great artesian oil and gas limited

ACN 078 607 682

PEL 106

Cooper/Eromanga Basin
South Australia

ANNUAL REPORT
PERMIT YEAR FOUR

April 9th 2006 to April 8th 2007

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1. INTRODUCTION

Petroleum Exploration Licence (PEL) 106 is situated on the southwestern margin of the Patchawarra Trough, one of the major depocentres in the South Australian portion of the Cooper Basin. PEL 106 covers an area of approximately 1000 square kilometres. The permit was granted to the Great Artesian Oil and Gas Limited on 9th April 2003 for an initial term of five years.

This Report covers work undertaken by the Licensee during the Fourth Permit Year, from 9th April 2006 to 8th April 2007, in accordance with the requirements of Section 33 of the Petroleum Regulations, 2002.

2. PERMIT SUMMARY

The working interest in PEL 106 as at the end of the reporting period was:

Great Artesian Oil and Gas Limited (GAOG) 100%

Beach Petroleum Limited, Traditional Oil Exploration N.L. (a wholly owned subsidiary of Enterprise Energy Limited), Everdue Pty Ltd and Kompliment Pty Ltd (both wholly owned subsidiaries of Energy Investments Limited) and Red Sky held equitable interests in the following portions of PEL 106.

Holder	Nature of Equitable Interest Held
Beach Farmin Block	Under the terms of a Letter Agreement dated 18 October 2004, Beach acquired an exclusive right to explore by funding 150 km of 2D seismic and at least one well per annum during permit life or farmin period. Under the terms of an Amendment Letter Agreement dated 23 November 2005 and 26 May 2006, Beach will earn a 50% participating interest in the Beach Farmin Block by funding 3 wells and 145 sq km of 3D seismic.

Holder	Nature of Equitable Interest Held
Smegsy Block	Under the terms of a Farmin Agreement and JOA signed on 10 March 2004, Traditional funded a 25% interest of the Smegsy-1. Subsequently modified by a Farmin Agreement dated 1 September 2005, Traditional funds 25% of a total of 4 wells in PEL 106 in order to earn 12.5% in a subsequent commercial discovery and obtain relief from funding 100% of the cost of drilling an exploration well in ATP 539 as part of a Farmin Agreement dated 10 March 2004.
Rossco Block	In accordance with a Letter Agreement dated 1 September 2005, Traditional Oil elected to fund 25% of Rossco-1 in order to earn a 12.5% interest in any subsequent PPL in the event of a commercial discovery. Under the terms of a Farmin Agreement dated 27 October 2005, Kompliment Pty Ltd funded 75% of Rossco-1 drilling costs in order to earn a 37.5% interest on similar terms.
Paranta Block	Under terms of a Farmin Agreement dated 26 October 2005 and 1 March 2006, Everdue Pty Ltd elected to fund the Cadenza-1.
Spinel Block	Under the terms of a Farmin Agreement dated 29 May 2006, Kompliment Pty Ltd agreed to fund 350 sq km of 3D seismic and drill at least one well in order to earn a 50% interest in any discovery and a right to continue exploration involving funding up to additional three wells for a 50% participating interest within the Spinel Block 3D seismic program foot-print.
Paprika Block	In accordance with a Letter Agreement dated 1 September 2005, Traditional Oil elected to fund 25% of Paprika-1. Under the terms of a Farmin Agreement dated 29 May 2006, Kompliment Pty Ltd agreed to fund 100% of Paprika-1 in order to earn a 37.5% interest in a subsequent commercial discovery.
Red Sky Survey Block	In accordance with a Heads of Agreement, dated 30 May 2006, amended 14 August 2006 and revised 31 January 2007, Red Sky will have the option to drill one prospect located in PEL 106, subject to other pre-existing rights. Red Sky will fully fund one well in order to earn a 50% interest in any subsequent PPL in the event of a commercial discovery.

The original work commitments for PEL 106 are summarised below:

Licence Year	Minimum Work Programme
Year 1 (9/04/03-8/04/04)	2 wells; 100 km 2D seismic; geological and geophysical review; seismic processing
Year 2 (9/04/04-8/04/05)	2 wells; 100 km 2D seismic or detailed 3D seismic program
Year 3 (9/04/05-8/04/06)	3 wells; 100 km 2D seismic or detailed 3D seismic program
Year 4 (9/04/06-8/04/07)	3 wells
Year 5 (9/04/07-8/04/08)	3 wells

Several variations to the original work programme have been made.

1) A request to offset the Permit Year One deficit of 10 km of new seismic acquisition with Permit Year Two seismic acquisition was submitted to PIRSA on 1 June 2004. The variation in the work programme of PEL 106 was granted on 9 June 2004.

2) A request to combine Years 2 and 3 minimum work programs was made to PIRSA on 22 March 2005 (a variation so that the remaining exploration well to be drilled during Year 2 be deferred until Year 3). The variation in the work programme of PEL 106 was granted 29 March 2005.

3) A request to seek a variation in the PEL106 work programme for Permit Year 3 was submitted to PIRSA on 15 November 2005 (a variation to drill 3 wells, a 3D seismic program and 100 km of 2D seismic). The variation in the work programme was granted on 23 November 2005.

4) A request to seek a variation in the PEL 106 work programme for Permit Year 5 in order to have Spinel seismic survey count for entire program was sent to PIRSA on 18 May 2007. The variation in the work programme was granted on 30 May 2007.

The current work commitments for PEL 106 are summarised below:

Licence Year	Work Programme	Actual Programme
Year 1	2 wells; 90 km 2D seismic; geological & geophysical review; seismic reprocessing	Nutmeg-1 & Paranta-1; 90 km Paranta 2D seismic; 379 km seismic reprocessing
Year 2	1 well; 110 km 2D seismic or detailed 3D seismic	Smegsy-1; 245 km of 2D seismic (177 km Malleus SS and 68 km Lena SS)
Year 3	3 wells; 100 km 2D seismic or detailed 3D seismic	Rossco-1; Udacha-1 & Middleton-1; Karla 2D SS (136.5 km) & Paranta 3D SS (82.5 km^2)
Year 4	**3 wells**	**Cadenza-1, Paprika-1 & Tennyson-1**
Year 5	3 wells	495 km^2 Spinel 3D SS

3. EXPLORATION ACTIVITY

3.1 Drilling

Three exploration wells, Cadenza-1, Paprika-1 and Tennyson-1 were drilled during the Permit Year, in May 2006 – August 2006.

Cadenza-1 was drilled to test the Patchawarra Formation reservoirs in a four way dip closure at the VC40 level. The well is located approximately 6.2 km east of the Welcome Lake East Gas Field, 3.2 km north of Paranta-1 and 4.7 km northeast of Nutmeg-1. Cadenza-1 was spudded on 19 May 2006. A number of sands with elevated gas readings were intersected within the Patchawarra section. Two drill-stem tests were attempted post-logging. DST #1, over the interval 2691 – 2694m in the 26-9 sand, flowed 1.54 mmcfd with approximately 40 bcpd. DST #2, over the interval 2641 – 2644m in the 26-4 sand, suffered a packer seat failure 4min into the second flow and failed to record any flow to surface. The well reached a total depth of 2993.0m within the Merrimelia Formation on 30 May 2006. The rig was released on 6 June 2006. The net gas pay is mapped in the Patchawarra Formation in the 26-9 sand (pay 2.4m, ø 14.0%, Sw 39.0%, K 4.1md) and in the 26-4 sand (pay 3.7m, ø 12.0%, Sw 39.0%, K 2.7md). Further pay exists in the 26-2 sand (pay 3.7m, ø 13.0%, Sw 54.0%, K 3.6md) and in the 26-1 sand (pay 1.6m, ø 13.0%, Sw 54.0%, K 1.2md). All of these sands were between the VC-30 and VC-50 coals. The sands below the VC-50 coal appeared to be gas saturated but tight. Cadenza-1 was cased and suspended as a Patchawarra Formation gas and condensate well and will be completed as a producer at a later date. A Well Completion Report for Cadenza-1 was submitted to PIRSA on 5 December 2006. To determine the specific nature, quantity and flow rates of hydrocarbons within the net pay zones, cased hole production testing will take place later in the year, once a suitable work-over rig is available.

Paprika-1 was drilled to test an anticlinal structure located approximately 9km southwest of the Welcome Lake East field, 7.5km northwest of the Rossco-1 new field gas discovery and 10km south of the Nulla field. Paprika-1 was spudded on 11 June 2006 and reached a total depth of 2919m within the Merrimelia Formation on 21 June 2006. Gas shows and fluorescence were observed from numerous sands within the Patchawarra Formation. Three attempts were made (inflate straddle DSTs) to test the 27-9 sand over the interval 2795 – 2805m. All attempts were unsuccessful due to tool failures, although the initial pressure build-up in DST#1A indicated that it is a better zone than the sand successfully tested in Cadenza -1 (flowed 1.54 mmcfd). The recovery from DST#1A emitted a strong hydrocarbon odour. The net gas pay is mapped in the Patchawarra Formation in the 25-4 sand (1.1m, ø 10.4%, Sw 42.9%), the 27-3 sand (8.1m, ø 13.2%, Sw 41.8%) and the 27-9 sand (10.2m, ø 10.3%, Sw 38.0%) for a total of 17.9m of pay (Av ø 11.6%, Av Sw 40.0%). These sands will be evaluated during a cased hole testing program later in the year. Paprika-1 was cased and suspended as a future Patchawarra gas and condensate producer. A Well Completion Report for Paprika-1 was submitted to PIRSA on 22 December 2006.

Tennyson-1 was drilled to test the hydrocarbon potential of a faulted anticlinal structure on the western margin of the Patchawarra Trough. The well was operated

by Beach Petroleum Ltd and was located within the Beach Farm-in Block in PEL 106. Tennyson-1 is located 3.6km to the northeast of Udacha-1 and 6.9km north-northwest of Middleton-1. The well was spudded on 6 August 2006. A conventional bottom hole drill stem test was conducted over 2718.5 – 2728.0m to test hydrocarbon shows observed in the Patchawarra Formation between 2721 – 2724m (trace to 5% dull yellow brown fluorescence). This test recovered 346m of fluid comprising gas cut mud, water cushion and possible formation fluid. The well reached a total depth of 2860m within the Merrimelia Formation on 21 August 2006. DST#2 (an inflated straddle test) was conducted to test hydrocarbon shows (up to 60% dull to moderate fluorescence) over the interval 2695 -2706m in the Patchawarra Formation. The sand flowed gas to surface at a sub-commercial rate of approximately 37,000 cfpd. This low flow rate was attributed to tight formation conditions. Better quality shallower reservoirs were interpreted to water-wet. The well was plugged and abandoned and the rig was released on 27 August 2006. A Well Completion Report for Tennyson-1 was submitted to PIRSA by Beach Petroleum in February 2007.

3.2 Cased Hole Production Testing

Cased Hole Production Testing (CHPT) was conducted on **Rossco-1**. The well was drilled late in 2005 and was cased and suspended as a potential future gas/condensate producer, subject to further cased hole production testing. This testing commenced on 7 June 2006 and ended on 26 June 2006. Four Patchawarra Formation sandstone intervals, interpreted as being hydrocarbon bearing on the basis of wireline logs, geological and engineering data, were tested. Two lowermost sandstones, the 29-9 (2991.5-2993.2m and 2995.2-2997.5m) and 29-7 (2978.9 – 2981.95m) were tested together during CHDST#1. No hydrocarbons flowed during this test. The 29-1 sandstone (2915-2922m) was tested during CHDST#2. Again no hydrocarbons flowed during this test. The 27-9 sand (2792.3-2794m), tested during CHDST#3, produced gas at a rate of approximately 4.2 MMCFD with associated condensate at between 100 and 150 barrels per day. The rate declined to 1.4 MMCFD after 6 days. The well has been suspended pending further engineering investigations. Prior to shut-in on 5 July 2006, over 26 mmcf of gas has been produced, together with 225 barrels of condensate and 83 barrels of water. On 13 July 2006 a static gradient test (from total depth) was conducted which confirmed that the production tubing was gas filled. Due to rain the separator had to be removed from site on 21 July 2006 prior to testing of the 25-2 sand interval. This interval will be tested in conjunction with CHPT of zones in Cadenza-1 and Paprika-1 once a testing program has been finalized, a work-over rig contracted and down-hole equipment obtained.

During September 2006 CHPT of the **Udacha-1** and **Middleton-1** commenced. The testing entailed a series of controlled gas flows and shut-ins for pressure build up and volumetric calculations. Udacha-1, drilled in January 2006 was credited as part of PEL 106 Year 3 work programme, although it is physically located in PEL 91 (operated by Beach Petroleum). Udacha-1 CHPT results will be submitted to PIRSA by the operator as part of PEL 91 reporting process.

Middleton-1 was drilled in February 2006 and flowed gas on DST at rates of up to 12mmcfd from the Patchawarra Formation. The well was cased and suspended subject to further production testing. The flow test for the well commenced on 15 September 2006 and continued for nineteen days. A build-up test followed immediately afterwards, and continued for a further sixteen days. The JV is currently evaluating the results of the test to determine the potential commercial viability of production from this well.

Extended production testing (EPT) was also conducted on **Smegsy-1**. The original EPT commenced at the beginning of March 2006 with a strong flow of some 5 mmcfd into the connected pipeline. The initial pressure and flow rapidly dropped, leading to the well being shut-in. Subsequent testing activity consisted of cyclical opening and shutting-in of the well to ascertain the reasons for the decline in productivity. It was the operator's interpretation that water ingress had caused the gas/condensate flow rate to essentially cease, and remedial action and testing was necessary.

On May 6 2006 the second testing programme began. This test, which did confirm the presence of water in the main reservoir, was completed on May 14. The test confirmed that water is encroaching from the Upper Patchawarra gas zone and as a result of the water loading, the zone is incapable of producing against the line pressure. Following recommendations from Great Artesian's consultant engineer, it has been decided to attempt to isolate this zone and produce from the remaining perforated Lower Patchawarra gas zone – production from which to date had been co-mingled. The well has been shut-in since 14 May 2006. Analysis of data indicates that produced fluids do not meet the specifications required under the existing sales agreement and further surface treatment equipment will be required in order to resume sales.

3.3 Seismic Data Acquisition

Great Artesian Oil and Gas had commenced the work on the Spinel 3D Seismic Survey on 15 December 2006. Covering a total of 495 sq km of portions of PELs 106 and 91, this survey was the largest exploration 3D seismic program ever undertaken in this region of the Cooper Basin.

The acquisition of the seismic data was completed on the 17th April 2007. The acquisition of this dataset will add significantly to the knowledge and understanding of the area and will naturally lead to the drilling of a number of exploration and development wells in the near future. Daily field reports were being submitted to PIRSA. Operation and Interpretation Reports will be forwarded to PIRSA later in the year.

3.4 Geochemical Data Acquisition

To assist in high-grading of seismically defined targets, an airborne geochemical survey was conducted across the western portion of PEL 106 and eastern portion of PEL 91 as part of a farm-in agreement with Red Sky Pty Ltd. The survey was

operated by Beach Petroleum as a joint PEL91-PEL106 project. The results of the survey will be submitted to PIRSA by the operator as part of PEL 91 reporting process. .

3.5 Smegsy-1 Pipeline

The pipeline to connect Smegsy-1 with the South Australian Cooper Basin Producers (SACBP) was constructed in early 2006 on behalf of the Smegsy JV by Santos, as operator for the SACBP. Production commenced on 1 March 2006 and after an initial flow, it rapidly declined due to water ingress. The well has been shut in since approximately the end of March 2006, whilst remedial measures are considered.

3.6 Geological and Geophysical Studies

Technical studies during the Fourth Permit Year were chiefly directed towards, the drilling of three exploration wells, Cadenza-1, Paprika-1 and Tennyson-1 and their implications to possible hydrocarbons in place. Geophysical studies were focused on planning the positioning of seismic coverage of the Spinel 3D Seismic Survey, conducting of this survey and interpretation of newly acquired seismic data from the Karla 2D and Paranta 3D programs

An Environmental Report for the 2007 Spinel 3D seismic survey has been submitted separately to this annual report.

The Paranta Block Joint Venture undertook a detailed interpretive petrophysical study of wells in its area of common interest. The report has been submitted separately to this annual report.

As part of geological work, all relevant well data for PEL 106 was populated into the Kingdom Project.

The pressure data from the cased and suspended wells, operated by Great Artesian Oil & Gas, was evaluated by the company's production engineer. Recommendations on a low pressure gas gathering system were made to better define deliverability and reserves and to initiate production from the greater PEL 106 wells.

