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## Statement of Environmental Objectives

### Drilling, Completion and Well Production Testing in the Otway Basin, South Australia

December 2018



Document Control					
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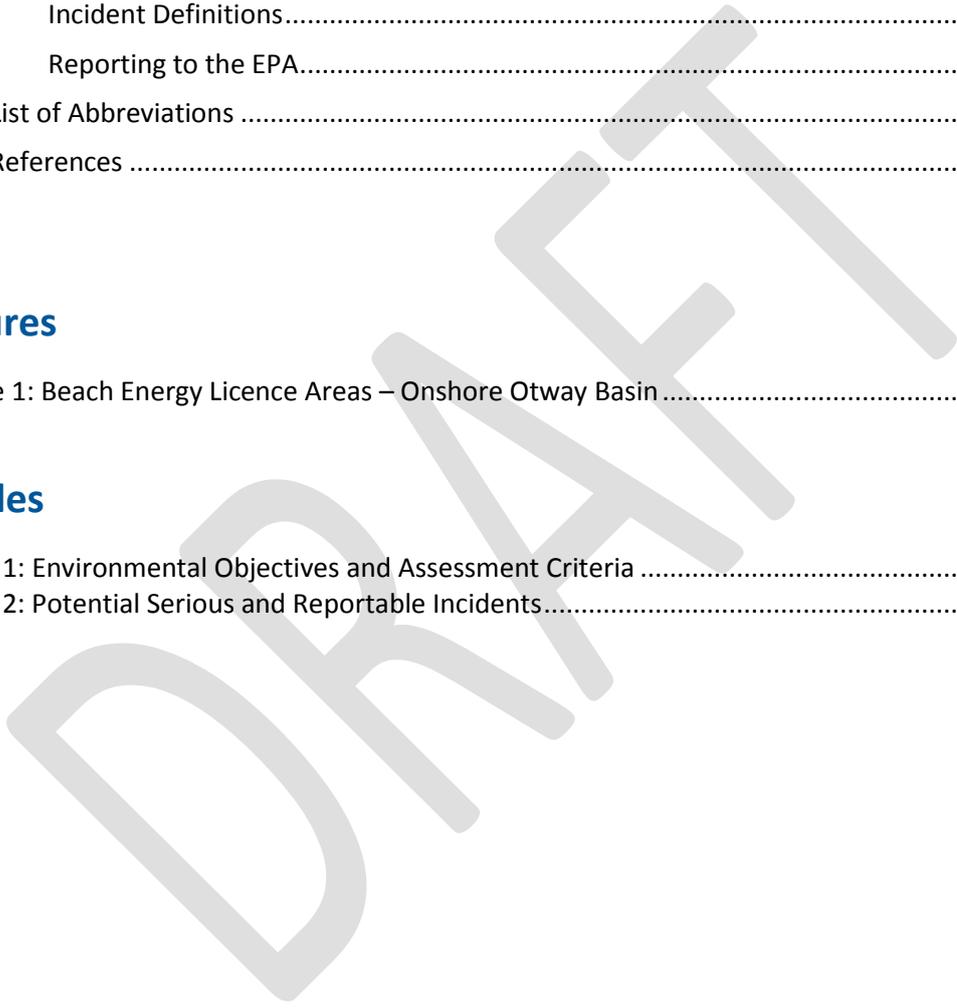
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# 1 Introduction

## 1.1 Purpose

This Statement of Environmental Objectives (SEO) has been prepared to meet the requirements of Sections 99 and 100 of the *Petroleum and Geothermal Energy Act 2000* and Regulations 12 and 13 of the *Petroleum and Geothermal Energy Regulations 2013*.

The intent of the SEO is to outline the environmental objectives to which drilling, completion and well production testing activities in the onshore South Australian Otway Basin will conform, and the criteria upon which the achievement of these objectives will be assessed.

The objectives of this SEO have been developed on the basis of the information provided in the Environmental Impact Report (EIR) (Beach Energy 2018), and are in keeping with the objectives of the Petroleum and Geothermal Energy Act, which include:

- to minimise the environmental damage from exploration for, or recovery or commercial utilisation of, resources to which the Act applies
- to establish appropriate consultative processes involving people directly affected by regulated activities and the public generally
- to protect the public from risks inherent in regulated activities.

Environment is broadly defined in the Petroleum and Geothermal Energy Act to include natural, social, cultural and economic aspects. The environmental objectives outlined in this SEO incorporate these aspects.

## 1.2 Scope

This SEO applies to drilling, completion and well production testing activities in the onshore Otway Basin in South Australia. These operations are described in the EIR (Beach Energy 2018).

Activities covered by this SEO are:

- well site and access track construction
- drilling
- well completion and workovers
- well production testing (both drill stem tests and any well production testing)
- well and zonal decommissioning<sup>1</sup>
- site and access decommissioning and rehabilitation.

The following operations are not covered by this SEO:

- seismic exploration activities
- fracture stimulation
- production and processing operations beyond well production testing
- production and processing operations at the Katnook gas plant site

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<sup>1</sup> Decommissioning of wells is equivalent to 'abandonment', which is the technical term used in the Petroleum and Geothermal Energy Regulations

- well operations (after drilling has finished) including production completions and workovers, well integrity management, artificial lift and wellhead production equipment, gas well deliquification and downhole decommissioning following production<sup>2</sup>
- field production / processing equipment installation, operation, decommissioning and rehabilitation
- pipeline construction, operation and decommissioning

This SEO does not cover activities in parks or reserves established under the *National Parks and Wildlife Act 1972*.

