

# South Australia Cooper Basin



## **Addendum to the Environmental Impact Report: Drilling and Well Operations**

### **Five Year Review of the Statement of Environmental Objectives**

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<b>DOCUMENT CONTROL SHEET</b>						
<b>Summary of Updates to Cooper Basin Drilling and Well Operations SEO</b>						
Document Reference	Revision Number	Revision Date	Compiled by	Checked by	Approved by	Comment
826-Addendum to Drilling Well Ops EIR	A	19/08/08	BW/SM	SM	SM	Issued to Santos as draft
	B	1/10/08	AJ/AW			Santos internal review
	C	17/10/08	SM		AJ (Santos)	Updated for Santos final review
Addendum to Drilling Well Ops EIR	0	6/11/08	BW	SM	AJ (Santos)	Final Santos review comments included. Issued to PIRSA
	1	13/5/09	SM	SM/BW	AJ (Santos)	PIRSA comments addressed. Issued to Santos
	2	14/5/09	SM	AG/AJ (Santos)	AG (Santos)	Second legal review. Issued to PIRSA
	3	17/11/2009	SM/AJ	AJ/TH (Santos)	CC (Santos)	Consultation comments addressed. Final legal review

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# 1 Introduction

The *South Australia Cooper Basin Operators Statement of Environmental Objectives: Drilling and Well Operations, November 2003* (SEO) (Santos 2003b) was prepared by Santos and, following an extensive consultation process, was approved under in November 2003.

Under Regulation 14 of the *Petroleum and Geothermal Energy Regulations 2000* (SA) (the Regulations), an approved SEO must be reviewed at least once in every five years. As such, Santos, as author of the SEO, has undertaken a review of the SEO. This document provides a summary of the review process and the proposed updates to the SEO.

The original SEO was produced on the basis of an Environmental Impact Report (EIR) (Santos 2003a). This document builds on the information provided in the EIR and has therefore been formulated as an *Addendum to the EIR*.

## 1.1 Scope and Methodology

The scope of the SEO review was based on the requirements of Regulation 14(2) of the Regulations, which states that a review must take into account, or address:

- (a) changes in information or knowledge in relevant areas
- (b) community expectations in relation to relevant environmental issues
- (c) changes in the use of land
- (d) changes in operational practices
- (e) other matters determined to be relevant by the Minister.

The following steps were undertaken in the review:

- a brief review of the information provided in the *South Australian Cooper Basin Operators Environmental Impact Report: Drilling and Well Operations, November 2003* (EIR) was undertaken, with particular reference to items (a), (c) and (d) above
- discussions were held with key groups within Santos to identify any issues with the SEO
- discussions were held with PIRSA to discuss the review process and any key issues with the SEO
- recent SEOs and comments made during their approval were reviewed to capture changes in approach or expectations
- the information in the SEO was reviewed to assess whether it was current, relevant and adequate
- the SEO was updated where appropriate based on the above information
- following internal Santos review, the revised SEO was submitted to PIRSA.

The review and the revision of the SEO was undertaken by Santos, and reflects Santos practices in drilling and well operations, rather than other Cooper Basin operators' practices, over which Santos has no control. This is reflected in the title and scope of the revised SEO, as discussed in Section 3.3.

It is important to note that the SEO is in continual use, and is reflected throughout other documentation (e.g. in the Santos Environment Health and Safety Management System). For this reason, all revisions were vetted to ensure that they were clearly necessary or beneficial, rather than representing slightly different wording that would achieve the same end result.

## 2 Information in the EIR

As discussed above, a brief review of the Environmental Impact Report was undertaken to determine whether there were any areas of relevance to the SEO where information required updating, with particular reference to the matters listed in Section 1.1.

In general, the information in the EIR was considered to provide an adequate basis for the preparation of the revised SEO. Only relatively minor updates would be required to ensure currency. Consequently, a full revision of the EIR was not undertaken.

The updates to information of relevance to the SEO are discussed below.

