



Statement of Environmental Objectives



Drilling Activities in PELs 81 and 253, Officer Basin

September 2010

RPS

Prepared for:

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1 Introduction

This Statement of Environmental Objectives (SEO) for petroleum drilling activities in petroleum exploration licences (PELs) 81 and 253 in the Officer Basin 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 2000*.

1.1 Purpose

The intent of the SEO is to outline the environmental objectives that Officer Basin Energy Pty Ltd (OBEPL, a wholly owned subsidiary of Rodinia Oil Corp.) is required and seeks to achieve during drilling and initial production testing activities 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 *Environmental Impact Report: Drilling Activities in PELs 81 and 253, Officer Basin* (RPS 2010).

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

1.2 Scope

This SEO applies to all of OBEPL's drilling and related activities in the Officer Basin (PELs 81 and 253), including initial production testing, as described in the Environmental Impact Report.

Figure 1 shows OBEPL's petroleum exploration licence areas in the Officer Basin.

Activities covered by this SEO include:

- wellsite and access track construction;
- airstrip construction (if required);
- petroleum drilling;
- well completions and workovers;
- production testing (both drill stem tests and any initial production testing);
- well and zonal abandonment; and
- site and access abandonment and remediation.

The following operations are not covered by this SEO:

- seismic exploration activities; and
- production and processing operations beyond initial production testing.