This document updates and supersedes the Statements of Environmental Objectives that have previously been developed to cover drilling, completion and well production testing activities in the region.

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<sup>2</sup> Well decommissioning following production is proposed to be covered under the scope of Beach's Onshore Otway Basin Petroleum Production Operations EIR and SEO. It has been retained in this drilling EIR and the accompanying SEO to ensure coverage is maintained, as the production EIR and SEO had not been approved at the time of writing. Once approved, the production SEO would provide coverage of decommissioning following production.

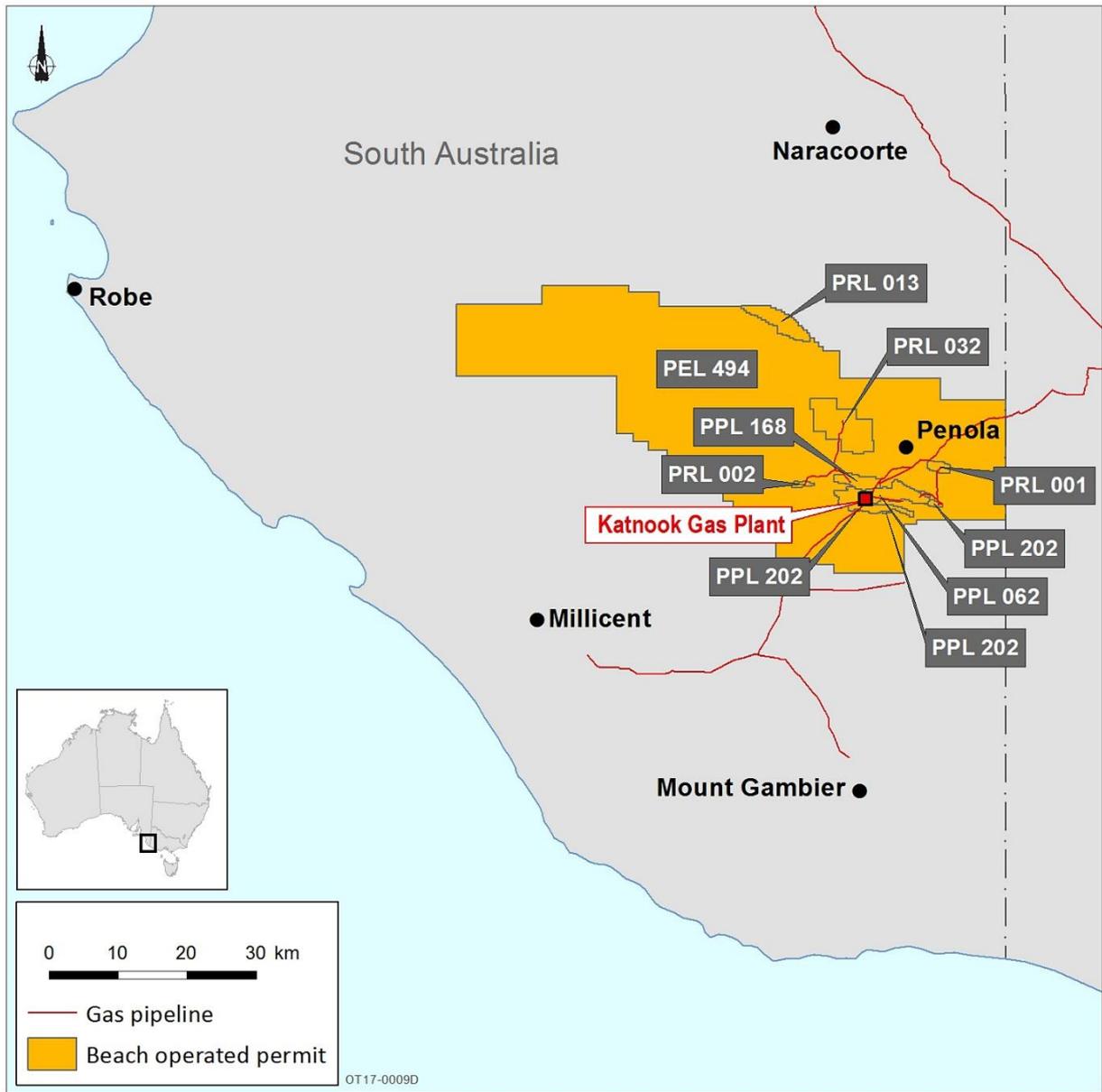


Figure 1: Beach Energy Licence Areas – Onshore Otway Basin

## 2 Environmental Objectives and Assessment Criteria

### 2.1 Objectives

Potential environmental hazards and consequences associated with drilling, completion and well production testing activities in the onshore Otway Basin have been identified in the Environmental Impact Report (Beach Energy 2018). Beach is committed to achieving a range of environmental objectives in regard to these potential hazards.

The environmental objectives for drilling, completion and well production testing operations are:

1. Avoid disturbance to sites of cultural and heritage significance
2. Minimise disturbance to native vegetation and native fauna (including wetland communities)
3. Avoid the introduction and spread of weeds, exotic pest fauna and pathogens
4. Minimise disturbance and avoid contamination of soil
5. Minimise loss of reservoir and aquifer pressures and avoid aquifer contamination
6. Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources
7. Minimise risks to the health and safety of the public
8. Minimise the visual impact of operations
9. Minimise disturbance to the local community and other land users
10. Minimise the impact on the environment of waste storage, handling and disposal
11. Remediate and rehabilitate operational areas to agreed standards.