4. ADMINISTRATION

4.1 Regulatory Compliance

A Compliance Report is attached which details the Licensee's compliance with the 2000 Petroleum Act, its Regulations, the terms and conditions of the Licence, and the agreed Statements of Environmental Objectives governing field operations undertaken during the permit term.

4.2 Data Submission

A list of the reports and data submitted during the Year Four period is tabulated below:

Document	Date Submitted
Cadenza-1: Request to commence earthworks	19 April 2006
Paprika-1: Application to conduct drilling & possible completion	20 April 2006
Cadenza-1: Drilling Program	24 April 2006
Paprika-1: Request to commence earthworks	11 May 2006
Lena seismic survey: Magnetic tapes, CD containing basic acquisition data and reports	17 May 2006
Cadenza-1: Daily drilling reports & mud logging data	18 May–6 June 2006
Paprika-1: Drilling Program	5 June 2006
Paprika-1: Daily drilling reports & mud logging data	11-29 June 2006
Smegsy-1: CD containing cement bond log (SBT)	20 June 2006
Rossco-1: Well completion report (CD & hard copy)	23 June 2006
Cadenza-1: CD containing final logs from Baker Atlas	6 July 2006
Paprika-1: CD containing final logs from Baker Atlas	8 July 2006
Rossco-1: CD containing revised well completion report	28 July 2006
Paprika-1: Paper prints 1:200 of wireline logs	27 July 2006
Karla seismic survey: Final Operations Report	19 October 2006
Karla seismic survey: Final Operations Report (replacement)	24 October 2006
Paranta 3D seismic survey: Magnetic tapes, 3 DVDs containing operations report and support data	10 November 2006
Paranta 3D seismic survey: CD and hard copy of final operations report	13 November 2006
Cadenza-1: Well completion report (CD & hard copy)	5 December 2006
Paprika-1: Well completion report (CD & hard copy)	22 December 2006
Karla seismic survey: Final interpretation report (CD & hard copy)	27 February 2007
Spinel seismic survey: Variation of Work Programme for Year 5	18 May 2007
Paranta Block JV Interpretive Log Analysis Project	7 June 2007
2007 Spinel 3D Seismic Survey Environmental Report	7 June 2007

4.3 Planned Exploration Program for Permit Year Five

At this stage the main focus of Year 5 exploration will be contingent upon the testing outcome of the Cadenza-1 and Paprika-1 wells and interpretation of the Spinel 3D, Paranta 3D and Karla 2D seismic surveys. Studies are currently underway to appreciate where analogs to the Raven field may be developed, especially along the western corridor of the Permit.

4.4 Associated Facilities Licences (AFL)

In order to conduct the Spinel seismic survey in PEL 106 eleven AFLs (AFL 71 to 81) were applied for during the Permit Year Four. Application for these AFLs was lodged on 26th October 2006. AFLs were granted on 11th December 2006.

5. EXPENDITURE STATEMENT

A licence expenditure summary for the period from 9 April 2006 to 8 April 2007 is presented in the following Table.

Table: Statement of Expenditure in PEL 106 for Fourth Permit Year

Activity	Amount
Commercial in Confidence	

5. COMPLIANCE WITH THE STATEMENTS OF ENVIRONMENTAL OBJECTIVES

A 1) DRILLING OPERATIONS

To meet the work program commitments for Year 4 of PEL 106, three exploration wells have been drilled: Cadenza-1, Paprika-1 and Tennyson-1 (the latter was operated by Beach Petroleum).

Government approval for Great Artesian to drill the Cadenza-1 and Paprika-1 wells was conditional upon Great Artesian committing to achieving the objectives defined in the "Statement of Environmental Objectives: Drilling and Well Operations" (November 2003), prepared by Santos for the South Australia Cooper Basin Operators.

The Cadenza-1 and Paprika-1 wells did encounter commercial indications of hydrocarbons and were cased and suspended pending extended production testing. The testing will take place later in 2007 year. Wells will remain cased and suspended until all engineering studies have been completed. Due to the requirement for continuing access, no rehabilitation has yet been undertaken of the sites or access roads.

The Tennyson-1 well, which was operated by Beach, did not encounter commercial indications of hydrocarbons and was plugged and abandoned in accordance with the guidelines specified in the SEO.

To date Great Artesian is satisfied that all the objectives required by the SEO were met. The spreadsheets below summarise the strategies that were employed to accomplish this compliance.

ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO WELL NAME: CADENZA-1				
OBJECTIVE	**COMMENT**	**GUIDE TO HOW OBJECTIVES CAN BE ACHIVED**	**ASSESSMENT CRITERIA**	**PERFORMANCE IN ACHIEVING OBJECTIVE**
Objective 1: ***Minimise the risk to public and other third parties.***	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. 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.	• 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.	▪ Reasonable measures implemented to ensure no injuries to the public or third parties.	The design and operation of the Cadenza-1 well was undertaken in accordance with Great Artesian safety policies, standards and guidelines. All employees undertook a safety induction prior to commencing work in the field and will undertake a refresher course if/when required. Cadenza-1 well was cased and suspended. The 2.5 - kilometre access track to Cadenza-1 turns off the Welcome Lake to Paranta-1 road, which is not open for public use. The drilling operations were not visible from the track. Signage was erected along the access track to advise that only authorised personnel were permitted on to the well site.

Objective 1: ***(Continued)*** ***Minimise the risk to public and other third parties.***	The backfilling of the well cellar and the removal of rubbish from the restored well site should be carried out 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.	▪ 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. ▪ All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards.		Accident / incident reporting systems were in place as defined in the Great Artesian Drilling Operation Manual. Records are reviewed regularly to assess trends. Great Artesian safety management plans are updated and reviewed on a regular basis. Appropriate PPE was issued to all personnel involved in the drilling operations.

Objective 1: ***(Continued)*** ***Minimise the risk to public and other third parties.***	The movement of heavy equipment associated with rig moves present a risk to the safety of employees, contractors and third parties (ie tourists).	▪ 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.		An Emergency Response Plan (ERP) was prepared for the drilling operations at Cadenza-1, and all personnel involved in the operations were aware of the Emergency Response Plan. However, no situation arose that required the implementation of the Plan. Great Artesian undertakes regular ERP exercises at selected drilling operations. Great Artesian maintained regular contact with landholders and associated stakeholders during the drilling operations at the Cadenza-1 site.

Objective 2 : ***Minimise disturbance and avoid contamination to soil.***	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).	<u>Well Site and Access Track Construction</u> ▪ 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. <u>Production Testing / Well Blowdowns</u> ▪ If appropriate use: - impermeable flare pit - flare tanks.	<u>Well Site and Access Track Construction</u> ▪ 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).	Site construction was in accordance with the guidelines outlined in Guidelines for Lease Construction and Restoration. There were no gibber pavements along the access track or at the Cadenza-1 well site. Topsoil was stockpiled for subsequent respreading when restoration activities are conducted. Vehicle movements were strictly limited to the defined access track and well pad area – areas which had been given cultural heritage clearance for the drilling operations. The Cadenza-1 well has been cased and suspended prior to production testing. If this production testing does not prove commercial producible hydrocarbons then the appropriate P/A program will be implemented.

Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***			<u>Borrow pit construction and restoration</u> ▪ 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. <u>Production Testing / Well Blowdowns</u> • No soil contamination as a result of production testing or well blowdown operations. <u>Fuel and Chemical Storage and Handling</u> ▪ No spills/leaks outside of areas designed to contain them.	Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating. No Production testing was undertaken at Cadenza-1. Production testing will take place at a later date. All fuel, oil and chemicals were stored in accordance with relevant standards. Refuelling was undertaken as per Drilling Contractors' procedures. There were no spills during the drilling operations that required reporting or corrective action to be taken in accordance with the Great Artesian Incident Reporting system. There were no spills during the drilling operations outside of areas designed to contain them.
		<u>Fuel and Chemical Storage and Handling</u> ▪ All fuel, oil and chemical storages bunded in accordance with the appropriate standards.		

Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***		• 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. <u>Spill Response / Contingency Planning</u> 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.	▪ Level of hydrocarbon continually decreasing for in situ remediation of spills. ▪ Soils remediated to a level as determined by the SHI process.	Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.

Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***		<u>Waste Disposal (domestic, sewage and sludges)</u> ▪ 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.	▪ 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.	Wastes were managed as described in the Cooper Basin Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.
Objective 3 : ***Avoid introduction or spread of pest plants and animals and implement control measures as necessary.***	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.	▪ 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.	▪ No weeds or feral animals are introduced to operational areas.	Drilling rig, associated equipment and all vehicles have already been working in the Cooper Basin prior to commencing the drilling operations at Cadenza-1.

Objective 4 : ***Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.***	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. 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.	<u>Drilling Mud Sumps and Flare Pits</u> ▪ 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.	<u>Well Lease and Access Track Construction</u> ▪ 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). <u>Drilling Mud Sumps and Flare Pits</u> ▪ No overflow of drill cuttings, muds and other drilling fluids from mud sumps. ▪ No waste material disposal to sumps and flare pits.	The Cadenza-1 well site was not located in an area where flooding from local watercourses is likely to occur. The drill pad and access track were constructed and situated to ensure that, in the event of local inundation, the flood waters would not be diverted from their natural flow direction. All drill cuttings, muds and non toxic drill fluids were contained within designated mud sumps with adequate freeboard at the completion of operations to allow for a 1m cover of clean fill at remediation.

Objective 4 : ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***	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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ 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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ No leaks/spills outside of areas designed to contain them.	Cadenza-1 well was cased and suspended. There was no requirement for a well head.
		<u>Well Blowdown / Production Testing</u> ▪ Activity is conducted in accordance with accepted industry standards / good oilfield practice. ▪ If appropriate use: - impermeable flare pit - flare tanks - separators - supervision	<u>Well Blowdown/Production Testing</u> ▪ No water (surface or groundwater) contamination as a result of production testing or well blowdown operations.	No Production testing was undertaken at Cadenza-1. The testing will be carried out at a later date.

Objective 4 ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.)***		Fuel and Chemical Storage and Handling ▪ All fuel, oil and chemical storages bunded 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.	Fuel/Chemical Storage and Handling ▪ No leaks/spills outside of areas designed to contain them.	Specific oil spill containment / cleanup materials were on site at all times. All fuel, oil and chemicals were in accordance with relevant standards. Refuelling was undertaken as per Drilling Contractors' procedures. There were no spills during the drilling operations outside of areas designed to contain them.

Objective 4 (Continued) ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.)***	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. 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.	<u>Spill Response / Contingency Planning</u> ▪ 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.		Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.

Objective 5 : ***Avoid disturbance to sites of cultural and heritage significance***.	The aim of the objective is to ensure that any sites of cultural (Aboriginal or non-Aboriginal) heritage significance are identified and protected.	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.	▪ 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. *Note:* 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.	Great Artesian has an agreement with the Dieri Aboriginal Corporation Native Title Claimant group which specifies the requirements for scouting areas proposed for well sites and access tracks to identify and avoid areas of heritage value and archaeological significance. A site visit was carried out with representatives from the Native Title Claimant group. Proposed drilling locations and access routes were agreed and given heritage clearance. Areas of significance were recorded and marked as exclusion zones.

Objective 6 : ***Minimise loss of aquifer pressures and avoid aquifer contamination***.	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. 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. The following geological formations are aquifers in the Cooper-Eromanga Basins. • Eyre, Winton & Mackunda; • Coorikiana & Cadna-owie; • Murta (incl. McKinlay Mbr) • Namur, Adori & Birkhead;	<u>Drilling & Completion Activities:</u> ▪ A competent cement bond between aquifer and hydrocarbon reservoirs is demonstrated. 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. <u>Producing, Injection and, Inactive Wells</u> ▪ 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.	<u>Drilling & Completion Activities</u> ▪ 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. <u>Producing, Injection, Inactive and Abandoned Wells</u> ▪ No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC.	

Objective 6 : ***(Continued)*** ***(Minimise loss of aquifer pressures and avoid aquifer contamination)***	• Hutton, Poolowanna; • Cuddapan; Nappamerri Group, Walkandi and Peera Peera formations; Toolachee; Daralingie; • Epsilon, Patchawarra or Mt Toodna or Purni. • Tirrawarra sandstone or Stuart Range; Merrimelia; Boorthanna; Crown Point formations and Basement reservoirs. **Note**: Crossflow (if it occurs), should not compromise the long term sustainability of a particular resource.	Well Abandonment Activities: ▪ Isolation barriers are set in place to ensure that cross-flow, contamination or pressure reduction will not occur. ▪ 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.		

Objective 7: ***Minimise disturbance to native vegetation and native fauna***.	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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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. <u>Borrow Pits Construction and Restoration</u> ▪ 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.	The Cadenza-1 well was not located in or near areas of high biological or wilderness values and hence the drilling operation presented no long term impact to any such area. National Parks and Wildlife flora/fauna databases contain no records of vulnerable or endangered species within 30km of the site. Access track construction required minimal clearance of vegetation and was aligned to avoid clearing trees. The site contained sparse vegetation, and clearance was minimised. Trees that were present on the site and adjacent to the site were not cleared. Facilities were designed and constructed to minimise fauna entrapment. Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, to attain the highest feasible GAS rating.

Objective 7: ***(Continued)*** ***(Minimise disturbance to native vegetation and native fauna*)**		Waste Management ▪ 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.	Waste Management ▪ Refer to assessment criteria for Objective 11. ▪ Fuel and Chemical Storage and Management ▪ Refer to assessment criteria for Objectives 2 and 4.	Great Artesian's Drilling Operations Manual sets out the company's policy in relation to storage, use and disposal of hazardous material. At the Cadenza-1 well site wastes were managed as described in the Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

Objective 8 : ***Minimise air pollution and greenhouse gas emissions.***	Atmospheric emissions occur as a result of standard practices undertaken during drilling and well operations. Emission**s** of particular environmental significance are: ▪ combustion by-products (eg. oxides of nitrogen, carbon monoxide and sulphur dioxide); ▪ organic carbon and carbon particulates (black smoke); and ▪ flared/vented hydrocarbons (gases).	<u>Well Testing</u> ▪ 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. <u>Well Blowdown</u> ▪ 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.	▪ Compliance with EPA requirements.	Two Drill Stem Tests were run during drilling operations at the Cadenza-1 well. Flaring of gas was kept to a practical minimum.

Objective 9 : ***Maintain and enhance partnerships with the Cooper Basin community.***	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.	▪ 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.	▪ No unresolved reasonable complaints from the community.	Great Artesian maintained regular contact with landholders and associated stakeholders prior to and while undertaking drilling operations at the Cadenza -1 site. Great Artesian donates money to the Royal Flying Doctor Service.

Objective 10 : ***Avoid or minimise disturbance to stakeholders and/or associated infrastructure.***	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.	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.	▪ No reasonable stakeholder complaints left unresolved.	Great Artesian maintained regular contact with landholders and associated stakeholders prior to and while undertaking drilling operations at the Cadenza-1 site. The access track and well were located away from tourist routes. The Cadenza-1 well site was not located near a cattle watering point and cattle were not present in significant numbers. Major de-stocking has occurred in this region due to prolonged drought conditions. When the initial lease restoration was conducted, suitable fencing was erected to isolate any pits or plant installed in site.

Objective 11 : ***Optimise waste reduction and recovery.***	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.	▪ Bulk chemical and oil purchasing and use of "bulk bins" or other storage tanks in place for large volume items.	▪ 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).	Waste was removed from the Cadenza-1 well site in accordance with Great Artesian policy set out in the company's Drilling Operations Manual. Non-putrescible waste material (including hazardous material) was stored safely on site for later removal to an EPA approved disposal facility.

Objective 12 : ***Remediate and rehabilitate operational areas to agreed standards.***		Rehabilitation / abandonment plans for surface activities will be developed in consultation with relevant stakeholders Well Site and Access Track Restoration ▪ Compacted soil areas have been ripped (except on gibber and tablelands) and soil profile and contours are reinstated following completion of operations.	▪ No unresolved reasonable stakeholder complaints. Contaminated Site Remediation ▪ 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. Well Site and Access Track Restoration - The attainment of 0, +1 or +2 GAS criteria for (refer Appendix 4): - "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"	Well site will be restored as per the standards and procedures detailed in the Cooper Basin SEO for Drilling and Well Operations (2003) and internal guidelines. Restoration of the well site will proceed when the sump pits have dried and earthmoving machinery is available in the vicinity. Contaminated sites were remediated in accordance with Great Artesian's Guidelines and Industry Standards. The Cadenza-1 borrow pits, well site and the access track will be rehabilitated (if the production testing does not indicate commercially producible quantities of hydrocarbons) and restored in accordance with the guidelines set down in PIRSA's Field Guide to attain the highest feasible GAS rating.

