

# 2021

## Statement of Environmental Objectives

Geophysical Operations in the Otway Basin, South Australia



April 2021

PGER 00325

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# Statement of Environmental Objectives

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# Statement of Environmental Objectives

## 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 geophysical operations 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 information provided in the Environmental Impact Report (EIR) (Beach Energy, 2020), 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

Beach Energy Limited and its group of subsidiaries (Beach) hold several petroleum exploration, production and retention licences in the onshore Otway Basin in the South East of South Australia. Beach's petroleum licences include Petroleum Exploration Licence (PEL) 494, Petroleum Retention Licences (PRLs) 1, 2, 13, 32, and Petroleum Production Licences (PPLs) 62, 168, 202. Beach's petroleum licences (henceforth referred to as the licence area) cover a continuous area of approximately 1360 km<sup>2</sup> (Figure 1-1).

This SEO (and the EIR) has been written to address geophysical operations undertaken in Beach's licence area<sup>1</sup> in the onshore Otway Basin in the South East of South Australia, rather than relating to a specific site or sites, or to specific projects. This approach has been applied in many other SEOs and EIRs that have been developed under the Petroleum and Geothermal Energy Act including previous SEOs and EIRs developed by Origin Energy, Adelaide Energy and Beach Energy for exploration in the onshore Otway Basin.

Activities covered by this SEO include:

- planning

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<sup>1</sup> Geophysical surveys may, from time to time, ingress upon adjacent contiguous land located outside Beach's licence area (Figure 1-1). These activities are required to ensure adequate geophysical data acquisition of the licence area. In such circumstances, Beach would apply for an Associated Activities Licence (AAL) to conduct associated activities on land located outside the area of the primary licence. An associated activity is anything that is reasonably necessary for, or incidental to, carrying out regulated activities in the area of, or the vicinity of, the primary licence area.

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- cultural heritage survey
- access track and seismic survey preparation activities
- surveying operations
- recording operations
- camp sites and associated activities
- rehabilitation / restoration; and
- monitoring and auditing.

These activities are described in detail in the EIR (Beach Energy, 2020).

The following operations are not covered by this SEO:

- airborne geophysical operations
- drilling, completion and well production testing
- fracture stimulation
- production and processing operations
- production and processing operations at the Katnook gas plant site
- pipeline construction, operation and decommissioning.

Fracture stimulation activities are not proposed and are not covered by this SEO or other SEOs. Other operations are covered by other EIRs and SEOs. The relevant SEOs in place at the time of preparation of this document include:

- *Statement of Environmental Objectives for airborne preliminary surveys and airborne geophysical operations in South Australia* (DSD, 2016)
- *Statement of Environmental Objectives Drilling, Completion and Well Production Testing in the Otway Basin, South Australia* (Beach Energy, 2019)
- *Statement of Environmental Objectives Onshore Otway Basin Petroleum Production Operations* (Beach Energy, 2019a).

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 geophysical operations in the region.

