
South Australia Cooper Basin Operators



Statement of Environmental Objectives:

Drilling and Well Operations

Prepared for:
South Australia Cooper Basin Operators

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List of Abbreviations

DOSAA	Department of State Aboriginal Affairs
DST	Drill stem test
EIR	Environmental Impact Report prepared in accordance with Section 97 of the <i>Petroleum Act 2000</i> and Regulation 10.
EPA	Environment Protection Authority.
EPBC	Environment Protection and Biodiversity Conservation (<i>Act 1999</i>)
ERP	Emergency response plan
GAB	Great artesian basin
GAS	Goal attainment scaling
KPI	Key performance indicator
NASAA	National Association Sustainable Agriculture Australia
NEPM	National Environment Protection Measures (Assessment of Contaminated Sites)
OBE	Organic Beef Exporters
PEL	Petroleum exploration licence
PIRSA	Primary Industries and Resources South Australia
PPE	Personal protective equipment
PPL	Petroleum production licence
SACB	South Australian Cooper Basin
SACBJV	South Australian Cooper Basin Joint Venture
SACOME	South Australian Chamber of Mines and Energy
SEO	Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the <i>Petroleum Act 2000</i> and Regulations 12 and 13.

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 South Australian *Petroleum Act 2000* (the Act) and Regulations 12 and 13 of the *Petroleum Regulations 2000*.

The intent of this SEO is to outline the environmental objectives that South Australia Cooper Basin (SACB) Operators are required to achieve during drilling and well operations (referred to throughout as operation/s), and the criteria upon which these objectives are to be assessed. Environmental objectives have been developed on the basis of information provided in the Environmental Impact Report (EIR) for drilling and well operations in the South Australian section of the Cooper Basin.

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

1.2 Scope

This SEO applies to all of the SACB Operators' drilling and well operations in the South Australian sector of the Cooper and Eromanga Basins (Figure 1-1). The operations that are covered by this SEO are:

- well site and access track construction;
- well site and access track abandonment;
- drilling;
- well completions and workovers;
- gas and oil systems on well leases;
- well and zonal abandonment; and
- waterflood or water injection activities.

These operations are described in detail in the EIR. Activities associated with Cooper Basin operations that are not discussed in the EIR or covered by this SEO, are:

- seismic exploration activities; and
- production and processing operations.

Two separate SEOs cover production and processing and seismic operations in the South Australian Cooper and Eromanga Basins. These are:

- Statement of Environmental Objectives for Seismic Operations in the Cooper and Eromanga Basins, South Australia (PIRSA 1998); and
- Statement of Environmental Objectives for Production and Processing Operations in the Cooper/Eromanga Basin, South Australia (Santos 2002a).

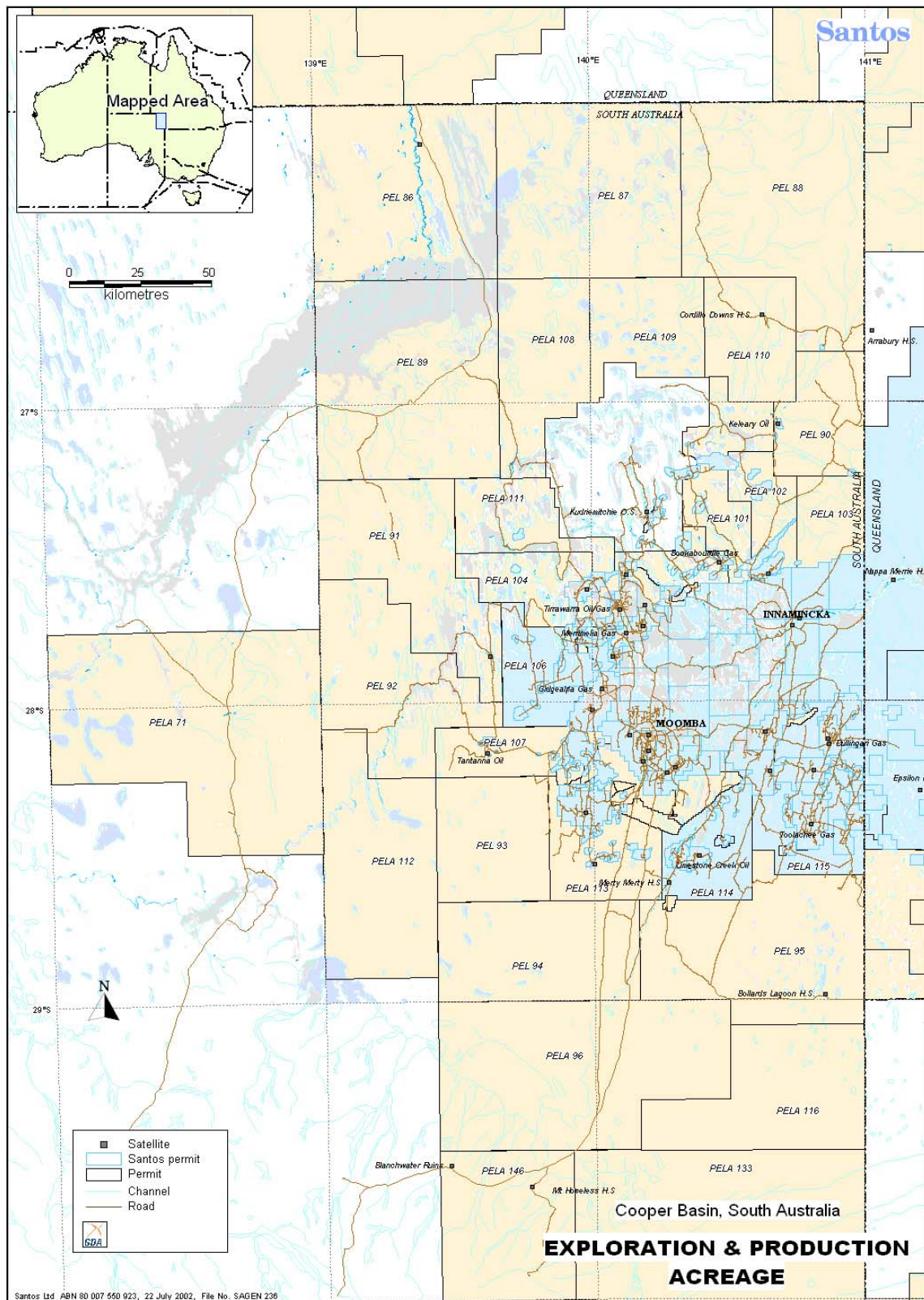


Figure 1-1: Cooper Basin Operators' Exploration Acreage in the South Australian Sector of the Cooper Basin

2 Environmental Objectives

2.1 Objectives

The objectives of the Act, include:

- to minimise environmental damage from activities involved in exploration for, or the recovery or commercial utilization of, petroleum and other resources
- to minimise environmental damage from activities involved in drilling and well operations.

Potential hazards and consequences associated with drilling and well operations by Operators in the South Australian Cooper Basin were identified in the EIR and are summarised in Appendix 1. Under the Act the Operators are committed to achieving a range of environmental objectives with respect to these potential hazards and consequences and which are in keeping with the above objectives of the Act. Environmental objectives for drilling and well operations are:

1. Minimise the risk to the public and other third parties.
2. Minimise disturbance and avoid contamination to soil.
3. Avoid the introduction or spread of pest plants and animals and implement control measures as necessary.
4. Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.
5. Avoid disturbance to sites of known cultural and heritage significance.
6. Minimise loss of aquifer pressure and avoid aquifer contamination.
7. Minimise disturbance to native vegetation and native fauna.
8. Minimise air pollution and greenhouse gas emissions.
9. Maintain and enhance partnerships with the Cooper Basin community.
10. Avoid or minimise disturbance to stakeholders and/or associated infrastructure.
11. Optimise waste reduction and recovery.
12. Remediate and rehabilitate operational areas to agreed standards.
13. Minimise as far as reasonably practicable interruptions to natural gas supply.

2.2 Assessment Criteria

The criteria for measuring the achievement of the environmental objectives are detailed in Table 2-1 and take one of the following forms:

- **Defined conditions** - In some cases, the achievement of an objective can be assessed through ensuring defined conditions are met or carried out. Such conditions include:
 - prohibitions to undertake a specific action (for example, to achieve the objective 'Minimise impacts to soil' during well site and access track construction, the assessment criteria may be to prevent the removal of the gibber mantle in gibber plan areas).
 - Requirements to carry out certain actions in accordance with approved procedures or industry accepted standards (for example, the storage and handling of fuel, oils and chemicals should be undertaken in accordance with Australian Standard AS 1940).
- **Goal Attainment Scaling (GAS) criteria** – Environmental objectives requiring visual assessment are likely to 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. GAS is applicable to measuring objectives related to minimisation of disturbances to natural vegetation, soil and rehabilitation of well sites and access tracks. Goal Attainment Scaling (GAS) criteria are referenced where available and presented in Appendices 2 to 6.
- **Scientific studies/monitoring** - In some cases the 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 (for example, the objective to 'Minimise loss of aquifer pressures and avoid aquifer contamination' may require ongoing monitoring of well bore pressures).