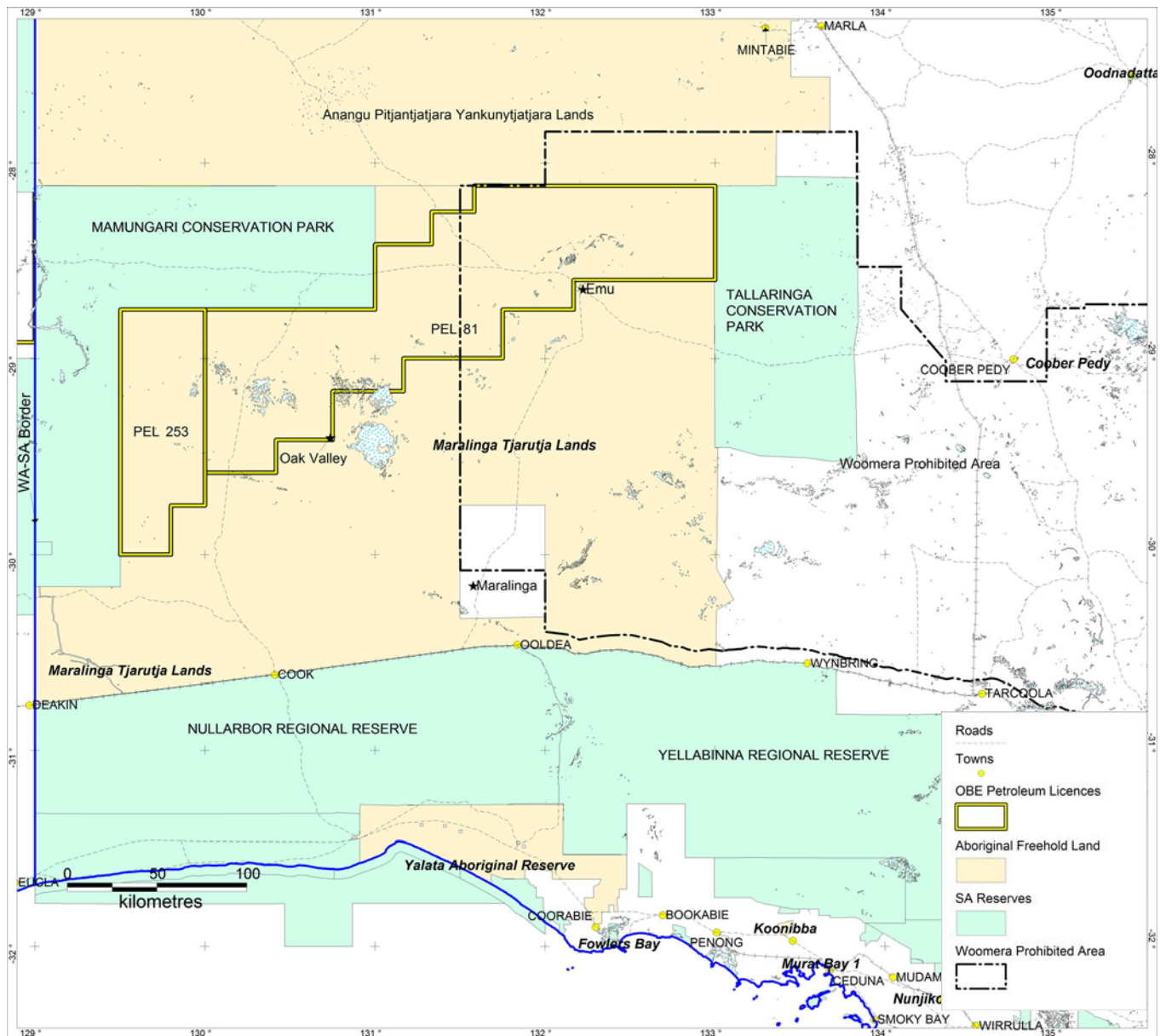


Figure 1: PELs 81 and 253, Officer Basin, western South Australia.

2 Environmental Objectives

Relevant objectives of the Petroleum and Geothermal Energy Act include:

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

Potential environmental hazards and consequences associated with drilling and associated activities have been identified in the Environmental Impact Report (RPS 2010).

The relevant environmental objectives for drilling and initial production testing which must be achieved to address the risks identified in the EIR are:

1. Avoid damage or disturbance to sites of Aboriginal and non-indigenous heritage significance.
2. Minimise disturbance to native vegetation and native fauna.
3. Prevent the introduction or spread of weeds and undertake control measures where required.
4. Minimise impacts to 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 safety of the public, employees and other third parties.
8. Minimise disturbance to Maralinga Tjarutja and any infrastructure.
9. Minimise visual impact.
10. Minimise the impact on the environment of waste storage, handling and disposal.
11. Remediate and rehabilitate operational areas to agreed standards.

3 Assessment Criteria

The environmental objectives identified in the previous section are subject to an assessment to measure the level of achievement. The assessment criteria for each objective will be one of the following:

- defined conditions that achieve the objective through the prevention of unacceptable actions (e.g. “No construction activities are carried out on salt lakes”)
- defined requirements to carry out certain actions in accordance with approved procedures or industry accepted standards (e.g. industry standards or Australian Standards)
- Goal Attainment Scaling (GAS) Criteria – objectives requiring visual assessment can be prone to uncertainties of subjective judgement. To minimise this occurring, GAS is used to measure such objectives against a series of criteria described by a written description and/or photographically. In this SEO, GAS is applied to wellsite construction and restoration and construction and restoration of borrow pits.

Appendix 1 tabulates the objectives and corresponding assessment criteria.

GAS criteria are presented in Appendix 2.

4 Reporting

Regulation 12(2) requires an SEO to identify events that could cause a serious incident or a reportable incident within the meaning of Section 85 of the Petroleum and Geothermal Energy Act.

4.1 Definitions

The following descriptions have been provided to help clarify and elaborate on the definitions given in Section 85(1) of the Act and Regulation 32(1).

4.1.1 Serious Incidents

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

- (a) a person is seriously injured¹ 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 supply arises².
- (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.

Pursuant to Regulation 12 (2), the incidents listed below are also considered to be serious incidents that may arise from drilling and well operations:

- 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
- any well incident or failure that threatens or poses imminent threat to security of supply or poses an imminent safety or environmental risk
- disturbance to sites of cultural and/or heritage significance without appropriate permits and approvals³
- explosion or fire at any facility or pipeline (i.e. well site)
- identification of cross flows in aquifers, or uncontrolled flows to the surface
- detection of a declared weed, animal/plant pathogen or plant pest species that has been introduced or spread as a direct result of activities
- any removal of rare, vulnerable or endangered flora and fauna without appropriate permits and approvals⁴.

4.1.2 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.

Regulation 32(1) classifies the following as reportable incidents:

- (a) an escape of petroleum⁵, a processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape

¹ Includes an immediately notifiable work-related injury pursuant to Division 6.6 of the *Occupational Health, Safety and Welfare Regulations 1995* that results in the issuing of a Prohibition Notice by SafeWork SA.

