

**SAPPEX**  
L I M I T E D



# **PEL122 & PEL123 Fracture Stimulation Activities**

## **Statement of Environmental Objectives**

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# 1 Introduction

## 1.1 Purpose

This Statement of Environmental Objectives (SEO) for fracture stimulation activities in PEL122 & PEL123 has been prepared to meet the requirements of Sections 99 and 100 of the South Australian *Petroleum and Geothermal Energy Act 2000* and Regulations 12 and 13 of the *Petroleum and Geothermal Energy Regulations 2013*.

The intent of this SEO is to outline the environmental objectives that SAPEX Limited (**SAPEX**), a wholly owned subsidiary of Tri-Star Energy Company, are required to achieve during fracture stimulation activities in shales within the Arckaringa Basin and the criteria upon which achievement of these objectives will be assessed.

The SEO has been developed based on the information and issues identified in the *PEL122 & PEL123 Fracture Stimulation Activities Environmental Impact Report (EIR)*, and are in keeping with the objectives of the Petroleum and Geothermal Energy Act 2000, 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

The Petroleum and Geothermal Energy Act broadly defines the environment to include natural, social, cultural and economic aspects. The environmental objectives outlined in the SEO incorporate all of these aspects.

## 1.2 Scope

This SEO applies to fracture stimulation operations in PEL122 and PEL123 shale targets in the Arkcaringa Basin, South Australia. These operations are described in the EIR (Sapex 2017). This SEO will only apply to PEL122 and PEL123 within the south eastern portion of the basin with the Arabana Native Title determination forming the boundary within PEL122 as shown in **Figure 1**.

Activities associated with operations in the Arckaringa Basin region that are not addressed in the EIR or covered by this SEO include:

- Exploration Drilling Activities (covered by Sapex 2013)
- Geophysical Operations (covered by Sapex 2013)

This SEO and the accompanying EIR focus on the fracture stimulation process carried out after the well has been drilled. Other aspects of drilling and well operations such as preparation of the well lease and access, drilling, casing and cementing of the well, camps, well operation and monitoring, initial production testing, well abandonment and well lease restoration are covered by the Arckaringa Basin Exploration Drilling Activities Statement of Environmental Objectives (SAPEX 2013) and are not revisited in the EIR or this SEO.