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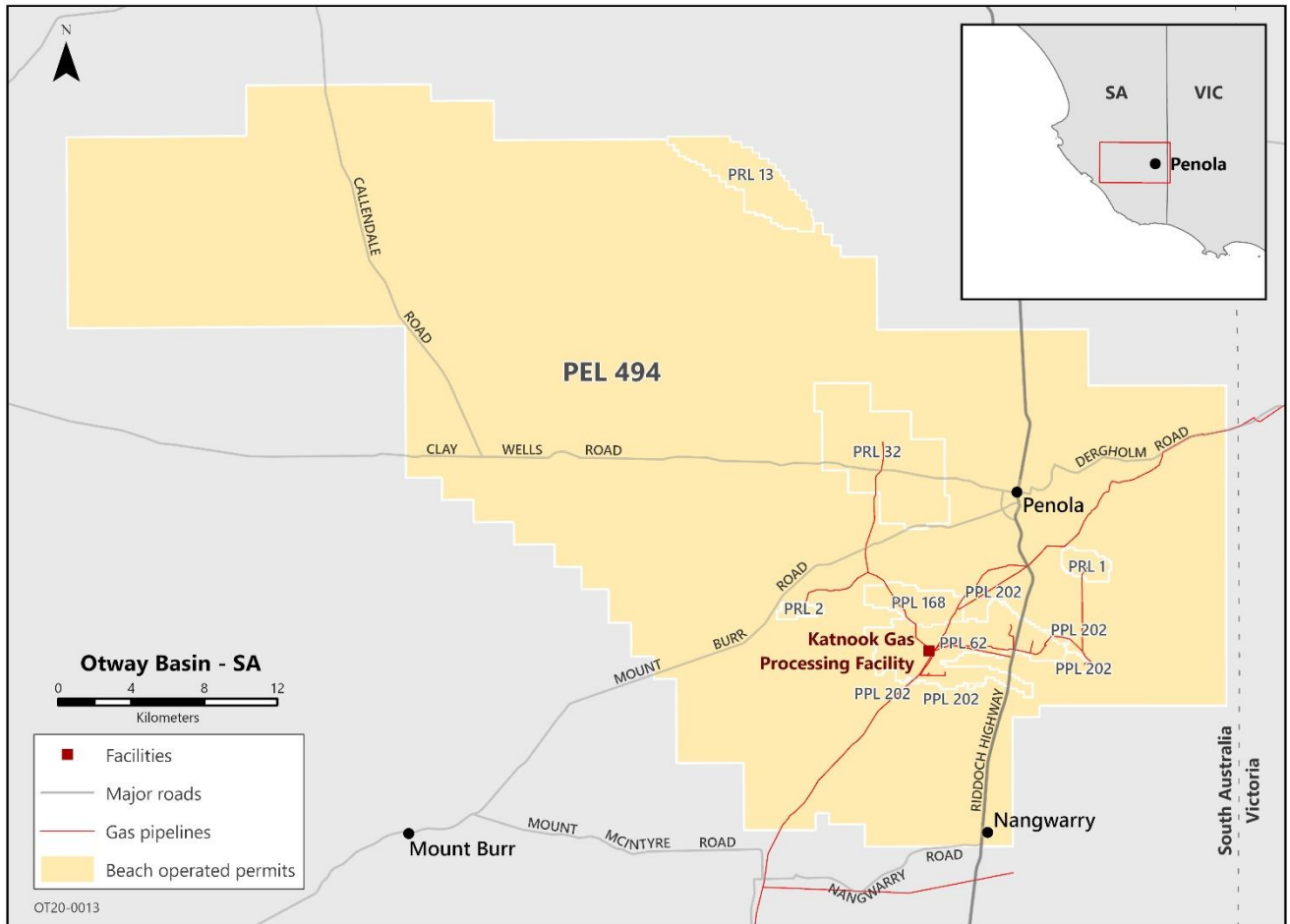


Figure 1-1: Location of Beach Energy’s onshore South Australian Otway Basin licence areas

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## 2 Environmental Objectives and Assessment Criteria

### 2.1 Objectives

Potential environmental hazards and consequences associated with geophysical operations in the onshore Otway Basin have been identified in the Environmental Impact Report (Beach Energy, 2020). Beach is committed to achieving a range of environmental objectives in regard to these potential hazards.

The environmental objectives for geophysical operations are:

1. Minimise the visual impact of operations
2. Avoid disturbance to sites of cultural and heritage significance
3. Minimise disturbance to native vegetation, fauna and associated habitat (including wetland communities)
4. Avoid the introduction and spread of weeds, exotic pest fauna and pathogens, and implement control measures as necessary
5. Minimise disturbance to drainage patterns
6. Avoid impacts to or contamination of surface waters and groundwater resources
7. Minimise disturbance to and avoid the contamination of soil
8. Minimise risks to the health and safety of the public
9. Minimise disturbance to the local community, landholders 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. Assessment criteria for measuring the achievement of environmental objectives covered in this SEO will take one or more of the following forms:

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.

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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.

Photo monitoring:

- Photographic evidence can provide visual documentation on the state of impact. Re-occupation of photo points over time can provide visual evidence of the level of recovery of geophysical impact.

Other techniques as appropriate:

- Other techniques may exist, or could be developed in the future, which could be beneficial. Use of other techniques can be included where they are appropriate and effective.

Each environmental objective for geophysical operations will be assessed using a selection of the assessment options outlined above. This will enable Beach, regulators, and others to consistently determine the level of achievement of the objectives. Comments on any variances will be recorded and reported where required (refer to Section 3).

Table 1 outlines the environmental objectives and associated assessment criteria to determine if compliance with the objectives has been achieved. The “Guide to How Objectives Can Be Achieved” column in Table 1 also outlines a range of high-level controls that will be implemented (where appropriate) to ensure environmental objectives are achieved.