² That is, after taking into account relevant factors on a day and rights and obligations under contracts, a significant curtailment of firm service that detrimentally impacts or is likely to impact upon the security of electricity supply to South Australia or to gas supplies to a significant number of commercial and/or domestic gas users in SA

³ Pursuant to *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*

⁴ Pursuant to *Native Vegetation Act 1991* (flora) and *National Parks and Wildlife Act 1972* (fauna)

- (b) an incident identified as a reportable incident under the relevant statement of environmental objectives.

Pursuant to Regulation 12(2) and Regulation 32(1)(b), the incidents listed below are also considered to be reportable incidents:

- demonstrated presence of cross flow or flows to surface from the well bore
- a reasonable complaint from a stakeholder as a result of operations
- unauthorised third party access to facilities
- malfunction or failure of critical plant or equipment that had (or still has) potential to cause a serious incident
- an introduction of an exotic species
- initiation of any unplanned fire that is not considered serious
- any other significant non-compliance with SEO objectives.

4.2 Reporting Requirements

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

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

⁵ In gaseous, liquid or solid state, as per Petroleum and Geothermal Energy Act definition

5 References

EPA (2007). Bunding and Spill Management. EPA Guidelines 080/07. South Australian Environment Protection Authority. Updated June 2007. <http://www.epa.sa.gov.au/guidelines.html>

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Appendix 1:

Environmental Objectives and Assessment Criteria

Table A1-1: Environmental Objectives and Assessment Criteria

Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Comment
1. Avoid damage or disturbance to sites of Aboriginal and non-indigenous heritage significance.	<p>A cultural heritage clearance survey has been undertaken for the proposed areas of disturbance (well leases, access tracks, borrow pits, airstrip) prior to commencement of site preparation, in accordance with the land access and production agreement between OBEPL and Maralinga Tjarutja.</p> <p>No impact to sites of Aboriginal or non-indigenous heritage significance.</p>	<p>Documents and/or reports of scouting for cultural/heritage are available for review.</p> <p>Known heritage sites have been identified and protected from operations (e.g. temporary flagging).</p> <p>A procedure is in place for the appropriate response to any sites discovered during drilling activities.</p> <p>Reports of any accidental discoveries during drilling activities are available for review.</p> <p>Records of sites forwarded to the Aboriginal Heritage Branch in compliance with the Aboriginal Heritage Act.</p> <p>Consult with Heritage Branch, DEH where appropriate regarding location of non-indigenous heritage sites.</p>	<p>The aim of this objective is to ensure that any sites of Aboriginal and European heritage significance are identified and protected.</p> <p>Newly discovered sites must be reported to the appropriate authorities.</p>
2. Minimise disturbance to native vegetation and native fauna.	<p><u>Well Lease, Access Track and Airstrip Construction and Restoration</u></p> <p>Any sites of rare, vulnerable and endangered flora and fauna have been identified and subsequently avoided.</p> <p>Maralinga Tjarutja requirements regarding any trees of cultural significance are met.</p> <p>Attainment of 0, +1 or +2 GAS criteria for vegetation-related objectives for wellsite and borrow pit restoration, as listed in Appendix 2.</p> <p><u>Drilling and Production Testing Activities</u></p> <p>No fires during drilling and 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><u>Well Lease, Access Track, Airstrip and Camp Site Construction and Restoration</u></p> <p>Appropriately trained and experienced personnel have scouted proposed wellsite (including sump and flare pit), access tracks, airstrip and campsites for the purpose of identifying and flagging/recording significant (or rare, vulnerable and endangered) flora and fauna.</p> <p>If avoidance of known locations of significant species is not possible, an onsite assessment of the potential to impact listed species has been undertaken, based on available species information, vegetation mapping and where appropriate, consultation with relevant experts.</p> <p>Vegetation clearance has been minimised and the conservation needs of specific species have been considered.</p> <p>The clearing of mature trees has been minimised.</p> <p>Airstrip (if required) is located in an area where earthworks and vegetation clearance requirements are limited.</p> <p>Campsites are located as far as possible in naturally sparse or clear areas in which campsite establishment does not require significant disturbance to vegetation.</p> <p>Documents and/or reports of assessment or scouting for flora/fauna are available for review.</p> <p>Facilities (e.g. borrow pits, well cellars) are designed and constructed as far as practicable to minimise fauna entrapment.</p> <p>Water storages are contained or fenced to minimise access by fauna (e.g. camels).</p> <p>Sumps and mud pits are fenced as appropriate to minimise wildlife</p>	<p>Where possible wellsites will be located to minimise the clearing of native vegetation.</p>

Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Comment
		<p>access.</p> <p>Borrow pits are restored to minimise water holding capacity where agreements are not in place with stakeholders.</p> <p>Impacts in adjacent Mamungari Conservation Park and Tallaringa Conservation Park are avoided.</p> <p>Appropriate buffers to adjacent conservation parks are maintained to ensure that inadvertent impacts are avoided.</p> <p><u>Drilling and Production Testing Activities</u></p> <p>Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire fighting equipment.</p> <p>Well site is adequately sized to maintain appropriate firebreak protection.</p> <p>Response to fire included in Emergency Response Plan.</p> <p>All personnel are fully informed on the fire danger season and associated restrictions</p> <p>Fire risk included in induction.</p> <p>Fire equipment maintained at well site and camp.</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 Objective 10.</p> <p><u>Fauna Management</u></p> <p>No domestic pets allowed at camps or worksites.</p> <p>Feeding of wildlife (e.g. dingoes) is not permitted.</p>	
3. Prevent the introduction or spread of weeds and undertake control measures where required.	Weeds are not introduced into, or spread in, operational areas as a consequence of activities	<p>All vehicles and equipment inspected and assessed for the risk of spreading weed material and, if required, cleaned prior to entering the licence areas.</p> <p>Vehicles and equipment are to be cleaned when moving from areas where weeds are present to non-affected areas.</p> <p>Cleaning to be carried out in accordance with relevant procedures and accepted practices.</p> <p>Records of vehicle and equipment cleaning are kept and available for review.</p> <p>The site and access will be monitored on a regular basis for new weed species and treated as necessary following discussions with Maralinga Tjarutja and regional NRM Board where appropriate.</p> <p>Records of detection, monitoring or eradication of exotic weeds or noxious species introduced by industry activities are kept and are available for review.</p>	<p>The major potential source of weed introduction is from vehicles and equipment brought in from other regions of the state or interstate for the various well activities.</p> <p>Particular attention should be given to reducing the risk of introduction of Buffel Grass (<i>Cenchrus ciliaris</i>).</p>

Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Comment
4. Minimise impacts to soil.	<p><u>Wellsite, Access Track and Airstrip Construction</u></p> <p>Attainment of 0, +1 or +2 GAS criteria for soil-related objectives as listed in Appendix 2.</p> <p>No construction activities are carried out on salt lakes or steep stony slopes.</p> <p>Gibber pavement is rolled rather than graded.</p> <p><u>Drilling and Production Testing</u></p> <p>No soil contamination as a result of drilling and production testing activities.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Soil in areas affected by any spill is removed and/or bioremediated.</p> <p>No soil contamination as a result of fuel and chemical storage and handling.</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10.</p>	<p>Planning has been undertaken to minimise impacts of operations and records are available for review.</p> <p>There is no evidence of off-road driving or creation of shortcuts.</p> <p><u>Wellsite, Access Track and Airstrip Construction and Restoration</u></p> <p>Orientate site constructions to minimise soil removal.</p> <p>Separate topsoil and sump spoil stockpiles.</p> <p>Soil removed in construction to be stored on site and returned to its original stratigraphic level upon restoration of the drill site.</p> <p>Oil spill areas have been ripped to an appropriate depth.</p> <p><u>Drilling and Production Testing</u></p> <p>Sump to have sufficient capacity.</p> <p>Camp and drill rig generators to be located in polyethylene lined bunded areas to contain any spills.</p> <p>Production storage tanks to be stored in clay-lined bunded areas.</p> <p>Bunded areas must have sufficient freeboard (e.g. to hold a 1:100 year, 24hr rainfall event).</p> <p>All bunded areas will be in accordance with EPA guidelines 080/07 <i>Bunding and Spill Management</i>.</p> <p>Initial production lines and tanks to be inspected prior to use.</p> <p>MSDS information readily available on the wellsite.</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 appropriately e.g. in approved containers in polythene lined bunded pits or on bunded pallets.</p> <p>No refuelling outside designated refuelling/servicing areas.</p> <p>Appropriate spill response equipment is available on site.</p> <p>Staff and contractors receive adequate 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.</p> <p>Records of spill events and corrective actions are maintained.</p> <p><u>Waste Management</u></p> <p>Refer to Objective 10.</p>	<p>The impacts associated with soil disturbance include wind and water erosion and dust generation.</p> <p>The main impact to soil is caused by the removal of existing soil and/or the importation of foreign material for the construction of the site. The excavation and subsequent backfill of the sump may also lead to the inversion or mixing of topsoil and sub-soils. This creates a visual impact and can also alter the soil characteristics that can in turn impact on the effective re-establishment of native vegetation.</p> <p>Wellsites will be positioned and orientated to minimise soil removal. Removed soil will be stored according to its position in the ground and will be returned to the excavation in the correct order.</p> <p>Another potential impact to soil is soil contamination from accidental spillages of chemicals or hazardous substances during well operations.</p> <p>Precautions will be taken to prevent and contain spills at all sites where fuels are used or transferred (generators, vehicle refuelling).</p> <p>Bunds shall be used or constructed where appropriate e.g. where containers of hazardous materials (including fuel, oil and chemicals) are stored.</p> <p>All waste removal contractors will be licensed and will operate within EPA guidelines.</p>

Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Comment
5. Minimise loss of reservoir and aquifer pressures and avoid aquifer contamination.	<p>No aquifer contamination as a result of drilling, completion or production testing activities.</p> <p><u>Drilling and Completion Activities</u></p> <p>No uncontrolled flow to surface (i.e. blow out).</p> <p>Sufficient barriers exist in casing annulus to prevent crossflow between separate aquifers or hydrocarbon reservoirs.</p> <p><u>Production Testing and Well Abandonment Activities</u></p> <p>No crossflow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by the Department of Water, Land and Biodiversity Conservation.</p>	<p><u>Drilling and Completion Activities</u></p> <p>Observed volumes of cement return to surface match calculations.</p> <p>Where there is evidence of insufficient isolation, remedial action to be conducted.</p> <p><u>Well Abandonment Activities</u></p> <p>Isolation barriers to be set in place to ensure that crossflow, contamination or pressure reduction does not occur.</p> <p>Records of plug depths and intervals are kept.</p>	<p>This objective seeks to protect the water quality and pressure of any aquifers and to maintain pressure in potential petroleum aquifers.</p>
6. Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.	<p><u>Well Lease, Access Track and Airstrip Construction and Restoration</u></p> <p>Wellsites and access tracks are located to maintain pre-existing water flows (i.e. channel contours are maintained on floodplains and at creek crossings).</p> <p><u>Drilling and Production Testing Activities</u></p> <p>No contamination of surface waters and shallow groundwater resources as a result of drilling or production testing activities.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>No contamination of surface waters and shallow groundwater resources as a result of fuel or chemical storage and handling.</p> <p><u>Waste Management</u></p> <p>Refer to Assessment Criteria for Objective 10.</p>	<p><u>Wellsite, Access Track and Airstrip Construction and Restoration</u></p> <p>All access through watercourse areas carefully assessed to determine the locations of least impact to channels and creek banks.</p> <p>Minor flows diverted around well lease if required.</p> <p>Any soil removed during the construction of the drill pad will be respread over the disturbed area during restoration.</p> <p>Any required remediation work carried out as soon as possible after completion of all activities.</p> <p>If any contamination from spillage of oils or fuel occurs, immediate effective clean-up procedures must be employed.</p> <p><u>Drilling and Completion Activities</u></p> <p>Information on muds and chemicals to be readily available on the rig.</p> <p>All drill cuttings, muds and non-toxic drill fluids are to be contained within a designated sump with adequate freeboard at completion of operations to allow for a 1m cover of clean fill at remediation.</p> <p>On completion of drilling the sump will be allowed to dry out and then backfilled level with the surrounding landscape.</p> <p>Fluid losses will be controlled during drilling.</p> <p>Where shallow aquifers are present mud pits will be lined with impervious material e.g. polyethylene.</p> <p><u>Drilling and Production Testing</u></p> <p>Sump to have sufficient capacity.</p> <p>Camp and drill rig generators to be located in polyethylene lined bunded areas to contain any spills.</p> <p>Production storage tanks to be stored in clay-lined bunded areas.</p>	<p>The main threats to drainage patterns, surface waters and shallow groundwater resources are considered to be contamination, as a result of spills, and interruption to natural drainage flows as a result of earthworks and drilling operations.</p> <p>Access track and wellsite selection will aim to minimise impact to drainage systems, by avoiding sensitive areas and appropriate construction methods.</p> <p>There is potential for the contamination of chemical and fuel storage areas, from oil and gas systems at well heads, during transportation of fuel and chemicals and during transportation of wastes. Localised contamination may result from spills or leaks of well operations chemicals (e.g. corrosion inhibitors) during storage and handling.</p> <p>The major threat of spills is the threat to soil, vegetation and watercourses directly impacted by the spill.</p> <p>Avoidance of spills will be paramount in areas where the spill can be potentially</p>