Each objective for drilling and well operations (refer 2.1) will be assessed using a selection of the assessment options outlined above. This will enable the Operator and others to determine whether the objectives are being achieved. Comments on any variances will be recorded and reported where required (Section 3).

Table 2-1: Environmental Objectives and Assessment Criteria

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 1: Minimise the risk to public and other third parties.</p>	<p>The criteria for assessing the achievement of this objective have been developed on the basis of the current understanding of the risks associated with drilling and well operations.</p> <p>The key to achieving this objective in relation to both downhole abandonment and surface well site restoration is to ensure that the visual prominence of the abandoned well site and its access track(s) is minimised to the extent where it is difficult for third parties to detect and therefore access these sites. The backfilling of the well cellar and the removal of rubbish from the restored well site should be carried out.</p> <p>Fires or explosions at well sites 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 (ie tourists).</p>	<ul style="list-style-type: none"> ▪ All employees and contractor personnel complete a safety induction prior to commencement of work in the field. ▪ All employees and contractor personnel undertake a refresher induction every 2 years. ▪ Signage in place to warn third parties of access restrictions to operational areas, with particular warnings when potentially dangerous operations are being undertaken. ▪ Permit to work systems in place for staff and contractors in dangerous situations. ▪ All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards. ▪ Effective Emergency Response Plan (ERP) and procedures are in place in the event of a fire or explosion. ▪ Annual exercise of ERP. ▪ Communication of rig moves and other potential hazards to safety associated with drilling and well operations to potentially affected parties prior to commencement of operations. ▪ Reporting systems for recording injuries and accidents in place, and annual; (at minimum) review of records to determine injury trends. Implementation of appropriate corrective actions. ▪ Ensuring safety management plans are updated and reviewed. 	<ul style="list-style-type: none"> ▪ Reasonable measures implemented to ensure no injuries to the public or third parties.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 2: Minimise disturbance and avoid contamination to soil.</p>	<p>The impacts associated with soil disturbance can potentially include wind and water erosion and dust generation. The main source of disturbance to soils is associated with lease and access track construction, creation of borrows pits, restoration activity, vehicle movement in off-road locations and sub-surface excavations (i.e. sumps, flare pits and borrow pits).</p>	<p><u>Well Site and Access Track Construction</u></p> <ul style="list-style-type: none"> ▪ Consider alternate routes during planning phase to minimise environmental impacts ▪ Gibber mantle on access tracks and well sites (excluding sumps) has not been removed, only rolled, during construction and restoration on gibber and tableland land systems. ▪ Topsoil stockpiled (including gibber mantle) from sump construction and respread on abandonment. ▪ The need to traverse sensitive land systems and the methods of managing the impacts should be justified in accordance with company procedures, recorded and available for auditing. <p><u>Production Testing / Well Blowdowns</u></p> <ul style="list-style-type: none"> ▪ If appropriate use: <ul style="list-style-type: none"> - impermeable flare pit - flare tanks. 	<p><u>Well Site and Access Track Construction</u></p> <ul style="list-style-type: none"> ▪ 0, +1 or +2 GAS criteria are attained for “Minimise visual impacts of abandoned well sites and access tracks” objective as listed in Appendix 4 for well lease and access track construction. ▪ No unauthorised off-road driving or creation of shortcuts. ▪ No construction activities are carried out on salt lakes, steep tableland land systems or wetlands land systems (as defined in EIR). <p><u>Borrow pit construction and restoration</u></p> <ul style="list-style-type: none"> ▪ 0, +1 or +2 GAS criteria are attained for “Minimise Visual Impacts for constructing borrow pits” objective as listed in Appendix 3, and “Minimise visual impacts” and “Minimise impact on soil” objectives as listed in Appendix 5. <p><u>Production Testing/Well Blowdowns</u></p> <ul style="list-style-type: none"> ▪ No soil contamination as a result of production testing or well blowdown operations.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 2 cont: Minimise disturbance and avoid contamination to soil.</p>		<p><u>Fuel and Chemical Storage and Handling</u></p> <ul style="list-style-type: none"> ▪ All fuel, oil and chemical storages banded in accordance with the appropriate standards ▪ Records of spill events and corrective actions maintained in accordance with company procedures. ▪ Spills or leaks are immediately reported and clean up actions initiated. ▪ Logged incidents are reviewed annually to determine areas that may require corrective action in order to reduce spill volumes in subsequent years (and drive continual improvement). ▪ Chemical and fuel storage procedures, including signage, are reviewed and monitored in audit process. <p><u>Spill Response / Contingency Planning</u></p> <ul style="list-style-type: none"> ▪ Results of emergency response procedures carried out in accord with Regulation 31 show that oil spill contingency plan in place in the event of a spill is adequate and any necessary remedial action needed to the plan is undertaken promptly. ▪ Oil spill contingency plan (reviewed annually) is up to date with specific scenarios relating to spills to creeks and floodplain areas. ▪ Spill response equipment is audited annually. ▪ Annual spill response training exercise is undertaken. 	<p><u>Fuel and Chemical Storage and Handling</u></p> <ul style="list-style-type: none"> ▪ No spills/leaks outside of areas designed to contain them. ▪ Level of hydrocarbon continually decreasing for in situ remediation of spills. ▪ Soils remediated to a level as determined by the SHI process.
		<p><u>Waste Disposal (domestic, sewage and sludges)</u></p> <ul style="list-style-type: none"> ▪ Covered bins are provided for the collection and storage of wastes. ▪ All loads of rubbish are covered during transport to the central waste facility. ▪ Pits are not established in locations, which pose an unacceptable hazard to stock or wildlife. 	<ul style="list-style-type: none"> ▪ All domestic wastes are disposed of in accordance with EPA licensing requirements. ▪ 0, +1 or +2 GAS criteria for 'Waste material' objective is attained. ▪ No spills or leaks from sewage treatment process and sludge pits.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 3: Avoid the introduction or spread of pest plants and animals and implement control measures as necessary.</p>	<p>Activity associated with lease and access track construction, such as movement of vehicles and equipment, is a potential source of weed or disease introduction and spread. The most effective technique to prevent the introduction and spreading of weed species is to ensure that vehicles and equipment are appropriately cleaned prior to entry into a construction site.</p>	<ul style="list-style-type: none"> ▪ Where appropriate a weed and feral animal management strategy is in place (avoidance and control strategies). ▪ Rig and vehicle wash downs are initiated in accordance with the management strategy. 	<ul style="list-style-type: none"> ▪ No weeds or feral animals are introduced to operational areas.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 4: Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.</p>	<p>The main threats to drainage patterns and surface waters, and shallow ground waters are considered to be interruption of natural flows as a result of earthworks and contamination.</p> <p>Access track and well site selection should aim to minimise impact to drainage systems, by avoiding sensitive areas and appropriate construction methods to avoid windrows.</p>	<p><u>Drilling Mud Sumps and Flare Pits</u></p> <ul style="list-style-type: none"> ▪ All drill cuttings, muds and non toxic drill fluids are contained within the designated mud sumps with adequate freeboard at the completion of operations to allow for a 1m cover of clean fill at remediation. 	<p><u>Well Lease and Access Track Construction</u></p> <ul style="list-style-type: none"> ▪ Well leases and access tracks are located and constructed to maintain pre-existing water flows (i.e. channel contours are maintained on floodplains and at creek crossings). <p><u>Drilling Mud Sumps and Flare Pits</u></p> <ul style="list-style-type: none"> ▪ No overflow of drill cuttings, muds and other drilling fluids from mud sumps. ▪ No waste material disposal to sumps and flare pits.
	<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 (eg. corrosion inhibitors) during storage and handling.</p>	<p><u>Well Heads (Oil and Gas Systems)</u></p> <ul style="list-style-type: none"> ▪ Where appropriate, imperviously lined well cellars are installed on oil wells. ▪ Chemical containment devices are installed on gas well skids. ▪ Well heads shut in and chemicals removed prior to flood events. ▪ Jet pumps are installed within containment device with an adequately sized containment sump. 	<p><u>Well Heads (Oil and Gas Systems)</u></p> <ul style="list-style-type: none"> ▪ No leaks/spills outside of areas designed to contain them.
		<p><u>Well Blowdown/Production Testing</u></p> <ul style="list-style-type: none"> ▪ Activity is conducted in accordance with accepted industry standards / good oilfield practice. ▪ If appropriate use: <ul style="list-style-type: none"> - impermeable flare pit - flare tanks - separators - supervision 	<p><u>Well Blowdown/Production Testing</u></p> <ul style="list-style-type: none"> ▪ No water (surface or groundwater) contamination as a result of production testing or well blowdown operations.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 4 cont: Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.</p>		<p><u>Fuel and Chemical Storage and Handling</u></p> <ul style="list-style-type: none"> ▪ All fuel, oil and chemical storages banded in accordance with the appropriate standards ▪ Records of spill events and corrective actions maintained in accordance with company procedures. ▪ Spills or leaks are immediately reported and clean up actions initiated. ▪ Logged incidents are reviewed annually to determine areas that may require corrective action in order to reduce spill volumes in subsequent years (and drive continual improvement). ▪ Chemical and fuel storage procedures, including signage, are reviewed and monitored in audit process. 	<p><u>Fuel/Chemical Storage and Handling</u></p> <ul style="list-style-type: none"> ▪ No leaks/spills outside of areas designed to contain them.
	<p>The major threat of spills is the threat to soil, vegetation and watercourses directly impacted by the spill. Therefore, the achievement of this objective also consequently contributes to the achievement of Objectives 2 and 7 in relation to minimising the impacts on soil and natural habitats.</p> <p>Avoidance of spills will be paramount in areas where the spill can be potentially spread beyond the immediate confines of the spill area into sensitive environments such as creeks and wetlands.</p>	<p><u>Spill Response / Contingency Planning</u></p> <ul style="list-style-type: none"> ▪ Results of emergency response procedures carried out in accord with Regulation 31 show that oil spill contingency plan in place in the event of a spill is adequate and any necessary remedial action needed to the plan is undertaken promptly. ▪ Oil spill contingency plan (reviewed annually) is up to date with specific scenarios relating to spills to creeks and floodplain areas. ▪ Spill response equipment is audited annually. ▪ Annual spill response training exercise is undertaken. 	