### 2.2 Assessment Criteria

The environmental objectives identified above are subject to an assessment to measure the level of achievement. The assessment criteria for each objective are set out in Table 1 and include:

- Defined conditions – In many cases the achievement of an objective can be assessed through ensuring defined conditions are met or carried out. Such conditions include:
  - Prohibitions that achieve the objective through the prevention of unacceptable actions
  - Requirements to carry out certain actions in accordance with approved procedures or industry accepted standards.
- Scientific studies / monitoring - In some cases assessment of the environmental objectives may not be possible in the shorter term and may require longer term monitoring and scientific evaluation. In such cases, the assessment criteria may be in the form of longer term data and information gathering.

Table 1 also outlines the controls that are planned to be implemented to ensure that environmental objectives are achieved, in the “Guide to How Objectives Can be Achieved” column.

**Table 1: Environmental Objectives and Assessment Criteria**

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<p>1. Avoid disturbance to sites of cultural and heritage significance</p>	<p>In the event the conditions of a cultural heritage clearance are not complied with, the incident is appropriately reported, investigated and remediated in consultation with the relevant Aboriginal heritage group.</p> <p>Damage, disturbance or interference to any Aboriginal sites, objects and remains (all as defined under the <i>Aboriginal Heritage Act 1988</i>) is avoided unless authorisation has been obtained under the <i>Aboriginal Heritage Act 1988</i>.</p> <p>Any Aboriginal heritage sites, objects and remains discovered during operations have been appropriately reported and responded to, consistent with the <i>Aboriginal Heritage Act 1988</i></p> <p>Non-Aboriginal heritage sites identified and avoided.</p> <p>No impact to non-Aboriginal heritage places and related objects protected under the <i>Heritage Places Act 1993</i> unless approval has been obtained under the <i>Heritage Places Act 1993</i>.</p>	<p>Cultural heritage inspection of proposed well sites and access tracks undertaken with the relevant Aboriginal heritage group.</p> <p>Known sites identified and protected from operations (e.g. using temporary flagging).</p> <p>Cultural heritage issues covered in inductions. Key personnel (e.g. supervisors, machinery operators) receive appropriate cultural heritage training.</p> <p>Procedure in place for the appropriate response to any sites discovered during activities.</p> <p>Records of sites forwarded to the Aboriginal Heritage Branch in compliance with the Aboriginal Heritage Act.</p> <p>Records relating to sites of cultural heritage significance kept and available for audit.</p> <p>Heritage site registers and Heritage Branch, DEW, consulted regarding the location of non-indigenous heritage sites where appropriate.</p>
<p>2. Minimise disturbance to native vegetation and native fauna (including wetland communities)</p>	<p>No unauthorised clearing of native vegetation</p> <p>Any sites of rare, vulnerable or endangered species or threatened communities have been identified, flagged and subsequently avoided.</p> <p>High quality or significant remnant vegetation has not been cleared.</p> <p>Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act.</p> <p>No significant adverse impacts on native fauna through any stage of construction, drilling or well production testing.</p> <p>No uncontrolled fires initiated as a result of drilling, completion and well production testing activities.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Refer to Assessment Criteria for Objective 4.</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10.</p>	<p>Appropriately trained and experienced personnel have assessed or scouted proposed well site, access track and camp locations to identify and flag significant (or rare, vulnerable or endangered) species and communities.</p> <p>Native vegetation clearance avoided or minimised by locating well sites and access tracks appropriately.</p> <p>Removal of large trees (including dead trees with hollows) is avoided.</p> <p>Areas of low quality native vegetation are avoided unless there are no viable alternatives (e.g. use of adjacent cleared areas).</p> <p>Areas of high quality or significant<sup>3</sup> remnant vegetation or Heritage Agreement Areas are avoided.</p> <p>Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act.</p> <p>If well sites are in close proximity to a park or reserve established under the National Parks and Wildlife Act and indirect impacts are likely, consultation is undertaken with DEW to determine appropriate mitigation measures.</p> <p>Excavations (e.g. sump) checked regularly for trapped fauna.</p> <p>Sumps and well site are appropriately fenced to minimise fauna access.</p> <p>If threatened species (e.g. Red-tailed Black-Cockatoos) are detected or likely to occur near the well site, specialist advice is sought regarding measures to mitigate potential impacts, particularly during breeding season. Undertake detailed assessments and EPBC Act referral (if required) if avoidance of species or habitats is not possible.</p> <p>Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire-fighting equipment.</p> <p>Liaise with CFS and local council regarding operations and Fire and Emergency Services Act requirements (e.g. permits for 'hot work' on fire ban days if required).</p> <p>Where necessary (e.g. in fire danger season), fire break constructed around well lease.</p> <p>Flare tank / stack located to ensure that radiant heat does not impact trees.</p> <p>Response to fire included in Emergency Response Plan.</p> <p>Ensure fire risk is included in the induction and all personnel are fully informed on the fire danger season and associated restrictions.</p>
<p>3. Avoid the introduction and spread of weeds, exotic pest fauna and pathogens</p>	<p>The presence of weeds, pest animals or pathogens is consistent with or better than pre-disturbance conditions and adjacent land or where this is not the case, a management plan is implemented promptly.</p> <p>Declared plants occurring as a result of regulated activities are reported and managed in accordance with the Natural Resources Management (NRM) Act and applicable NRM plans.</p>	<p>All reasonable and practical endeavours taken to minimise the risks of introducing weeds, exotic pest fauna and pathogens into the areas of operations.</p> <p>Appropriate consultation regarding weeds or pathogens carried out with landholders and NRM Board officers.</p> <p>Vehicles and equipment arriving at the site must be clean and free of soil and plant material.</p> <p>Vehicles and equipment entering the region or moving between sites (especially from weed or pathogen infested areas into non-infested areas) will be assessed for the risk of transporting weeds and pathogens and cleaned down where appropriate.</p> <p>Biosecurity procedures implemented as agreed with landholders.</p> <p>Records of vehicle or equipment inspections and cleaning will be kept for auditing.</p> <p>Paving materials will be sourced from licensed quarries that are free of weeds.</p> <p>Sites and access tracks monitored on a regular basis for new weed species / infestations and treated as necessary in accordance with requirements of the landholder, and if appropriate the NRM Board.</p> <p>Records of detection, monitoring or eradication of weeds or pathogens introduced by activities are kept and available for review.</p>

