSEMS. The System structure is illustrated in Figure 4-1. The Origin HSE Policy, shown near the top of the triangle, demonstrates the commitment and intentions of the Company. In subsequent tiers, the Origin HSE standards and Directives detail corporate expectations on the implementation of the Policy and HSE risk management across the Company. At the Business level, the System is complemented by Asset and Site procedures and major plans such as the Facility Specific Safety Cases, the Pipeline Management Plan, the Asset Integrity Plan, Emergency Response Plan (ERP) and Environment Plan (EP).

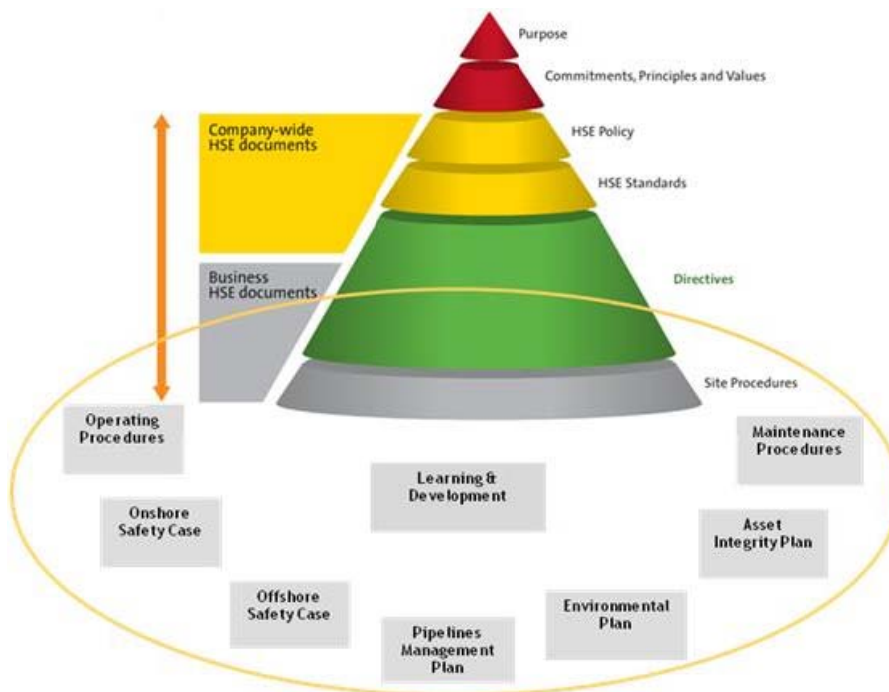


Figure 4-1 HSE Management System Structure





The implementation of the Origin HSEMS at BassGas extends the elements and expectations of the Company processes, the Upstream Oil & Gas divisional requirements and specific regulatory licence requirements to the BassGas Operations.

Implementing and complying with these requirements is the responsibility of everyone associated with the BassGas Operations. Further detail on the BassGas HSEMS can be referenced in the BassGas HSEMS Manual [OEUP-V5100-PLN-SAF-003].

#### **4.1.1 Incident Management**

The Origin Incident Management Process is applied for all incident and accident analysis and reporting for the BassGas facilities [HSE-PRC-004]. The requirements of incident analysis and investigations are detailed in Origin Directive - Incident Management. This Directive describes the steps to be taken after an incident has occurred or a hazard has been identified.

The purpose of an analysis is to determine the causes of incidents (including near misses) or to correctly determine hazards that have not been adequately identified, assessed or controlled. Having verified the underlying causes, an analysis must then recommend how to prevent a recurrence.

The potential of all incidents and hazards is assessed and categorised on a scale ranging from 'low' to 'extreme' in accordance with the Origin Risk Matrix. The analysis and reporting requirements are determined by the potential of the event to cause harm.

The number of outstanding actions is reported monthly on a 12 month rolling basis as a key performance measure which is published in the Divisional monthly report. Incident reports and corrective actions will be managed using the Origin corporate Origin Collective Intelligence System (OCIS) database (Incident Management Module).