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Table 2-1: Environmental Objectives and Assessment Criteria

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<b>1. Minimise the visual impact of operations</b>	<p>Geophysical surveys and associated infrastructure appropriately located, prepared and rehabilitated / restored to minimise visual impact</p> <p>Geophysical survey areas and operational sites kept free of litter and rubbish</p>	<p>Planning has been undertaken to minimise impacts of activities, and records are available for audit.</p> <p>Where possible, existing tracks or roads are used for access.</p> <p>Seismic lines are kept to a maximum width of approximately 4 m.</p> <p>Locate seismic survey lines and drilling sites and associated infrastructure (camps / laydowns / explosive storage magazines) to minimise disturbance to soil.</p> <p>Excess drill cuttings will be removed from site and disposed of at an appropriately licensed waste management facility unless otherwise agreed with the landowner.</p> <p>Landholders and relevant stakeholders (e.g. local council, industry associations) consulted regarding location of proposed activities where appropriate.</p> <p>Activities are restricted to agreed / defined areas.</p> <p>Adequate buffers maintained between proposed activities and residences.</p> <p>Machinery, equipment and camps will be promptly removed from site following the completion of operations.</p> <p>Required remediation work carried out as soon as possible after completion of all activities.</p> <p>During restoration / rehabilitation of gravel paved areas, excess gravel is removed, and soils are then ripped, before returning stockpiled topsoil. This will include removal of imported materials from site, and soil profiles and contours restored unless otherwise agreed with the landholder.</p> <p>Refer to additional measures listed under Objectives 3, 5, 9, 10 and 11.</p>
<b>2. Avoid disturbance to sites of cultural and heritage significance</b>	<p>In the event the conditions of a cultural heritage clearance are not complied with, the incident is appropriately reported<sup>2</sup>, 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 geophysical survey areas and infrastructure locations undertaken with the relevant Aboriginal heritage group.</p> <p>Known sites identified and protected from operations using temporary flagging, fencing or exclusion zones to prevent damage, disturbance or interference.</p> <p>Cultural heritage awareness and issues covered in inductions. Key personnel (e.g. supervisors, machinery operators) receive appropriate cultural heritage training.</p> <p>Procedures consistent with the relevant obligations under the <i>Aboriginal Heritage Act 1988</i> are in place to appropriately report and respond 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>Where damage, disturbance or interference to Aboriginal sites, objects or remains is unavoidable, then an application for authorisation pursuant to section 23 of the Aboriginal Heritage Act will be sought from the Minister for Aboriginal Affairs and Reconciliation (the Premier). Appropriate consultation with Aboriginal groups, traditional owners or Aboriginal persons with interests in the matter, as well as the State Aboriginal Heritage Committee, will be conducted by AAR in relation to the application (as per section 13 of the Act).</p> <p>Heritage site registers and Heritage Branch, DEW, consulted regarding the location of non-Aboriginal heritage sites where appropriate.</p>

<sup>2</sup> This may include compliance with reporting obligations pursuant to s.20 of the *Aboriginal Heritage Act 1988*