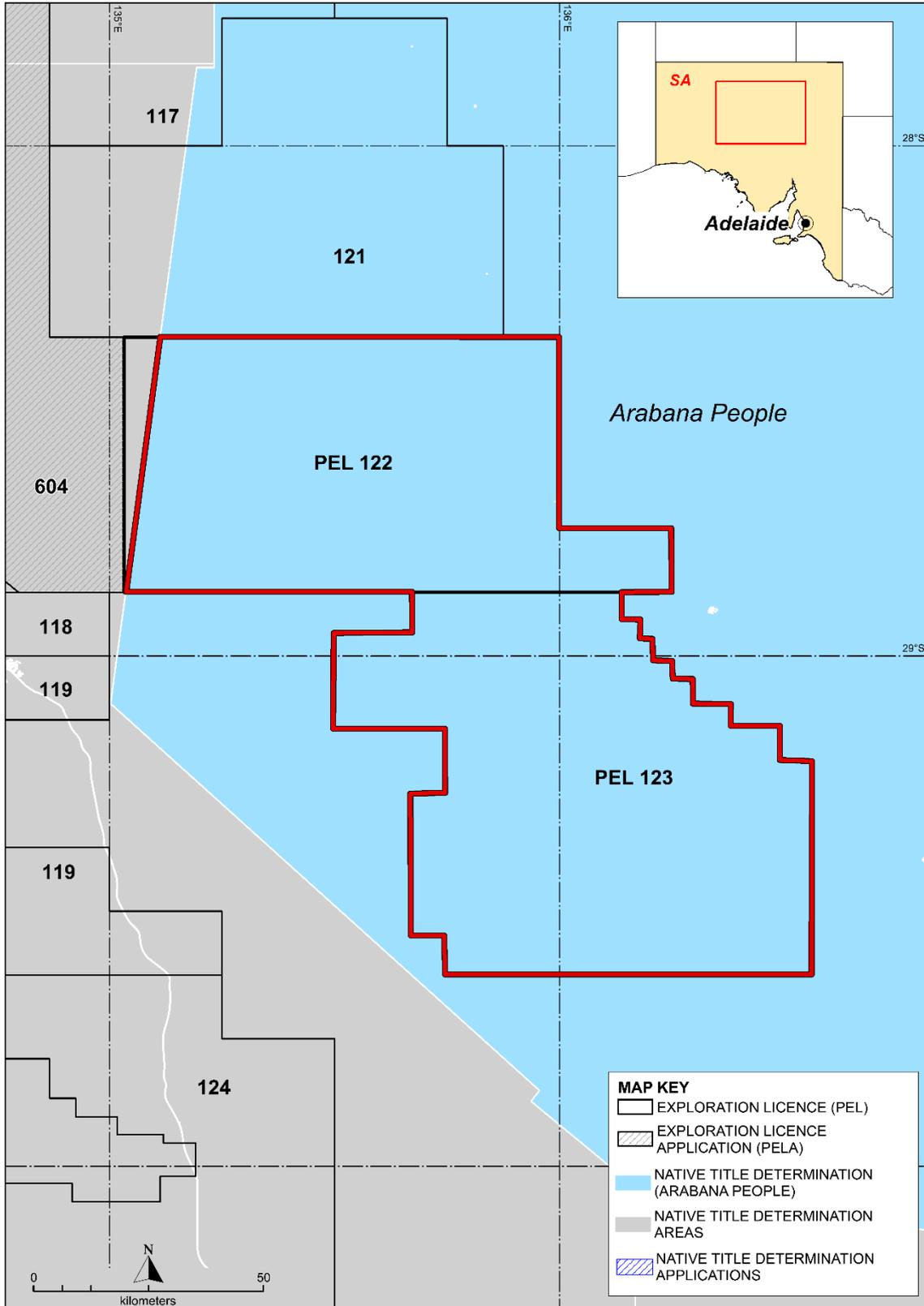


Figure 1: Arckaringa Basin

## 2 Environmental Objectives

### 2.1 Objectives

Potential environmental hazards and consequences associated with fracture stimulation activities in the Ackaringa Basin shale targets have been identified in the Environmental Impact Report (Sapex 2017). Sapex is committed to achieving a range of environmental objectives in regard to these potential hazards.

The relevant environmental objectives for fracture stimulation activities in the Arckaringa shale targets are:

1. Minimise loss of aquifer pressure and avoid aquifer contamination.
2. No impacts on groundwater dependant ecosystems | No significant impacts on existing groundwater users
3. Avoid contamination of surface water | No disruption to natural drainage paths or alteration to flow distribution
4. Minimise disturbance and avoid contamination to soil.
5. Minimise disturbance to native vegetation and native fauna.
6. Avoid the introduction or spread of weeds, pest animals and pathogens as a consequence of regulated activities and implement control measures as necessary.
7. Avoid disturbance to Aboriginal and non-Aboriginal heritage sites, objects, remains and place unless prior approval under relevant legislation obtained.
8. Air pollution and greenhouse gas emissions reduced to as low as reasonably practical.
9. Protect the public and third parties from risks inherent in regulated activities.
10. Avoid or minimise disturbance to stakeholders and / or associated infrastructure.
11. Optimise waste avoidance, reduction, reuse, recycling, treatment and disposal.
12. 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 Appendix 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 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 Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>1. Minimise loss of aquifer pressure and avoid aquifer contamination.</p>	<p>Compliance with assessment criteria relating to well integrity in the Drilling Activities SEO</p> <p>No loss of aquifer pressure or contamination of aquifers as a result of fracture stimulation operations.</p>	<p><u>Well Integrity</u></p> <p>Casing and wellhead designed to meet pressure, temperature, operational stresses and loads.</p> <p>Well pressure tested prior to commencing fracture stimulation.</p> <p>Monitoring programs implemented (e.g. through well logs, pressure measurements, casing integrity measurements and corrosion monitoring programs) to assess condition of casing and cross-flow behind casing.</p> <p>Trip systems installed to shut off stimulation pumping units if pre-set operational maximum pressure is reached.</p> <p>Note: well integrity issues are subject to requirements of the Exploration Drilling Activities SEO (Sapex 2013)</p> <p><u>Fracture Stimulation Planning and Monitoring</u></p> <p>Assessment of geological and geomechanical settings undertaken during design of fracture stimulation treatments to avoid growth into undesired strata.</p> <p>Fracture design (including pressures, injection rate, fluid makeup and proppant concentration) undertaken to provide confidence that the fracture treatment does not extend into overlying aquifers</p> <p>Fracture stimulation treatment modelled prior to all operations</p> <p>Injection pressures monitored and compared to expected fracture initiation pressure.</p> <p>Investigation undertaken if unexpected water flows occur during production testing, to determine source (e.g. may indicate communication with aquifer).</p> <p>Hydraulic fracturing diagnostics used to assess fracture height growth where appropriate. Specific diagnostic tools (e.g proppant tracers, chemical tracers etc) will be selected based on parameter of interest</p>
<p>2. No impacts on groundwater dependant ecosystems</p> <p>No significant impacts on existing groundwater users</p>	<p>Landholder complaints regarding impact on groundwater users are documented and reasonable steps taken to resolve them can be demonstrated</p> <p>No impact on groundwater dependent ecosystems resulting from extraction of groundwater.</p> <p>No change in the capacity of third party groundwater users to undertake their respective activities</p>	<p>Water extraction, if required, will be in compliance with licensing and water allocations where applicable. Liaise with DEWNR to ensure appropriate authorisations are in place</p> <p>Landowners consulted regarding water well locations and water use</p> <p>Water extraction for fracture stimulation in accordance with licensing and water allocation plan where applicable.</p> <p>Monitoring of water extraction volumes and pressures</p> <p>Options for alternative water supplies investigated / used where feasible (e.g. produced formation water, recycling, reuse).</p> <p>Avoid extracting groundwater where there is potential for impacts to groundwater dependent ecosystems. Where it is not possible to avoid extracting groundwater from these aquifers and there is potential for impact a monitoring plan will be implemented</p>