The corporate HSE Group reviews all incidents and hazards to ensure a consistent approach.

The HSE Incidents and Hazards notification system (Electronic reporting via OCIS or the paper Notification Form) enables individuals to report any hazards that they identify and which cannot be eliminated at the time of discovery. These hard copy notification forms are submitted to the Immediate Supervisor or Team Leader for initial review who then forwards them to the HSE Advisor who also reviews them and records the hazard details and agreed actions into the OCIS database where they are tracked until closed out. Where appropriate, supervisors table the forms at daily meetings, such as the Daily PTW Coordination Meeting for general discussion and information.

Incidents involving serious injury, significant environmental damage, or asset/business loss, shall be immediately reported to relevant Regulatory Authorities together with internal Origin incident escalation process as specified in the Origin Incident Management Procedure.

At the Divisional and Corporate levels investigation of significant incidents are shared with other Business areas and leanings are used to improve systems and processes to prevent recurrence.

#### **4.1.2 Performance Measurement and Reporting**

Reports giving details of HSE performance statistics are prepared to meet internal company requirements and applicable regulatory requirements. Such reports are used to benchmark the BassGas operation's current performance against past performance and that of other peer group organisations

Key Performance Indicators (KPI's) related to HSE performance are defined in the BassGas HSE Action Plan [OEUP-V5100-PLN-BUS-001] with performance against these KPIs being measured monthly. The relevance and effectiveness of these KPIs are reviewed annually and where appropriate, the KPIs redefined for the coming year.

Communication of HSE performance to personnel is made by internal employee communication vehicles, the intranet where the monthly companywide target is displayed and up-dated monthly, internal presentation by the executive management and Asset Managers and finally through the annual sustainability report.



The results from monitoring, audits and reviews will be incorporated into appropriate work plans, procedures, work instructions and/or training, to facilitate the continuous improvement of operations. As part of these processes, new procedures will be developed from time to time and/or existing procedures modified or renamed. Communication and consultation mechanisms are in place to involve the appropriate personnel in this process.

#### ***4.1.3 Crisis and Emergency Management***

An Emergency Response Plan (ERP) [OEUP-V5100-PLN-ERS-002] has been developed describing the actions to be taken in the event of all identified incidents, or medical emergencies occurring at a BassGas facility.

Development of the ERP involved input from a broad range of sources including onsite staff, HSRs, relevant emergency services. All BassGas staff receive training in the ERP and details of the ERP have been made available to emergency services and relevant municipal authorities.

Reporting relationships for command, control and communications are specified in the ERP together with interfaces to emergency services specialist response groups, statutory authorities and other external bodies. The roles and responsibilities are detailed for onshore and offshore personnel involved in an emergency, including the response teams, onshore support teams, visitors, contractors and employees.

The ERP defines the communication requirements to notify both the company and external bodies of the incident so as to obtain assistance where needed and to fulfil reporting obligations.

The ERP is periodically reviewed to establish its effectiveness and updated, as necessary, to incorporate lessons learned from training, exercises and incidents, both internally to BassGas and externally.

Emergency response training and exercises will be conducted both onshore and offshore. They will allow personnel to develop competence and proficiency in fulfilling their assigned roles and responsibilities under the ERP.

A plan showing when all exercises and drills are scheduled to take place has been developed [OEUP-V5100-PLN-SAF-017] and will be complied with. The results of such exercises and drills will be recorded and utilised to make improvements to procedures, systems and equipment as appropriate.

Systems will be established to provide effective management in the event of a discharge of hydrocarbons to the marine environment. Such processes will include initial response, reporting requirements, and the involvement of third parties having the appropriate skills and facilities necessary to respond effectively to oil spill issues (refer to the Oil Spill Contingency Plan (OSCP) [OEUP-T5100-PLN-PFM-004]).