<sup>3</sup> Significant in this context includes listed plant species, listed communities or important fauna habitat

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<p>4. Minimise disturbance and avoid contamination of soil</p>	<p>No disturbance to soil profiles resulting from activities remains after restoration.</p> <p>Local erosion rates are not significantly accelerated above those of surrounding land.</p> <p>No adverse impact to land use or native vegetation and native fauna outside drilling sites due to an escape of petroleum, processed substance, chemical or fuel.</p> <p>Any escape of petroleum, processed substance, chemical or fuel to land is either immediately contained and removed or assessed in accordance with NEPM guidelines and remediated in a timely manner.</p> <p><u>Waste Management</u> Refer to Assessment Criteria for Objective 10.</p>	<p><u>Well Site and Access Track Construction and Restoration</u></p> <p>Locate and orientate well lease and access to minimise soil removal and area of cut and fill.</p> <p>Soil removed in construction to be stored on site and returned to its original stratigraphic level upon restoration of the drill site. Separate storage of topsoil, subsoil and clays will be undertaken to assist in regeneration of pasture or crops.</p> <p>Restoration of the well site to be approved by the landowner or in accordance with landowner's wishes should retention of specific parts of the site be requested (e.g. pad or access track).</p> <p>Landowner to be consulted about earthworks required, location of access tracks and general information to minimise surface damage and to facilitate rehabilitation.</p> <p>Well sites are rehabilitated following drilling or the lease area reduced to the minimum size necessary if the well is successful.</p> <p>During rehabilitation the soil beneath the tracks, camp and pad will be ripped after removal of imported fill and before returning of stockpiled topsoil.</p> <p>Soil profile and contours will be reinstated following completion of operations.</p> <p><u>Drilling and Production Testing Activities</u></p> <p>Lined sump to have sufficient capacity.</p> <p>Drill pad runoff from high risk areas (e.g. drill rig, generators) directed into sump.</p> <p>Storage of synthetic based muds (SBM) to be located to contain any spills (e.g. polyethylene lined bunded areas or with suitable alternative spill containment.)</p> <p>SBM muds and cuttings returned from the wellbore will be collected in enclosed tanks and removed from site by a licensed contractor to a licensed treatment or disposal facility.</p> <p>Flooding risk is considered in well lease location and construction and additional measures implemented if required (e.g. a small berm around the sump to prevent floodwater entering the sump, drainage installed around site).</p> <p>Camp and drill rig generators to be appropriately located to contain any spills (e.g. in polyethylene lined bunded areas or with suitable alternative spill containment).</p> <p>Bunded areas must have sufficient freeboard.</p> <p>All bunded areas will be in accordance with EPA guidelines <i>080/16 Bunding and Spill Management</i>.</p> <p>Safety Data Sheet information readily available at the well site.</p> <p>Refer to additional measures under Objective 6.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Hazardous material stored, used and disposed of in accordance with relevant legislation on dangerous substances.</p> <p>All hazardous materials including fuels, oils and chemicals are to be stored in approved containers in polythene lined bunded areas or on bunded pallets.</p> <p>Production tanks to be located in lined bunded areas.</p> <p>Production lines and tanks to be inspected prior to use.</p> <p>No refuelling outside designated refuelling or servicing areas.</p> <p>Appropriate drip capture / spill capture methods implemented in refuelling areas (e.g. use of drip trays or liners).</p> <p>Appropriate spill response equipment is available on site.</p> <p>Personnel have received training in the use of spill response equipment.</p> <p>Spills or leaks are immediately reported and clean up actions initiated.</p> <p>All contaminated soil will either be treated in-situ or removed for treatment / disposal at an EPA approved facility.</p> <p>Assessment and remediation of uncontained spills with larger scale impact is consistent with the National Environment Protection (Assessment of Site Contamination) Measure and relevant SA EPA guidelines.</p> <p>Records of spill events and corrective actions are maintained.</p> <p>All fuel and chemical storage areas will be in accordance with EPA guidelines <i>080/16 Bunding and Spill Management</i>.</p> <p><u>Waste Management</u> Refer to Objective 10.</p>