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>3. Avoid contamination of surface water.</p> <p>No disruption to natural drainage paths or alteration to flow distribution</p>	<p>No overflow or escape of flowback fluids from temporary ponds</p> <p>No unauthorised discharge or escape of petroleum, processed substance, fracturing fluid chemical, fuel or solid wastes to surface water.</p> <p>All regulated activities are located and constructed to maintain pre-existing water flows as far as practicable (e.g. channel contours are maintained on floodplains and at creek crossings and overland flows diverted around site if required)</p>	<p>Well sites and pond locations selected to ensure that consequences of a potential pond failure are minimised (e.g. ponds not located in close proximity to the springs or significant watercourses such that failure would result in direct release to these watercourses).</p> <p>Well leases located on higher ground as far as practicable.</p> <p>Where well leases have potential for infrequent flooding, measures undertaken to ensure ponds are not vulnerable to flooding (e.g. ponds on higher ground, construction of higher pond walls, removal of flowback fluids off-site either during testing or at completion of operations).</p> <p>Flowback fluids securely contained in ponds lined with UV stabilised material. Ponds with above-ground walls / bunds to prevent surface runoff into ponds.</p> <p>Chemical utilisation during stimulation kept to the lowest possible to achieve necessary stimulation outcome.</p> <p>Lower toxicity chemical additives used where practicable and suited to the stimulation design required</p> <p>Quality control on pond construction and liner installation to minimise risk of compromised liner integrity.</p> <p>Maximum pond fill level not exceeded (allow for rain events and wave effects).</p> <p>Water balance method used for leak detection (incorporating inflow, evaporation, fluid levels and measurement uncertainty).</p> <p>Pond operation monitored (e.g. pond wall integrity) and repair / remediation and / or decommissioning / rehabilitation undertaken where appropriate (e.g. if leak evident, recover excess fluid where practicable, repair or decommission / rehabilitate pond).</p> <p>Well site and water extraction points are discussed with landholders prior to use to eliminate any impact issues. Refer to Objective 4 for criteria relating to fuel and chemical storage and handling.</p> <p>Locations where flooding risk is high should be avoided</p> <p>Ponds should not be located within 50m of any watercourse</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>Refer to Objective 4 for criteria relating to fuel and chemical storage and handling</p>