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<p>Objective 5: Avoid disturbance to sites of cultural and heritage significance.</p>	<p>The aim of the objective is to ensure that any sites of cultural (Aboriginal or non-Aboriginal) heritage significance are identified and protected.</p>	<ul style="list-style-type: none"> ▪ Consultation with stakeholders (i.e. government agencies, landholders etc) in relation to the possible existence of heritage sites, as necessary. ▪ Heritage report forms completed for any sites or artefacts identified, and report forms forward to the Department of State Aboriginal Affairs (DOSAA). ▪ Survey records are kept and are available for auditing. ▪ Areas requiring remediation which lie outside previously surveyed sites should be surveyed in accordance with company heritage clearance procedures. <p><i>Note:</i> Where a negotiated agreement or determination for heritage clearance is in place, compliance with the negotiated agreement or determination takes precedence over the above criteria.</p>	<ul style="list-style-type: none"> ▪ Proposed well sites and access tracks have been surveyed and any sites of Aboriginal and non-Aboriginal heritage identified. ▪ Any identified cultural and heritage sites have been avoided.

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<p>Objective 6: Minimise loss of aquifer pressures and avoid aquifer contamination.</p>	<p>This objective seeks to protect the water quality and water pressure of aquifers that may potentially be useful as water supplies, and to maintain pressure in sands that may host petroleum accumulations elsewhere.</p> <p>To address this objective, the risks of cross flow between aquifer cells known to be permeable and in natural hydraulic isolation from each other, or where there is insufficient information to determine that they are permeable or in hydraulic communication, must be assessed on a case by case basis and procedures implemented to minimize the fresh water aquifer cells from contamination and isolate potential and producing formations from formations that may deplete the reservoir pressure when not on production.</p> <p>The following geological formations are aquifers in the Cooper-Eromanga Basins. They may contain permeable sands which may be in natural hydraulic isolation from each other (from shallowest to deepest), and in general isolation will be maintained between these groups:</p> <ul style="list-style-type: none"> • Eyre; • Winton, • Mackunda; • Coorikiana; • Cadna-owie; • Murta (including McKinlay Member) • Namur, Adori, • Birkhead, Hutton, Poolowanna, • Cuddapan; Nappamerri Group formations, Walkandi and Peera Peera formations • Toolachee; Daralingie; • Epsilon, Patchawarra or Mt Toodna or Purni; 	<p><u>Drilling & Completion Activities</u></p> <ul style="list-style-type: none"> ▪ A competent cement bond between aquifer and hydrocarbon reservoirs is demonstrated. <p>For cases where isolation of these formations is not established, a risk assessment incorporating the use of pressure / permeability / salinity data is undertaken in consultation with DLWBC & AAWCMB to determine if lack of cement or poor bond will cause or has caused damaging crossflow which needs to be remediated.</p> <p><u>Producing, Injection and, Inactive Wells</u></p> <ul style="list-style-type: none"> ▪ Monitoring programs implemented (eg. Through well logs, pressure measurements, casing integrity measurements and corrosion monitoring programs) to assess condition of casing and cross-flow behind casing. ▪ Casing annulus pressures are monitored every 2 years. ▪ The condition of the primary casing barrier is adequate. ▪ For cases where crossflow is detected, a risk assessment incorporating the use of pressure / permeability / salinity data is undertaken in consultation with DLWBC & AAWCMB to determine if lack of cement or poor bond will cause or has caused damaging crossflow which needs to be remediated. <p><u>Well Abandonment Activities</u></p> <ul style="list-style-type: none"> ▪ Isolation barriers are set in place to ensure that crossflow, contamination or pressure reduction will not occur. 	<p><u>Drilling & Completion Activities</u></p> <ul style="list-style-type: none"> ▪ There is no uncontrolled flow to surface (Blow out). ▪ Sufficient barriers exist in casing annulus to prevent crossflow between separate aquifers or hydrocarbon reservoirs. ▪ Relevant government approval obtained for abandonment of any radioactive tool left downhole. <p><u>Producing, Injection, Inactive and Abandoned Wells</u></p> <ul style="list-style-type: none"> ▪ No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 6 cont: Minimise loss of aquifer pressures and avoid aquifer contamination.</p>	<ul style="list-style-type: none"> • Tirrawarra sandstone or Stuart Range; Merrimelia; Boorthanna; Crown Point formations and Basement reservoirs. <p>Note: Crossflow (if it occurs), should not compromise the long term sustainability of a particular resource.</p>	<ul style="list-style-type: none"> ▪ Barriers will be set to meet or exceed the requirements of applicable standards for the decommissioning and abandonment of water bores and abandonment of petroleum wells. ▪ The placement of isolation barriers will in general be to isolate the groups of formations as listed under comments. The number and placement of barriers may be varied from this standard approach on a case-by-case basis by SACB Operator personnel using relevant available data and the SA Cooper Basin Water Pressure and Salinity Module Report (2002), and in consultation with DWLBC. 	

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<p>Objective 7: Minimise disturbance to native vegetation and native fauna.</p>	<p>Primary risks to native fauna include clearing of habitat and obstruction of movement through cleared areas, the presence of borrow pits, fuel and chemical storage and management, and waste management activities.</p>	<p><u>Well Lease and Access Track Construction and Restoration</u></p> <ul style="list-style-type: none"> ▪ Proposed well sites, camp sites, access tracks and borrow pit sites have been assessed for rare, vulnerable and endangered flora and fauna species before the commencement of construction. ▪ Consider alternate routes during planning phase to minimise environmental impacts ▪ Facilities (e.g. borrow pits, well cellars) are designed and constructed as far as practicable to minimise fauna entrapment. ▪ Sumps and mud pits are fenced as appropriate to minimise wildlife access ▪ Assessment records are kept and are available for auditing. ▪ In recognised conservation reserves (i.e. Innamincka Regional Reserve) excavations are left in a state as agreed with the responsible statutory body ▪ Borrow pits are restored to minimise water holding capacity, where agreements are not in place with stakeholders. <p><u>Waste Management</u></p> <ul style="list-style-type: none"> ▪ Covered bins are provided for the collection and storage of wastes. ▪ All loads of rubbish are covered during transport to the central waste facility. ▪ Pits are not established in locations, which pose an unacceptable hazard to stock or wildlife. 	<p><u>Well Lease and Access Track Construction and Restoration</u></p> <ul style="list-style-type: none"> ▪ Any sites with rare, vulnerable and endangered flora and fauna have been identified and avoided. ▪ 0, +1 or +2 GAS criteria are attained for “Minimise impacts on vegetation” objective as listed in Appendix 2, during well lease and access track site selection and construction and for “Re-establish natural vegetation on abandoned well sites and access track” objective in Appendix 4. <p><u>Borrow Pits Construction and Restoration</u></p> <ul style="list-style-type: none"> ▪ 0, +1 or +2 GAS criteria are attained for “Minimise impacts on vegetation” objective as listed in Appendix 4 during borrow pit site selection and construction, and “Minimise Impact on Vegetation” objective in Appendix 5 for borrow pit restoration. <p><u>Waste Management</u></p> <ul style="list-style-type: none"> ▪ Refer to assessment criteria for Objective 11. <p><u>Fuel and Chemical Storage and Management</u></p> <ul style="list-style-type: none"> ▪ Refer to assessment criteria for Objectives 2 and 4.