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Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<b>3. Minimise disturbance to native vegetation, fauna and associated habitat (including wetland communities)</b>	<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>No rare, vulnerable or endangered flora removed without appropriate permits</p> <p>High quality or significant remnant vegetation<sup>3</sup> 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 geophysical operations</p> <p>No native fauna casualties that could have reasonably been prevented through the management measures described in the guide</p> <p><u>Fuel and Chemical Storage and Handling</u> Refer to Assessment Criteria for Objective 7</p> <p><u>Fire Risk</u> Refer to Assessment Criteria for Objective 9</p> <p><u>Waste Management</u> Refer to Assessment Criteria for Objective 10</p>	<p><u>Seismic Line and Site Preparation / Temporary Infrastructure Construction</u></p> <p>Appropriately trained and experienced personnel have assessed or scouted proposed geophysical survey areas and infrastructure locations to identify and flag significant (or listed) species and communities (including wetland communities).</p> <p>Native vegetation clearance avoided or minimised by locating and orientating geophysical surveys and associated infrastructure appropriately.</p> <p>Vegetation is trimmed (e.g. using a chainsaw) rather than removed where possible.</p> <p>Vegetation, ground cover and root stock are retained on seismic lines as far as practicable.</p> <p>Removal of large trees (including dead trees with hollows) is avoided.</p> <p>Prioritise location of geophysical survey activities and infrastructure in areas of existing disturbed land wherever practicable.</p> <p>Significant disturbance to areas of high quality or significant remnant vegetation or Heritage Agreement Areas are avoided.</p> <p>Significant disturbance to areas of lower-quality native vegetation is avoided unless there are no viable alternatives (e.g. adjacent cleared areas).</p> <p>Seismic lines are weaved through vegetation if the plant density is sparse enough to allow it.</p> <p>Low impact seismic survey methods used to minimise impacts to vegetation wherever practicable e.g. walk-in methods, use of vegetation slashing / mulching equipment.</p> <p>Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act.</p> <p>If proposed activities are located 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>All drill holes are immediately covered, capped and backfilled on completion of survey activities to prevent injury or death to wildlife and stock in accordance with relevant industry standards and guidelines (e.g. SA Earth Resources Information Sheet M21 - <i>Mineral Exploration Drillholes — General specifications for construction and backfilling</i>).</p> <p>Where excavations are required to be open for an extended period (e.g. overnight), they will be covered or fenced to exclude wildlife and stock.</p> <p>Shot holes will be backfilled immediately following loading, however if this activity is not completed at the end of each working day a cap will be placed over the hole.</p> <p>Areas that present risk (chemical storage or contaminated areas) to wildlife and stock are appropriately fenced to minimise access.</p> <p>If threatened species (e.g. Red-tailed Black-Cockatoos) are detected or likely to occur near proposed survey activities or infrastructure locations, 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>Fauna mortality (if it occurs) to be captured by incident reporting system and advice from an ecologist if required.</p> <p>Feeding of wildlife is not permitted.</p> <p>No domestic pets allowed at camps or operational sites.</p> <p>No unauthorised off-road or off-line driving or creation of shortcuts.</p> <p>Areas of native vegetation disturbed by proposed activities are rehabilitated in consultation with DEM, DEW and other relevant stakeholders.</p> <p>Refer to additional measures listed under Objectives 1, 5, 6, 8 and 11.</p> <p><u>Fuel and Chemical Storage and Handling</u> Refer to measures listed under Objective 7.</p> <p><u>Fire Risk</u> Refer to measures listed under Objective 9.</p> <p><u>Waste Management</u> Refer to measures listed under Objective 10.</p>
<b>4. Avoid the introduction and spread of weeds, exotic pest fauna and pathogens, and implement control measures as necessary</b>	<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 relevant legislation and Regional Landscape 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 Limestone Coast Landscape 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>

<sup>3</sup> Significant in this context includes listed plant species, listed communities or important fauna habitat. Site specific assessment by an appropriately qualified specialist would be used to determine whether any native vegetation proposed to be cleared constitutes large trees, high quality vegetation or significant vegetation.

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		<p>All records of vehicle or equipment inspections and cleaning will be kept for auditing.</p> <p>Imported paving materials (gravel) will be sourced from licensed quarries that are free of weeds.</p> <p>Any new weed species / infestations as a result of activities are treated as necessary in accordance with requirements of the landholder, and if appropriate the Limestone Coast Landscape Board.</p> <p>Records of detection, monitoring or eradication of weeds or pathogens introduced by activities are kept and available for review.</p>
<b>5. Minimise disturbance to drainage patterns</b>	<p>Geophysical surveys and associated temporary infrastructure appropriately located, prepared, constructed and rehabilitated / restored to maintain pre-existing water flows as far as practicable</p> <p>No new 'water affecting activities' are undertaken unless relevant permits have been obtained</p>	<p>Geophysical surveys and associated infrastructure appropriately located/prepared and constructed to avoid surface water features such as swamps, significant wetland areas, and to maintain pre-existing surface water flows.</p> <p>Landholders 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>Original drainage patterns will be restored.</p> <p>Low impact or hand carry / walk-in seismic survey methods used wherever practicable in sensitive aquatic environments.</p> <p>All access through watercourses / drainage lines / water features are carefully assessed to determine the locations of least impact.</p>
<b>6. Avoid impacts to or contamination of surface waters and groundwater resources</b>	<p>No unauthorised discharge or escape of petroleum, chemical, fuel or solid wastes to surface water and/or groundwater</p> <p>No uncontrolled flows to surface from aquifers intersected by drill holes</p> <p>Appropriate barriers in place to protect separate aquifer systems that are typically in natural hydraulic isolation from each other.</p> <p>Landholder complaints regarding impact on groundwater users are documented and reasonable steps taken to resolve them can be demonstrated</p> <p><u>Fuel and Chemical Storage and Handling</u> Refer to Assessment Criteria for Objective 7</p> <p><u>Waste Management</u> Refer to Assessment Criteria for Objective 10</p>	<p>Drilling activities, backfilling, and plugging of all drill holes will be undertaken in accordance with relevant industry standards and guidelines including the SA Earth Resources Information Sheet M21 - <i>Mineral Exploration Drillholes — General specifications for construction and backfilling</i>.</p> <p>Water based drilling muds used if mud drilling is undertaken.</p> <p><u>Explosive Storage, Handling and Use</u></p> <p>Seismic charges will be solid (not a liquid or emulsion) and encased in sealed hard-plastic shells to limit interaction with groundwater and soil.</p> <p>Detonator installation practices (e.g. multiple detonators, appropriate waterproofing) to minimise chance of charge detonation failure.</p> <p>Seismic charges designed to biodegrade if not detonated.</p> <p>Adequate buffer distances (vertical and horizontal) between buried seismic charges and groundwater wells incorporated into survey design.</p> <p>Buried seismic charges will not be placed near aquifer boundaries.</p> <p>Risk assessment for any unexploded charges to identify whether additional monitoring or mitigation measures are required (e.g. monitoring bore, sympathetic detonation).</p> <p>Refer to additional measures listed under Objective 8</p> <p><u>Fuel and Chemical Storage and Handling</u> Refer to measures listed under Objective 7.</p> <p><u>Waste Management</u> Refer to measures listed under Objective 10.</p>