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		<p>Initial production lines and tanks to be inspected prior to use.</p> <p><u>Fuel and Chemical Storage and Handling</u></p> <p>Appropriate spill response equipment is available on site.</p> <p>Refer to Objective 4.</p> <p><u>Waste Management</u></p> <p>Refer to Objective 10.</p>	spread beyond the immediate confines of the spill area into sensitive environments such as creeks and wetlands.
7. Minimise risks to the safety of the public, employees and other third parties.	No injuries to the public, employees or third parties as a result of drilling, completion and production testing activities.	<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><u>Drilling and Completion Activities</u></p> <p>Drill rig, ancillary and any testing equipment to comply with Regulations, meet relevant industry standards and be "Fit for Purpose".</p> <p>Casing design carried out to meet worst case expected loads and environmental conditions determined for the specific geology intercepted by the well. Details of work to be performed are set out in the Drilling Program.</p> <p>Casing set in accordance with design parameters.</p> <p>Casing cemented to surface with visible return.</p> <p>Blow out prevention precautions / well control equipment in place in accordance with defined procedures and appropriate to the expected downhole conditions.</p> <p>Satisfactory kick tolerance in casing program design.</p> <p>Emergency Response Procedures in place.</p> <p>Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire fighting equipment.</p> <p><u>Well Abandonment Activities</u></p> <p>Downhole abandonment is carried out to meet worst case expected loads and downhole environmental conditions.</p> <p>Effective isolation maintained between any potential aquifers to prevent crossflow.</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><u>Wellsite Restoration Activities</u></p> <p>Assessment of the threat to third parties from well completion / downhole abandonment.</p> <p>Necessary measures (e.g. fencing, signage) taken to prevent the public</p>	<p>The guide to how to achieve this objective has been developed on the basis of the current understanding of the risks of wells to third party safety. Risks may span in time from immediate (e.g. unauthorised access, abandoned waste), to long term (e.g. breakdown over time of cement integrity around casing allowing crossflow).</p> <p>All reasonable steps will be taken to prevent unauthorised access to the site and warning signs will be appropriately located.</p> <p>The key to achieving the third party safety objective in relation to both downhole abandonment and surface wellsite restoration is to ensure that the visual prominence of the abandoned wellsite and access track is minimised to the extent where it is difficult for third parties to detect and therefore access the site.</p> <p>Fires or explosions at wellsites could result in complications resulting in a spill of production fluids (formation water and hydrocarbon), atmospheric emissions, disturbance of native vegetation and wildlife habitat, loss of reservoir pressure, and risk to employees, contractors and the public.</p> <p>The movement of heavy equipment associated with rig moves present a risk to the safety of employees, contractors and third parties (e.g. Traditional Owners or tourists).</p> <p>Abandonment plugs must be set to ensure long term isolation of any potential aquifers intersected or shallow zones may become</p>