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 8: Minimise air pollution and greenhouse gas emissions.</p>	<p>Atmospheric emissions occur as a result of standard practices undertaken during drilling and well operations. Emissions of particular environmental significance are:</p> <ul style="list-style-type: none"> ▪ combustion by-products (eg. oxides of nitrogen, carbon monoxide and sulphur dioxide); ▪ organic carbon and carbon particulates (black smoke); and ▪ flared/vented hydrocarbons (gases). 	<p><u>Well Testing</u></p> <ul style="list-style-type: none"> ▪ Conduct well testing in accordance with appropriate industry accepted standards. ▪ Continually review and improve operations. ▪ Appropriate emergency response procedures are in place for the case of a gas leak. <p><u>Well Blowdown</u></p> <ul style="list-style-type: none"> ▪ Blowdown carried out in accordance with industry accepted standards / good production practice. ▪ Any well that is consistently blown down is identified for a small ID tubing or plunger lift installation to minimise blow downs on that well. 	<ul style="list-style-type: none"> ▪ Compliance with EPA requirements.
<p>Objective 9: Maintain and enhance partnerships with the Cooper Basin community.</p>	<p>The importance of liaison with and contribution to the local community is recognised by the South Australian Cooper Basin Operators. Notification, consultation, contribution to community activities, projects and events and membership of relevant organisations are considered to be key strategies for ensuring partnerships with the local community are enhanced.</p>	<ul style="list-style-type: none"> ▪ Relevant affected parties are notified and consulted on proposed activities. ▪ Forward development plans are presented to the local community. ▪ Local community projects and events are sponsored and supported where appropriate. ▪ Industry membership of appropriate regional land management committees and boards i.e. the Lake Eyre Basin Consultative Council, Marree Soil Conservation Board, and Catchment Committees. 	<ul style="list-style-type: none"> ▪ No unresolved reasonable complaints from the community.

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<p>Objective 10: Avoid or minimise disturbance to stakeholders and/or associated infrastructure</p>	<p>Communication and the establishment of good relations with stakeholders and community is fundamental to minimising disturbance to as low as practicably possible. Many pastoral properties are certified under the Organic Beef or CattleCare accreditation schemes and therefore may be affected by fuel and chemical storage, moving machinery and contaminated sites.</p>	<ul style="list-style-type: none"> ▪ Induction for all employees and contractors covers pastoral, conservation, legislation and infrastructure issues. ▪ Relevant stakeholders are notified prior to survey and construction of well sites, camp sites and access tracks and undertaking of operations (pursuant to Petroleum Regulations). Borrow pits left open (unrestored) if requested by landholder and upon receipt of letter of transfer of responsibility to landholder. ▪ Gates or cattle grids are installed to a standard, consistent with pastoral infrastructure in fences where crossings are required for access. ▪ All gates left in the condition in which they were found (ie. open/closed). ▪ Potential sources of contamination are fenced as appropriate to prevent stock access. ▪ System is in place for logging landholder complaints to ensure that issues are addressed as appropriate. ▪ Requirements of the Cattle Care and Organic Beef accreditation programs are complied with. ▪ In recognised conservation reserves (i.e. Innamincka Regional Reserve) excavations are left in a state as agreed with the responsible statutory body. 	<ul style="list-style-type: none"> ▪ No reasonable stakeholder complaints left unresolved.

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<p>Objective 11: Optimise waste reduction and recovery.</p>	<p>Waste reduction requires continual improvements in purchasing, efficiency of use and reuse. Due to the distances involved the costs of recycling a large range of products is not possible however continual review of recycling options is required to ensure that any opportunities are taken advantage of.</p>	<ul style="list-style-type: none"> ▪ Bulk chemical and oil purchasing and use of "bulki bins" or other storage tanks in place for large volume items. 	<ul style="list-style-type: none"> ▪ With the exception of drilling fluids, drill cuttings and other fluids disposed during well clean-up, and sewage wastes, all wastes to be disposed of at an EPA licensed facility in accordance with EPA Licence conditions. ▪ Attainment of GAS criteria for "Site left in clean, tidy and safe condition after final clean-up" objective during well site restoration (refer Appendix 4). ▪ Attainment of GAS criteria for "Site left in clean, tidy and safe condition" objective during borrow pit restoration (refer Appendix 5).

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<p>Objective 12: Remediate and rehabilitate operational areas to agreed standards.</p>		<p>Rehabilitation/ abandonment plans for surface activities will be developed in consultation with relevant stakeholders</p> <p><u>Well Site and Access Track Restoration</u></p> <ul style="list-style-type: none"> ▪ Compacted soil areas have been ripped (except on gibber and tablelands) and soil profile and contours are reinstated following completion of operations. 	<ul style="list-style-type: none"> ▪ No unresolved reasonable stakeholder complaints. <p><u>Contaminated Site Remediation</u></p> <ul style="list-style-type: none"> ▪ 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><u>Well Site and Access Track Restoration</u></p> <ul style="list-style-type: none"> ▪ The attainment of 0, +1 or +2 GAS criteria for (refer Appendix 4): <ul style="list-style-type: none"> - "minimise visual impact of abandoned well sites" - "minimise visual impact of abandoned access tracks" - "re-establish natural vegetation on abandoned well sites and access tracks" <p><u>Borrow Pit Restoration</u></p> <ul style="list-style-type: none"> ▪ The attainment of 0, +1 or +2 GAS criteria for (refer Appendix 5): <ul style="list-style-type: none"> - "minimise impact on vegetation" - "minimise impact on soil" - "Minimise visual impacts" ▪ <i>Note:</i> Well abandonment issues addressed under objective 6.

3 Reporting

Petroleum 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 Act, 2000*.

3.1 Serious Incidents

Section 85 of the Act defines a serious incident as an incident arising from activities conducted under a licence in which any of the following repercussions occur:

1. A person is seriously injured or killed.
2. An imminent risk to public health or safety arises.
3. Serious environmental damage occurs or an imminent risk of serious environmental damage arises.
4. Security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises.
5. Unauthorised encroachment by third party on pipeline easement that results in contact of the pipeline.
6. Any incident where it is reasonably likely to result, or has resulted, in one or more gas customers being informed that their gas supply is or is likely to be interrupted and an interruption of gas supply to the customer(s) could reasonably be expected to cause social disruption such as electricity supply cuts for periods of more than one day or gas supply restrictions to commercial and domestic customers

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

- any spill of fuel, oil or hazardous material which encroaches onto land used for purposes other than petroleum production and processing or into groundwater supplies
- any well failure that threatens or poses imminent threat to security of supply
- any disturbance to sites of Aboriginal or non-Aboriginal heritage significance
- explosion or fire at any facility or pipeline (i.e. well site)
- well incident that threatens gas supply or poses an imminent safety or environmental risk
- identification of cross flows in aquifers, or uncontrolled flows to the surface.

3.2 Reportable Incidents

Reportable incidents are incidents (other than a serious incident) arising from activities conducted under a license issued under the Petroleum Regulations.

Pursuant to Regulation 12(2), the incidents listed below are considered to be reportable incidents that may arise from SACB Operators' activities:

- any spill or leak of fuel/chemical outside areas designed to contain them
- demonstrated presence of cross flow or flows to surface from the well bore
- a complaint from a stakeholder as a result of operations (for example pipeline construction activities)
- removal of rare, vulnerable or endangered flora and fauna species (without appropriate permits and approvals)
- any introduction of weed species
- detected unauthorised third party access to facilities
- any incident which results in less than the prudent level of gas being supplied to a purchaser for more than 12 hours.

4 Consultation

A stakeholder consultation process was a key component of the preparation of the Environmental Impact Report for Drilling and Well Operations (Santos Ltd 2003) and for this Statement of Environmental Objectives prior to its submission to PIRSA for review and approval. Consultation workshops were held in both Adelaide and Moomba and an overview of this process, including a list of key stakeholders, is provided in Appendix 7. Throughout the consultation process, a range of issues were raised resulting in changes to both the EIR and SEO. These comments and responses to them are summarised in Appendix 8.

5 References & Further Reading

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Appendix 1:

Environmental Hazards and Potential Consequences for Drilling and Well Operations

The Drilling and Well Operations EIR identified potential environmental hazards and consequences associated with SACB Operators' drilling and well operations in the South Australian sector of the Cooper Basin.