<p>4. Minimise disturbance and avoid contamination to soil.</p>	<p>No overflow or escape of flowback fluids from storage tanks ponds. Refer to Objective 12 for rehabilitation criteria.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>No adverse impact to rare or threatened plant species or Priority 1 or 2 plant species outside pre-disturbed / operational areas due to an escape of petroleum, processed substance, fracturing fluid, chemical or fuel</p> <p>Any escape of petroleum, processed substance, fracturing fluid, 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>Refer to Objective 12 for rehabilitation criteria.</p> <p><u>Waste Disposal</u></p> <p>Refer to Assessment Criteria for Objective 11.</p>	<p>Routine inspections of storage ponds, general lease area and equipment.</p> <p>Flowback lines from wellhead rated and pressure tested to appropriate pressure and emergency shut-down system installed on well-head.</p> <p>Spills / leaks cleaned up and remediated.</p> <p>Flare pit cleaned up and remediated as required following completion of operations.</p> <p>Refer to Objective 3 for criteria related to pond integrity.</p> <p>Refer to Objective 9 for pressure integrity of fracture stimulation pumping equipment.</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 fuels, oils and chemicals are to be stored in approved containers in polythene lined bunded pits or on bunded pallets, and in accordance with the appropriate standards and guidelines e.g. Australian Standard AS 1940, EPA guideline 080/16 Bunding and Spill Management, the Australian Dangerous Goods Code (ADG) and product safety data sheets (SDS).</p> <p>No refuelling outside designated refuelling/servicing areas.</p> <p>Refuelling is undertaken with appropriate drip capture systems.</p> <p><u>Spill Response / Contingency Planning</u></p> <p>Appropriate spill response equipment is available on site.</p> <p>Spills or leaks are immediately reported and clean up actions initiated.</p> <p>Personnel trained in correct procedures for use of materials, including refuelling and clean-up procedures.</p> <p>Records of spill events and corrective actions are maintained.</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 (e.g. greater than 200 litres to land, or any volume to water) undertaken in accordance with the National Environmental Protection (Assessment of Site Contamination) Measure (1999) amended in 2013 and relevant SA EPA guidelines</p> <p><u>Waste Management</u></p> <p>Refer to Objective 11.</p>
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Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>5. Minimise disturbance to native vegetation and native fauna.</p>	<p>No unauthorised clearing of vegetation.</p> <p>Fracture stimulation activities confined to cleared areas (e.g. access tracks and prepared well lease).</p> <p>No impact on to native vegetation outside pre-disturbed / operational areas due to an escape of petroleum, processed substance, chemical or fuel</p> <p>No rare, vulnerable or endangered flora removed without appropriate permits</p> <p>No native fauna casualties that could have reasonably been prevented through management measures described in the guide.</p> <p><u>Waste Management</u></p> <p>Refer to assessment criteria for Objective 11</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Refer to assessment criteria for Objective 4.</p>	<p>Impacts to flora and fauna minimised by well lease siting, scouting and preparation in accordance with the Arckaringa Basin Exploration Drilling Activities SEO.</p> <p>Activities confined to existing cleared areas (e.g. access roads, prepared well lease) within area subject to environmental assessment.</p> <p>If flora with significant conservation value is present in vicinity of well site it will be flagged and / or fenced off where necessary to prevent disturbance.</p> <p>Ponds securely fenced to exclude stock and large native fauna.</p> <p>Appropriate escape ramps for trapped animals will be installed.</p> <p>Pond construction to minimise attractiveness to birds i.e. relatively steep sides and lined with suitable polyethylene material, with no 'beaches' or vegetation.</p> <p>Routine surveillance monitoring will be undertaken to detect fauna incursions. Ongoing inspection and monitoring of ponds would detect fauna mortality (if it occurred). Fauna mortality to be captured by incident reporting system.</p> <p>Bird deterrent measures introduced if bird mortality incidents are observed.</p> <p>No domestic pets allowed at camps or worksites.</p> <p>Feeding of wildlife (e.g. dingoes) is not permitted.</p> <p><u>Waste Management</u></p> <p>Refer to Objective 11 for Waste Management.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Refer to Objective 4 for Fuel and Chemical Storage and Handling.</p>
<p>6. Avoid the introduction or spread of weeds, pest animals and pathogens as a consequence of regulated activities and implement control measures as necessary.</p>	<p>The presence of weeds, pest animals or pathogens consistent with or better than pre-disturbance conditions and adjacent land or where this is not the case, a management plan is implemented.</p> <p>Declared plants are reported and managed in accordance with Natural Resources Management (NRM) Act and regional NRM plans</p>	<p>Operations and equipment confined to existing cleared areas (e.g. access roads, prepared well lease). All vehicles and equipment will be appropriately cleaned and checked prior to entering the Arckaringa Basin .</p> <p>Vehicles and equipment are to be cleaned and checked when moving from areas within the Arckaringa Basin where weeds are present.</p> <p>Avoid importation of material from areas of weed / pathogen infestation.</p> <p>Weed, pest animal or pathogen control plans prepared in consultation with the relevant NRM officer and the land &amp; tenures manager where the actions of Sapex or its contractors have led to the introduction or increase in density or abundance</p>