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<p><b>7. Minimise disturbance to and avoid the contamination of soil</b></p>	<p>Geophysical surveys and associated infrastructure appropriately located, prepared and rehabilitated / restored to minimise disturbance to soil resources</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>Any escape of chemical, fuel or oil to land is either immediately contained and removed or assessed in accordance with NEPM<sup>4</sup> guidelines and remediated in a timely manner</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10</p>	<p><u>Seismic Line and Site Preparation / Temporary Infrastructure Construction</u></p> <p>Planning has been undertaken to minimise impacts of activities, and records are available for audit.</p> <p>Where possible, existing tracks or roads are used for access.</p> <p>Disturbance to soil during seismic line and drilling site preparation is minimised to as low as practicable.</p> <p>Seismic lines are kept to a maximum width of approximately 4 m.</p> <p>Locate seismic survey lines and drilling sites and associated infrastructure (camps / laydowns / explosive storage magazines) to minimise disturbance to soil.</p> <p>Areas subject to inundation are assessed for conduciveness to support vehicles prior to access.</p> <p>Balloon tyres or tracked Vibroseis trucks are used to reduce ground pressures and minimise impact on soil where necessary.</p> <p>Survey line and drilling site preparation techniques are monitored and documented to minimise soil disturbance.</p> <p>Landholders to be consulted about earthworks required, and location of infrastructure (e.g. piping and bores) to minimise surface damage and facilitate rehabilitation / restoration.</p> <p>Separate storage of topsoil, subsoil and clays will be undertaken to assist in regeneration of pasture or crops where appropriate.</p> <p>No unauthorised off-road or off-line driving or creation of shortcuts.</p> <p><u>Restoration / Rehabilitation</u></p> <p>Soil profile and contours will be reinstated following completion of operations.</p> <p>Infrastructure sites to be rehabilitated following completion of activities, or handed over to the landholder under a deed of transfer or similar where appropriate.</p> <p>Restoration / rehabilitation of disturbances to be approved by the landholder, or undertaken in accordance with landholder's wishes, should retention of specific areas of parts of survey infrastructure be requested (e.g. part of an access track).</p> <p>During rehabilitation / restoration of gravel paved areas, excess gravel is removed, and soils are then ripped (where appropriate), before returning stockpiled topsoil.</p> <p>Imported paving materials (gravel) are removed from site, and soil profiles and contours restored unless otherwise agreed with the landholder.</p> <p>Required remediation work carried out as soon as possible after completion of all activities.</p> <p>Excess drill cuttings will be removed from site and disposed of at an appropriately licensed waste management facility unless otherwise agreed with the landowner.</p> <p><u>Fuel and Chemical Storage and Handling</u></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>Hazardous materials 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>Bunded areas must have sufficient freeboard.</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>Generators to be appropriately located to contain any spills (e.g. in polyethylene lined bunded areas or with suitable alternative spill containment).</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 be removed for treatment / disposal at an EPA approved facility.</p> <p>If larger scale spills occur, that cannot be immediately contained and cleaned-up, they would be assessed and remediated in accordance with the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i>, amended 2013 (NEPM).</p> <p>Affected areas fenced if a threat is posed to livestock or wildlife.</p> <p>Records of spill events and corrective actions are maintained.</p> <p>Safety Data Sheet information readily available on site.</p> <p><u>Explosive Storage, Handling and Use</u></p> <p>Refer to measures listed under Objective 8.</p> <p><u>Waste Management</u></p> <p>Refer to measures listed Objective 10.</p>