A summary of environmental hazards and potential consequences associated with various drilling and well operations, as identified in the EIR, is provided in Tables 1 to 9. Environmental objectives outlined in Section 2 of this SEO have specifically been identified in response to the environmental hazards and potential consequences discussed in the EIR (Chapters 7 and 8).

Table 1: Summary of Environmental Hazards and Potential Consequences for Well Site and Access Track Construction and Restoration

Hazard	Potential Consequence/s
Earthworks	<ul style="list-style-type: none"> ▪ Impeded fauna movement through construction zone ▪ Loss of visual amenity ▪ Damage to native vegetation ▪ Introduction and/or spread of weeds ▪ Disturbance to natural drainage patterns ▪ Damage to third party infrastructure ▪ Soil erosion and siltation of watercourses ▪ Inversion of soil profile ▪ Dust generation ▪ Soil compaction ▪ Disturbance to cultural heritage sites
Vegetation clearing	<ul style="list-style-type: none"> ▪ Impeded fauna movement through construction zone ▪ Loss of vegetation and fauna habitat ▪ Damage to native vegetation ▪ Disturbance to cultural heritage sites ▪ Soil erosion and siltation of watercourses ▪ Short to medium term loss of visual amenity
Movement of heavy machinery and vehicles along proposed access routes and well sites	<ul style="list-style-type: none"> ▪ Dust generation ▪ Soil compaction ▪ Soil erosion ▪ Damage to native vegetation ▪ Injury or death of native fauna ▪ Disturbance to cultural heritage sites ▪ Introduction and/or spread of weeds ▪ Damage to third party infrastructure ▪ Disruption to land use (eg. grazing and recreation) ▪ Increased public access to remote areas
Presence of borrow pits	<ul style="list-style-type: none"> ▪ Injury to or loss of stock and wildlife ▪ Dispersal of watering points and redistribution of stock movements
Spills and leaks associated with chemical and fuel storage	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public
Spills and leaks associated with chemical and fuel transportation	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public

Table 2 cont

Flooding of the Cooper Creek floodplain and associated watercourses	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and/or watercourses ▪ Soil erosion and siltation of watercourses ▪ Loss of vegetation and topsoil (either stockpiled or in situ)
Movement of construction materials (earthworks)	<ul style="list-style-type: none"> ▪ Introduction and/or spread of weeds

Table 3: Summary of Environmental Hazards and Potential Consequences for Drilling Operations

Hazard	Potential Consequence/s
Blowout or kick	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon (liquid or gas) to surface ▪ Contamination of soil, groundwater and/or watercourses ▪ Danger to health and safety of employees, contractors and possibly the public ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Atmospheric pollution (gas) ▪ Loss of reserves and reservoir pressure
Equipment failure	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Contamination of soil, groundwater and/or watercourses ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public ▪ Atmospheric pollution (gas) ▪ Loss of reserves and reservoir pressure
Downhole problems (lost circulation, sloughing hole, stuck pipe, over pressured zone)	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification
Casing failure	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill or gas release ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Loss of reserves and reservoir pressure
Explosion or fire on lease (during drilling operations)	<ul style="list-style-type: none"> ▪ Atmospheric pollution ▪ Danger to health and safety of employees, contractors and possibly the public ▪ Loss of vegetation and fauna habitat ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification

Table 4 cont

Cement failure	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Loss of reserves and reservoir pressure
Drill pipe failure	<ul style="list-style-type: none"> ▪ Temporary restricted control over well fluids and circulation system
Loss of containment of gas or oil while testing	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and/or watercourses ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Atmospheric pollution ▪ Danger to health and safety of employees, contractors
Spill or leak of drilling, completion, and workover fluids and chemicals (transportation, handling and storage)	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and /or watercourses ▪ Atmospheric pollution (gas) ▪ Disruption to land use (eg. grazing) ▪ Injury to or loss of stock and wildlife ▪ Danger to health and safety of employees and contractors
Spill or leak associated with overflow of drilling, completion or workover fluids in pits on lease (produced formation water, hydrocarbon or chemical)	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and/or watercourses ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public ▪ Release of atmospheric emissions ▪ Disruption to land use (eg. grazing)
Spill associated with onsite drilling, completion or workover equipment (diesel fuel, oils)	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and /or watercourses ▪ Atmospheric pollution (gas) ▪ Disruption to land use (eg. grazing) ▪ Injury to or loss of stock and wildlife ▪ Danger to health and safety of employees and contractors
Spill associated with the transport of oil and condensate (via truck)	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public
Flaring of propane, butane, methane and ethane during testing	<ul style="list-style-type: none"> ▪ Release of atmospheric pollutants and greenhouse gas
Disposal of hydrocarbon and formation waters to excavated flare pits during well testing and clean up	<ul style="list-style-type: none"> ▪ Localised contamination of soil and/or groundwater ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification
Vehicle movement	<ul style="list-style-type: none"> ▪ Dust generation ▪ Soil compaction ▪ Soil erosion ▪ Collision with other road users ▪ Damage to native vegetation ▪ Disturbance to cultural heritage sites ▪ Introduction and/or spread of weeds ▪ Damage to third party infrastructure ▪ Disruption to land use (eg. grazing and recreation) ▪ Collision with stock or wildlife resulting in injury or loss

Table 5 cont

Rig moves	<ul style="list-style-type: none"> ▪ Dust generation ▪ Soil compaction ▪ Soil erosion ▪ Collision with other road users ▪ Damage to native vegetation ▪ Introduction and/or spread of weeds ▪ Damage to third party infrastructure ▪ Disruption to land use (eg. grazing and recreation) ▪ Collision with stock or wildlife resulting in injury or loss
Flooding of surrounding floodplain/watercourses	<ul style="list-style-type: none"> ▪ Contamination of soil and/or groundwater ▪ Damage to infrastructure (eg. flare pits, drilling pits)
Loss of radioactive source	<ul style="list-style-type: none"> ▪ Aquifer contamination

Table 6: Summary of Hazards and Potential Consequences Associated with Well Completion and Workover Operations

Hazard	Potential Consequence/s
Blowout or kick	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Contamination of soil, groundwater and /or watercourses ▪ Danger to health and safety of employees and contractors ▪ Injury to or loss of stock and wildlife ▪ Atmospheric pollution (gas) ▪ Loss of reserves and reservoir pressure
Cement failure	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Contamination of soil, groundwater and /or watercourses ▪ Danger to health and safety of employees and contractors ▪ Atmospheric pollution (gas) ▪ Loss of reserves and reservoir pressure
Casing failure	<ul style="list-style-type: none"> ▪ Aquifer contamination ▪ Aquifer pressure reduction ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill or gas release ▪ Loss of reserves and reservoir pressure
Lubricator failure	<ul style="list-style-type: none"> ▪ Release of atmospheric pollutants and greenhouse gas ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill ▪ Access to stock and wildlife causing injury or loss ▪ Loss of reserves and reservoir pressure ▪ Danger to health and safety of employees and contractors
Packer failure	<ul style="list-style-type: none"> ▪ Formation crossflow ▪ Loss of reserves and reservoir pressure
Tubing failure	<ul style="list-style-type: none"> ▪ Formation crossflow ▪ Loss of reserves and reservoir pressure
Surface equipment failure	<ul style="list-style-type: none"> ▪ Uncontrolled release of water and hydrocarbon to surface resulting in an oil and water spill or gas to surface. ▪ Contamination of soil, groundwater and /or watercourses
Loss of containment of gas or oil while production testing.	<ul style="list-style-type: none"> ▪ Danger to health and safety of employees, contractors. ▪ Release of atmospheric emissions (gas) ▪ Contamination of soil and/or groundwater (oil) ▪ Access to stock and wildlife causing injury or loss