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>7. Avoid disturbance to Aboriginal and non-Aboriginal heritage sites, objects, remains and place unless prior approval under relevant legislation obtained.</p>	<p>Areas of proposed land disturbance have been surveyed and any identified sites, objects, remains and places of Aboriginal and non-Aboriginal heritage have been avoided.</p> <p>Any Aboriginal and non-Aboriginal heritage sites, objects, and remains discovered during operations have been appropriately reported and responded to.</p> <p>If disturbance occurs outside of an approved work area an assessment to evaluate the impacts has been carried out and if required rehabilitation is undertaken in accordance with legislation and/or consultation with Native Title Claimant groups and other Aboriginal people or heritage groups who may have an interest.</p>	<p>Activities confined to cleared areas (e.g. access roads, prepared well lease) within area subject to Work Area Clearance for cultural heritage.</p> <p>Training and induction for all personnel to educate them on the importance of remaining within designated / approved areas.</p> <p>Approved work areas and restricted areas clearly delineated on site</p> <p>Where necessary, cultural heritage sites or exclusion zones in the vicinity of the well site flagged and / or fenced off to prevent disturbance.</p> <p>A mechanism is in place to appropriately report and respond to any sites discovered during operations</p>
<p>8. Air pollution and greenhouse gas emissions reduced to as low as reasonably practical</p>	<p>Reasonable practical measures implemented in design and operation to minimise emissions</p> <p>Stakeholder complaints regarding air quality are documented and reasonable steps taken to resolve them can be demonstrated</p> <p>No unplanned gas release or unnecessary venting.</p>	<p>Equipment operated and maintained in accordance with manufacturer specifications.</p> <p>Three phase separator to be used to separate oil, gas and water (if well produces significant quantities of gas) to allow gas to be flared during flowback or production testing</p> <p>Flaring during production testing kept to minimum length of time necessary to establish resource and production parameters.</p> <p>Dust control measures (e.g. water spraying) implemented if dust generation becomes a problem e.g. near sensitive sites.</p> <p>Appropriate emergency response procedures are in place for the case of a gas leak.</p> <p>Greenhouse gas emissions are estimated, recorded and reported in accordance with NGER and National Pollution Inventory (NPI) requirements. Reporting outcomes are reviewed and used to identify emission reduction opportunities and as a basis for continual improvement.</p>

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>9. Protect the public and third parties from risks inherent in regulated activities</p>	<p>Reasonable measures implemented to ensure no injuries or health risks to the public, employees or third parties as a result of fracture stimulation activities</p> <p>No injuries, incidents or adverse health impacts involving the public or third parties from regulated activities that could have been reasonably prevented by the operator.</p> <p>No uncontrolled fires resulting from regulated activities.</p>	<p><u>Fracture Stimulation Activity</u></p> <p>All employees and contractor personnel complete a safety induction prior to commencement of work in the field.</p> <p>Signage in place to warn third parties of access restrictions to operational areas, with particular warnings when potentially dangerous operations are being undertaken and where required, fencing to delineate restricted / hazardous areas.</p> <p>Contractor equipment has valid certifications, is properly secured and pressure tested prior to commencement of stimulation at each site and trip systems are installed to shut off stimulation pumping units if pre-set operational maximum pressure is reached.</p> <p>All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards.</p> <p>Flowback monitored where radioactive proppant tracers are used to ensure radiation levels are within acceptable limits.</p> <p>Safety management plans prepared as required for the activity.</p> <p>Permit to work systems in place for staff and contractors as required.</p> <p>Effective Emergency Response Plan (ERP) and procedures are in place.</p> <p><u>General Area</u></p> <p>All employees and contractor personnel complete a safety induction prior to commencement of work in the field.</p> <p>Speed restrictions and appropriate signage to reduce speed and increase awareness of hazards for public, employees and third parties.</p> <p>Traffic and journey management procedures followed.</p> <p>Fire and Emergency Services Act requirements complied with (e.g. permits for 'hot work' on total fire ban days).</p> <p>Fire fighting equipment available as appropriate for location and use.</p> <p>Where appropriate, necessary authorisations are obtained for access to the Woomera Prohibited Area.</p>