## 5. Environmental Reporting

This section summarises the environmental reporting arrangements for the MLE Construction campaign. The Origin Southern Australia Assets Operations Manager is responsible for ensuring that all BassGas environmental reporting requirements are met.

### 5.1 Reportable and Recordable Incidents

All offshore environmental incidents must be reported to the Operations Manager and are investigated in accordance with the BassGas Hazard and Incident Reporting, Recording and Investigation Procedure [OEUP-V5100-PRO-SAF-050].

The Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 define incidents to be recorded and, where appropriate, reported to the Designated Authority as follows:

- Recordable incident: for an operator of an activity, means an incident arising from the activity that:
  - (a) breaches a performance objective or standard in the Environment Plan that applies to the activity; and
  - (b) is not a reportable incident.
- Reportable incident: for an operator of an activity, means an incident relating to an activity that has caused, or has the potential to cause, moderate to significant environmental damage.

In the context of the Origin Energy Corporate Risk Matrix and the Environment Risk Assessment (ERA) completed for the Yolla MLE construction activities (Table 8.1), a 'moderate to significant' risk is defined as any incident of consequence category 2 or greater. The risk events/incidents identified as having a consequence category of 2 or greater are as follows:

- Collision with the platform by shipping, fishing, or supply vessels;
- Third party Influences; and
- Deck drainage - stormwater runoff, deck wash-down water, and drainage from machinery and work areas.

In addition, the following incidents must also be reported to Designated Authority irrespective of how their risk has been assessed:

- An uncontained spill of oil or diesel greater than 80 litres.
- An uncontrolled release of hydrocarbons.
- An unplanned gaseous release over 500 m<sup>3</sup>.
- Injury or damage to or death of a threatened species (e.g., listed cetaceans).
- Causes any unplanned impact to a matter of National Environmental Significance

A recordable environment incident is an incident arising from an activity that breaches an Environment Plan (EP) performance standard or objective but that is not classified as a reportable incident.



## 6. Environment Plan Consultation

### 6.1 Employee Consultation

Consultation with employees in the development of the Environment Plan (EP) can be demonstrated through employee participation in the campaign-specific ERA conducted in June 2011. The risk assessment was a workshop-based approach for reviewing the risk events previously identified and for identifying new risks associated with the construction campaign. The workshop involved a multi-disciplinary team including representatives from Origin and Sea Trucks Group. The Implementation Strategy for the EP was developed based on the outcomes of the Environment Risk Assessment (ERA).

As part of the project induction that all offshore project personnel must attend, Origin's HSE expectations, the main environmental issues, their controls and the reporting requirements will all be presented and discussed. Posters will also be developed for use offshore, highlighting the EP and the key issues. Environmental issues are encouraged to be raised during 'toolbox talks' and JHAs.

### 6.2 Ongoing Community Consultation

Origin Energy has developed systems to regularly assess the general community's expectations of Origin Energy as a corporate citizen. A community Environmental Liaison Group (ELG) meeting forum has been established to respond to external feedback and engage with the general community and key regulators. The meetings, held on a quarterly basis at the BassGas facility, are open to the general community and key stakeholders and act as a consultation forum to communicate Origin Energy's HSE goals and performance. The community consultation meetings ensure that HSE management issues arising from the operation of the BassGas project are managed to the satisfaction of the relevant regulatory authorities and the local community. The MLE project has been presented and discussed at these meetings and project progress has been added as an item on the agenda.

The MLE Project has also developed a specific stakeholder consultation plan [OEUP-5100-PLN-BUS-001] aimed at stakeholders who may be impacted by the offshore construction activities, e.g. regulatory bodies, commercial fishers and Bass Strait shipping traffic. The stakeholder consultation plan provides details of the consultation provided to these stakeholders.

### 6.3 Regulatory Consultation

The Origin Energy MLE project team has maintained open communication with the regulator throughout the project planning process and will continue to do so during construction and post-construction through the necessary close-out reporting.