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<p>5. Minimise loss of reservoir and aquifer pressures and avoid aquifer contamination</p>	<p>No aquifer contamination as a result of drilling, completion or well production testing activities.</p> <p>No uncontrolled flow to surface (e.g. blow out).</p> <p>No impact on other groundwater users due to water extraction activities.</p> <p>Appropriate barriers exist to protect separate aquifer systems and / or hydrocarbon reservoirs that are typically in natural hydraulic isolation from each other.</p>	<p><u>Drilling and Completion Activities</u></p> <p>Activities performed in accordance with applicable industry and regulatory standards.</p> <p>Wells designed to meet pressure, temperature, operational stresses and loads.</p> <p>Effective barriers exist to maintain well control and prevent crossflow between aquifers systems or hydrocarbon reservoirs.</p> <p>Operational reports verify that barriers have been set and/or remedial cement work carried out in accordance with the work program submitted to and agreed with DEM.</p> <p>Groundwater aquifers isolated behind casing strings, cemented in place. Surface casing to be cemented to surface with visible return.</p> <p>Cement bond logs run on production casing to confirm quality of cement.</p> <p>Refer to Objective 6 for protection of near-surface aquifers during drilling of top hole section.</p> <p>Immediate retrieval of any radioactive source lost downhole.</p> <p>If retrieval is not possible, tool is cemented in hole to isolate it from adjacent formations.</p> <p>Relevant government approval obtained for decommissioning of any radioactive tool left downhole.</p> <p>Periodic well integrity processes in place for whole of life well monitoring and management.</p> <p>Monitoring programs implemented (e.g. through well logs, pressure measurements / testing and, or corrosion monitoring programs) to aid in the assessment of wellbore barrier conditions.</p> <p>Where monitoring identifies potential issues, working within Beach Management Systems, risk assessment undertaken to identify hazards / scenarios and propose recommendations and mitigation controls where appropriate to reduce or monitor risk.</p> <p>Casing annulus pressures are routinely checked and reported, if accessible.<sup>4</sup></p> <p><u>Well Decommissioning Activities</u></p> <p>Well decommissioning program submitted to DEM prior to implementation.</p> <p>Downhole decommissioning carried out to meet worst case expected loads and downhole environmental conditions.</p> <p>Appropriate barrier controls put in place to prevent crossflow, contamination or further pressure reduction occurring.</p> <p>Pressure testing and / or negative inflow testing performed on barrier envelopes / components where feasible.</p> <p>Inhibited fluid placed between barriers where applicable.</p> <p>Operational reports for barrier installation and testing submitted and retained.</p> <p><u>Water bore construction</u></p> <p>Water bore to be drilled by licensed driller with knowledge of local aquifers (e.g. the seal above the Dilwyn formation which must not be penetrated).</p> <p>Water extracted from shallow bores in accordance with the local Water Allocation Plan.</p> <p>Monitor existing bores within close proximity to drilling activities.</p>

<sup>4</sup> These ongoing well integrity management measures have been retained to ensure coverage is maintained, as the production EIR and SEO had not been approved at the time of writing. Once approved, the production SEO will provide coverage.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<p>6. Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources</p>	<p>Well leases and access tracks are located and constructed to maintain pre-existing water flows as far as practicable</p> <p>No new 'water affecting activities' (as defined under the NRM Act and regional NRM Plan) are undertaken unless relevant permits have been obtained</p> <p>No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or solid wastes to surface water and/or groundwater.</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10.</p>	<p><u>Well Lease and Access Track Construction and Restoration</u></p> <p>Well sites and access tracks are located to avoid surface water features such as swamps and significant wetland areas and to maintain pre-existing water flows. Temporary drainage depressions / culverts installed where required to maintain surface runoff.</p> <p>Landowners or infrastructure owners consulted regarding requirements for crossings of artificial drainage channels. Appropriate measures implemented where required (e.g. culverts).</p> <p>Sediment and erosion control measures (e.g. sediment fences) installed where necessary (e.g. if in close proximity to drains or surface water features).</p> <p>Any area artificially elevated by pad or access track construction will be lowered to original ground level by removal of paving material unless otherwise instructed by the landowner.</p> <p>Original drainage patterns will be restored.</p> <p>Well sites are not constructed in locations where they are likely to impact the marine environment.</p> <p><u>Drilling and Well Production Testing</u></p> <p>Information on muds and chemicals to be readily available on the rig.</p> <p>The sump will be lined with a suitable impermeable liner to prevent percolation into the soil.</p> <p>Water based drilling muds used on the surface hole. Water based or synthetic based fluids may be used on intermediate or production hole.</p> <p>Surface casing installed and cemented back to surface before drilling of intermediate to production hole section.</p> <p>Fresh water mud is used in the top hole to prevent saline mud filtrate impacting shallow freshwater aquifers.</p> <p>Fluid losses will be controlled during drilling.</p> <p>Synthetic based mud and cuttings circulated to surface will exit via an enclosed mud system to holding tanks, which will be in a lined area to ensure containment.</p> <p>Synthetic based mud and cuttings removed from site by a licensed contractor to a licensed treatment or disposal facility.</p> <p>Drilling fluids selection and management is consistent with Beach WECS and chemical selection process</p> <p>If required the sump may be pumped and excess fluid disposed of as appropriate.</p> <p>The drill cuttings and sump water will be tested to analyse their suitability for reuse, industrial recycle, fill or waste and will be disposed of accordingly, along with the sump liner. Sump contents to be disposed as waste will be removed by a licensed contractor to an EPA licensed waste disposal facility.</p> <p>Waste water (e.g. excess water from the sump) will not be disposed to land (e.g. by irrigation) unless it has landowner agreement and water quality meets applicable criteria and any relevant approvals (e.g. DEM / EPA) have been obtained.</p> <p>Wastewater is not allowed to drain to surface water drainage features such as swamps.</p> <p>Any oil contamination of sump from contaminated drill cuttings will be controlled and pumped out to a disposal tank.</p> <p>Separator tank used during well production testing to separate any produced liquids from gas before gas is sent to flare.</p> <p>Flare tank is used for emergency well control situations while drilling.</p> <p>Refer to measures under Objective 4.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Refer to Objective 4</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10.</p>