<sup>4</sup> *National Environment Protection (Assessment of Site Contamination) Measure (1999)* amended in 2013

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<p><b>8. Minimise risks to the health and safety of the public</b></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 geophysical survey activities that could have been reasonably prevented by the operator</p> <p><u>Fire Risk</u></p> <p>Refer to Assessment Criteria for Objective 9</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10</p>	<p><u>Unauthorised Access by Third Parties</u></p> <p>Signage warning of dangers associated with geophysical operations placed at the entry to access tracks or at geophysical operations specific work sites as appropriate.</p> <p>Additional signage installed at operational areas where required / appropriate.</p> <p>Survey manager / site manager given authority to refuse entry of unauthorised third parties to geophysical operational areas.</p> <p>All minor excavations (e.g. for septic tank) to be backfilled following completion of operations.</p> <p>All drill holes are immediately covered, capped and backfilled on completion of survey activities to prevent injury or death to wildlife and stock in accordance with relevant industry standards and guidelines (e.g. SA Earth Resources Information Sheet M21 - Mineral Exploration Drillholes — General specifications for construction and backfilling).</p> <p><u>Vehicle Movement</u></p> <p>Control production and dispersion of dust on unsealed roads and tracks.</p> <p>Compliance with relevant speed restrictions on access roads and tracks.</p> <p>Warning signage and traffic management measures installed where appropriate.</p> <p>If necessary, unsealed roads will be sprayed with water as required to minimise dust generation.</p> <p>Driver behaviour and vehicle speed limits to be included in compulsory induction.</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 initial mobilisation and final demobilisation from project sites.</p> <p>Transport trucks to be restricted to daylight hours as far as possible.</p> <p>All required authorisations (e.g. local council, DIT, police) obtained where required for movement of heavy vehicles (and transport of dangerous goods) along public roads, including joint inspections of roads before and after transport moves if necessary.</p> <p>Project site mobilisation and demobilisations to detour around town centres where possible.</p> <p>Any deterioration of property tracks or other infrastructure as a result of operational traffic is rectified.</p> <p>Systems in place for logging stakeholder complaints to ensure that issues are addressed as appropriate.</p> <p><u>Explosive Storage, Handling and Use</u></p> <p>Explosives use, storage, handling and disposal will be undertaken in accordance with relevant industry codes, standards and guidelines (e.g. Australian Dangerous Goods Code), and the requirements of the South Australian <i>Explosives Act 1936</i> and <i>Explosives Regulations 2011</i>.</p> <p>Explosives will only be handled and utilised by appropriately trained and licensed personnel (e.g. holders of a SafeWork SA Blaster's Licence) in accordance with Beach health and safety and applicable legislative requirements.</p> <p>Explosives are required to be stored in an approved receptacle, store or magazine. Magazines will typically take the form of a transportable shipping container type structure. A licence to store explosives and a magazine licence may also be required depending on the volume of explosive stored at any one time.</p> <p>Ensure risks and requirements associated with explosive storage, handling and use is included in the induction and all personnel are fully informed of risks and associated restrictions.</p> <p>Emergency response procedures included in staff training.</p> <p><u>Fire Risk</u></p> <p>Refer to measures listed under Objective 9.</p> <p><u>Waste Management</u></p> <p>Refer to measures listed Objective 10.</p>
<p><b>9. Minimise disturbance to the local community, landholders and other land users</b></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 damage to infrastructure or disturbance to 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 resulting from regulated activities</p>	<p><u>Seismic Line and Site Preparation / Temporary Infrastructure Construction</u></p> <p>Seismic survey and infrastructure construction, activities restricted to daylight hours.</p> <p>Machinery, equipment and camps removed from site promptly following completion of activities, particularly in visible locations.</p> <p>Equipment operated and maintained in accordance with manufacturer specifications.</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>Assessments of potential noise impacts undertaken as appropriate during design and planning stages.</p> <p>Noise limitation (particularly during early morning and evening) to be included as part of induction procedures (e.g. unnecessary use of horns, reversing of machinery).</p>