#### Operational practices, hazards and risks

There have been no significant changes in Santos operational practices in the Cooper Basin, although improvements are continually being implemented (e.g. trials of drilling rigs with a smaller footprint, trials of sumpless drilling and improved sewage management as discussed below). In general, the description of operations and hazards and risks provided in the EIR are appropriate for current operations.

Sewage management practices have been under ongoing review. The principal focus has been a move towards the use of transportable aerated wastewater treatment plants (AWTP) for drilling and well operations that are fully approved by the SA Department of Health. At the time of writing an AWTP from a suitable supplier was undergoing field testing. Santos continues to work with its suppliers to achieve this objective, and has been implementing interim measures for management of sewage effluent in consultation with the SA Department of Health. These interim measures aim to minimise any risks to human health posed by current sewage disposal methods and include specifications for separation distances of sewage disposal areas from camps.

Since the preparation of the EIR, the drilling of new wells and the maturing of the Cooper Basin operations has resulted in natural variation from the statistics quoted for some aspects of the operations (e.g. numbers of wells drilled, worked over or fractured). However, the level of variation is not considered material to the setting of objectives and assessment criteria in the SEO. Consequently, an update of the full range of statistics regarding drilling and well operations is not provided in this document. However, the following table is provided as an indication of current numbers of the South Australia Cooper Basin parties' (SACBP<sup>1</sup>) wells.

**Table 1: Number of Wells by Category (2008)**

Well Type	No. of Wells
Cased and Suspended	58
In Production	811
Abandoned	435
Suspended/Inactive	329

#### Description of Existing Environment

Some changes have occurred to the information provided in Section 5 of the EIR. Of particular note are:

- Proclamation of the Coongie Lakes National Park in 2005 (in which oil and gas exploration is excluded) and establishment of three adjacent management zones (which supersede the previous Coongie Lakes Control Zone): the "No-mining Zone", the "Walk-in Mining Zone" and the 'Controlled Access Mining Zone"
- Ongoing changes to the conservation status of numerous species that occur in the region under state and Commonwealth legislation
- Changes to the state's natural resources management framework, with the introduction of the South Australian Arid Lands Natural Resources Management Board
- Change over time in statistics quoted (e.g. tourist visitation, value of pastoral production).

<sup>1</sup> South Australia Cooper Basin parties are the parties to joint ventures in the Cooper Basin operated by Santos

While they may affect specific drilling locations (e.g. locations inside the area now proclaimed as Coongie Lakes National Park or in the adjacent management zones), these changes do not make a significant difference to the evaluation of hazards, risks and management measures in the EIR.

Figure 1 shows an updated map of the Cooper Basin.

### Management of Environmental Risks

Section 8.2 of the EIR provides an overview of how Cooper Basin Operators manage environmental risks for Drilling and Well Operations. This information is still directly relevant to Santos. Santos has systems and processes in place to ensure the measures outlined in this section are undertaken.

The Environmental Health and Safety Management System (EHSMS) forms the backbone of Santos's approach to managing risks to the environment. Based on AS4801 and AS/NZS ISO 14001, the EHSMS provides rigor and consistency to its performance, and additional surety that Santos is complying with all regulatory obligations.

Santos has a multi-layered approach to managing environmental risks, including:

- vision and policies
- environment committees at Board and management levels
- specialist environmental staff and advisors
- specific standards that employees and contractors must follow as part of their day-to-day responsibilities
- regular internal and external environmental audits.

The EHSMS and the way it is implemented is continually being reviewed and improved. Areas deserving special attention are identified along with other initiatives to foster responsible environmental attitudes and behaviour amongst Santos employees and contractors.