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<p>7. Minimise risks to the health and safety of the public</p>	<p>Reasonable measures implemented to ensure no injuries or health risks to the public.</p> <p>No injuries, incidents or adverse health impacts involving the public from drilling, completion or well production testing activities that could have been reasonably prevented by the operator.</p>	<p><u>Unauthorised Access by Third Parties</u></p> <p>“No Entry” signs warning of dangers associated with drilling operations placed at the entry to the site access track.</p> <p>Site area to be fenced with a gate on the access track.</p> <p>Access gate to well site will be closed during testing and appropriate signage will be in place to restrict entry.</p> <p>Drilling Supervisor and Drilling Contractor Manager given authority to refuse entry of unauthorised third parties.</p> <p>All minor excavations (e.g. for septic tank) to be backfilled soon after rig release.</p> <p>Sump to be backfilled as soon as practicable after waste materials have been appropriately removed.</p> <p>Well head and sump to be individually fenced if delay in clean-up / workover rig operations to occur.</p> <p><u>Drilling, Completion and Well Production Testing</u></p> <p>Rig, ancillary and any testing equipment to comply with Regulations, meet relevant industry standards and be ‘Fit for Purpose’.</p> <p>Casing set in accordance with design parameters.</p> <p>Details of work to be performed are set out in the Drilling Program.</p> <p>Blow out prevention precautions in place in accordance with defined procedures and appropriate to the expected downhole conditions.</p> <p>Well control equipment used during coiled tubing, wireline and workover activities.</p> <p>Satisfactory kick tolerance in casing program design.</p> <p>Emergency response procedures in place.</p> <p>Personnel remain on site during well production testing.</p> <p>Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire-fighting equipment (e.g. fire unit consisting of trailer with water tank, pump and hoses in high fire danger season).</p> <p><u>Well Decommissioning Activities</u></p> <p>Refer to Objective 5.</p> <p><u>Vehicle Movement</u></p> <p>Control production and dispersion of dust on unsealed roads and drilling lease areas.</p> <p>Compliance with relevant speed restrictions on access roads and tracks.</p> <p>Warning signage and traffic management measures installed where appropriate in the vicinity of well sites.</p> <p>If necessary, unsealed roads will be sprayed with water as required to minimise dust generation.</p> <p><u>Well Site Restoration Activities</u></p> <p>Necessary measures (e.g. fencing, signage) taken to prevent the public accessing the well head equipment or waste relating to the well.</p> <p>Effective rehabilitation of the well site so that potentially dangerous variations in ground level do not remain.</p>
<p>8. Minimise the visual impact of operations</p>	<p>Well site maintained in a clean and tidy condition.</p> <p>Restored well site contours and colour blend with the surroundings.</p>	<p>Landholders and relevant stakeholders (e.g. local council, industry associations) consulted regarding location of proposed activities.</p> <p>Drill rigs and camps removed from site promptly following completion of activities, particularly in visible locations.</p> <p>In the case of a decommissioned restored site, the entire area will be restored to original land surface topography with no irregularities, unless otherwise agreed with the landowner.</p> <p>Refer to Objective 4 and 11 for further details on well site restoration measures.</p>