Objective 12 : ***Continued)*** ***(Remediate and rehabilitate operational areas to agreed standards)***			Borrow Pit Restoration ▪ The attainment of 0, +1 or +2 GAS criteria (refer Appendix 5) for: "minimise impact on vegetation", "minimise impact on soil", "Minimise visual impacts" Note: Well abandonment issues addressed under objective 6.	

ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO WELL NAME: PAPRIKA-1				
OBJECTIVE	**COMMENT**	**GUIDE TO HOW OBJECTIVES CAN BE ACHIVED**	**ASSESSMENT CRITERIA**	**PERFORMANCE IN ACHIEVING OBJECTIVE**
Objective 1: ***Minimise the risk to public and other third parties.***	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. 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.	▪ 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.	▪ Reasonable measures implemented to ensure no injuries to the public or third parties.	The design and operation of the Paprika-1 well was undertaken in accordance with Great Artesian safety policies, standards and guidelines. All employees undertook a safety induction prior to commencing work in the field and will undertake a refresher course if/when required. Paprika-1 well was cased and suspended. The 4 - kilometre access track to Paprika-1 turns off the Jack Lake to Welcome Lake road, which is not open for public use. The drilling operations were not visible from the track. Signage was erected along the access track to advise that only authorised personnel were permitted on to the well site.

Objective 1: ***(Continued)*** ***Minimise the risk to public and other third parties.***	The backfilling of the well cellar and the removal of rubbish from the restored well site should be carried out 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.	▪ 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. ▪ All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards.		Accident / incident reporting systems were in place as defined in the Great Artesian Drilling Operation Manual. Records are reviewed regularly to assess trends. Great Artesian safety management plans are updated and reviewed on a regular basis. Appropriate PPE was issued to all personnel involved in the drilling operations.

Objective 1: ***(Continued)*** ***Minimise the risk to public and other third parties.***	The movement of heavy equipment associated with rig moves present a risk to the safety of employees, contractors and third parties (ie tourists).	▪ 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.		An Emergency Response Plan (ERP) was prepared for the drilling operations at Paprika-1, and all personnel involved in the operations were aware of the Emergency Response Plan. However, no situation arose that required the implementation of the Plan. Great Artesian undertakes regular ERP exercises at selected drilling operations. Great Artesian maintained regular contact with landholders and associated stakeholders during the drilling operations at the Paprika-1 site.

Objective 2 : ***Minimise disturbance and avoid contamination to soil.***	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).	<u>Well Site and Access Track Construction</u> ▪ 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. <u>Production Testing / Well Blowdowns</u> ▪ If appropriate use: - impermeable flare pit - flare tanks.	<u>Well Site and Access Track Construction</u> ▪ 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). <u>Production Testing / Well Blowdowns</u> ▪ No soil contamination as a result of production testing or well blowdown operations.	Site construction was in accordance with the guidelines outlined in Guidelines for Lease Construction and Restoration. There were no gibber pavements along the access track or at the Paprika-1 well site. Topsoil was stockpiled for subsequent respreading when restoration activities are conducted. Vehicle movements were strictly limited to the defined access track and well pad area – areas which had been given cultural heritage clearance for the drilling operations. The Paprika-1 well has been cased and suspended prior to production testing. If this production testing does not prove commercial producible hydrocarbons then the appropriate P/A program will be implemented.

Objective 2 : ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***			<u>Borrow pit construction and restoration</u> ▪ 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. <u>Production Testing / Well Blowdowns</u> ▪ No soil contamination as a result of production testing or well blowdown operations. <u>Fuel and Chemical Storage and Handling</u> ▪ No spills/leaks outside of areas designed to contain them.	Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating. No Production testing was undertaken at Paprika-1. All fuel, oil and chemicals were stored in accordance with relevant standards. Refuelling was undertaken as per Drilling Contractors' procedures. There were no spills during the drilling operations that required reporting or corrective action to be taken in accordance with the Beach Incident Reporting system. There were no spills during the drilling operations outside of areas designed to contain them.
		<u>Fuel and Chemical Storage and Handling</u> ▪ All fuel, oil and chemical storages bunded 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.	▪ Level of hydrocarbon continually decreasing for in situ remediation of spills. ▪ Soils remediated to a level as determined by the SHI process.	
Objective 2 : ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil.)***		▪ 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. <u>Spill Response / Contingency Planning</u> ▪ 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.		Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.

		<u>Waste Disposal (domestic, sewage and sludges)</u> ▪ 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.	▪ 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.	Wastes were managed as described in the Cooper Basin Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

<u>Objective 3 :</u> ***Avoid introduction or spread of pest plants and animals and implement control measures as necessary.***	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.	▪ 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.	▪ No weeds or feral animals are introduced to operational areas.	Drilling rig, associated equipment and vehicles have already been working in the Cooper Basin prior to commencing the drilling operations at Paprika-1.

Objective 4 : ***Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.***	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. 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.	Drilling Mud Sumps and Flare Pits ▪ 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.	Well Lease and Access Track Construction ▪ 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). Drilling Mud Sumps and Flare Pits ▪ No overflow of drill cuttings, muds and other drilling fluids from mud sumps. ▪ No waste material disposal to sumps and flare pits.	The Paprika-1 well site was not located in an area where flooding from local watercourses is likely to occur. The drill pad and access track were constructed and situated to ensure that, in the event of local inundation, the flood waters would not be diverted from their natural flow direction. All drill cuttings, muds and non toxic drill fluids were contained within designated mud sumps with adequate freeboard at the completion of operations to allow for a 1m cover of clean fill at remediation.

Objective 4 : ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***	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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ 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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ No leaks/spills outside of areas designed to contain them.	Paprika-1 well was cased and suspended. There was no requirement for a well head.
		<u>Well Blowdown / Production Testing</u> ▪ Activity is conducted in accordance with accepted industry standards / good oilfield practice. ▪ If appropriate use: - impermeable flare pit - flare tanks - separators - supervision	<u>Well Blowdown/Production Testing</u> ▪ No water (surface or groundwater) contamination as a result of production testing or well blowdown operations.	No Production testing was undertaken at Paprika-1.

Objective 4 : ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***		Fuel and Chemical Storage and Handling ▪ All fuel, oil and chemical storages bunded 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.	Fuel/Chemical Storage and Handling ▪ No leaks/spills outside of areas designed to contain them.	Specific oil spill containment / cleanup materials were on site at all times. All fuel, oil and chemicals were in accordance with relevant standards. Refuelling was undertaken as per Drilling Contractors' procedures. There were no spills during the drilling operations outside of areas designed to contain them.

Objective 4 : ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***	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. 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.	<u>Spill Response / Contingency Planning</u> ▪ 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.		Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.

Objective 5 : ***Avoid disturbance to sites of cultural and heritage significance***.	The aim of the objective is to ensure that any sites of cultural (Aboriginal or non-Aboriginal) heritage significance are identified and protected.	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.	▪ 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. *Note:* 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.	Great Artesian has an agreement with the Dieri Aboriginal Corporation Native Title Claimant group which specifies the requirements for scouting areas proposed for well sites and access tracks to identify and avoid areas of heritage value and archaeological significance. A site visit was carried out with representatives from the Native Title Claimant group. Proposed drilling locations and access routes were agreed and given heritage clearance. Areas of significance were recorded and marked as exclusion zones.

Objective 6 : ***Minimise loss of aquifer pressures and avoid aquifer contamination***.	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. 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. 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:	Drilling & Completion Activities: ▪ A competent cement bond between aquifer and hydrocarbon reservoirs is demonstrated. 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. Producing, Injection and, Inactive Wells ▪ 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.	Drilling & Completion Activities: ▪ 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. Producing, Injection, Inactive and Abandoned Wells ▪ No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC.	

Objective 6 : ***(Continued)*** ***(Minimise loss of aquifer pressures and avoid aquifer contamination)***.	• Eyre, Winton & Mackunda; • Coorikiana & Cadna-owie; • Murta (incl. McKinlay Mbr) • Namur, Adori & Birkhead; • Hutton, Poolowanna; • Cuddapan; Nappamerri Group formations, Walkandi and Peera Peera formations • Toolachee; Daralingie; • Epsilon, Patchawarra or Mt Toodna or Purni; • Tirrawarra sandstone or Stuart Range; Merrimelia; Boorthanna; Crown Point formations and Basement reservoirs. **Note**: Crossflow (if it occurs), should not compromise the long term sustainability of a particular resource.	Well Abandonment Activities: ▪ Isolation barriers are set in place to ensure that cross-flow, contamination or pressure reduction will not occur ▪ 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.		

Objective 7 : ***Minimise disturbance to native vegetation and native fauna***.	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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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. <u>Borrow Pits Construction and Restoration</u> ▪ 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.	The Paprika-1 well was not located in or near areas of high biological or wilderness values and hence the drilling operation presented no long term impact to any such area. National Parks and Wildlife flora/fauna databases contain no records of vulnerable or endangered species within 30km of the site. Access track construction required minimal clearance of vegetation and was aligned to avoid clearing trees. The site contained sparse vegetation, and clearance was minimised. Trees that were present on the site and adjacent to the site were not cleared. Facilities were designed and constructed to minimise fauna entrapment. Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating.

Objective 7 : (Continued) ***(Minimise disturbance to native vegetation and native fauna)***		Waste Management ▪ 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.	Waste Management ▪ Refer to assessment criteria for Objective 11. Fuel and Chemical Storage and Management ▪ Refer to assessment criteria for Objectives 2 and 4.	Great Artesian's Drilling Operations Manual sets out the company's policy in relation to storage, use and disposal of hazardous material. At the Paprika-1 well site wastes were managed as described in the Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

Objective 8 : ***Minimise air pollution and greenhouse gas emissions.***	Atmospheric emissions occur as a result of standard practices undertaken during drilling and well operations. Emissions of particular environmental significance are: ▪ combustion by-products (eg. oxides of nitrogen, carbon monoxide and sulphur dioxide); ▪ organic carbon and carbon particulates (black smoke); and ▪ flared/vented hydrocarbons (gases).	Well Testing ▪ 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. Well Blowdown ▪ 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.	▪ Compliance with EPA requirements.	Three Drill Stem Tests were run at the Paprika-1 well. Flaring of gas was kept to a practical minimum.

Objective 9: ***(Maintain and enhance partnerships with the Cooper Basin community)***	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.	▪ 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.	▪ No unresolved reasonable complaints from the community.	Great Artesian maintained regular contact with landholders and associated stakeholders prior to and while undertaking drilling operations at the Paprika-1 site. Great Artesian donates money to the Royal Flying Doctor Service.

Objective 10 : ***Avoid or minimise disturbance to stakeholders and/or associated infrastructure***	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.	▪ 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.	▪ No reasonable stakeholder complaints left unresolved.	Great Artesian maintained regular contact with landholders and associated stakeholders prior to and while undertaking drilling operations at the Paprika-1 site. The access track and well were located away from tourist routes. The Paprika-1 well site was not located near a cattle watering point and cattle were not present in significant numbers. Major de-stocking has occurred in this region due to prolonged drought conditions. When the initial lease restoration was conducted, suitable fencing was erected to isolate any pits or plant installed in site.

Objective 11 : ***Optimise waste reduction and recovery.***	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.	▪ Bulk chemical and oil purchasing and use of "bulk bins" or other storage tanks in place for large volume items.	▪ 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).	Waste was removed from the Paprika-1 well site in accordance with Great Artesian's policy set out in the company's Drilling Operations Manual. Non-putrescible waste material (including hazardous material) was stored safely on site for later removal to an EPA approved disposal facility.

Objective 12 : ***Remediate and rehabilitate operational areas to agreed standards.***		Rehabilitation / abandonment plans for surface activities will be developed in consultation with relevant stakeholders Well Site and Access Track Restoration ▪ Compacted soil areas have been ripped (except on gibber and tablelands) and soil profile and contours are reinstated following completion of operations.	▪ No unresolved reasonable stakeholder complaints. Contaminated Site Remediation ▪ 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. Well Site and Access Track Restoration ▪ The attainment of 0, +1 or +2 GAS criteria for (refer Appendix 4): - "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"	Well site will be restored as per the standards and procedures detailed in the Cooper Basin SEO for Drilling and Well Operations (2003) and internal guidelines. Restoration of the well site will proceed when the sump pits have dried and earthmoving machinery is available in the vicinity. Contaminated sites were remediated in accordance with Great Artesian Guidelines and Industry Standards. The Paprika-1 borrow pits and well site will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating.

Objective 12 : ***(Continued)*** ***Remediate and rehabilitate operational areas to agreed standards.***			Borrow Pit Restoration ▪ The attainment of 0, +1 or +2 GAS criteria (refer Appendix 5) for: "minimise impact on vegetation", "minimise impact on soil", "minimise visual impacts" ▪ *Note:* Well abandonment issues addressed under objective 6.	

ASSESSMENT OF BEACH PETROLEUM'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO WELL NAME: TENNYSON-1				
OBJECTIVE	**COMMENT**	**GUIDE TO HOW OBJECTIVES CAN BE ACHIEVED**	**ASSESSMENT CRITERIA**	**PERFORMANCE IN ACHIEVING OBJECTIVE**
Objective 1: ***Minimise the risk to public and other third parties.***	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. 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.	▪ 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.	▪ Reasonable measures implemented to ensure no injuries to the public or third parties.	The design and operation of the Tennyson-1 well was undertaken in accordance with Beach safety policies, standards and guidelines. All employees undertook a safety induction prior to commencing work in the field and will undertake a refresher course if/when required. Tennyson-1 was plugged and abandoned, as no commercial quantities of hydrocarbons were encountered. The 5 - kilometre access track to the well site commenced from an existing station track on Mungeranie station, which is not open for public use. The drilling operations were not visible from the track. Signage was erected along the access track to advise that only authorised personnel were permitted on to the well site. Beach Permit to Work system was in operation during the drilling operations to control potentially dangerous situations.

Objective 1: ***(Continued)*** ***(Minimise the risk to public and other third parties)*** .	The backfilling of the well cellar and the removal of rubbish from the restored well site should be carried out 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.	▪ 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. ▪ All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards.		Accident / incident reporting systems were in place as defined in the Beach Drilling Operation Manual. Records are reviewed regularly to assess trends. Beach safety management plans are updated and reviewed on a regular basis. Appropriate PPE was issued to all personnel involved in the drilling operations.

Objective 1: ***(Continued)*** ***(Minimise the risk to public and other third parties)***	The movement of heavy equipment associated with rig moves present a risk to the safety of employees, contractors and third parties (ie tourists).	▪ 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.		An Emergency Response Plan (ERP) was prepared for the drilling operations at Middleton-1, and all personnel involved in the operations were aware of the Emergency Response Plan. However, no situation arose that required the implementation of the Plan. Beach undertakes regular ERP exercises at selected drilling operations. Beach maintained regular contact with landholders and associated stakeholders during the drilling operations at the Tennyson-1 site.

Objective 2 : ***Minimise disturbance and avoid contamination to soil.***	▪ 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).	▪ <u>Well Site and Access Track Construction</u> ▪ 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. <u>Production Testing / Well Blowdowns</u> ▪ If appropriate use: - impermeable flare pit - flare tanks.	<u>Well Site and Access Track Construction</u> ▪ 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).	Site construction was in accordance with the guidelines outlined in Guidelines for Lease Construction and Restoration. There were no gibber pavements along the access track or at the Tennyson-1 well site. Topsoil was stockpiled for subsequent respreading when restoration activities are conducted. Vehicle movements were strictly limited to the defined access track and well pad area – areas which had been given cultural heritage clearance for the drilling operations. Restoration of the well site will proceed when the sump pits have dried and earthmoving machinery is available in the vicinity. The rehabilitation will be in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia to attain the highest feasible GAS rating.

Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil.)***			Borrow pit construction and restoration ▪ 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. Production Testing / Well Blowdowns ▪ No soil contamination as a result of production testing or well blowdown operations.	Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating. No production testing was undertaken at Tennyson-1. All fuel, oil and chemicals were stored in accordance with relevant standards. Refuelling was undertaken as per Drilling Contractors' procedures. There were no spills during the drilling operations that required reporting or corrective action to be taken in accordance with the Beach Incident Reporting system.
		▪ Fuel and Chemical Storage and Handling ▪ All fuel, oil and chemical storages bunded in accordance with the appropriate standards	Fuel and Chemical Storage and Handling ▪ No spills/leaks outside of areas designed to contain them.	▪ There were no spills during the drilling operations outside of areas designed to contain them.

Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil.)***		▪ 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. <u>Spill Response / Contingency Planning</u> ▪ 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.	▪ Level of hydrocarbon continually decreasing for in situ remediation of spills. ▪ Soils remediated to a level as determined by the SHI process.	Beach's Oil Spill Contingency Plan is included in the Emergency Response Plan.

Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil.)***		▪ Waste Disposal (domestic, sewage and sludges) ▪ 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.	▪ All domestic wastes are disposed of in accordance with EPA licensing requirements. ▪ 0, +1 or +2 GAS criteria for 'Waste material' objective are attained. ▪ No spills or leaks from sewage treatment process and sludge pits	Wastes were managed as described in the Cooper Basin Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

Objective 3 : ***Avoid introduction or spread of pest plants and animals and implement control measures as necessary.***	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.	Pits are not established in locations, which pose an unacceptable hazard to stock or wildlife. ▪ 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.	▪ No weeds or feral animals are introduced to operational areas.	Drilling rig and associated equipment and vehicles had already been working in the Cooper Basin prior to commencing the drilling operations at Tennyson-1.

Objective 4 : ***Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.***	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. 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.	Drilling Mud Sumps and Flare Pits ▪ 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.	Well Lease and Access Track Construction ▪ 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). Drilling Mud Sumps and Flare Pits ▪ No overflow of drill cuttings, muds and other drilling fluids from mud sumps. ▪ No waste material disposal to sumps and flare pits.	The Tennyson-1 well site was not located in an area where flooding from local watercourses is likely to occur. The drill pad and access track were constructed and situated to ensure that, in the event of local inundation, the flood waters would not be diverted from their natural flow direction. All drill cuttings, muds and non toxic drill fluids were contained within designated mud sumps with adequate freeboard at the completion of operations to allow for a 1m cover of clean fill at remediation.

Objective 4 : ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***	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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ 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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ No leaks/spills outside of areas designed to contain them.	Tennyson-1 well was plugged and abandoned.
		<u>Well Blowdown / Production Testing</u> ▪ Activity is conducted in accordance with accepted industry standards / good oilfield practice. ▪ If appropriate use: - impermeable flare pit - flare tanks - separators - supervision	<u>Well Blowdown/Production Testing</u> ▪ No water (surface or groundwater) contamination as a result of production testing or well blowdown operations.	During the drilling operations at Tennyson-1, testing was undertaken at two levels to determine if hydrocarbons were present in potentially commercial volumes for production. No contamination of surface water resulted from these tests.

Objective 4: ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***		Fuel and Chemical Storage and Handling ▪ All fuel, oil and chemical storages bunded 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.	Fuel/Chemical Storage and Handling ▪ No leaks/spills outside of areas designed to contain them.	Specific oil spill containment / cleanup materials were on site at all times. All fuel, oil and chemicals were in accordance with relevant standards. Refuelling was undertaken as per Drilling Contractors' procedures. There were no spills during the drilling operations outside of areas designed to contain them.

Objective 4: ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***	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. 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.	<u>Spill Response / Contingency Planning</u> ▪ 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.		Beach's Oil Spill Contingency Plan is included in the Emergency Response Plan.

Objective 5 : ***Avoid disturbance to sites of cultural and heritage significance***.	The aim of the objective is to ensure that any sites of cultural (Aboriginal or non-Aboriginal) heritage significance are identified and protected.	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.	▪ 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. *Note:* 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.	Beach has an agreement with the Dieri Aboriginal Corporation Native Title Claimant group which specifies the requirements for scouting areas proposed for well sites and access tracks to identify and avoid areas of heritage value and archaeological significance. A site visit was carried out with representatives from the Native Title Claimant group. Proposed drilling locations and access routes were agreed and given heritage clearance. Areas of significance were recorded and marked as exclusion zones.

Objective 6 : ***Minimise loss of aquifer pressures and avoid aquifer contamination***.	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. 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. 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	Drilling & Completion Activities: ▪ A competent cement bond between aquifer and hydrocarbon reservoirs is demonstrated. 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. Producing, Injection and, Inactive Wells ▪ 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	Drilling &Completion Activities: ▪ 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. Producing, Injection, Inactive and Abandoned Wells ▪ No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC.	

	isolation will be maintained between these groups:	remediated.		
Objective 6 : ***(Continued)*** ***(Minimise loss of aquifer pressures and avoid aquifer contamination)***	• Eyre, Winton & Mackunda; • Coorikiana & Cadna-owie; • Murta (incl. McKinlay Mbr) • Namur, Adori & Birkhead;, • Hutton, Poolowanna; • Cuddapan; Nappamerri Group formations, • Walkandi and Peera Peera formations • Toolachee; Daralingie; • Epsilon, Patchawarra or Mt Toodna or Purni; • Tirrawarra sandstone or Stuart Range; Merrimelia; Boorthanna; Crown Point formations and Basement reservoirs. **Note**: Crossflow (if it occurs), should not compromise the long term sustainability of a particular resource.	Well Abandonment Activities: ▪ Isolation barriers are set in place to ensure that cross-flow, contamination or pressure reduction will not occur. ▪ 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.		

Objective 7: ***Minimise disturbance to native vegetation and native fauna***	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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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. <u>Borrow Pits Construction and Restoration</u> ▪ 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.	The Tennyson-1 well was not located in or near areas of high biological or wilderness values and hence the drilling operation presented no long term impact to any such area. National Parks and Wildlife flora/fauna databases contain no records of vulnerable or endangered species within 30km of the site. Access track construction required minimal clearance of vegetation and was aligned to avoid clearing trees. The site contained sparse vegetation, and clearance was minimised. Trees that were present on the site and adjacent to the site were not cleared. Facilities were designed and constructed to minimise fauna entrapment. Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating.

Objective 7: ***(Continued)*** ***(Minimise disturbance to native vegetation and native fauna*)**		Waste Management ▪ 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.	Waste Management ▪ Refer to assessment criteria for Objective 11. ▪ Fuel and Chemical Storage and Management ▪ Refer to assessment criteria for Objectives 2 and 4.	Beach's Drilling Operations Manual sets out the company's policy in relation to storage, use and disposal of hazardous material. At the Tennyson-1 well site wastes were managed as described in the Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

Objective 8 : ***Minimise air pollution and greenhouse gas emissions.***	Atmospheric emissions occur as a result of standard practices undertaken during drilling and well operations. Emission**s** of particular environmental significance are: ▪ combustion by-products (eg. oxides of nitrogen, carbon monoxide and sulphur dioxide); ▪ organic carbon and carbon particulates (black smoke); and ▪ flared/vented hydrocarbons (gases).	<u>Well Testing</u> ▪ 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. <u>Well Blowdown</u> ▪ 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.	▪ Compliance with EPA requirements.	Two Drill Stem Tests were run during drilling operations at the Tennyson-1 well. Flaring of gas was kept to a practical minimum.

Objective 9: ***Maintain and enhance partnerships with the Cooper Basin community***	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.	▪ 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.	▪ No unresolved reasonable complaints from the community.	Regular contact was maintained with landholders and associated stakeholders prior to and while undertaking drilling operations at the Tennyson-1 site.

Objective 10 : ***Avoid or minimise disturbance to stakeholders and/or associated infrastructure***	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.	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.	No reasonable stakeholder complaints left unresolved.	Regular contact was maintained with landholders and associated stakeholders prior to and while undertaking drilling operations at the Tennyson-1 site. The access track and well were located away from tourist routes. The landowner has requested that no rehabilitation be undertaken on the access track. The Tennyson-1 well site was not located near a cattle watering point and cattle were not present in significant numbers. Major de-stocking has occurred in this region due to prolonged drought conditions. When the initial lease restoration was conducted at the conclusion of drilling operations, suitable fencing was erected to isolate any pits or plant installed on site.

Objective 11 : ***Optimise waste reduction and recovery.***	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.	▪ Bulk chemical and oil purchasing and use of "bulk bins" or other storage tanks in place for large volume items.	▪ 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).	Waste was removed from the Tennyson-1 well site in accordance with Beach's policy set out in the company's Drilling Operations Manual. Non-putrescible waste material (including hazardous material) was stored safely on site for later removal to an EPA approved disposal facility.

Objective 12 : ***Remediate and rehabilitate operational areas to agreed standards.***		Rehabilitation / abandonment plans for surface activities will be developed in consultation with relevant stakeholders <u>Well Site and Access Track Restoration</u> ▪ Compacted soil areas have been ripped (except on gibber and tablelands) and soil profile and contours are reinstated following completion of operations.	▪ No unresolved reasonable stakeholder complaints. <u>Contaminated Site Remediation</u> ▪ 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. <u>Well Site and Access Track Restoration</u> ▪ The attainment of 0, +1 or +2 GAS criteria for (refer Appendix 4): - "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"	The Tennyson-1 well site will be restored as per the standards and procedures detailed in the Cooper Basin SEO for Drilling and Well Operations (2003) and internal guidelines. Restoration of the well site will proceed when the sump pits have dried and earthmoving machinery is available in the vicinity. The access track to the well site will not be rehabilitated, as requested by the landowner.

Objective 12 : ***(Continued)*** ***(Remediate and rehabilitate operational areas to agreed standards)***			Borrow Pit Restoration ▪ The attainment of 0, +1 or +2 GAS criteria (refer Appendix 5) for: "minimise impact on vegetation", "minimise impact on soil", "minimise visual impacts" ▪ *Note:* Well abandonment issues addressed under objective 6.	Restoration of the borrow pits and well site will be in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating. Contaminated sites were remediated in accordance with Beach Guidelines and Industry Standards.

5. COMPLIANCE WITH THE STATEMENTS OF ENVIRONMENTAL OBJECTIVES

B 1) EXTENDED PRODUCTION TESTING AT MIDDLETON-1

On August 18th, 2006, PIRSA approved an application by the PEL 106 Joint Venture to carry out an Extended Production Test on the Middleton-1 well.

The flow test for the well commenced on 15th September, 2006 and continued for nineteen days. A build-up test followed immediately afterwards, and continued for a further sixteen days.

The Joint Venture is currently evaluating the results of the test to determine the potential commercial viability of production from this well.

PIRSA's approval to conduct the EPT was conditional on the operator committing to achieving the objectives defined in the "Statement of Environmental Objectives - Cooper Basin Petroleum Production Operations", prepared by Beach Petroleum in November 2003.

An incident occurred during the EPT which constituted a non-compliance with Objective 6 of the SEO. A small volume of oily water spilt onto an area that was not within an earthen bund. Although the volume involved was not sufficient to classify the incident as a Serious Incident, a report was prepared and submitted to PIRSA.

Beach is satisfied that the EPT operations at Middleton met all other objectives required by the SEO, and the attached spreadsheet provides comments on the strategies that were employed to achieve this compliance.

ACHIEVEMENT OF ENVIRONMENTAL OBJECTIVES DURING THE EXTENDED PRODUCTION TEST ON MIDDLETON-1

TESTING PERIOD: 15th SEPTEMBER 2006 - 20th OCTOBER 2006

Objective	Goal	Measure / How	Objective Achieved	Performance Against Objectives
1. To avoid unnecessary disturbance to 3rd party infrastructure, landholders or land use	1.1 To minimise disturbance or damage to infrastructure / land use and remediate where disturbance cannot be avoided	Timely notification to adjacent landholders / 3rd party prior to & during new or significant works. Procedures in the POM, EMS and PIRSA guidelines address removal of waste products, re-instatement of soil profiles and rehabilitation. Incident reports	Where disturbance is unavoidable or accidental, infrastructure or land use is restored to as is reasonably appropriate to the original undisturbed condition or as agreed with the landholder	Landowner was notified of the intention to conduct an EPT at Middleton six weeks prior to commencement of operations. No additional land clearing was required outside of the area cleared initially for production.
	1.2 To minimise disturbance to landholders	Records of communications with adjacent landholders / 3rd parties Record of disturbance management through appropriate documentation	No unresolved reasonable landholder/3rd party complaints Landholder activities not restricted or disturbed as a result of activities unless by prior arrangement	There are no occupied dwellings within 10 kms of the Middleton site.
2. To maintain soil stability / integrity	2.1 To remediate erosion as a result of production operations in a timely manner	Inspections undertaken as part of regular patrols or following specific works or following significant storm events to look at evidence of erosion, subsidence, vegetation loss & compare to adjacent land Preventative measures implemented and monitored in susceptible areas (eg. monitor for salinisation/erosion effects)	The extent of soil erosion is consistent or less than surrounding land	No significant erosion has been reported either at the site nor along the access road.
	2.2 To prevent soil inversion	Inspections undertaken as part of regular patrols to look for soil discolouration and the success of vegetation return as an indicator Contractor to indicate top soil/subsoil are stockpiled separately and soil profiles appropriately reinstated following the rehabilitation of earthworks/excavations	Vegetation cover is consistent with surrounding land No evidence of significant subsoil on surface (colour)	Topsoil was stockpiled when the site was originally cleared for the drilling operations. Rehabilitation of the Middleton production site will be undertaken when production ceases.

Objective	Goal	Measure / How	Objective Achieved	Performance Against Objectives
	2.3 To minimise and remediate soil disturbance	Restrict activities (including vehicle access) to production areas and associated infrastructure and easements Minimise area required for safely undertaking activities in accordance with procedures Planning and assessment of proposed activities to minimise impact Design and construct road with drainage features (e.g. culverts and offtakes) to minimise erosion and sedimentation Rip areas of compacted soil (except on gibber plains and tableland environments Restored borrow pits have topsoil / overburden replaced and pit re-profiled where necessary to prevent erosion Contractor to indicate that soil profiles appropriately reinstated following the rehabilitation of earthworks/excavations	No production activities undertaken on salt lakes, steep tableland land systems or wetlands land systems (as defined in the EIR) Abandoned areas (e.g. borrow pits) are remediated and rehabilitated to be reasonably consistent with the surrounding area 0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B)	All vehicle movements are restricted to the designated access roads and the production facility area. Middleton production site and access track are located in a dunefield environment. The clay surface on the access roads minimises disturbance to the soil beneath. No significant drainage channels were traversed by the access road to the production site. Rehabilitation of the Middleton production sites and access tracks will be undertaken in consultation with the landowner when production ceases.

3. To minimise disturbance to native vegetation	3.1 To maintain regrowth of native vegetation on reinstated areas to be consistent with surrounding area	Disturbance management to facilitate regrowth in rehabilitated areas Follow-up rehabilitation work was undertaken where natural regeneration was inadequate	Species abundance and distribution on the reinstated areas was consistent with the surrounding area Note: assessment of the consistency with surrounding areas will take into account that regrowth is a time and rainfall dependent process 0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B)	Rehabilitation of the Middleton production site will include reestablishment of the topsoil to ensure regrowth of the native vegetation .
	3.2 To minimise additional clearing of native vegetation as part of production activities	Planning and assessment of proposed activities to minimise impact which may include consultation with Native Vegetation Council Avoid significant or priority vegetation and ensure proposed routes have been scouted for significant vegetation and wildlife habitats by appropriately trained and experienced personnel Use existing cleared areas for laydowns and turn-arounds Consideration of sensitive vegetation during vegetation trimming and / or clearing activities Vegetation trimmed rather than cleared where possible Minimise area required for safely undertaking activities in accordance with procedures	Vegetation clearing is limited to previously disturbed areas or areas assessed to be of lowest sensitivity No rare, vulnerable or endangered flora removed without appropriate permits No production activities undertaken on salt lakes, steep tableland land systems or wetlands land systems (as defined in the EIR) 0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B)	No additional clearing of native vegetation was required for the EPT.
	3.3 To ensure production activities are planned and conducted in a manner that minimises impacts on native fauna	Planning and assessment of proposed activities to minimise impact In event of earthworks, open trenches are monitored daily and not left open for more than 72 hours	Vegetation clearing is limited to previously disturbed areas or areas assessed to be of lowest sensitivity No rare, vulnerable or endangered fauna removed without appropriate permits 0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B)	No record of rare, vulnerable or endangered fauna in this area.