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
10. Avoid or minimise disturbance to stakeholders and / or associated infrastructure.	<p>No disturbance to landholder/owner activities as a result of regulated activities unless by prior arrangement</p> <p>Stakeholder complaints are documented and reasonable steps taken to address them can be demonstrated</p> <p>Where disturbance is unavoidable or accidental, infrastructure or and use is restored to the satisfaction of the landholder / owner or as near as practicable to undisturbed condition</p>	<p>Induction for all employees and contractors covers pastoral, conservation, tourism, legislation and infrastructure issues.</p> <p>Relevant stakeholders notified prior to undertaking operations (pursuant to Regulations).</p> <p>Fracturing not carried out in close proximity to towns or pastoral station residences.</p> <p>Ponds securely fenced to exclude stock and large native fauna.</p> <p>Landowner liaison regarding notification / management of works and site issues including livestock management</p> <p>All gates left in the condition in which they were found (i.e. open/closed).</p> <p>Potential sources of contamination fenced as appropriate to prevent stock access.</p> <p>System is in place for logging landholder complaints to ensure that issues are recorded, addressed as appropriate and complaints are resolved in a timely manner.</p> <p>Appropriate, necessary authorisations are obtained for access to the Woomera Prohibited Area.</p> <p>In the event of an oil or fluid spill, contingency plan to be implemented after the spill event.</p>

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>11. Optimise waste avoidance, reduction, reuse, recycling, treatment and disposal</p>	<p>No soil, surface water or ground water contamination as a result of waste storage and disposal.</p> <p>All wastes to be disposed of at an EPA licensed facility in accordance with EPA Licence conditions, with the exception of:</p> <ul style="list-style-type: none"> <li>▪ drilling fluids, drill cuttings and other fluids disposed during well clean-up</li> <li>▪ sewage and grey water</li> <li>▪ putrescible wastes from small camp sites should be buried at an appropriate location and depth in order to prevent exposure of waste by fauna or wind/water erosion. Once covered, the site should also be compacted to further minimise the risk of future exposure</li> </ul> <p>All wastewater disposed of in accordance with Department of Health Regulations</p>	<p>Waste streams segregated on site to maximise opportunities for waste recovery, reuse and recycling.</p> <p>Chemical utilisation kept to the lowest level possible.</p> <p>Hazardous wastes handled in accordance with relevant legislation and standards.</p> <p>Licensed contractors used for waste transport.</p> <p>Pond liners removed off-site following evaporation, for disposal at an appropriately licensed waste disposal facility.</p> <p>Spill clean-up materials and wastes appropriately contained for off-site disposal to a licensed waste management facility.</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>Putrescible domestic wastes (e.g. food waste, paper) buried on site in accordance with EPA requirements or transported to EPA licensed facility with other waste where practical.</p> <p>All wastewater disposed in accordance with the <i>Public and Environmental Health (Waste Control) Regulations 2010</i> (i.e. the waste water disposal system must either comply with the <i>Standard for the Construction, Installation and Operation of Septic Tank Systems in SA</i> or be operated to the satisfaction of the Department of Health).</p> <p>Treated sewage wastewater disposed of onto land should not pool, and disposal should be well away from any place from which it is reasonably likely to enter any waters (through seepage or runoff).</p> <p>Production of waste is minimised by purchasing reusable, biodegradable or recyclable materials where practical.</p>

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can Be Achieved
<p>12. Remediate and rehabilitate operational areas to agreed standards.</p>	<p>Stakeholder complaints are documented and reasonable steps taken to address them can be demonstrated.</p> <p>Contaminated sites are remediated in accordance with criteria developed with the principles of the National Environment Protection Measure for contaminated sites, and in consultation with the EPA.</p> <p><u>Note:</u> Well abandonment and well site restoration issues are addressed under Objectives 6 and 12 in the Drilling and Well Operations SEO (Santos 2009).</p>	<p>Temporary ponds re-profiled following completion of operations and restored in accordance with well lease restoration criteria in the Exploration Drilling Activities SEO.</p> <p>Flare pit cleaned up and remediated following completion of operations.</p> <p>Well leases ultimately restored in accordance with the Exploration Drilling Activities SEO.</p> <p><u>Contaminated Site Remediation</u></p> <p>Areas of potential contamination (e.g. from spills or leaks, including serious or reportable incidents as outlined in Section 3) assessed to determine level of contamination and appropriate remediation measures developed in consultation with DPC and EPA.</p>

### 3 Reporting

It is a requirement under Section 85 of the Petroleum and Geothermal Energy Act that any incidents that are determined to be 'serious' or 'reportable' incidents must be reported to the Minister.