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<p>9. Minimise disturbance to the local community and other land users</p>	<p>No adverse impact (outside agreed disturbance / compensation areas) on land use as a result of activities.</p> <p>Adverse impacts of accidental or unforeseen disturbance to infrastructure or land use resolved to the reasonable satisfaction of the landholder.</p> <p>Timely consultation and notification of proposed activities with relevant landowners and stakeholders can be demonstrated.</p> <p>Landholder / stakeholder complaints are documented and reasonable steps taken to resolve them can be demonstrated.</p> <p>No uncontrolled fires initiated as a result of drilling, completion and well production testing activities.</p>	<p>Driver behaviour and vehicle speed limits to be included in compulsory induction.</p> <p>Rig mobilisation and demobilisation to detour around town centres where possible.</p> <p>Noise limitation (particularly at night) to be included as part of induction procedures (e.g. noisy tubular / pipe handling, unnecessary use of horns, reversing of forklifts).</p> <p>Adequate buffer maintained between well site and residences.</p> <p>Equipment operated and maintained in accordance with manufacturer specifications.</p> <p>Well site and access track construction restricted to daylight hours.</p> <p>Transport trucks to be restricted to daylight hours as far as possible.</p> <p>Heavy truck drivers to be instructed not to use engine brake near dwellings.</p> <p>Vehicle speed limits to be observed.</p> <p>Landholders, local councils, potentially affected residents and emergency services will be informed of significant activities such as rig mobilisation and demobilisation.</p> <p>All required authorisations (e.g. local council, DPTI, police) obtained where required for movement of rig along public roads, including joint inspections of roads before and after transport moves if necessary.</p> <p>Any deterioration of property tracks or infrastructure as a result of drilling-related traffic is rectified.</p> <p>All gates left in the condition in which they were found (open / closed).</p> <p>Any lighting required is positioned to minimise light emanating from the well site.</p> <p>Systems in place for logging stakeholder complaints to ensure that issues are addressed as appropriate.</p> <p>Biosecurity procedures implemented as agreed with landholders</p> <p>In the case of a decommissioned restored site, the entire area will be restored to original land surface topography with no irregularities likely to cause injury to stock, unless otherwise agreed with the landowner.</p> <p>Liaise with CFS regarding operations to ensure fire concerns are addressed and any Fire and Emergency Services Act requirements are met (e.g. permits for 'hot work' on fire ban days if required).</p> <p>Landholder is consulted regarding the location, management and timing of proposed activities. Ongoing landholder liaison during and following operations.</p> <p>Activities are restricted to agreed / defined areas.</p> <p>Compliance with Part 10 of the Petroleum and Geothermal Energy Act (Notice of Entry requirements).</p> <p>Flaring during well production testing kept to minimum length of time necessary.</p>
<p>10. Minimise the impact on the environment of waste storage, handling and disposal</p>	<p>Wastes are segregated and transported to an EPA licensed facility for recycling or disposal.</p> <p>Reasonable steps are taken to securely contain waste prior to removal from site.</p> <p>All wastewater disposed of in accordance with the <i>South Australian Public and Environmental Health (Wastewater) Regulations 2013</i>.</p>	<p>EPA's Waste Hierarchy model (avoid, reduce, reuse, recycle, recover, treat, dispose) should be complied with and waste management undertaken with regard to the <i>Environment Protection (Waste to Resources) Policy 2010</i>.</p> <p>Covered bins are provided for the collection and storage of wastes. All loads of rubbish are covered during transport to an approved waste facility.</p> <p>Waste streams are segregated on site and transported to appropriate facilities to maximise waste recovery, reuse and recycling.</p> <p>Production of waste is minimised by purchasing reusable, biodegradable or recyclable materials where practical.</p> <p>Hazardous wastes handled in accordance with relevant legislation and standards.</p> <p>Licensed contractors used for waste transport.</p> <p>Sewage treatment units and septic tanks used at camp and drill rig ablutions. Septic tanks pumped out on an 'as required' basis by a licensed septic waste removal contractor and disposed of at a licensed facility.</p> <p>Any necessary approvals are obtained for use of wastewater disposal system.</p> <p>Well site is kept free of litter and rubbish.</p> <p>Refer to measures Objective 6 regarding disposal of sump contents.</p>
<p>11. Remediate and rehabilitate operational areas to agreed standards</p>	<p>Surface structures are removed and the ground surface re-contoured consistent with pre-existing contours unless alternative agreement is reached with the regulator and stakeholders.</p> <p>No reasonable stakeholder complaints left unresolved.</p> <p>No rubbish or litter remains on restored sites.</p> <p>Refer to Assessment Criteria for Objectives 4, 5 and 8.</p>	<p>Refer to Objectives 4, 5, 6, 7, 8, 10.</p> <p>Rehabilitation plans for surface activities will be developed in consultation with relevant stakeholders.</p> <p>Imported materials are removed from site and soil profiles and contours restored unless otherwise agreed with the landowner. See Objective 4 for details.</p> <p>Well sites with native vegetation are rehabilitated in consultation with DEM, DEW and other relevant stakeholders.</p>

### 3 Reporting

It is a requirement under Section 85 of the Petroleum and Geothermal Energy Act that ‘serious’ and ‘reportable’ incidents must be reported to the Minister.

**Serious Incidents** must be reported to the Minister as soon as practicable after the occurrence, as per Section 85 of the Petroleum and Geothermal Energy Act and Regulation 32 of the Petroleum and Geothermal Energy Regulations.

**Reportable Incidents** must be reported to the Department for Energy and Mining (DEM) on a quarterly basis within 1 month of the end of the quarter, as per Regulation 32.

#### 3.1 Incident Definitions

Regulation 12 (2) requires an SEO to identify events that could, if not properly managed or avoided, cause a serious incident or a reportable incident within the meaning of Section 85 of the Act. Table 2 identifies the potential serious and reportable incidents relevant to production activities. These definitions are based on standard definitions for facilities and pipelines developed by DSD, which are intended to expand on definitions provided in Section 85(1) of the Act and Regulation 32(1), and provide consistency for Licensee reporting.

In accordance with Section 85 of the Act and Regulation 32(1):

**Serious Incident** means an incident arising from activities conducted under the licence in which:

- a. a person is seriously injured or killed; or
- b. an imminent risk to public health or safety arises; or
- c. serious environmental damage occurs or an imminent risk of serious environmental damage arises; or
- d. security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises; or
- e. some other event or circumstance occurs or arises that results in the incident falling within a classification of serious incidents under the regulations or a relevant statement of environmental objectives.

**Reportable Incident** is defined in Section 85(1) of the Act as incidents (other than a serious incident) arising from activities conducted under a licence that are classified under the Regulations as a reportable incident. Regulation 32(1) classifies the following as reportable incidents:

- a. an escape of petroleum, a processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape; and
- b. an incident identified as a reportable incident under the relevant statement of environmental objectives.