Table 7 cont

Explosion or fire at the wellsite	<ul style="list-style-type: none"> ▪ Contamination of soil and/or groundwater ▪ Atmospheric pollution (gas) ▪ Danger to health and safety of employees and contractors ▪ Loss of Vegetation and fauna habitat ▪ Disruption to land use (eg. Grazing)
Spill or leak associated with service rig fluids and chemicals (via truck and storage and handling at lease)	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and /or watercourses ▪ Atmospheric pollution (gas) ▪ Disruption to land use (eg. grazing) ▪ Injury to or loss of stock and wildlife ▪ Danger to health and safety of employees and contractors
Spill associated with on service rig equipment (diesel fuel, oils)	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and /or watercourses ▪ Atmospheric pollution (gas) ▪ Disruption to land use (eg. grazing) ▪ Injury to or loss of stock and wildlife ▪ Danger to health and safety of employees and contractors
Spills or leaks associated with storage and disposal of oil and gas liquids or other produced fluids.	<ul style="list-style-type: none"> ▪ Contamination of soil, groundwater and /or watercourses ▪ Atmospheric pollution (gas) ▪ Disruption to land use (eg. grazing) ▪ Injury to or loss of stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees and contractors
Flaring of propane, butane, methane and ethane during production testing	<ul style="list-style-type: none"> ▪ Release of atmospheric pollutants and greenhouse gas
Disposal of hydrocarbon and formation waters to excavated flare pits during well testing and clean-up	<ul style="list-style-type: none"> ▪ Localised contamination of soil and/or groundwater ▪ Access to stock and wildlife causing injury or loss ▪ Loss of Organic Beef certification
Vehicle movement	<ul style="list-style-type: none"> ▪ Dust generation ▪ Soil compaction ▪ Soil erosion ▪ Damage to native vegetation ▪ Disturbance to cultural heritage sites ▪ Introduction and/or spread of weeds ▪ Damage to third party infrastructure ▪ Disruption to land use (eg. grazing and recreation) ▪ Increased public access to remote areas with increased chance of road accidents ▪ Access to stock and wildlife causing injury or loss
Flooding of surrounding floodplain/watercourses	<ul style="list-style-type: none"> ▪ Contamination of soil and/or groundwater ▪ Damage to infrastructure (eg. flare pits)

Table 8: Summary of Hazards and Potential Consequences Associated with Oil and Gas Systems

Hazard	Potential Consequence/s
Stuffing box failure	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public
Storage and handling of diesel fuels	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public
Storage and handling of chemicals	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public
Sump overflow (jet pump)	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public

Table 9: Summary of Hazards and Potential Consequences Associated with Waste Handling and Disposal

Hazard	Potential Consequence/s
Storage and transportation of domestic wastes	<ul style="list-style-type: none"> ▪ Scavenging by native and pest species ▪ Pest outbreaks ▪ Localised contamination of soil and/or groundwater
Sewage treatment and disposal to earthen pits	<ul style="list-style-type: none"> ▪ Localised contamination of soil and/or groundwater
Disposal of drill cuttings and muds to excavated sumps	<ul style="list-style-type: none"> ▪ Localised contamination of soil and/or groundwater ▪ Access by stock and wildlife ▪ Loss of Organic Beef certification

Table 10: Summary of Hazards and Potential Consequences Associated with Aquifer Use

Hazard	Potential Consequence/s
Extraction of water from the artesian and sub-artesian reservoirs	<ul style="list-style-type: none"> ▪ Depletion of the GAB and sub-artesian water supplies
Spills or leaks associated with the transportation of waters from source to well locations	<ul style="list-style-type: none"> ▪ Localised salinisation and/or acidification of soil ▪ Water wastage

Table 11: Summary of Hazards and Potential Consequences Associated with Fuel and Chemical Storage and Transportation

Hazard	Potential Consequence/s
Spills to land associated with transport of fuels and chemicals (via truck)	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Danger to health and safety of employees, contractors and possible the public ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification
Spills to water associated with the transport of fuels and chemicals (via truck)	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Danger to health and safety of employees, contractors and possibly the public ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification
Spills associated with chemical and fuel storage and handling	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Contamination of water resources (surface and groundwater) ▪ Access to contaminants by stock and wildlife ▪ Loss of Organic Beef certification ▪ Danger to health and safety of employees, contractors and possibly the public

Table 12: Summary of Hazards and Potential Consequences Associated with Well Blowdown Activities

Hazard	Potential Consequence/s
Well blowdown	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Release of atmospheric emissions, pollutants and greenhouse gases ▪ Contamination of water resources (surface and groundwater) ▪ Loss of Organic Beef certification ▪ Injury or loss to stock and/or wildlife ▪ Ignition of bushfires ▪ Loss of fauna vegetation and fauna habitat ▪ Danger to health and safety of employees, contractors and possible the public

Table 13: Summary of Hazards and Potential Consequences Associated with Water Injection and Water Disposal Systems

Hazard	Potential Consequence/s
Packer failure	<ul style="list-style-type: none"> ▪ Reduced injection efficiency
Injection of water into artesian reservoirs or non-target zones	<ul style="list-style-type: none"> ▪ Contamination of aquifer
Spill or leak associated with transportation of waters from the production facility to the water injection well	<ul style="list-style-type: none"> ▪ Localised acidification and/or salinisation of soil
Spill of radioactive tracer	<ul style="list-style-type: none"> ▪ Localised contamination of soil ▪ Danger to health and safety of employees and contractors

Appendix 2:

Criteria for Assessing Well Site Location and Construction

Goals	Minimise impacts on soil		Minimise impact on vegetation	Reduce disturbance to drainage patterns
Objectives	<i>Roll gibber</i>	<i>Topsoil stockpiling</i>	<i>Minimise perennial vegetation clearance</i>	<i>No obstruction of water flows</i>
-2	Blading has occurred in gibber and tableland environments.	No stockpiled topsoil evident.	Trees of priority 1 in Field Guide ¹ removed in area where could have been avoided.	Water flows obstructed as a result of earthworks.
-1			Vegetation of priority 2 or 3 in Field Guide ¹ removed in area where could have been avoided.	Minor channels only obstructed during well lease and access track construction.
0	Gibber rolled.	Topsoil and any cleared vegetation stockpiled at well lease and campsite.	Trees and vegetation removed in area where could not have been avoided.	No obstruction of water flows, or flows diverted around the well lease if required.
1			No trees removed, only vegetation of priority 4 in Field Guide ¹ cleared. No trees or vegetation removed.	
2				No obstruction of channels of any dimension.

¹ Field Guide refers to the *Field Guide to the Common Plants of the Cooper Basin – South Australia and Queensland* (SEA Pty Ltd 1997)

Appendix 3:

Criteria for Assessing the Siting and Construction of Borrow Pits

Goals	Minimise impacts on vegetation	Protect unknown sites of natural, scientific, or heritage significance	Minimise visual impacts
Objectives	Perennial vegetation clearance minimised	Avoid sites	Site pit appropriately
-2	Trees of priority 1 in Field Guide ¹ removed in area where could have been avoided.	Sites disturbed.	Borrow pit less than 20m from road.
-1	Trees of priority 2 or 3 in Field Guide ¹ removed in area where could have been avoided.		Borrow pit less than 50m from road.
0	Trees and vegetation removed in area where could not have been avoided.	Sites identified, flagged and avoided.	Borrow pit more than 50m from road. Visible from road due to lack of screening vegetation.
+1	No trees removed, only vegetation of priority 4 in Field Guide ¹ cleared.		Borrow pit shielded from road by utilising screening vegetation or landform.
+2	No trees or vegetation removed.	Sites identified, flagged and avoided by 100m.	Borrow pit not visible from road.

¹ Field Guide refers to the *Field Guide to the Common Plants of the Cooper Basin – South Australia and Queensland* (SEA Pty Ltd 1997)

Appendix 4: Criteria for Assessing Well Site Restoration

Objective	Minimise visual impact of abandoned well sites ³		Minimise visual impact of abandoned access tracks ¹	Re-establish natural vegetation on abandoned well sites and access tracks ¹		Site to be left in a clean, tidy and safe condition	
	Interdune and floodplain well sites	Well sites located on dunes	Access tracks assessed from the main track	For well sites where it has been less than 5 years since restoration	For well sites where it has been more than 5 years since restoration	Well marked and cellar backfilled	Rubbish removed
-2	The site remains as a prominent consolidated surface with a distinct edge.	Extensive gully erosion down the face of the dune and/or a steep site edge is prominent.	The track is prominent because of a scraped surface, windrows along its edges or gully erosion.	The site remains as a consolidated surface.	No revegetation evident.	Cellar not backfilled completely.	Large items of litter present across site, eg. drums, pieces of casing and cables etc.
-1	The site surface and edge have been contoured into the surrounding landscape, but the colour of foreign material contrasts with the surroundings.	The edge of the site has been restored into the natural contour of the dune, but the colour of foreign material contrasts with the surroundings.	The track surface has been contoured into the surrounding landscape, but the colour of foreign material contrasts with the surroundings.	The colour of foreign material contrasts with the surroundings.	The revegetation mostly consists of annuals and biennials. In contrast to the surroundings, there are few perennials.	Cellar backfilled but no marker erected.	Small items of litter spread over more than 50% of the site, eg. tin cans, nuts and bolts, rags, small pieces of cable and wood etc.
0	The site contours and colour blend with the surroundings; but earthwork disturbance (eg ripping or respreading of original material) is still prominent.	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 track contours and colour blend with the surroundings, but the earthwork disturbance (eg. ripping, rolling or respreading of original material) is still prominent.	The site surface has been appropriately restored to facilitate revegetation (eg. ripping or respreading of original material).	The revegetation consists of annuals, biennials and perennials, but there are some bare patches which are inconsistent with the surroundings.	Cellar backfilled and marker erected.	No evidence of litter on site.
+1	The earthwork disturbance is beginning to blend into the surroundings.	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 track contours and colour blend with the surroundings and the earthwork disturbance is beginning to blend also.	The revegetation is extensive and consists of annuals and biennials. In contrast to the surroundings, there are no perennials.	The revegetation, mostly perennials, is consistent with the surroundings, but there is contrast in maturity between them.		
+2	The site contours and colour blend with the surroundings and the earthwork disturbance is indistinguishable from the surroundings.	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 track contours and colour blend with the surroundings and the earthwork disturbance is indistinguishable.	The revegetation is extensive and mostly consists of annuals and biennials. Perennials which are consistent with the surroundings are beginning to establish.	The revegetation type, density and maturity is indistinguishable from the surroundings.		