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Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
	<p><u>Fuel and Chemical Storage and Handling</u> Refer to Assessment Criteria for Objective 7</p> <p><u>Explosive Storage, Handling and Use</u> Refer to Assessment Criteria for Objective 8</p> <p><u>Waste Management</u> Refer to Assessment Criteria for Objective 10</p>	<p>Adequate buffers maintained between proposed activities and residences.</p> <p>Dust generation is minimised by restriction of speeds on unsealed roads and spraying of unsealed roads with water to moderate the potential for dust generation where required.</p> <p>Where excavations are required to be open for an extended period (e.g. overnight), they will be covered or fenced to exclude wildlife and stock.</p> <p>Areas that present risk (chemical storage or contaminated areas) to wildlife and stock are appropriately fenced to minimise access.</p> <p>Landholders and relevant stakeholders (e.g. local council, industry associations) consulted regarding location of proposed activities where appropriate.</p> <p>In the survey planning phase, consult landholders on location and schedule of seismic survey activities in order to minimise economic impacts and disruption to landholder activities.</p> <p>Compensation agreements are agreed and put into place before any activities are undertaken.</p> <p>Activities are restricted to agreed / defined areas / times.-</p> <p>All gates left in the condition in which they were found (open / closed). Temporary gates in fences are restored in accordance with landholder requirements.</p> <p>Systems in place for logging stakeholder complaints to ensure that issues are addressed as appropriate.</p> <p>Compliance with Part 10 of the Petroleum and Geothermal Energy Act (Notice of Entry requirements).</p> <p><u>Restoration / Rehabilitation</u></p> <p>In the case of a decommissioned restored site (e.g. camp 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 landholder.</p> <p>All drill holes are immediately covered, capped and backfilled on completion of survey activities to prevent injury or death to wildlife and stock in accordance with relevant industry standards and guidelines (e.g. SA Earth Resources Information Sheet M21 - <i>Mineral Exploration Drillholes — General specifications for construction and backfilling</i>).</p> <p>During restoration / rehabilitation of gravel paved areas, excess gravel is removed, and soils are then ripped, before returning stockpiled topsoil. This will include removal of imported materials from site, and soil profiles and contours restored unless otherwise agreed with the landholder.</p> <p><u>Fire Risk</u></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>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>Where necessary (e.g. in fire danger season), fire break constructed around camps/operational sites.</p> <p>Response to fire included in Emergency Response Plan.</p> <p>Emergency response procedures included in staff training.</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><u>Fuel and Chemical Storage and Handling</u> Refer to measures listed under Objective 7.</p> <p><u>Explosive Storage, Handling and Use</u> Adequate buffer distances will be maintained between activities and residences. Activities are restricted to agreed / defined areas / times. Seismic survey activities restricted to daylight hours. Systems in place for logging stakeholder complaints to ensure that issues are addressed as appropriate. Refer to additional measures listed under Objective 8</p> <p><u>Waste Management</u> Refer to measures listed under Objective 10.</p>



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Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved
<b>10. Minimise the impact on the environment of waste storage, handling and disposal</b>	<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 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>All waste disposal is at an EPA licensed facility.</p> <p>Hazardous wastes handled in accordance with relevant legislation and standards.</p> <p>Licensed contractors used for waste transport.</p> <p>Sewage wastes are handled using septic tanks or self-contained on-site treatment systems that are approved and managed under the <i>South Australian Public Health (Wastewater) Regulations 2013</i> and in compliance with the South Australian Health On-site Wastewater Systems Code.</p> <p>Where septic tanks are used to contain wastewater (black water and grey water), they will be pumped out by licensed contractors as required for disposal at a licensed facility.</p> <p>Small pits may be constructed to house the tanks which will be removed after operations are completed.</p> <p>Wastewater is not allowed to drain to surface water drainage features such as swamps.</p> <p>Any necessary approvals (e.g. local council) for use of wastewater disposal systems / installation of the septic tanks will be obtained.</p> <p>Survey areas and operational sites kept free of litter and rubbish.</p>
<b>11. Remediate and rehabilitate operational areas to agreed standards</b>	<p>Any surface infrastructure is removed and the ground surface is 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 / survey areas</p> <p>Refer to Assessment Criteria for Objectives 1, 3, 4, 5, 6, 7, 9 and 10</p>	<p>During restoration / rehabilitation of gravel paved areas, excess gravel is removed, and soils are then ripped, before returning stockpiled topsoil. This will include removal of imported materials from site, and soil profiles and contours restored unless otherwise agreed with the landholder.</p> <p>All excavations (e.g. for septic tank) to be backfilled following completion of operations.</p> <p>Rehabilitation / restoration of surface disturbance from geophysical survey is undertaken where required, including reinstatement of subsidence at shot holes, ripping of compacted soil, removal of excess drill cuttings at drilling sites, re-spreading and smoothing of windrow material or wheel rutting.</p> <p>Drilling activities, backfilling, and plugging of all drill holes will be undertaken in accordance with relevant industry standards and guidelines including the SA Earth Resources Information Sheet M21 - <i>Mineral Exploration Drillholes — General specifications for construction and backfilling</i>.</p> <p>Required remediation work carried out as soon as possible after completion of all activities.</p> <p>Refer to measures listed under Objectives 1, 3, 4, 5, 6, 7, 9 and 10.</p>