	3.4 To minimise disturbance of aquatic habitats (specifically wetlands, permanent waterholes and flowing water courses)	Obtain regulatory approval prior to undertaking disturbance in aquatic habitat (contact should be initially made with PIRSA during the planning process) Planning and assessment of proposed activities to minimise impact	Works in aquatic habitats (e.g. flowing watercourses) has been approved by PIRSA	Middleton site is at least 15 kms from the nearest significant watercourse (Cooper Creek) which flows only during major flood events (1 in 5 years)
4. To prevent the introduction or spread of weeds, pathogens and pest fauna	4.1 To ensure that weeds, pathogens and pest fauna are controlled at a level that is at least consistent with adjacent land	Regular patrols undertaken to look for evidence of weeds on production site and adjacent land (if weeds on production facility or easement but not adjacent land must implement control to prevent spread) Records of outbreaks found, weed control activities and photo-monitoring of significant outbreaks	The presence of weeds and pathogens was consistent with or better than adjacent land No new outbreak or spread of weeds reported	No new outbreak or spread of weeds was reported.
5. To minimise the impact of the production operations on water resources	5.1 To maintain current surface drainage patterns	Regular patrols undertaken to look for evidence of erosion, abnormal vegetation growth or death Observations are also to be undertaken following significant storm events	For excavations, surface drainage profiles restored to as is reasonably consistent with surrounding area For existing easements, drainage is maintained similar to pre-existing conditions	There are no water courses in the close vicinity of the Middleton site, nor crossing the access road.
	5.2 To minimise impact to aquifers / groundwater volumes and flow patterns	The volume/flow of water extracted is monitored and recorded Water usage is to be reviewed annually and management strategies implemented to reduce overall water usage where practical	Volume of water produced recorded No uncontrolled flow to the surface (i.e. no free flowing bores) Note: the drilling and well operations SEO provides detail on aquifer issues.	The volume of water extracted in the production operations is monitored and recorded.

6. To avoid land or water contamination	6.1 To prevent spills occurring and if they occur minimise their impact	All production facilities and flowlines are designed and constructed in accordance with relevant standards Containment of all hazardous substances including hydrocarbons and liquid waste in appropriate vessels and bunds Tanker load-out in lined area, with appropriate bunding to contain spills Roads and causeways designed to minimise risk of vehicle accident and appropriate safety signage installed (e.g. at access to public roads) Fuel and chemical handling and emergency response procedures included in staff training, implemented and reviewed periodically Transport procedures and restrictions to achieve compliance with POM and EMS (including no transport in wet conditions and no wet wheel fording) Implement POM procedures for temporary product storage pits Prevention program including inspection, maintenance and pigging where appropriate Patrols to look for evidence of soil discolouration, vegetation or fauna death Production operations will cease in event of flood inundation. In floodplain land systems, the following will be undertaken: • Storage tanks and flowlines drained, purged and filled with water to reduce buoyancy • Interceptor pit skimmed to remove oil • Fuel tanks drained, engines and all hydrocarbons (e.g. fuel and lubricants) removed off-site Fencing of contaminated areas if threat is posed to stock or wildlife Incident record system (preventative and post incident review)	No evidence of any spills or leaks to areas not designated to contain spills In the event of a spill, the spill was: ▪ Contained ▪ Reported ▪ Cleaned-up • Cause investigated and corrective and/or preventative action implemented Compliance with the Environment Protection Act, Australian Standard 1940 and the Australian Dangerous Goods Code.	A spill of oily water occurred in an area that was not contained by specifically designed bunding. The spill was contained in a depression formed by a combination of the natural landscape and recent earthworks. The volume of the spill was not sufficient for the incident to constitute a Serious Incident under the Regulations. Nevertheless, the incident did constitute a non-compliance with this Objective, and a report was prepared and submitted to PIRSA.

	6.2 To remediate and monitor areas of known contamination arising from production activities (salinisation, hydrocarbons, other production chemicals)	Incident record system (preventative and post incident review) Active remediation methods implemented where it is determined that contamination is spreading or level of contamination is not decreasing Use of groundwater monitoring bores. The number and positioning of monitoring bores will be in accordance with relevant industry practice to ensure adequate coverage of any potential underground water contamination and movement. Use of soil farms for remediation where appropriate	Contamination restricted to known areas and remediation strategies investigated and implemented where practical. Level of hydrocarbon contamination continually decreasing, ultimately to meet Environment Protection Authority (EPA) guidelines[1]	
	6.3 To ensure that rubbish and waste material is disposed of in an appropriate manner	Minimise generation of waste where practicable Provide suitable bins for the collection and storage of wastes and collect all waste in one area at each camp site Design and operation of any domestic waste disposal facility in accordance with EPA licence and guidelines Regular patrols undertaken to look for evidence of rubbish, spills (soil discolouration) Appropriately licensed contractors used for any hazardous waste disposal and records are maintained for all hazardous waste disposal All transported waste is adequately secured to the vehicle.	No evidence of rubbish or litter on easements or at facilities No evidence that waste material is not contained and disposed of in accordance with Beach approved procedures Evidence of waste tracking certificates for prescribed wastes Evidence of compliance with any waste disposal licence conditions (e.g. EPA permits)	All waste material was disposed of in accordance with Beach approved procedures.

	6.4 To prevent impacts as a result of hydrotest water and waste water (e.g. washdown water) disposal	Water disposed of in a manner that prevented discharge or runoff to watercourses or environmentally sensitive areas Water discharged onto stable ground, with no evidence of erosion as a result of discharge Records on source of water and discharge method/location Use of biocides and toxic chemicals are kept to a minimum and where practicable UV-degradable biocides (e.g. TPHS) shall be used Appropriate assessment of hydrostatic test water quality to determine disposal method Inspection of water disposal sites for evidence of water entering a watercourse or environmentally sensitive area	No evidence of impacts to soil, water and vegetation as a result of water disposal (i.e. soil erosion, dead vegetation, water discoloration)	
	6.5 To ensure the safe and appropriate disposal of grey water (sullage, sewage)	Compliance with the relevant local government regulations or relevant health and sanitation regulations	No evidence of non-compliance with local or state government regulations	There were no operators accommodated at the Middleton site during the EPT. Operators stationed at the nearby Udacha site were in attendance at the Middleton EPT on a continuous roster basis. Accordingly, there was no requirement for the disposal of grey water at Middleton.

	6.6 To minimise impacts as a result of produced formation water treatment and disposal and restrict to defined areas	Produced formation water treatment and disposal in accordance with Beach approved procedures in POM and EMS Site ponds appropriately[2] to minimise potential impacts Fence contaminated areas if threat is posed to stock or wildlife Monitor evaporation pond water and sludge annually Monitor ponds for surrounding upwelling of PFW Undertake appropriate water quality monitoring where shallow groundwater exists in the vicinity of PFW ponds Records of volumes of produced formation water maintained and reported annually	Water monitoring results indicated levels of Total Petroleum Hydrocarbons (TPH) below 30mg/L in bunded holding ponds and 10mg/L in bunded and / or freeform evaporation ponds No evidence of overflow of product from interceptor pit No evidence of hydrocarbon contamination immediately adjacent to bunded ponds	During the EPT at Middleton, water was produced at an average rate of approximately 4 - 5 cubic metres per day. The water was stored in a tank which was carted off site for disposal at an appropriate facility
	6.7 To minimise impacts as a result of land treatment units and restrict to defined areas	Land treatment areas constructed and operated in accordance with procedures Records of soil added to land treatment areas to be maintained and reported annually (including quantity, location of source) Monitoring of surrounding soil and groundwater for contaminants annually as required by licence Monitoring and reporting of remediation.	Periodic reports as required detail quantity, level of contamination and proposed ongoing operation of the LTU	There is no land treatment unit at Middleton. In the event that soil becomes contaminated, it is either treated in situ or taken to a registered soil treatment area.

[1] Soil Health Index (SHI) study is currently being undertaken by Santos, in consultation with PIRSA and EPA. The results of this study will provide a proforma for establishing site-specific bench marks for soil remediation.

[2] Appropriately manage means to take into consideration and assess relevant environmental factors (including location of surface water, shallow groundwater, potential flooding, location of vegetation, etc.) and take measures to reduce the potential impact on these factors through the use of best practice.

7. To minimise the risk to public health and safety	7.1 To adequately protect public safety during normal production operations	Risk Assessments and inspections of facilities Use of signage, bunting and traffic management practices to identify all potentially hazardous areas Records of regular emergency response training for employees and review of procedures Incident record system (preventative and post incident review) Development, implementation and periodic review of Emergency Response Plan (ERP) All production facilities and flowlines are designed and constructed in accordance with relevant standards Safety, testing, maintenance and inspection procedures are implemented Personnel are trained to supervise and instruct individuals entering area to conduct work Safe work permits must be obtained to ensure only individuals with proper clearance can conduct works	No injuries or incidents involving the public Demonstrated compliance with relevant standards Emergency procedures implemented and personnel trained	No incidents of risk to public health and safety during the EPT period. The haul road from the Middleton facility is not available for use by the public.
	7.2 To avoid fires associated with production activities	Incident record system (preventative and post incident review) Regular fire safety and emergency response training for all operations personnel and review of procedures Established procedures for minimising fire risk during operations All production facilities are designed and constructed in accordance with relevant standards Appropriate fire fighting equipment on site	No uncontrolled operations related fires Emergency procedures implemented and personnel trained	No fires occurred at the Middleton facility during the EPT period.
	7.3 To prevent unauthorised access to production facilities	Use of signage, bunting to identify all potentially hazardous areas Communications with landholders All reports of unauthorized activity are reported and investigated	No unauthorised activity	There were no incidents of unauthorised entry to the Middleton facility during the EPT.

8. Minimise impact of emergency situations	8.1 To minimise the impact as a result of an emergency situation or incident	Incident record system (preventative and post incident review) Emergency response trials and associated documentation Records of regular emergency response training for all personnel and review of procedures	Emergency response procedures are effectively implemented in the event of an emergency Emergency response exercises are aligned with credible threats and consequences identified in the risk assessment	No emergency situations arose at the Middleton facility during the reporting period. Beach HSE system includes periodic simulation of Emergency situations at production facilities.
	8.2 To restore any damage that may occur as a result of an emergency situation	Refer to previous criteria (Objective 1, 2, 3 & 6)	Refer to previous criteria (Objective 1, 2, 3 & 6)	
9. To minimise noise due to operations	9.1 To take reasonable practical measures to comply with noise standards	Incident record system (preventative and post incident review) Monitoring results, where deemed necessary (e.g. frequent complaints)	Operational activities have taken reasonable practical measures to comply with noise regulations, under the Environment Protection Act 1993 No unresolved reasonable complaints	Middleton facility is at least 10 kilometres from the nearest dwelling.
10. To minimise atmospheric emissions	10.1 To minimise uncontrolled atmospheric emissions	Conduct all production activities in accordance with procedures Identify and implement strategies to minimise volume s if needed	Reasonable practical measures implemented in design and operation to minimise emissions	There were no uncontrolled atmospheric emissions during the EPT operations at Middleton-1.
	10.2 To minimise controlled atmospheric emissions	Conduct all production activities in accordance with procedures Identify and implement strategies to minimise volumes if needed Record and report annual emission volumes	Reasonable practical measures implemented in design and operation to minimise emissions Annual report includes atmospheric emissions data	The flaring of gas during production testing generated controlled atmospheric emissions. Production testing was maintained only for a period sufficient to determine the commercial viability or otherwise of the well, and this minimised the volume of emissions to the atmosphere.
	10.3 To minimise the generation of dust.	Incident record system (preventative and post incident review) Compliance with procedures (vehicle movement, dust suppression, etc.)	No reasonable complaints received No dust related injuries recorded	Middleton facility is approximately 10 kms from the nearest dwelling. During the three-week period of the EPT , approximately four truckloads of oil were transported from the Middleton facility to the Tantanna terminal. There are no dwellings along the route taken by the road tankers.

11. To adequately protect cultural heritage sites and values during operations and maintenance	11.1 To ensure that identified cultural sites are not disturbed	Consultation with relevant heritage groups if operations occurring outside known surveyed areas Surveys / cultural heritage monitoring before excavations Records of site locations within information systems Site examined by relevant aboriginal claimant group for cultural heritage material prior to work on areas not previously cleared	Proposed construction areas and access tracks surveyed by relevant cultural heritage group Any new sites identified are recorded and reported to appropriate authority No impact to identified sites	A scouting team from the Dieri Aboriginal Corporation (DAC) Claimant Group conducted a cultural heritage survey over the Middleton site prior to the commencement of the drilling operations.

INCIDENT INVESTIGATION FORM – OGC

Date Of Incident	October 2006	Incident Location	Middleton 1 Well Site	Job File No	
Investigated by	Matt McCall	Date of Site Investigation		Date of File Review	

List of Attachments	Yes/No	Comments
Client Complaint	Yes	Email was received on the 14th December 2006. Advising that there had been an oil spill at Middleton. PIRSA had been out to location and noticed it. Email is attached.
Photographs	Yes	Attached
Statements from Staff (SGS) involved	Yes	Kim McNair – Operator on nights. Email attached.
Statements from 3rd party staff	No	
Claim for damages (details)		
Accident reports	No	
Environmental reports		
Other documents		
Attached		SGS Environmental Mngt Plan 2006 Upstream Services
Attached		PR-AU-[OGC(EXP)]-QU-034 Remote Operations

Details of incident (include drawings/photographs where possible):

Photos are attached.
PIRSA visited the site in December and found the spill on the ground and reported it to Beach Petroleum. Neither Beach nor SGS were aware that there had been a spill at this time.

While the crew were performing testing operations in September and October they were required to drain the test tanks of water before loading the truck. This was performed with personnel manning the valves to ensure no oil was released with the water.

Since the crew demobilised the water has evaporated and left a stain on the ground. At the time no one reported any spills. There may have been a small amount of oil but almost all of it was water (this may have appeared dirty).

Details of all staff involved (SGS) and brief outline of the role they played *(include supervisor/manager who was in charge of site staff/lab staff at the time of he incident and/or briefed the staff involved on the task*.

Rob McQuatt – Testing Operator.
Kim McNair – Testing Operator (Night Shift)
Robin Shirreffs – Assistant
David John - Assistant

Details of all other people involved in the incident (non-SGS personnel)

Details of immediate cause of the incident

Cause was from draining fluid from tanks onto ground. There was a small amount of oil released from tanks and left a small film on top of the water. This caused the large stain on the ground.

By Date

Analysis of the problem: (use 5 why or similar process)

- No evidence of a specific risk assessment for the process
- Procedure and work instructions not clear or specific enough so as to not allow the operators to miss-interpret the procedure
- Insufficient hose to reach the pit
- Deficiencies not communicated to supervision/support
- Fluid run off was believed to be water only

By R. L. Brock Date 18 Dec 2006

Root cause of the problem

Operator not following procedure to dump fluids to the flare pit.

By Date

Proposed corrective action

1). In future the test crew will ensure that a line is rigged to the flare pit if draining of fluids is required. The flare pit must be fenced and approval given from Client.

2). Procedure to reflect the methods and importance of the above actions.

3). Environmental awareness training for all Upstream crews, this is to include preventative control measures as well as spill clean up recognition and training.

4). Risk assessment training and new risk assessment tools for SGS to be implemented.

BY M. McCall & R. L. Brock Date 18 Dec 2006

Management Review of proposed Corrective action:

By Date

Corrective action implementation record

Stage	Details	Implementation date
1).	Point 1 – Proposed corrective action	Immediate and on-going, communicate to all new crews on rotation in.
2).	Point 2	Procedure review and changes to be completed by 28 Feb 2007
3).	Point 3	Training package to be finalised by end Q1 2007. Implementation throughout 2007.
4).	Point 4	New risk assessment tool to be ready for roll out by end Q1 2007. Roll out and training to commence by Q2 2007, training will then be on-going.

5. COMPLIANCE WITH THE STATEMENTS OF ENVIRONMENTAL OBJECTIVES

B 2) EXTENDED PRODUCTION TESTING AT SMEGSY-1

On February 28th, 2006, PIRSA approved an application to carry out an Extended Production Test (EPT) on the Smegsy-1 well.

The original EPT commenced at the beginning of March 2006 with a strong flow of some 5 mmcfd into the connected pipeline. After an initial pressure and flow rapidly dropped due to water encroachment, the well has been shut-in.

The second testing programme began on 6th May, 2006 and continued for 8 days. The test has confirmed that water is encroaching from the Upper Patchawarra gas zone and as a result of the water loading, the zone is incapable of producing against the line pressure. The well has been shut-in since 14 May 2006, whilst remedial measures are considered.

PIRSA's approval to conduct the EPT was conditional on the operator committing to achieving the compliance with the relevant Statement of Environmental Objectives. In absence of its own SEO for EPT, Great Artesian Oil & Gas is using the objectives defined in the "Statement of Environmental Objectives - Production and Processing Operations", prepared by Santos in October 2003.

Great Artesian Oil and Gas is satisfied that the EPT operations at Smegsy-1 met all objectives required by the SEO, and the attached spreadsheet provides comments on the strategies that were employed to achieve this compliance.