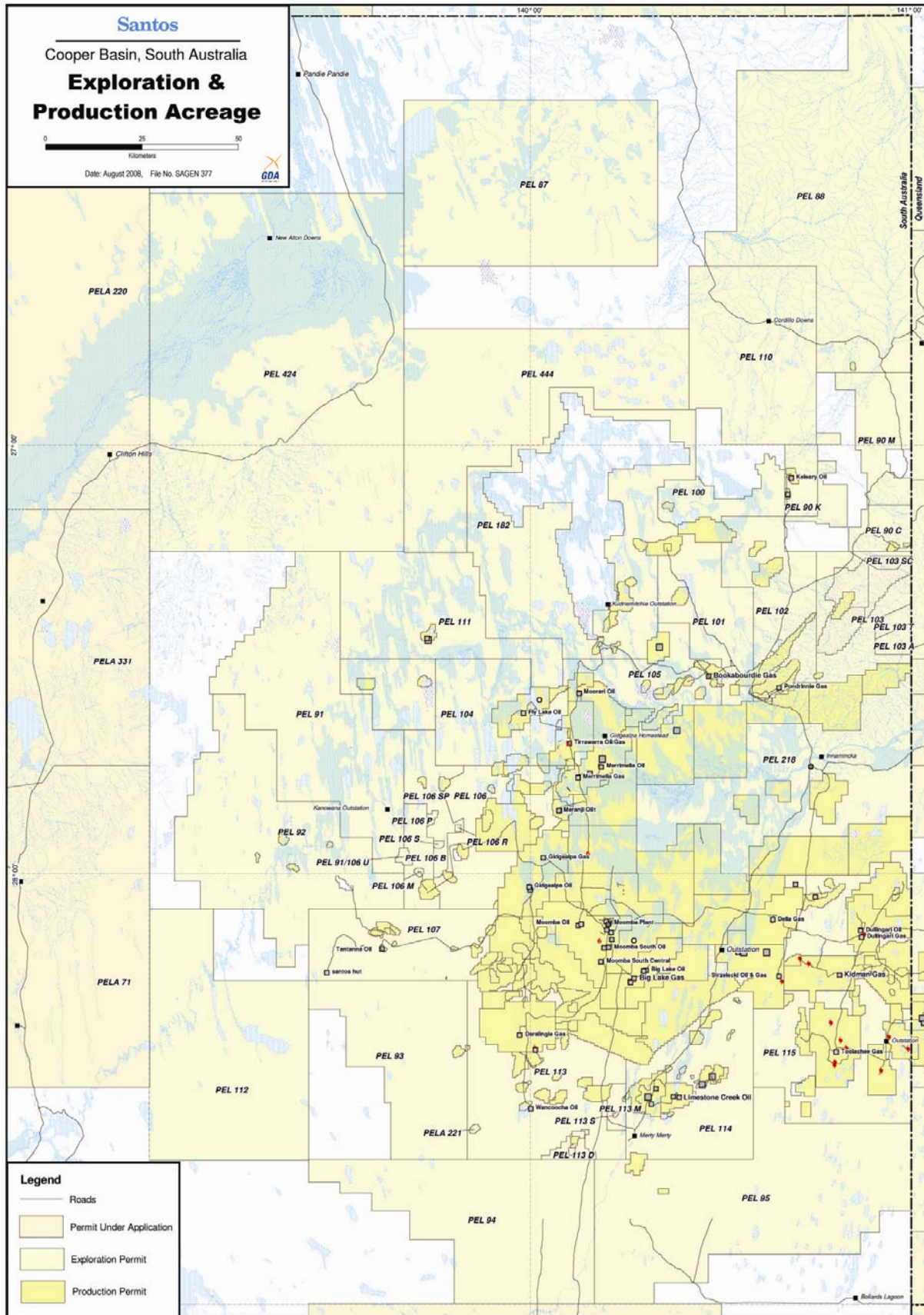


Figure 1: Exploration Acreage in the South Australian Sector of the Cooper Basin

### 3 Changes to the SEO

It was generally agreed during the review process that the SEO has been effective in establishing appropriate and workable environmental objectives and measurement criteria. Consequently, extensive revisions to the SEO objectives and measurement criteria were not considered to be required, and the review exercise can be considered to be a 'fine tuning' of the existing SEO.