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## 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 of the Petroleum and Geothermal Energy Regulations.

### 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 3-1 identifies the potential serious and reportable incidents relevant to geophysical operations. These definitions are based on standard definitions developed by the Regulator, 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.



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Table 3-1: Potential Serious and Reportable Incidents

Serious Incidents	Reportable Incidents
<ol style="list-style-type: none"> <li>1. A person is seriously injured<sup>5</sup> or killed.</li> <li>2. An imminent risk to public health or safety arises.</li> <li>3. Serious environmental damage occurs or an imminent risk of serious environmental damage arises. For example:               <ol 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> </ol> </li> <li>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></li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>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).</li> <li>2. An event that has the potential to compromise the physical integrity of an asset or facility. For example:               <ul style="list-style-type: none"> <li>◦ An unapproved excursion outside of critical design or operating conditions / parameters.</li> <li>◦ Identification of a critical barrier failure that could lead to the potential for cross flows between aquifers in natural hydraulic isolation, or uncontrolled flows to the surface.</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> </li> <li>3. Malfunction or failure of critical plant or equipment that had (or still has) potential to cause a serious incident.</li> <li>4. Unresolved reasonable complaints from stakeholders regarding operations.</li> <li>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).</li> </ol>

<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.

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## 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.

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.

## 3.3 Reporting to SafeWork SA

Notifiable incidents (i.e. death, serious injury or illness, or dangerous incidents) must be reported to SafeWork SA in accordance with Part 3 of the South Australian *Work Health and Safety Act 2012*.

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## 4 Abbreviations and Glossary

Abbreviation	Definition
ALARP	as low as reasonably practicable
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> .
DEM	Department for Energy and Mining (DEM) (regulator of the <i>Petroleum and Geothermal Energy Act</i> )
DEW	Department for Environment and Water
DIT	Department for Infrastructure and Transport
Drill hole	A hole that is drilled using a mechanical device (e.g. a drilling rig). In the context of a seismic survey this would be for the purposes of installing seismic energy sources or receivers
DSD	Department of State Development (now DEM)
EIR	Environmental Impact Report prepared in accordance with Section 97 of the <i>Petroleum and Geothermal Energy Act 2000</i> and Regulation 10.
EPA	Environment Protection Authority (South Australia)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
HSEMS	Health, Safety and Environment Management System
infrastructure	Infrastructure includes buildings (including residences), fences, bores, tanks, piping, roads and tracks and other structures, utilities or equipment.
minimise	To reduce as far as reasonably practical, considering all other factors e.g. requirements for safe operations and accessibility.
NEPM	<i>National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013</i>
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.
Shot hole	Drilled hole into which small explosive charges are placed to generate a 'buried source' of energy for a seismic survey
Uphole	Drilled hole in which an underground seismic receivers (geophones) are placed during uphole seismic surveys

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## 5 References

Beach Energy (2019). *Statement of Environmental Objectives Drilling, Completion and Well Production Testing in the Otway Basin, South Australia*. August 2019. Beach Energy Limited, Adelaide, South Australia.

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DSD (2016). *Statement of Environmental Objectives for airborne preliminary surveys and airborne geophysical operations in South Australia*. Department of State Development, Energy Resources Division, Adelaide, South Australia.

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## 6 Document Information and History

Document custodian group

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