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		<p>accessing the wellhead equipment or waste relating to the well.</p> <p>Effective rehabilitation of the wellsite so that potentially dangerous perturbations in ground level do not remain.</p> <p><u>Woomera Prohibited Area</u></p> <p>Appropriate, necessary authorisations are obtained for access to the Woomera Prohibited Area.</p>	over-pressured.
8. Minimise disturbance to Maralinga Tjarutja and any infrastructure.	<p>No reasonable concerns raised by the Maralinga Tjarutja are left unresolved.</p> <p>No Maralinga Tjarutja facilities have been disturbed during operations without prior written consent.</p> <p>Any breaches of the land access and production agreement between Maralinga Tjarutja and OBEPL will also be deemed a breach of this SEO (provided those conditions relate to environmental matters).</p>	<p>Maralinga Tjarutja are consulted during the planning phase and notified prior to the commencement of activities.</p> <p>Periodic meetings with the Maralinga Tjarutja community are organised to identify any potential or unresolved issues and other community land uses.</p> <p>Induction for all employees and contractors to cover cultural, conservation, infrastructure and legislation issues.</p> <p>Induction to cover requirements of the land access and production agreement between Maralinga Tjarutja and OBEPL, including prohibition on alcohol, firearms and hunting for OBE personnel.</p> <p>Damage to tracks is avoided or tracks are repaired if damage related to drilling activities occurs.</p> <p>All vehicles will travel at safe speeds to avoid collisions.</p> <p>All gates left in the condition in which they were found (i.e. open/closed).</p> <p>System is in place for logging complaints to ensure that issues are addressed as appropriate.</p> <p>Noise levels are to remain within appropriate acceptable limits.</p>	Communication and the establishment of good relations with the community is fundamental to minimising disturbance to as low as practicably possible.
9. Minimise visual impact.	The attainment of 0, +1 or +2 GAS criteria for visual impact objectives for wellsite and borrow pit restoration as listed in Appendix 2.	<p>Compacted soil areas ripped (except in gibber pavement) and soil profile and contours are reinstated following completion of operations.</p> <p>Soil removed in construction to be stored on site and returned to its original stratigraphic level upon restoration of the drill site.</p> <p>PIRSA (2009) Field Guide contains photographic examples of GAS criteria.</p>	<p>Fatchen and Woodburn (1997) study concluded that the predominant impacts of wellsite and access track construction are predominantly visual and not ecological.</p> <p>On the basis of this study a set of assessment criteria was established for assessing rehabilitation of abandoned and restored wellsites and access tracks (PIRSA 2009 Field Guide).</p>

Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Comment
10. Minimise the impact on the environment of waste storage, handling and disposal.	<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 drilling fluids, drill cuttings and other fluids disposed during well clean-up.</p> <p>Wastewater (sewage and grey water) disposed of in accordance with the <i>Public and Environmental Health (Waste Control) Regulations 1995</i> or to the Department of Health's satisfaction.</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 management practices will be guided by the principles of the waste hierarchy (i.e. avoid, reduce, reuse, recycle, recover, treat, dispose).</p> <p>All wastewater disposed in accordance with the <i>Public and Environmental Health (Waste Control) Regulations 1995</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, well away from any place from which it is reasonably likely to enter any waters, in accordance with clause 11 of the <i>Environment Protection (Water Quality) Policy 2003</i>.</p> <p>Production of waste is minimised by purchasing reusable, biodegradable or recyclable materials where practical.</p>	<p>Bins are covered to prevent access by fauna and the spread of rubbish by wind.</p> <p>Waste reduction requires continual improvement in purchasing, efficiency of use and reuse. Due to the distances involved, the cost of recycling a large range of products may be prohibitive. Ongoing review of recycling options is required to ensure that improvements are implemented as far as practical.</p> <p>Responsible handling and disposal of waste will reduce both short-term and long-term impacts of waste on the environment.</p>
11. Remediate and rehabilitate operational areas to agreed standards	<p><u>Well Lease, Access Track, Airstrip and Borrow Pit Restoration</u></p> <p>The attainment of 0, +1 or +2 GAS criteria as listed in Appendix 2.</p> <p>Cellar backfilled and marker erected</p> <p>No evidence of litter on site.</p> <p>All areas are to be rehabilitated as soon as practical.</p> <p>No sites are left contaminated or without treatment.</p>	<p>Refer to Objectives 2, 4, 5, 6, 7, 8, 9, 10.</p> <p>Compacted soil areas have been ripped (except on gibber pavement) and soil profile and contours are reinstated following completion of operations.</p> <p>Rehabilitation will meet the environmental and rehabilitation requirements of the land access and production agreement between Maralinga Tjarutja and OBEPL.</p> <p>Rehabilitation/abandonment plans for surface activities will be developed in consultation with relevant stakeholders.</p>	<p>Refer to Objectives 2, 4, 5, 6, 7, 8, 9, 10.</p>

Appendix 2:

Goal Attainment Scaling Criteria for Well Site and Borrow Pit Restoration

Table A2-1: GAS Criteria for Wellsite Restoration

Objectives	Measure	Goal Exceeded +2	Goal Exceeded +1	Goal Attained 0	Minor Shortfall - 1	Significant Shortfall - 2
To minimise the visual impact¹	Access tracks	The track contours and colour blend with the surroundings and the earthwork disturbance is indistinguishable.	The track contours and colour blend with the surroundings and the earthwork disturbance is beginning to blend also.	The track contours and colour blend with the surroundings; but the earthwork disturbance is still prominent (e.g. ripping, rolling or respreading of original material).	The track surface has been contoured into the surrounding landscape; but the colour of foreign material contrasts with the surroundings.	The track is prominent because of a scraped surface, windrows along its edges or gully erosion.
	Interdune wellsites	The site contours and colour blend with the surroundings and the earthwork disturbance is indistinguishable.	The site contours and colour blend with the surroundings and the earthwork disturbance is beginning to blend also.	The site contours and colour blend with the surroundings; but the earthwork disturbance is still prominent (e.g. ripping, rolling or respreading of original material).	The site surface and edge have been contoured into the surrounding landscape; but the colour of foreign material contrasts with the surroundings.	The site remains as a prominent consolidated surface with a distinct edge.
	Dune wellsites	The edge and colour of the site blend with the surroundings. The site contours are indistinguishable whether viewed from the top or base of the dune.	The edge and colour of the site blend with the surroundings. The site contours are visible only when viewed from the top of the dune; they cannot be seen from the base. There are no erosion gullies down the face of the dune.	The edge and colour of the site blend with the surroundings. The site contours are visible only when viewed from the top of the dune; they cannot be seen from the base. Erosion gullies are present down the face of the dune but they are not extensive or prominent.	The site has been restored into the natural contour of the dune, but the colour of foreign material contrasts with the surroundings.	Extensive gully erosion down the face of the dune and/or a steep site edge is prominent.
	Gibber wellsites	Site is indistinguishable from the surrounds.	Site matches adjacent contours and the gibber is uniformly spread with no imported material evident.	Site matches adjacent contours with some imported material still evident within gibber spread.	Site matches adjacent colours, but is visible due to inconsistent spreading of the gibber and some bare areas.	Site is poorly formed and predominantly bare due to incomplete spreading or loss of the gibber.
The revegetation of indigenous species¹	Predictive rehabilitation on abandonment	N/A	N/A	There has been appropriate preparation of the ground surface to promote revegetation.	The restored surface is inconsistent with the surroundings.	No attempt has been made to restore the wellsite.
	Less than five years since wellsite abandonment	The revegetation is extensive and mostly consists of annuals and biennials; perennials are beginning to establish which is consistent with the surroundings.	The revegetation is extensive and consists of annuals and biennials; in contrast to the surroundings there are no perennials.	Colonisation of the original species is starting to occur.	Revegetation with inappropriate species.	No revegetation is occurring.
	At least five years since abandonment	The revegetation type, density and maturity is indistinguishable from the surroundings.	The revegetation, mostly perennials, is consistent with the surroundings; but there is a contrast in maturity between them.	The revegetation consists of annuals, biennials and perennials; but there are some bare patches which are inconsistent with the surroundings.	The revegetation mostly consists of annuals and biennials; in contrast to the surroundings, there are few perennials.	There is no revegetation.

¹ These criteria are consistent with PIRSA (2009) *Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites* which also contains photographic examples of these outcomes

Table A2-2: GAS Criteria for Borrow Pit Restoration

Objectives	Goals	Goal Exceeded +2	Goal Exceeded +1	Goal Attained 0	Minor Shortfall - 1	Significant Shortfall - 2
Minimise impacts on vegetation	Acceptable revegetation after rainfall	Vegetation type and density indistinguishable from surrounding landscape		Perennial grasses and shrubs revegetated, type consistent with surroundings. Some bare patches still present Vegetation cover uniform over base and sides of pit	Revegetation localised on the base of the pit but none or very little on the sides of the pit	No revegetation evident
Minimise impact on soil	Minimise erosion	No erosion anywhere on the pit		Minor erosion along the sides of the pit	Moderate erosion	Severe erosion evident
Minimise visual impacts	Borrow pit effectively recontoured and ripped	Pit contours indistinguishable from surrounding landscape. Access ripped	Pit contours blend well into surrounding landscape, although still evident	Pit sides battered and ripped along the contour, but is still highly visible Topsoil and vegetation respread over disturbed area	Pit sides battered but not ripped	No re-contouring of pit has occurred – pit sides are very steep Topsoil and vegetation not respread
Site to be left in a clean and tidy condition	Rubbish removed			No evidence of litter	Small items of litter present on site	Large items of litter present