**Table 2: Potential Serious and Reportable Incidents**

Serious Incidents	Reportable Incidents
<p>1. A person is seriously injured<sup>5</sup> or killed.</p> <p>2. An imminent risk to public health or safety arises.</p> <p>3. Serious environmental damage occurs or an imminent risk of serious environmental damage arises. For example:</p> <ul style="list-style-type: none"> <li>a. Damage, disturbance or interference to sites of cultural and / or heritage significance without appropriate permits and approvals<sup>6</sup>.</li> <li>b. An escape of petroleum, process substance, a chemical or a fuel to a water body, or to land in a place where it is reasonably likely to enter a water body by seepage or infiltration, or onto land that affects the health of native flora and fauna species.</li> <li>c. Identification of cross flows between aquifers in natural hydraulic isolation, or uncontrolled flows to the surface.</li> <li>d. Any well incident or failure that threatens or poses an imminent risk to safety or a risk of serious damage to environmental values whether or not those values are referred to in State or Commonwealth legislation.</li> <li>e. Detection of a declared weed, animal / plant pathogen or plant pest species that has been introduced or spread as a direct result of activities.</li> <li>f. Any removal of rare, vulnerable or endangered flora and fauna or threatened ecological community without appropriate permits and approvals<sup>7</sup>.</li> <li>g. Any significant alteration of hydrology that affects a significant wetland area.</li> </ul> <p>4. A regulated activity<sup>8</sup> being undertaken in manner that involved or will involve a serious risk to the health or safety of a person emanating from an immediate or imminent exposure to a hazard.<sup>9</sup></p> <p>5. An uncontrolled release resulting in the activation of emergency response and / or evacuation procedures of an area in or adjacent to the release, and / or fire or explosion.</p>	<p>1. An escape of petroleum<sup>10</sup>, processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape<sup>11</sup> (other than a serious incident).</p> <p>2. An event that has the potential to compromise the physical integrity of an asset or facility. For example:</p> <ul style="list-style-type: none"> <li>• An unapproved excursion outside of critical design or operating conditions / parameters.</li> <li>• Failure of a critical procedural control in place to reduce a credible threat to low or as low as reasonably practicable (ALARP)<sup>12</sup>.</li> </ul> <p>3. Malfunction or failure of critical plant or equipment that had (or still has) potential to cause a serious incident.</p> <p>4. Unresolved reasonable complaints from stakeholders regarding operations.</p> <p>5. Any event where an incursion outside a culturally cleared area has occurred or the conditions of a cultural heritage clearance have not been complied with (other than a serious incident).</p>

<sup>5</sup> As per the definition in Section 36 of the *Work Health and Safety Act 2012*.

<sup>6</sup> Pursuant to *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*.

<sup>7</sup> Pursuant to *Native Vegetation Act 1991* (flora) and *National Parks and Wildlife Act 1972* (fauna).

<sup>8</sup> Regulated activity as defined in Section 10 of the *Petroleum and Geothermal Energy Act*.

<sup>9</sup> Resulting in the issuing of a prohibition notice by SafeWork SA pursuant to Section 195 of the *Work Health and Safety Act 2012*.

<sup>10</sup> In gaseous, liquid or solid state, as per *Petroleum and Geothermal Energy Act* definition.

<sup>11</sup> An area assigned during a Hazard and Operability Process (HAZOP) study as a hazardous area for the purpose of gas venting, and designed as such, is considered to be an area specifically designed to contain a gas escape.

<sup>12</sup> As per the Safety Management System process articulated in AS 2885.1-2012, or similar risk assessment process.

### 3.2 Reporting to the EPA

Where applicable, incidents causing or threatening serious or material environmental harm under the *Environment Protection Act 1993* must be reported to the Environmental Protection Authority (EPA) in accordance with section 83 of the *Environment Protection Act 1993*.

The Environment Protection Act and its reporting obligations do not apply to:

- petroleum exploration activity undertaken under the Petroleum and Geothermal Energy Act; or
- wastes produced in the course of an activity (not being a prescribed activity of environmental significance) authorised by a licence under the Petroleum and Geothermal Energy Act when produced and disposed of to land within the area of the licence.

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## 4 List of Abbreviations

ALARP	as low as reasonably practicable
ANZECC	Australian and New Zealand Environment Conservation Council (in reference to the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000</i> )
CFS	Country Fire Service
Contamination	As defined by the <i>Environment Protection Act 1993</i> and the <i>National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013</i>
DEW	Department of Environment and Water
DEM	Department for Energy and Mining (DEM) (regulator of the Petroleum and Geothermal Energy Act)
DPTI	Department of Planning, Transport and Infrastructure
EIR	Environmental Impact Report prepared in accordance with Section 97 of the Petroleum and Geothermal Energy Act 2000 and Regulation 10.
EPA	Environment Protection Authority (South Australia)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
HSEMS	Health, Safety and Environment Management System
minimise	To reduce as far as reasonable practical, considering all other factors e.g. requirements for safe operations and accessibility
NEPM	<i>National Environment Protection (Assessment of Site Contamination) Measure (1999)</i> amended in 2013
NRM	Natural Resources Management
SEO	Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the <i>Petroleum and Geothermal Energy Act 2000</i> and Regulations 12 and 13.

## 5 References

Beach Energy (2018). *Environmental Impact Report: Drilling, Completion and Well Production Testing in the Otway Basin, South Australia, December 2018.*