#### 3.1 Definitions

##### Serious Incidents

The Section 85(1) of the Act defines a 'serious incident' as an incident in which:

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

##### Reportable Incidents

Section 85(1) of the Act defines reportable incidents as incidents (other than a serious incident) arising from activities conducted under a licence that are classified under the Regulations as a reportable incident.

Reportable incidents are defined under Regulation 32(1) as:

- (a) an escape of petroleum<sup>1</sup>, a processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape
- (b) an incident identified as a reportable incident under the relevant statement of environmental objectives.

Regulation 12(2) requires an SEO to identify events which could arise 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 fracture stimulation activities, pursuant to Regulation 12(2) and Regulation 32(1)(b). These definitions are based on the standard incident definitions for facilities and pipelines that have been developed by the Department of Premier and Cabinet (DPC).

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<sup>1</sup> In gaseous, liquid or solid state, as per Petroleum and Geothermal Energy Act definition

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

Serious Incidents	Reportable Incidents
<ol style="list-style-type: none"> <li>1. A person is seriously injured<sup>2</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: <ul style="list-style-type: none"> <li>• Damage, disturbance or interference to Aboriginal or non-indigenous sites of cultural and / or heritage significance without appropriate permits and approvals<sup>3</sup>.</li> <li>• An escape of petroleum, process substance, fracturing fluid, 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>• Identification of cross flows in aquifers in natural hydraulic isolation, or uncontrolled flows to the surface.</li> <li>• Any well incident or failure that threatens or poses an imminent risk to safety or a risk of serious damage to environmental values.</li> <li>• 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>• Any removal of rare, vulnerable or endangered flora and fauna without appropriate permits and approvals<sup>4</sup>.</li> </ul> </li> <li>4. An event that results in a rupture of a pressure containing asset or facility.</li> <li>5. A regulated activity<sup>5</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>6</sup></li> <li>6. 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>7</sup>, oil, chemicals or fracturing fluid that affects an area that has not been specifically designed to contain such an escape (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>• Failure of a critical procedural control in place to reduce a credible threat to low or as low as reasonably practicable (ALARP)<sup>8</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>5. An excursion (disturbance) outside a culturally cleared area has occurred but not impacted on any site of significance as determined by relevant authority or Native Title Claimant (must be treated as serious until no impact determined).</li> <li>6. Any detected unauthorised third-party access to facilities and associated infrastructure.</li> </ol>

<sup>2</sup> Includes an immediately notify able work-related injury pursuant to Section 38(2) of the *Work Health and Safety Act 2012*

<sup>3</sup> Pursuant to *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*.

<sup>4</sup> Pursuant to *Native Vegetation Act 1991* (flora) and *National Parks and Wildlife Act 1972* (fauna).

<sup>5</sup> Regulated activity as defined in Section 10 of the *Petroleum and Geothermal Energy Act*.

<sup>6</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>7</sup> In gaseous, liquid or solid state, as per *Petroleum and Geothermal Energy Act* definition

<sup>8</sup> As per the Safety Management System process articulated in AS 2885.1-2007, or similar risk assessment process.

### 3.2 Reporting Requirements

**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 2000 and Regulation 32.

**Reportable Incidents** must be reported to DPC on a quarterly basis within 1 month of the end of the quarter, as per Regulation 32.

### 3.3 Reporting to EPA

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

The reporting obligation under the Environment Protection Act does 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 disposed of to land within the area of the licence.

## 4 List of Abbreviations

APPEA	Australian Petroleum Production & Exploration Association
AS 1940	Australian Standard AS 1940 <i>Storage and Handling of Flammable and Combustible Liquids</i>
DEWNR	Department of Environment, Water and Natural Resources
DPC	Department of the Premier and Cabinet, Resources and Energy
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
ERP	Emergency response plan
SDS	Safety Data Sheet
NGER	National Greenhouse and Energy Reporting (Act)
PPE	Personal protective equipment
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

APPEA (2011). *Western Australian Onshore Gas Code of Practice for Hydraulic Fracturing*. Australian Petroleum Production & Exploration Association Ltd, Perth.

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SAPEX (2013). *Arckaringa Basin Exploration Drilling Activities Environmental Impact Report*.

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