ACHIEVEMENT OF ENVIRONMENTAL OBJECTIVES DURING THE EXTENDED PRODUCTION TEST ON SMEGSY-1

TESTING PERIOD (when well was in Great Artesian possession): 6 MAY – 29 AUGUST 2006

Environmental Objectives	Guide to How Objectives Can Be Achieved	Assessment Criteria	Performance in Achieving Objective
Objective 1: Minimise the risk to public and other third parties	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 (personal 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.	Reasonable measures implemented to ensure no injuries to the public or third parties.	The EPT at the Smegsy-1 well was undertaken in accordance with Great Artesian safety policies, standards and guidelines. All employees undertook a safety induction prior to commencing work in the field. Signage was erected along the access track to advise that only authorised personnel were permitted on to the well site. Great Artesian Health Safety and Environmental Manual is updated and reviewed on a regular basis.
Objective 2: Minimise disturbance and avoid contamination to soil.	Construction Activities (eg. Pipelines and roads) Santos operational procedures and guidelines are in place and will be followed for construction activities, for example to conserve soils resources: Consider alternate routes during planning phase to minimise environmental impacts Works are restricted to construction ROW. The need to traverse sensitive land systems and the method of managing the impacts will be justified in accordance with company procedures. Annual audit of construction practices.	0, +1 or +2 GAS criteria are attained for goals related to this objective. 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).	Soil disturbance in minimised wherever possible. Rootstock is left intact and top soil is stockpiled for respreading. Vehicle movements were strictly limited to the defined access track and well pad area – areas which had been given cultural heritage clearance for the drilling operations. No additional clearing was required for the Smegsy-1 EPT.

Objective 2; Continued	Spill Response / Contingency Planning 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.		Emergency procedures for spill responses are in place. All fuel, oil and chemicals were stored in accordance with relevant standards. Refuelling was undertaken as per Contractors' procedures.
	Oil/Condensate Spills (Pipeline/Road Transport) Pipelines are compliant with AS2885 pipeline standards Pipeline Management System is reviewed annually. Pipelines are inspected and maintained in accordance with Pipeline Management System Spills or leaks are immediately reported and clean up actions initiated. Records of spill events and corrective actions are maintained in accordance with company procedures.	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.	There were no spills during the testing operations that required reporting or corrective action to be taken in accordance with the Great Artesian Incident Reporting system. There were no spills during the testing operations outside of areas designed to contain them. Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.
	Produced Formation Water (PFW) A study into development of a Soil Health Index (SHI) for impacted soils and sediments is currently being undertaken. This will ultimately assist in the rehabilitation of water disposal/evaporation ponds to a level consistent with appropriate adjacent land uses. The study will also enable an assessment of contaminants of concern in PFW in order to determine disposal criteria.	0, +1 or +2 GAS criteria are attained for goals related to produced formation water impacts on soil, PFW contaminant levels are below disposal criteria. PFW EMP developed and objectives achieved.	Results of the SHI study by Santos, in consultation with PIRSA and EPA, are not yet available.
	Waste Disposal (domestic, sewage and sludges) 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.	All domestic wastes are disposed of in accordance with EPA licensing requirements. 0, +1 or +2 GAS criteria for 'Waste material' is attained. No spills or leaks from sewage treatment process and sludge pits. For LTUs contamination confined to designated treatment area.	Wastes were managed as described in the Cooper Basin Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

Objective 3: Avoid the introduction or spread of pest plants and animals and implement control measures as necessary.	Where appropriate, weed and feral animal management strategy are in place (avoidance and control strategies). Vehicle and equipment wash downs will be initiated in accordance with the management strategy.	No weeds or feral animals are introduced to operational areas.	There is no evidence of the introduction of weeds or feral animals. Testing equipment and all vehicles have already been working in the Cooper Basin prior to commencing the testing operations at Smegsy-1.
Objective 4: Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.	Construction Activities (eg. Pipelines and roads) Constructed activities undertaken are designed and managed to avoid diversion of water flows.	0, +1 or +2 GAS criteria are attained for goals related to this objective. Construction activities (i.e. access tracks) are located and constructed to maintain pre-existing water flows (i.e. channel contours are maintained on floodplains and at creek crossings). No water (surface or groundwater) contamination as a result of production activities.	The Smegsy-1 well site was not located in an area where flooding from local watercourses is likely to occur. The drill pad and access track were constructed and situated to ensure that, in the event of local inundation, the flood waters would not be diverted from their natural flow direction.
	Fuel and Chemical Storage, Handling and Transportation All fuel, oil and chemicals are stored, handled and transported in accordance with appropriate standards. Fuel and chemical storage, handling and transport procedures are reviewed and monitored in audit process. Records of spill events and corrective actions are 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 to reduce spill volumes in subsequent years (and drive continual improvement). SHI project currently being undertaken will assist in the rehabilitation of spill sites to a level consistent with appropriate adjacent land uses.	No spills/leaks outside of areas designed to contain them. Soils remediated to a level as determined by the SHI process. No water (surface or groundwater) contamination as a result of production activities.	An emergency response plan was in place for specific oil spill containment. All fuel, oil and chemicals were in accordance with relevant standards. Refuelling was undertaken as per Contractors' procedures.

Objective 4: (Continued) Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.	Spill Response / Contingency Planning 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.		There were no spills during the testing operations outside of areas designed to contain them.
	Oil/Condensate Spills (Pipeline/Road Transport) Pipelines are compliant with AS2885 pipeline standards Pipeline Management System is reviewed annually. Pipelines are inspected and maintained in accordance with Pipeline Management System Spills or leaks are immediately reported and clean up actions initiated. Records of spill events and corrective actions are maintained in accordance with company procedures.	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.	Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.
	Produced Formation Water (PFW) A study into development of a Soil Health Index (SHI) for impacted soils and sediments is currently being undertaken. This will ultimately assist in the rehabilitation of water disposal/evaporation ponds to a level consistent with appropriate adjacent land uses. The study will also enable an assessment of contaminants of concern in PFW in order to determine disposal criteria.	0, +1 or +2 GAS criteria are attained for goals related to produced formation water impacts on soil. PFW contaminant levels are below disposal criteria.	
	Produced Formation Water (PFW) Review status of PFW facilities and develop an Environmental Management Plan (EMP) to achieve the objectives of the SA EPA Environment Protection (Water Quality) Policy, 2003, as appropriate.	PFW EMP developed and objectives achieved.	
	Waste Disposal (domestic, sewage and sludges) 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.	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. Land Treatment Unit contamination confined to designated treatment area.	Wastes were managed as described in the Cooper Basin Drilling & Well Operations EIR. Wastes were collected, stored and transported in covered bins / containers. All rubbish was disposed of at a licensed waste facility.

Objective 5: Avoid disturbance to sites of known cultural and heritage significance.	Consultation with stakeholders (i.e. government agencies, stakeholders 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. *Note:* Where a negotiated agreement or determination for heritage clearance is in place, performance with the negotiated agreement or determination takes precedence over the above criteria.	• Proposed construction 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. • 0, +1 or +2 GAS criteria are attained for 'Aboriginal Heritage'.	Great Artesian has an agreement with the Dieri Aboriginal Corporation Native Title Claimant group which specifies the requirements for scouting areas proposed for well sites and access tracks to identify and avoid areas of heritage value and archaeological significance.
Objective 6: Minimise loss of aquifer pressures and avoid aquifer contamination.	• The volume/flow of water used by the Moomba Plant is continuously monitored to ensure appropriate management. • Water usage is continuously monitored, reviewed and management strategies implemented to minimise wastage. • Review water licensing requirements and allocation plans.	There is no uncontrolled flow to the surface (i.e. no free flowing bores). *Note:* The Drilling and Well Operations EIR and SEO provide detailed discussion on aquifer issues.	There were no uncontrolled flows from water bores. Minimised water usage where possible. The quantity of formation fluids produced is monitored and recorded.
Objective 7: Minimise disturbance to native vegetation and native fauna.	<u>Construction Activities</u> • Proposed construction areas 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 • Assessment records are kept and are available for auditing. <u>Borrow Pits</u> • Pits are not established in locations which pose an unacceptable hazard to stock or wildlife (i.e. not within 50m of any roads or access tracks, well leases or other plant and equipment). • Borrow pits are restored as soon as practicable after material extraction is complete to a standard consistent with the surrounding land use. • Borrow pits are restored to minimise water holding capacity, where agreements are not in place with stakeholders • In recognised conservation reserves (i.e. Innamincka Regional Reserve) excavations are left in a state as agreed with the responsible statutory body.	• Any sites of rare, vulnerable and endangered flora and fauna have been identified, flagged and subsequently avoided. • 0, +1 or +2 GAS criteria for 'Minimise impacts on vegetation' objective are attained during site selection and construction. • 0, +1 or +2 GAS criteria for 'Minimise impacts on vegetation' objective, are attained during site selection and construction.	The Smegsy-1 well was not located in or near areas of high biological or wilderness values and hence the testing operation presented no long term impact to any such area. National Parks and Wildlife flora/fauna databases contain no records of vulnerable or endangered species within 30km of the site. Access track construction required minimal clearance of vegetation and was aligned to avoid clearing trees. The site contained sparse vegetation, and clearance was minimised. Trees that were present on the site and adjacent to the site were not cleared.

Objective 7: **Continued** Minimise disturbance to native vegetation and native fauna.	Fuel and Chemical Storage and Management Waste Management 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. PFW pits are fenced as appropriate to minimise wildlife access.	Refer to assessment criteria for Objectives 2 and 4. Refer to assessment criteria for Objectives 2, 4 and 11.	See Objectives 2 and 4. See Objectives 2 and 4.
Objective 8: Minimise air pollution and greenhouse gas emissions.	Conduct production operations 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.	Gathering Systems/Satellite Facilities/Moomba Plant Compliance with EPA requirements.	Production testing was maintained only for a period sufficient to determine the commercial viability or otherwise of the well, and this minimised the volume of emissions to the atmosphere..
Objective 9: Maintain and enhance partnerships with the Cooper Basin community.	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.	No reasonable stakeholder complaints left unresolved.	Great Artesian maintained regular contact with landholders and associated stakeholders.

Objective 10: Avoid or minimise disturbance to stakeholders and/or associated infrastructure.	Induction for all employees and contractors covers pastoral, conservation, legislation and infrastructure issues. Relevant stakeholder is 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 stakeholder and upon receipt of letter of transfer of responsibility to stakeholder. 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 (i.e. open/closed). Potential sources of contamination are fenced as appropriate to prevent stock access. System is in place for logging stakeholder 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.	No unresolved reasonable stakeholder complaints.	The access track and well were located away from tourist routes. The Smegsy-1 well site was not located near a cattle watering point.
Objective 11: Optimise waste reduction and recovery.	Chemical and oil is purchased in bulk. 'Bulk bins' or other storage tanks are in place for large volume items. Fencing around waste disposal facility is regularly inspected and maintained.	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. For LTUs contamination confined to designated treatment area.	Waste was removed from the Smegsy-1 well site in accordance with Great Artesian policy set out in the company's Drilling Operations Manual.

Objective 12: Remediate and rehabilitate operational areas to agreed standards.	Rehabilitation/ abandonment plans for surface activities will be developed in consultation with relevant stakeholders. Construction Site and Access Track Restoration Compacted soil areas have been ripped (except on gibber and tablelands) and soil profile and contours are reinstated following completion of operations.	No unresolved reasonable stakeholder complaints. Contaminated Site Remediation 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. Construction Site and Access Track Restoration The attainment of 0, +1 or +2 GAS criteria for: - "minimise visual impact of abandoned well sites and access tracks" - "re-establish natural vegetation on abandoned well sites and access tracks" - Borrow Pit Restoration - The attainment of 0, +1 or +2 GAS criteria for: - "minimise impact on vegetation, soil and visual impacts"	Smegsy-1 remains cased and shut-in as the EPT results are currently being evaluated. Rehabilitation of the well site will be undertaken when gas production from the well becomes no longer economically viable.

5. COMPLIANCE WITH THE STATEMENTS OF ENVIRONMENTAL OBJECTIVES

C) CASED HOLE TESTING AT ROSSCO-1

The flow test for the Rossco-1 well commenced on 7 June 2006 and ended on 26 June 2006. Three cased hole tests were conducted. Prior to shut-in on 5 July 2006, over 26 mmcf of gas has been produced, together with 225 barrels of condensate and 83 barrels of water. On 13 July 2006 a static gradient test (from total depth) was conducted which confirmed that the production tubing was gas filled. The well has been suspended pending further engineering investigations.

Great Artesian Oil & Gas is satisfied that cased hole testing operations at Rossco-1 met all objectives required by the SEO, and the attached spreadsheet provides comments on the strategies that were employed to achieve this compliance.

ACHIEVEMENT OF ENVIRONMENTAL OBJECTIVES DURING THE CASED HOLE TESTING ON ROSSCO-1 Testing Period: 7-26 June 2006				
OBJECTIVE	**COMMENT**	**GUIDE TO HOW OBJECTIVES CAN BE ACHIVED**	**ASSESSMENT CRITERIA**	**PERFORMANCE IN ACHIEVING OBJECTIVE**
Objective 1: ***Minimise the risk to public and other third parties.***	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. 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.	• 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.	▪ Reasonable measures implemented to ensure no injuries to the public or third parties.	The cased hole testing at the Rossco-1 well was undertaken in accordance with Great Artesian safety policies, standards and guidelines. The 1 - kilometre access track to Rossco-1 turns off the Jack Lake to Doublejay-1 road, which is not open for public use. The testing operations were not visible from the track. No additional land clearing was required. Signage was erected along the access track to advise that only authorised personnel were permitted on to the well site.

Objective 1: ***(Continued)*** ***Minimise the risk to public and other third parties.*** .	The backfilling of the well cellar and the removal of rubbish from the restored well site should be carried out 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.	▪ 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. ▪ All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards.		Accident / incident reporting systems were in place as defined in the Great Artesian Drilling Operation Manual. Records are reviewed regularly to assess trends. Great Artesian safety management plans are updated and reviewed on a regular basis.
Objective 1: ***(Continued)*** ***Minimise the risk to public and other third parties.***	The movement of heavy equipment associated with rig moves present a risk to the safety of employees, contractors and third parties (ie tourists).	▪ 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.		An Emergency Response Plan (ERP) was prepared for the drilling operations at Rossco-1, and all personnel involved in the testing operations were aware of the Emergency Response Plan. However, no situation arose that required the implementation of the Plan. Great Artesian maintained contacts with landholders during the testing operations at the Rossco-1 site.

Objective 2 : ***Minimise disturbance and avoid contamination to soil.***	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).	<u>Well Site and Access Track Construction</u> ▪ 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. <u>Production Testing / Well Blowdowns</u> ▪ If appropriate use: - impermeable flare pit - flare tanks.	<u>Well Site and Access Track Construction</u> ▪ 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).	• No significant erosion has been reported either at the site nor along the access road. • Vehicle movements were strictly limited to the defined access track and well pad area – areas which had been given cultural heritage clearance for the drilling operations. • Flaring of gas was kept to a practical minimum.
Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***			<u>Borrow pit construction and restoration</u> ▪ 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.	Rehabilitation of the Rossco-1 site will be undertaken when production ceases.

			Production Testing / Well Blowdowns • No soil contamination as a result of production testing or well blowdown operations.	
		Fuel and Chemical Storage and Handling ▪ All fuel, oil and chemical storages bunded in accordance with the appropriate standards.	Fuel and Chemical Storage and Handling ▪ No spills/leaks outside of areas designed to contain them.	• All fuel, oil and chemicals were stored in accordance with relevant standards. • Refuelling was undertaken as per Drilling Contractors' procedures.
Objective 2: ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***		• 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.	▪ Level of hydrocarbon continually decreasing for in situ remediation of spills. ▪ Soils remediated to a level as determined by the SHI process.	• There were no spills during the drilling operations that required reporting or corrective action to be taken in accordance with the Great Artesian Incident Reporting system.

		<u>Spill Response / Contingency Planning</u> 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.		Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.
<u>Objective 2:</u> ***(Continued)*** ***(Minimise disturbance and avoid contamination to soil)***		<u>Waste Disposal (domestic, sewage and sludges)</u> ▪ 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.	▪ 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.	• Wastes were managed as described in the Cooper Basin Drilling & Well Operations EIR. • Wastes were collected, stored and transported in covered bins / containers. • All rubbish was disposed of at a licensed waste facility.