The proposed changes to the SEO are described in the following sections.

#### 3.1 Minor Changes and Updates

Details such as abbreviations, names of government departments, statutory bodies, legislation and other SEOs have been updated and a number of corrections to minor errors have been made throughout the document. These have not been individually delineated.

Other minor changes include fonts and paragraph formats (which have been changed to a universally available font and clearly legible paragraph spacing), page and table numbering (which have been simplified) and an updated map of the Cooper Basin.

#### 3.2 Document Structure

A number of changes to the SEO's structure have been made to 'streamline' the SEO and make it as simple, clear and usable as possible. These changes have included removing material that is not essential to the operation of the SEO, and required in an SEO by the *Petroleum and Geothermal Energy Act 2000 (SA)* (the Act).

The key changes to the structure are:

- The columns in the table of environmental objectives and assessment criteria (formerly Table 2.1) have been re-ordered to a more readable structure that has been used in recent SEOs (e.g. the geophysical operations SEO (Santos 2006)).
- Consultation information (Section 4 and Appendix 6 and 7) has been deleted. This information is of historical value, and is still on record in the original SEO and the EIR, however it is not required in an SEO by the Act and adds little to the day-to-day use of the SEO.
- Appendix 1 (Environmental Hazards and Potential Consequences) has been deleted. This information is contained in the EIR and it is not required in an SEO by the Act.
- Appendices 2, 3, 4 and 5 (the Goal Attainment Scaling Criteria) have been combined in a single appendix and reformatted to make them more simple and accessible. The use of the words "objective" and "goal" in the row headings has been standardised (i.e. they have been interchanged in Appendices 2, 3 and 5). The contents of these GAS tables have also been modified (as discussed in section 3.4 of this report), including revisions to maintain consistency with PIRSA's *Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites*, which was updated in 2009.
- The table of abbreviations has been moved from the preface to Section 4.

#### 3.3 Scope

Santos has reviewed and updated the SEO in the context of Santos' own practices in drilling and well operations, rather than other operators' practices, over which Santos has no control. Consequently, the title and scope of the SEO have been modified so that they refer to Santos and the South Australia Cooper Basin parties (SACBP), rather than the *South Australia Cooper Basin Operators*. The South Australia Cooper Basin parties are the parties to joint ventures in the Cooper Basin operated by Santos.

Although the title and scope no longer refer directly to all Cooper Basin operators, this makes little material difference to the use of the SEO by other Cooper Basin operators. There is no reason that the SEO cannot be continued to be used by other operators, provided they can demonstrate to PIRSA that it adequately covers their operations (as they must with the current SEO).

### 3.4 Objectives and Assessment Criteria

The Environmental Objectives and Assessment Criteria (along with the incident definitions discussed in Section 3.5 of this report) are the sections of the SEO most integral to its use. As discussed above, the contents of these have been changed only where the review identified a genuine need for update, clarification or improvement.

The key changes to the Objectives and Assessment Criteria are:

- All objectives:
  - References to GAS criteria in the *Assessment Criteria* column reworded to match the reorganised GAS tables and to ensure that all appropriate entries in the GAS tables are referenced under the correct objective.
  - Some redundant information in the *Comments* column has been deleted.
- Objective 1
  - 'Safety' added to the objective wording to clarify i.e. "Minimise risks to *the safety of the public and other third parties*".
  - Reference to 'health risks' added to assessment criteria
  - Measures added / edited in *Guide to How Objectives Can Be Achieved* column.
- Objective 2:
  - Reference to GAS criteria in the *Assessment Criteria* column for "Minimise impacts on soil" added for well lease and access track construction (GAS criteria existed but were previously not referred to in the assessment criteria)
  - Reference to wetlands land systems in the *Assessment Criteria* column for well lease and access track construction has been removed as it is not relevant to the objective (which deals with soil) and is inconsistent with the wording in the EIR. Additional reference to wetlands has been added under Objectives 4 (water) and 7 (flora and fauna). Reference to steep tableland land systems has been changed to "steep tableland slopes" to more accurately reflect the EIR.
  - Reference to GAS criteria for "Waste material" (which does not exist) replaced with "Site to be left in a clean and tidy condition"
  - Reference to sludge pits removed
  - Measures added / edited in *Guide to How Objectives Can Be Achieved* and *Comments* column.
- Objective 3: Assessment criteria modified ("spread" added) to better reflect objective wording.
- Objective 4:
  - Assessment criteria "No spills or leaks outside of areas designed to contain them" replaced with "No water (surface or groundwater) contamination as a result of fuel or chemical storage and handling" which better reflects the objective.
  - Measures added / edited in *Guide to How Objectives Can Be Achieved* column.
- Objective 5: Measure added to *Guide to How Objectives Can Be Achieved* column.
- Objective 6: This objective is subject to ongoing review and is currently unchanged from the 2003 SEO. Several issues have been identified; these will be addressed in the ongoing review and resolutions will be put forward for approval in a later revision of the SEO:
  - There is some question over the accuracy of the schedule of aquifers set out in this objective. The objective is subject to ongoing review and is currently unchanged from the 2003 SEO. Further scientific research is being carried out to clarify the accuracy of objective 6. Future amendments may be required once the work is complete.

- other, less significant issues include:
  - the wording needs to be modified to clearly differentiate between “formations” and “aquifers”
  - references to DWLBC and SAALNRMB need to refer to PIRSA as the primary agency for consultation and approval, with PIRSA consulting these bodies where appropriate. This will more accurately reflect the current process and regulatory responsibilities
  - reference to two-yearly pressure monitoring of casing annulus pressures needs to be modified to reflect current practice (e.g. to read “casing annulus corrosion inhibitor top-ups are maintained under a risk managed frequency (typically varying from every 1 to 3 years), and records maintained”).
- Objective 7: Measures added to *Guide to How Objectives Can Be Achieved* column including additional reference to wetlands.
- Objectives 8 and 9: No changes (other than updates to names etc).
- Objective 10: Minor edits to *Guide to How Objectives Can Be Achieved* column.
- Objective 11:
  - Reworded objective to clarify drivers for optimisation
  - Assessment criteria clarified
  - Reference to requirements of the *Public and Environmental Health (Waste Control) Regulations 1995* regarding sewage management added in *Assessment Criteria* and *Guide to How Objectives Can Be Achieved* columns to reflect legislative requirements (and to be consistent with recent SEOs)
  - Additional measures added to *Guide to How Objectives Can Be Achieved* column.
- Objective 12:
  - Reference to SHI process added to *Assessment Criteria* column
  - Reference to appropriate GAS criteria added.

### 3.5 Reporting

The key changes are:

- Descriptions of incident types reworded and simplified
- Incident definitions modified to match PIRSA’s standardised incident definitions for operation activities (released in September 2009) where relevant
- Item 5 under ‘Serious Incidents’ (pipeline easement encroachment) deleted as it is not listed in the Act and not relevant to drilling and well operations.
- Reportable incident description edited to simplify and include reference to Regulation 32(1) classifying prescribed reportable incidents.
- Added ‘reasonable’ to the complaints-related reportable incident
- Added reference to requirements to report incidents causing or threatening serious environmental harm to EPA where applicable.

## 4 References

Santos Ltd. (2003a). *South Australia Cooper Basin Operators Environmental Impact Report: Drilling and Well Operations*. Santos Ltd, Adelaide.

Santos Ltd. (2003b). *South Australia Cooper Basin Operators Statement of Environmental Objectives: Drilling and Well Operations*. Santos Ltd, Adelaide.

Santos Ltd (2006). *South Australian Cooper Basin Operators Statement of Environmental Objectives: Geophysical Operations*. Santos Ltd, Adelaide.