³ See PIRSA guidelines (PIRSA 1998) for photographic examples of the following outcomes

Appendix 5:

Criteria for Assessing the Restoration of Borrow Pits

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

Appendix 6: Overview of Stakeholder Consultation Process

NATALIE FULLER
& Associates
ACN 080 625 083



Consultation and Social Planning Consultants

17 DEC 2002

Mr Peter Klaosen
Santos Ltd
GPO Box 2319
ADELAIDE SA 5001
12 December 2002

Dear Peter

RE: REPORT ON EIR/SEO STAKEHOLDER CONSULTATION

Please find enclosed the report on the consultation process conducted between September and November 2002 regarding the draft Environmental Impact Reports (EIRs) and the Statement of Environmental Objectives (SEOs) for:

- Drilling & Well Operations in the Cooper Basin; and
- Production & Processing Operations in the Cooper Basin.

The report details the key components of the consultation process namely:

- Disseminating information to identified key stakeholders;
- Conducting a series of workshops;
- Inviting written responses.

Key outcomes from the consultation workshops were recorded by GHD and have been forwarded separately to Santos.

Yours sincerely,

Natalie Fuller

NATALIE FULLER
& A s s o c i a t e s
ACN 080 625 083



Drilling & Well and Production & Processing Operations in the Cooper Basin – Outcomes of Stakeholder Consultation Process

1 Introduction

Santos Ltd conducted a stakeholder consultation process between September and November 2002 regarding the draft Environmental Impact Reports (EIRs) and the Statement of Environmental Objectives (SEOs) for:

- Drilling & Well Operations in the Cooper Basin; and
- Production & Processing Operations in the Cooper Basin.

Documents relating to Drilling & Well Operations were prepared by Santos on behalf of other petroleum companies, while those relating to Production & Processing Operations were prepared solely for and by Santos.

The purpose of the consultation was to:

- Provide information about the draft documents as well as the approval process as required under the South Australian Petroleum Act 2000;
- Seek comments on the draft documents, particularly regarding:
 - the hazards and consequences, management strategies and level of risk identified in the EIRs;
 - the environmental objectives and associated indicators in the SEOs.

The consultation process involved:

- Disseminating information to identified key stakeholders;
- Conducting a series of workshops;
- Inviting written responses.

Natalie Fuller and Associates Pty Ltd was engaged to facilitate the consultation process with technical support provided by the Principal Environmental Scientist of GHD.

This report summarises the consultation process. Key outcomes from the consultation workshops were recorded by GHD for further consideration by Santos.

2 Dissemination of Information

The draft EIR and SEO for both Drilling & Well and Production & Processing Operations in the Cooper Basin, together with a guide explaining all the documents, were sent by Santos in the week starting 19 August 2002 to a comprehensive range of stakeholder groups from:

- Government Departments
- Statutory Bodies
- Non-Government Organisations
- Pastoral Interests
- Joint venture partners
- Petroleum Companies
- relevant Government Ministers and Shadow Ministers.

A full list of stakeholder groups is detailed in Appendix 1.

In addition, members of the public were informed via an advertisement (see Appendix 2) explaining the release of documents and inviting written responses placed in 'The Advertiser', the 'Stock Journal' and the 'Transcontinental' in the last week of August 2002.

3 Workshops

The information sent to the above groups included a letter inviting representatives to attend one of the following three workshops:

- Friday 13th September in Adelaide from 9.00 am – 2.00pm in Adelaide regarding Production & Processing Operations;
- Monday 16th September in Adelaide from 1.00 – 5.00pm regarding Drilling & Well Operations;
- Tuesday 17th September at Moomba from 2.00 – 7.00 pm regarding both Drilling & Well Operations and Production & Processing Operations.

The date for the latter workshop was subsequently changed to Monday 23 September so as not to clash with a local rural event.

Follow up phone calls were made to all stakeholder groups encouraging their representatives to attend a workshop, or if this was not possible to forward a written response.

A fourth workshop was held on Monday 4th November 2002 with representatives of the Aboriginal Legal Rights Movement.

The format for each workshop was essentially the same with:

- a welcome and introductory remarks;
- a presentation by PIRSA representatives regarding the approval process under the SA Petroleum Act 2000;
- a brief presentation by Santos staff regarding current operations and associated risks;
- facilitated discussion in smaller groups critiquing:
 - the hazards and consequences, management strategies and level of risk identified in the EIRs;
 - the environmental objectives and associated indicators in the SEOs.
- large group feedback and discussion;
- information about the next steps of the consultation process.

The workshops were well attended, as shown in Appendix 3.

4 Written Responses

Written responses were received from

- SA Tourism Commission
- Department of Water, Land and Biodiversity Conservation
- Transport SA
- Arid Areas Catchment Water Management Board
- Aboriginal Legal Rights Movements Incorporated
- Kidman Holding Ltd – leasees of Innamincka Station
- Peter S Lewis

Appendix 1: Key Stakeholder Groups Sent Information

GOVERNMENT DEPARTMENTS

- Environmental Australia
- Department of Environment and Heritage
- Environmental Protection Authority
- National Parks and Wildlife Service
- Department of State Aboriginal Affairs (DOSSA)
- Heritage SA
- Department of Water, Land and Biodiversity Conservation
- Transport SA
- SA Tourism Commission
- Planning SA
- Greenhouse Office

STATUTORY BODIES

- Pastoral Management Board
- Great Artesian Basin Consultative Council
- Marree Soil Conservation Board
- Arid Areas Catchment Water Management Board
- Aboriginal Legal Rights Movements Incorporated (ALMA)

NON-GOVERNMENT ORGANISATIONS

- Australian Conservation Foundation
- Conservation Council of South Australia
- Wilderness Society
- Nature Conservation Society
- Innamincka Progress Association
- Cooper Creek Catchment Committee
- Lake Eyre Basin Co-ordinating Group
- SA Farmers Federation

PASTORAL INTERESTS

- Clifton Hills PL
- Pandie Pandie Station
- Cordillo Downs Station
- Merty Merty Station
- Mungerannie Station
- Bollards Lagoon Station
- Innamincka Station
- Doce Pty Ltd

JOINT VENTURE PARTNERS

- South Australia Chamber of Mines and Energy (SACOME)
- Origin Energy Resources Limited
- Basin Oil Pty Ltd
- SE Asia & Australasia Region, Novus Australia Resources NL
- Delhi Petroleum Pty Ltd

PETROLEUM COMPANIES

- Origin Energy Resources Limited
- Beach Oil & Gas Pty Ltd
- Stuart Petroleum NL
- Geodynamics Ltd
- Oil Company of Australia Ltd
- Cooper Energy
- Epic Energy

MINISTERS

- Minister for Mineral Resources Development
- Minister for Environment & Conservation
- Shadow Minister for Energy & Minerals & Petroleum Resources
- Shadow Minister for Environment & Conservation

Appendix 2: Advertisement

Santos

STAKEHOLDER CONSULTATION RE PETROLEUM OPERATIONS IN THE SA COOPER BASIN

Members of the public are invited to comment on the:

- draft Environmental Impact Report (EIR) and draft Statement of Environmental Objectives (SEO) for **Drilling & Well Operations**; and
- draft EIR and draft SEO for **Production & Processing Operations**

recently prepared by Santos either independently or on behalf of other petroleum companies relating operating in the South Australian sector of the Cooper Basin.

These documents have been prepared in accordance with Section 97 and Regulation 10 of the SA Petroleum Act and Regulations 2000.

The Environmental Impact Reports (EIR) outline management strategies developed in response to potential operational risks/hazards and associated consequences; while the Statement of Environmental Objectives (SEO) documents outline environmental objectives as well as the criteria to measure the attainment of objectives.

Santos is keen to get feedback on the issues covered in the draft documents so that they can be addressed prior to the documents being submitted to the Department of Primary Industries and Resources SA (PIRSA) for consideration and approval by the Minister for Mines and Energy.