Objective 3 : ***Avoid introduction or spread of pest plants and animals and implement control measures as necessary.***	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.	▪ 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.	▪ No weeds or feral animals are introduced to operational areas.	• The associated equipment and all vehicles have already been working in the Cooper Basin prior to commencing the testing operations at Rossco-1.

Objective 4 : ***Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.***	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. 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.	<u>Drilling Mud Sumps and Flare Pits</u> ▪ 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.	<u>Well Lease and Access Track Construction</u> ▪ 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). <u>Drilling Mud Sumps and Flare Pits</u> ▪ No overflow of drill cuttings, muds and other drilling fluids from mud sumps. ▪ No waste material disposal to sumps and flare pits.	• No significant drainage channels were traversed by the access road to the production site. • The Rossco-1 well site was not located in an area where flooding from local watercourses is likely to occur. • The drill pad and access track were constructed and situated to ensure that, in the event of local inundation, the flood waters would not be diverted from their natural flow direction.
Objective 4 : ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources)***	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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ 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.	<u>Well Heads (Oil and Gas Systems)</u> ▪ No leaks/spills outside of areas designed to contain them.	• Rossco-1 well was cased and suspended. There was no requirement for a well head.

		Well Blowdown / Production Testing ▪ Activity is conducted in accordance with accepted industry standards / good oilfield practice. ▪ If appropriate use: - impermeable flare pit - flare tanks - separators - supervision	Well Blowdown/Production Testing ▪ No water (surface or groundwater) contamination as a result of production testing or well blowdown operations.	
Objective 4 ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.)***		Fuel and Chemical Storage and Handling ▪ All fuel, oil and chemical storages bunded 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.	Fuel/Chemical Storage and Handling ▪ No leaks/spills outside of areas designed to contain them.	• Specific oil spill containment / cleanup materials were on site at all times. • All fuel, oil and chemicals were in accordance with relevant standards ▪ Refuelling was undertaken as per Drilling Contractors' procedures. ▪ There were no spills during the testing operations outside of areas designed to contain them.

Objective 4 ***(Continued)*** ***(Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.)***	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. 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.	<u>Spill Response / Contingency Planning</u> ▪ 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.		• Great Artesian's Oil Spill Contingency Plan is included in the Emergency Response Plan.

Objective 5 : ***Avoid disturbance to sites of cultural and heritage significance***.	The aim of the objective is to ensure that any sites of cultural (Aboriginal or non-Aboriginal) heritage significance are identified and protected.	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.	▪ 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. *Note:* 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.	A scouting team from the Dieri Aboriginal Corporation Native Title Claimant group conducted a cultural heritage survey over the Rossco-1 site prior to the commencement of the drilling operations.

Objective 6 : ***Minimise loss of aquifer pressures and avoid aquifer contamination***.	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. 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. The following geological formations are aquifers in the Cooper-Eromanga Basins. • Eyre, Winton & Mackunda; • Coorikiana & Cadna-owie; • Murta (incl. McKinlay Mbr) • Namur, Adori & Birkhead; • Hutton, Poolowanna;	<u>Drilling & Completion Activities:</u> ▪ A competent cement bond between aquifer and hydrocarbon reservoirs is demonstrated. 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. <u>Producing, Injection and, Inactive Wells</u> ▪ 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.	<u>Drilling & Completion Activities</u> ▪ 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. <u>Producing, Injection, Inactive and Abandoned Wells</u> ▪ No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC.	

Objective 6 : ***(Continued)*** ***(Minimise loss of aquifer pressures and avoid aquifer contamination)***	• Cuddapan; Nappamerri Group, Walkandi and Peera Peera formations; Toolachee; Daralingie; • Epsilon, Patchawarra or Mt Toodna or Purni. • Tirrawarra sandstone or Stuart Range; Merrimelia; Boorthanna; Crown Point formations and Basement reservoirs. **Note**: Crossflow (if it occurs), should not compromise the long term sustainability of a particular resource.	Well Abandonment Activities: ▪ Isolation barriers are set in place to ensure that cross-flow, contamination or pressure reduction will not occur. ▪ 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.		

Objective 7: ***Minimise disturbance to native vegetation and native fauna***.	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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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.	<u>Well Lease and Access Track Construction and Restoration</u> ▪ 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. <u>Borrow Pits Construction and Restoration</u> ▪ 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.	The Rossco-1 well was not located in or near areas of high biological or wilderness values and hence the testing operations presented no long term impact to any such area. National Parks and Wildlife flora/fauna databases contain no records of vulnerable or endangered species within 30km of the site. No additional clearing was required. Facilities were designed and constructed to minimise fauna entrapment. • Borrow pits will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, to attain the highest feasible GAS rating.

Objective 7: ***(Continued)*** ***(Minimise disturbance to native vegetation and native fauna)***		Waste Management ▪ 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.	Waste Management ▪ Refer to assessment criteria for Objective 11. Fuel and Chemical Storage and Management Refer to assessment criteria for Objectives 2 and 4.	• Great Artesian's Drilling Operations Manual sets out the company's policy in relation to storage, use and disposal of hazardous material. • At the Rossco-1 well site wastes were managed as described in the Drilling & Well Operations EIR. • Wastes were collected, stored and transported in covered bins / containers. • All rubbish was disposed of at a licensed waste facility.

Objective 8 : ***Minimise air pollution and greenhouse gas emissions.***	Atmospheric emissions occur as a result of standard practices undertaken during drilling and well operations. Emission**s** of particular environmental significance are: ▪ combustion by-products (eg. oxides of nitrogen, carbon monoxide and sulphur dioxide); ▪ organic carbon and carbon particulates (black smoke); and ▪ flared/vented hydrocarbons (gases).	Well Testing ▪ 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. Well Blowdown ▪ 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.	▪ Compliance with EPA requirements.	Sources of atmospheric emissions were limited to the diesel engines operating the testing equipment.

Objective 9 : ***Maintain and enhance partnerships with the Cooper Basin community.***	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.	▪ 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.	▪ No unresolved reasonable complaints from the community.	- Great Artesian maintained regular contact with landholders and associated stakeholders prior to testing operations at the Rossco-1 site.

Objective 10 : ***Avoid or minimise disturbance to stakeholders and/or associated infrastructure.***	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.	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.	▪ No reasonable stakeholder complaints left unresolved.	▪ No incidents of risk to public health and safety during the testing period. ▪ The access track and well were located away from tourist routes. ▪ The Rossco-1 well site was not located near a cattle watering point and cattle were not present in significant numbers. ▪ There were no incidents of unauthorised entry to the Rossco facility during the testing operations.

Objective 11 : ***Optimise waste reduction and recovery.***	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.	▪ Bulk chemical and oil purchasing and use of "bulk bins" or other storage tanks in place for large volume items.	▪ 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).	▪ Waste was removed from the Rossco-1 well site in accordance with Great Artesian policy set out in the company's Drilling Operations Manual. ▪ Non-putrescible waste material (including hazardous material) was stored safely on site for later removal to an EPA approved disposal facility.

Objective 12 : ***Remediate and rehabilitate operational areas to agreed standards.***		Rehabilitation / abandonment plans for surface activities will be developed in consultation with relevant stakeholders <u>Well Site and Access Track Restoration</u> ▪ Compacted soil areas have been ripped (except on gibber and tablelands) and soil profile and contours are reinstated following completion of operations.	▪ No unresolved reasonable stakeholder complaints. <u>Contaminated Site Remediation</u> ▪ 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. <u>Well Site and Access Track Restoration</u> - The attainment of 0, +1 or +2 GAS criteria for (refer Appendix 4): - "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" <u>Borrow Pit Restoration</u> ▪ The attainment of 0, +1 or +2 GAS criteria (refer Appendix 5) for : "minimise impact on vegetation", "minimise impact on soil", "Minimise visual impacts"	▪ Rehabilitation of the Rossco-1 production site will be undertaken when production ceases.

5. COMPLIANCE WITH THE STATEMENTS OF ENVIRONMENTAL OBJECTIVES

D) SEISMIC OPERATIONS

Seismic field operations during Year Four of PEL 106 consisted of recording of 495 sq km of 3D seismic data. The Spinel seismic survey was conducted by Great Artesian Oil and Gas during December 2006 – April 2007. Processing and interpretation of the data is expected to take another 3 to 6 months.

Government approval for Great Artesian Oil and Gas to conduct the seismic survey was conditional upon Great Artesian committing to the objectives defined in the "Statement of Environmental Objectives: Geophysical Operations – for the Cooper Basin Operators, South Australia" (June 2006).

Great Artesian's strategies for achieving each of the SEO objectives for the Spinel Seismic Survey are outlined below.

The SEO requires an Environmental Report to be submitted at the completion of each seismic survey. Although actual recording of the Spinel survey was completed on 15 April 2007, it took several days to pickup the spread and several more weeks to complete de-pegging. The Environmental Report for the 2007 Spinel Seismic Survey has been submitted separately to this annual report.

As part of the ongoing monitoring of rehabilitation after previous seismic surveys a field inspection of the PEL 106 area was conducted by RPS-Ecos in July 2006. The "Rehabilitation Progress Report" that resulted from that inspection is also submitted with the Annual Report (refer to Appendix).

ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN SEISMIC SEO

SURVEY: 3D SPINEL SEISMIC SURVEY **SURVEY PERIOD: 15 DECEMBER 2006 – 17 APRIL 2007**

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 1: Minimise the visual impact of operations.	**Campsite and survey line preparation** Proposed survey lines and campsites have been appropriately located and prepared to minimise the visual impact. The attainment of 0, +1 or +2 GAS criteria for 'visual impact' objective listed in Appendix 3.	Pre-survey planning has been undertaken to minimise visibility of operations and records are available for audit. Maximise use of vegetation or land forms to disguise operations. Offset sand dune crest cuts along the length of the survey line to minimise visibility. Avoid extensive side cuts on dune flanks. Lessen visual impact of uphole cuttings, where they contrast with the surface, e.g. by use of appropriate colouring agents. Avoid cutting sand dunes facing tourist access tracks. All litter is to be disposed of correctly.	If techniques to disguise their presence are not implemented, the visual impact of survey lines can be significant. Location of and preparation techniques for survey lines are key factors in determining visual impact.	GAS audits were taken after the Spinel survey. GAS scores were recorded at 90 locations within the 495 sq kms of the survey. Negative GAS scores of -1 and -2 were recorded for litter in two instances. (see Objective 7, Page 131). Four occurrences of GAS scores of -1 were recorded for disturbance to Land Surface (see Objective 2, Page 125) Overall visual impact was as little as might be expected for this kind of operation and natural rehabilitation processes are expected to restore the viewscape in the short to medium term.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 2: Minimise disturbance to and contamination of soil resources.	**Campsite and survey line preparation** Attainment of 0, +1 or +2 GAS criteria for 'Minimise impacts to land surface' objective, as listed in Appendix 3. Proposed survey lines and campsites have been appropriately located and prepared to minimise the disturbance to soil resources. **Fuel Storage and Handling** No refuelling occurs outside designated refuelling/servicing areas. Spills or leaks are immediately reported and clean up actions initiated. Records of spill events and corrective actions are maintained in accordance with company procedures. Appropriate spill response equipment is available on site.	Pre-survey planning has been undertaken to minimise impacts of operations and records are available for audit. Survey line preparation techniques are monitored and documented to minimise soil disturbance, particularly in gibber and floodplain/wetland terrains. Gibber mantle has not been removed in gibber and tableland land systems. Gibber surface is not ripped at campsites. Any requirement to traverse sensitive land systems and the method of managing the impacts should be justified in accordance with company procedures. Any records should be available for audit. There is no evidence of off-road driving or creation of shortcuts. No survey line or access track preparation is carried out on salt lakes. Areas subject to inundation have been assessed for conduciveness to support vehicles. Oil spills areas have been ripped to an appropriate depth.	The main sources of disturbance to soils are survey line preparation, vehicle traffic along tracks and restoration activity. The impacts associated with soil disturbance can potentially include wind and water erosion and dust generation. All fuel stored and used should be under the control of qualified or trained personnel.	Refer to the comments above in relation to the performance in achieving Objective 1. Disturbance to soil was kept to a minimum. Two GAS scores of -1 were recorded for disturbance to Floodplain Land Surface and two Gas scores of -1 were recorded for disturbance to Dunefield Land Surfaces. All occurrences were unavoidable and are expected to rehabilitate by natural processes. There were no incidents of soil contamination arising from the survey activities.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 3: Minimise disturbance to native vegetation and fauna.	**Campsite and survey line preparation** The attainment of either 0, +1 or +2 GAS criteria for 'Impact on native vegetation' objective listed in Appendix 3. No mature trees are removed. Vehicle access to survey lines is to be via existing access tracks or pre-existing survey lines, except where they have rehabilitated. Other temporary access tracks may be utilised where such use is likely to result in less environmental impact than other options. **Fuel and Chemical Storage and Management** Refer to assessment criteria for objective. **Fire Danger Season restrictions and education** All personnel are fully informed on the fire danger season and associated restrictions.	Terrain and vegetation is considered in planning stage when designing layout of the survey. Records of vegetation clearance/habitat disturbance are kept and available for auditing. Appropriately trained and experienced personnel have scouted proposed survey lines access tracks and campsites. Native vegetation clearance has been minimised and the conservation needs of specific species have been considered. Campsites are established in locations where the preparation of a new access track is not necessary. **Waste Management** Covered bins are provided for the collection and storage of wastes, while all loads of rubbish are covered during transport to the central waste facility. **Fire Danger Season restrictions and education** Include Fire Season education as part of the induction.	Primary risks to native fauna include clearing of habitat and obstruction of movement through prepared areas. Current survey line and access track preparation techniques have been shown by a number of studies to have an insignificant impact on wildlife habitat and minimal impact on vegetation. This is due to the small and confined area of impact of survey lines and the rate of recovery of most vegetation types and surface morphology. The aim of this objective is to also maximize the potential for vegetation regrowth. Potential impacts of waste on vegetation and fauna also addressed under Objective 8.	At each of the locations where GAS scores were recorded, the scores for "impact on vegetation" were either 0 or +1, indicating there were no instances where the disturbance was greater than is usual for these types of operations.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 4: Avoid disturbance to sites of cultural and heritage significance.	The following is one possible procedure to achieve the objective. Appropriately trained and experienced cultural/heritage advisors have scouted proposed survey line locations and access tracks. The operator has a mechanism in place to appropriately report and respond to any sites discovered during survey operations. Any sites identified have been flagged and subsequently avoided. *Note:* Where a negotiated agreement or determination for heritage is in place, compliance with the negotiated agreement or determination takes precedence over the above criteria. The EIR details this possible procedure.	The possible procedure may well be achieved by the following: Documents and/or reports of scouting for cultural/heritage are available for audit. Environmental Report Forms (ERF) to be completed for any sites or artefacts identified. The ERFs relating to Aboriginal sites are forwarded to Department for Aboriginal Affairs and Reconciliation (DAARE). *Note*: Where a negotiated agreement or determination for heritage is in place, provisions may include that appropriately trained and experienced cultural /heritage advisors will carry out a Work Area Clearance (WAC) and produce a report for sites of cultural and heritage significance before commencement of line preparation. This provision will take precedence over the above guideline. The EIR details these criteria for the possible procedure.	The aim of this objective is to ensure that any sites of Aboriginal and non-Aboriginal heritage significance are identified and protected. New suspected sites located should be recorded and copies of the records submitted to DAARE.	Great Artesian has an agreement with the Dieri Aboriginal Corporation (DAC) Native Title Claimant group which specifies the requirements for scouting proposed seismic lines to identify and avoid areas of heritage value and archaeological significance. Joint site visits were carried out with representatives from the Native Title Claimant group. Proposed line locations and access routes were agreed and given heritage clearance. Areas of significance were recorded and marked as exclusion zones.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 5: Minimise disturbance to livestock, pastoral infrastructure and landholders.	The attainment of 0, +1 or +2 GAS criteria for 'Impact on infrastructure' objective listed in Appendix 3. No reasonable concerns raised by stakeholders are left unresolved. The extent to which the relevant sections of the Petroleum Act and Regulations have been followed and implemented and in particular in relation to landowner liaison and notification.	Relevant landowners and occupiers are notified prior to survey of preparation of campsites, preparation of survey lines and undertaking of operations (pursuant to the Petroleum Regulations). Compliance with requirements of the Cattle Care and Organic Beef accreditation programmes. System is in place for logging landholder complaints to ensure that issues are addressed as appropriate. Seismic sources are not to operate within 20 m of any pipeline, utility, installation or building. This distance may need to be larger for explosive-sources, pending size of explosive used. Damage to station tracks is avoided. Operations in wet weather are not allowed. All gates are left in the condition in which they were found. When necessary, all fences are restored to satisfaction of landowner /managers. Induction for all employees and contractors covers pastoral, conservation, legislation and infrastructure issues.	Communication and the establishment of good relations with landowners and community are fundamental to minimising disturbance as much as practicably possible. Many pastoral properties are certified under the Organic Beef or Cattle Care accreditation schemes and therefore may be affected by fuel and chemical storage, moving machinery and contaminated sites. *Note:* The PIRSA publication "*Liaison guidelines for landholders and petroleum explorers in SA"* is a recommended source for effective liaison with landowners. Access to land is a key factor for a long-term sustainable petroleum industry. Community support is vital for the petroleum industry to access land and hence realise the resources beneath the land. It is imperative that the industry establishes and maintains good relations with the landowner /occupier and managers of parks and reserves.	Great Artesian maintained regular contact with the pastoral lessees prior to and while undertaking survey operations. None of the seismic lines interfered with cattle watering points. Extensive seismic survey operations have been undertaken regularly in recent years on the pastoral leases covered by the Spinel survey. No issues of concern have been raised by landowners in relation to these activities.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 6: Avoid the introduction or spread of exotic species and implement control measures as necessary.	Weeds or feral animals are not introduced into, or spread, in operational areas.	All vehicles and equipment appropriately cleaned prior to entering the Cooper Basin. Vehicles and equipment are to be cleaned when moving from areas within the Cooper Basin where weeds are present. Cleaning carried out in accordance with specified company procedures and accepted practices. Records of vehicle and equipment cleaning are kept and available for auditing. Records of detection, monitoring or eradication of exotic weed or other pest or noxious species introduced by industry activities are kept and are available for audit.	A potential source of weed or pest introduction is from vehicles and equipment brought in from other regions of the State or interstate. The most effective way of preventing such introduction is by thoroughly cleaning vehicles and equipment prior to entering the Cooper Basin.	Machinery and vehicles used for line preparation and survey recording were already working in the Cooper Basin prior to commencing of the Spinel survey.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 7: Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.	**Campsite and survey line preparation** Campsites and survey lines/traverses are located and constructed to avoid diversion of water flows. The attainment of 0, +1 or +2 GAS criteria for 'disturbance to land surface' objective listed in Appendix 3. No uncontrolled flows to surface from aquifers intersected in upholes /shallow boreholes. There is no unnecessary interference with natural drainage features. **Fuel Storage and Handling** No spills occur outside of areas designed to contain them. Refuelling occurs at least 1km from watercourses or sensitive ecological environments (wetlands). Appropriate spill response equipment is available on site. Spills or leaks are immediately reported and clean up actions initiated promptly.	All access through watercourses area carefully assessed to determine the locations of least impact to channels and creek banks. Any artesian flows are to be immediately plugged and monitored to ensure effectiveness of plug(s). Any required remediation work carried out as soon as possible after completion of all activities. If any contamination from spillage of oils or fuel occurs during vehicular operations, immediate effective clean-up procedures must be employed.	The main threat to drainage patterns and surface waters is the interruption of natural flows as a result of access track preparation through watercourse channels and creek bank disturbance. Campsite and line preparation should aim to minimise impacts to drainage systems, by avoiding sensitive areas and using appropriate preparation methods to avoid or minimise the development of windrows. Any remediation work should be undertaken immediately upon completion of all activities. Localised contamination may result from spills or leaks of vehicles during storage and handling or vehicle travel. 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 4 in relation to minimizing impacts on soil and natural habitats.	The seismic lines recorded during the Spinel survey did not traverse any watercourses or surface waters.