Further information about how to view or get a copy of the documents, please contact Julie Mitchell, Manager Corporate Affairs Santos, on 8218 5111.

Written comments are due by Friday 20th September 2002.

SANTOS24-8 3115300

Appendix 3: Attendance at Workshops

FRIDAY 13TH SEPT: PRODUCTION AND PROCESSING OPERATIONS

Arid Areas Catchment Water Management Board: David Leek, Lynn Brake,
Beach Petroleum: Nick Dunstan, Gordon Moseby
Cooper Energy: Chris Porter, Tony Wright
Environment Australia: Karl Heiden
EPA: Nicholas Fox
Epic Energy: Alex Blood, David Fotheringham
National Parks and Wildlife: Brian Moore
Stuart Petroleum: Tim Fatchen

MONDAY 16TH SEPT: DRILLING AND WELL OPERATIONS

Beach Petroleum: Nick Dunstan, Gordon Moseby
Cooper Energy: Chris Porter, Tony Wright
Dept of Water, Land and Biodiversity Conservation: Lloyd Sampson, Brigette Soreson
EPA: Nicholas Fox
National Parks and Wildlife: Brian Moore

MONDAY 23RD SEPT: MOOMBA

Beach Petroleum: Gordon Moseby
Cooper Creek Catchment Committee: Nora Brandli, Marree Morton
Gidgealpa: Jason Barnes
Innamincka Progress Association: Joan Osborne, John Osborne
Merty Merty Station: Pam Rieck
Mungerannie Station: Graham Bett
National Parks and Wildlife: Christine Crafter, Brian Moore

WEDNESDAY 4TH NOVEMBER: ADELAIDE

Aboriginal Legal Rights Movement: Parry Agius, Andrew Beckworth, Sandy Jarvis Sharon Lucas

Appendix 7: Stakeholder Comments and Responses

Stakeholder Comment	Santos Response / Comment
General	
<ul style="list-style-type: none"> Avoid using the word 'avoid' 	Appropriate in some cases
<ul style="list-style-type: none"> Reference to 'avoid' and 'minimise' 	Wording has been altered to ensure consistency.
<ul style="list-style-type: none"> Objectives should include restoration of affected areas. 	Included appropriate remedial actions in Objective 12. Additional objective has been added.
<ul style="list-style-type: none"> Define timeframes for assessment criteria and management strategies (ie. what is regular) Criteria for objective are often statements and not specific procedures or actions. 	Assessment criteria have been refined in response to this comment (refer revised Attachment A of this SEO).
<ul style="list-style-type: none"> Additional objective is required to address protecting 'key sites' and broaden to include 'visual amenity'. 	Key sites are considered to be covered under objectives which require the protection of heritage sites, water resources, habitats etc. It was considered that the addition of an additional specific objective would be repetitive. Similarly visual amenity is a key assessment criterion for a number of the objectives, particularly for Objective 12.
<ul style="list-style-type: none"> 'Strict' and 'guidelines' are mutually exclusive. 	Reference to strict has been removed.
<ul style="list-style-type: none"> Need to define procedures. Santos procedures should be followed (as an operational experience in reducing impacts). 	Santos specific procedures are not defined as these cannot be imposed on all Operators. All operators, including Santos, must ensure that procedures are developed as part of their management systems to ensure that all objectives are met.
<ul style="list-style-type: none"> Improve awareness and education. 	Criteria defined to ensure annual induction.
<ul style="list-style-type: none"> Refer to specifications (ie. Drilling Operations Manual) in the assessment criteria. 	Santos specific procedures are not defined in the Drilling and Well Operations EIR and SEO as these documents apply to all Operators.
Objective 1: <i>Continuously improve the safety of employees, contractors, the public, and other third parties.</i>	
<ul style="list-style-type: none"> Why is objective just soil and not 'soil and water'. 	Water (surface and groundwater) is covered under Objective 4.
<ul style="list-style-type: none"> Roads and access tracks. 	Some roads are the responsibility of Transport SA and not just Santos. Transport SA must also have appropriate procedures and design standards.
<ul style="list-style-type: none"> Include 'appropriate mitigation and remedial actions' or words to this effect as well as 'minimise'. 	Objective 12 has been added to cover mitigating actions and remediation for each environmental element (soil, water and native vegetation etc).
<ul style="list-style-type: none"> There are no criteria to assess public safety associated with rig moves. 	Criteria added. Management strategies are identified in the EIR (Appendix E: Table E-26)

Stakeholder Comment	Santos Response / Comment
Objective 2: Conserve soil resources by minimising disturbance and avoiding contamination.	
<ul style="list-style-type: none"> • Why does this not include water? 	Water included in Objective 4.
<ul style="list-style-type: none"> • Need to have no unauthorised tracks (off-road driving). 	This is covered in staff and contractor inductions. Management strategies and assessment criteria are in place to assess performance.
Objective 3: Avoid the introduction and spread of pest plants and animals and implement control measures as necessary.	
<ul style="list-style-type: none"> • Include feral animals. 	Objective wording has been altered to cover this.
<ul style="list-style-type: none"> • 'All vehicles...' – dedicated wash down areas 	Vehicle washdown is undertaken on an as required basis.
<ul style="list-style-type: none"> • Catchment committees are trying to have washdown bays installed. 	This is noted.
<ul style="list-style-type: none"> • Known weed infestations should be identified and managed accordingly. 	This is not only a management strategy defined in the EIR, but also (depending upon the weed species) a legislative requirement.
<ul style="list-style-type: none"> • Rig moves considered high risk (particularly from Qld). 	This is recognised (refer EIR Appendix E: Table E-26).
<ul style="list-style-type: none"> • Cats are also an issue. 	This is recognised (EIR Section 8.2.7).
Objective 4: Reduce disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.	
<ul style="list-style-type: none"> • Interference of blockage of natural drainage patterns is avoided. 	Already covered in the SEO.
<ul style="list-style-type: none"> • Add surface waters. 	Added into objective wording above.
Objective 5: Avoid disturbance to sites of known cultural and heritage significance.	
<ul style="list-style-type: none"> ▪ Improve cultural heritage awareness. 	Education and induction programs aim to achieve this awareness.
Objective 6: Minimise loss of aquifer pressures and avoid aquifer contamination.	
<ul style="list-style-type: none"> ▪ Use 'Avoid' contamination of aquifers. 	Objective wording has been changed.
<ul style="list-style-type: none"> ▪ Add 'significant' before contamination. 	Significant not added as difficult to define.
<ul style="list-style-type: none"> ▪ Change objective to include aquifers that are currently used or may be potentially used. 	Overall objective is to avoid changes to aquifers (non-oil and gas bearing formations) whether it be pressure or water quality. The model identifies aquifer salinity which is a defining criteria and it is not considered necessary to complicate the objective to include just the protection of used or potentially used zones.

Stakeholder Comment	Santos Response / Comment
Objective 7: Conserve natural environment habitats by minimising disturbance to native vegetation and reducing risks to native fauna.	
<ul style="list-style-type: none"> ▪ Don't knock down trees. 	<p>Current procedures avoid large shrubs and trees unless absolutely necessary. Booklets are provided to ensure that flora with a high conservation significance are avoided (refer to assessment criteria in appendices 2-6).</p>
Objective 8: Minimise air pollution and greenhouse gas emissions.	
<ul style="list-style-type: none"> ▪ Make less smoke. 	<p>Monitoring of emissions and operations undertaken in accordance with standard industry practice. Any issues that are identified as part of monitoring programs are addressed in accordance with principles of ecologically sustainable development.</p>
Objective 9: Maintain and enhance partnerships with the Cooper Basin community.	
<ul style="list-style-type: none"> ▪ Contribution to the management of threatening processes. 	<p>Petroleum companies contribute to managing threatening processes in the community, such as weeds and feral animal control. Contributions also to local natural resource management committee programs (ie. the Marree Soil Conservation Board and catchment committees).</p>
Objective 10: Avoid or minimise disturbance to livestock, pastoral infrastructure and landholders.	
<ul style="list-style-type: none"> ▪ Should include 'livestock' in the above objective. 	<p>Objective amended.</p>
<ul style="list-style-type: none"> ▪ Should be criteria for the impact of helicopters on livestock. 	<p>Not considered that establishment of a measurable objective is possible. The use of the helicopter is minimised where possible due to cost, and low flying is also minimised due to safety concerns.</p>
Objective 11: Optimise waste reduction and recovery.	
<ul style="list-style-type: none"> ▪ No specific comments recorded. 	
Objective 12: Remediate and rehabilitate operational areas to agreed standards.	
<ul style="list-style-type: none"> ▪ No specific comments recorded. 	