Environmental Objective	Assessment Criteria	Guide to How Objective Can Be Achieved	Comments	Performance in Achieving Objective
Objective 8: Optimise waste reduction and recovery.	Wastes are segregated, burnt or transported to an Environment Protection Authority (EPA) approved waste disposal facility for recycling or burial in accordance with approved procedures. 0, +1 or +2 GAS criteria are attained for 'Negligible survey markers and rubbish in situ' objective listed in Appendix 3.	Production of waste is minimised by purchasing biodegradable or recyclable materials where practical.	Waste reduction requires continual improvements in purchasing, efficiency of use and reuse. Due to the distances involved, the cost of recycling a large range of products may be prohibitive. However, continual review of recycling options is required to ensure that improvements are implemented as far as practical.	Most GAS scores recorded in relation to "Pollution and litter" (control) were either +1 or +2 (mainly +2), indicating that there was extremely strict control of litter during the survey operations. Two occurrences of negative GAS scores were noted. A score of -1 was recorded for pin flags left behind at one location after de-pegging was supposedly completed. The pins were retrieved at the time and remedial action taken to avoid further occurrences. A score of -2 was recorded following an inspection by PIRSA on 28 April 2007, where wind scattered litter was reported around the abandoned campsite near the Tennyson-1 well location. The contractor was notified and the litter was cleaned up. The contractor was instructed to take remedial action to prevent future occurrences.

Appendix 3 Goal attainment scaling (GAS) criteria for assessing seismic lines on completion of survey in the Cooper Basin South Australia

LAND SYSTEM	MEASURE	SCORE				
	Associated goals	+2[b & d]	+1[b & d]	0[b & d]	-1[a & d]	-2[a, c & d]
Non land system specific	*Visual impact (Obj 1)*[g]	• No evidence of survey operations.	• Only wheel tracks are evident. • Line of sight is significantly impaired.	• Established roads and tracks have been reshouldered. • Doglegs have been placed at established roads and tracks in vegetated areas. • Dozer or grader has been walked 40m either side of established road or track. • Line weaves through vegetated areas at least every 100m. • Line of sight is impaired. • Line follows route that is most conducive to access by utilising naturally clear areas through vegetation.	• No doglegs at established roads or tracks in vegetated areas. • Weaving is not appropriate to terrain traversed. • Line of sight is unimpaired. • Uphole cuttings clearly visible in landscape.	• Line is clearly evident and dominates the landscape.
	Impact on infrastructure (Obj 5)[g]	• No impact to any pastoral, tourist or production infrastructure.	• No observable repair or damage to infrastructure.	• Any impact to infrastructure has been reported and reinstated or repaired.	• Repair to damaged infrastructure is incomplete or inappropriate. • Damage has not been reported.	• Damage to any infrastructure has been left un-repaired and not reported.
	Uphole site restoration (Obj 1,2,3,5,7)[g]	• No evidence of upholes.	• No evidence of cuttings. • Some evidence of operations.	• Cuttings are evident but dispersed around hole. • No subsidence. • Hole has been plugged.	• Cuttings form mound. • Subsidence is evident. • Cuttings markedly discoloured compared to surface.	• Hole is open.
	Pollution or litter (All Objectives[g])	• No pollution or litter.	• No evidence of water or oil pollution. • Maximum of 1 pin flag/km.	• Wastewater and vehicle oil spills have been managed appropriately. • Maximum of 2 pin flags/km. • No other litter.	• Wastewater forms ponds or extensive boggy ground. • Vehicle oil spills have not been remedied. • Maximum of 9 pin flags/km. • Maximum of 4 items of other litter/km.	• Extensive wastewater ponding. • Oil spills of more than 20L have not been remedied. • Ten or more pin flags/km. • Five or more items of other litter/km.
Dunefield	*Impact on vegetation (Obj 1,2,3,5)*[g]	• No removal of vegetation.	• Only herbs and shrubs less than 0.5m high removed on dunes. • No removal of vegetation in swales.	• No removal of Priority 1 and 2 vegetation[e]. • No removal of Priority 3 shrubs >2m high[e]. • Less than 30% of tree branches have been removed from individual trees.	• Priority 1 or 2 vegetation[e] <2m high have been removed, including rootstock. • Priority 3 shrubs[e] >2m high have been removed, including rootstock.	• Priority 1 or 2 vegetation[e] >2m high have been removed.
	Disturbance to land surface (Obj 1-5 & 7)[g]	• No dune cuts. • No windrows.	• Dune cuts are <0.5m deep. • No blade cutting in swales.	• Dune cuts are 0.5–1m deep. • Clay-rich dune cuts are <1m deep. • Side cuts in clay rich dunes <0.75m. • Sand is stacked along side of cut. • Windrows in swale are <0.1m high and not continuous.	• Dune cuts are 1–2m deep. • Side cuts in clay dunes >0.75m. • Clay dune cuts >1m. • Off line trafficking is evident. • Minor ramping of sand onto swale. • Windrows in swale are 0.1–0.3m high.	• Dune cuts are >2m deep. • Extensive ramping of sand onto swale. • Windrows in swales are continuous. • Windrows in swales are >0.3m high. • Claypans have been cut.

LAND SYSTEM	MEASURE	SCORE				
	Associated goals	+2[b & d]	+1[b & d]	0[b & d]	-1[a & d]	-2[a, c & d]
Floodplain and wetlands	*Impact on vegetation (Obj 1,2,3,5)*[g]	• No removal of vegetation.	• No removal of Priority 1 and 2 vegetation[e]. • No removal of Priority 3 vegetation[e] >1m.	• No removal of Priority 1 and 2 vegetation[e]. • No removal of Priority 3 shrubs >2m high[e]. • Less than 10% of tree branches have been removed from individual trees. • Rootstock is intact.	• Priority 1 and 2 vegetation[e] <2m high have been removed. • Priority 3[e] shrubs >2m high have been removed.	• Trees and/or shrubs >2m high have been removed. • Rootstock has been removed.
	Disturbance to land surface (Obj 1-5 & 7)[g]	• No windrows. • No interference with drainage channels.	• Windrows are <0.1m high for more than 50% of line length. • Only creek banks <0.5m high have been cut.	• Windrows are <0.1m high. • Creek banks <1m high have been cut. • Creeks are not blocked. • Wheel tracks are <0.1m deep.	• Windrows are <0.3m high. • Windrows are generally continuous. • Creek banks 1–2m high have been cut and not restored. • Creeks are blocked by material <1m deep. • Wheel tracks are >0.1m deep.	• Windrows are >0.3m high. • Windrows are continuous. • Creek banks >2m high have been cut. • Creeks are blocked by material >1m deep.
Gibber plain and tableland	*Impact on vegetation (Obj 1,2,3,5)*[g]	• No disturbance to vegetation.	• No removal of vegetation.	• Maximum of two trees 1–3m high have been unavoidably removed at creek crossings or escarpments. • Less than 10% of tree branches have been removed from individual trees. • Creek crossings are doglegged.	• Vegetation has been removed unnecessarily. • Three or more trees 1–3m high have been removed at creek crossings or escarpments.	• Trees have been removed unnecessarily. • Two or more trees >3m high have been removed at creek crossings or escarpments.
	Disturbance to land surface (Obj 1-5 & 7)[g]	• No evidence of survey line.	• Only wheel tracks are evident.	• Line has been rolled or walked. • No blade work. • Creek banks have been cut only where necessary. • Creeks are not blocked.	• Creek banks 1–2m high have been cut and not restored. • Creeks are blocked by material <1m deep. • Windrows[f] exist but are <0.5m high. • Off line trafficking is evident. • Extensive wheel ruts exist.	• Gibber mantle has been removed. • Creek banks >2m high have been cut and not restored. • Creeks are blocked by material >1m deep. • Windrows[f] are >0.5m high.
Salt lake	*Disturbance to land surface* (Obj 1)[g]	• No evidence of survey line.	• No evidence of shotholes. • Little evidence of foot trafficking.	• Only footprints are evident. • No significant evidence of shotholes.	• Wheel tracks exist and are <0.2m deep. • Minor evidence of shotholes.	• Wheel tracks exist and are >0.2m deep. • Bog holes are evident. • Dominant evidence of shotholes (e.g. cratering, blow out, discolouration).

(a) If any criterion (dot point) within a -1 or -2 cell occurs, then a score of -1 or -2 will be allocated.

(b) For 0, +1 and +2 cells, all relevant criteria (dot point) within the cell must be satisfied to score at that level.

(c) Some criteria at -2 levels may also be subject to defined conditions, but are included in this table to ensure that they are clearly identified.

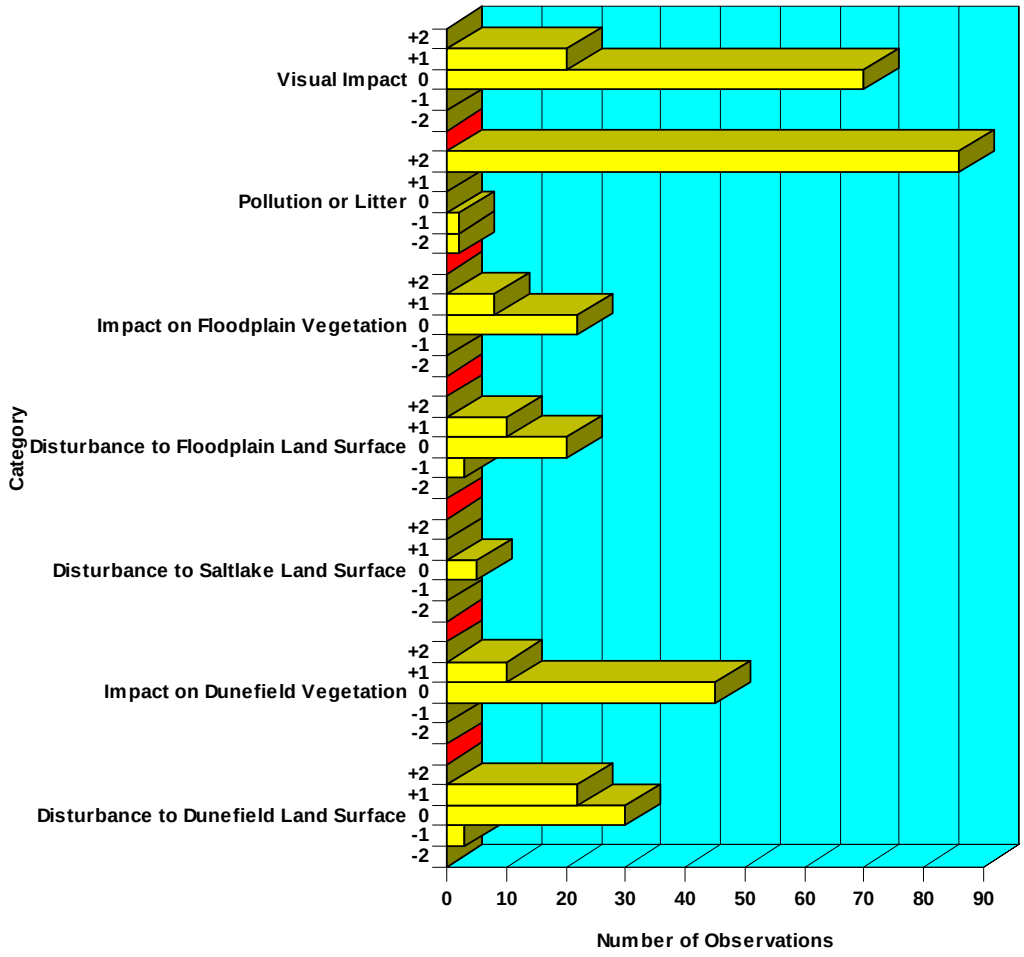
(d) All vertical measurements to be measured from normal ground surface.

(e) Priority classification refers to Wiltshire and Schmidt (1997).

(f) Windrows in this context means mounding of gibbers through the action of wheel trafficking and associated dispersal of gibbers away from wheel tracks.

(g) Relevant environmental objective.

Fig # 5: GAS Audit of the Great Artesian Oil & Gas 2007 Spinel 3D, PEL 106/91



5. COMPLIANCE WITH THE STATEMENTS OF ENVIRONMENTAL OBJECTIVES

E) SMEGSY-1 PIPELINE

The pipeline to connect Smegsy-1 with the South Australian Cooper Basin Producers (SACBP) was constructed on behalf of the Smegsy JV by Santos, as operator for the SACBP. The 4-kim pipeline is owned by Smegsy JV. Production commenced on 1 March 2006 and after an initial flow, it rapidly dropped due to water encroachment. The well has been shut-in since approximately the end of March 2006, whilst remedial measures are considered.

Santos in its letter dated 30 May 2007, confirmed that the operation of the Smegsy-1 and the associated pipeline complies with the “South Australian Cooper Basin Joint Ventures Statement of Environmental Objectives: Production and Processing Operations”, AS 2885, Santos Procedures and the APIA Code of Environmental Practice.

Santos Ltd
ABN 80 007 550 923
Santos Centre
60 Flinders Street
Adelaide SA 5000
Telephone: 08 8116 5000
Gas Marketing & Commercialisation
Direct: 08 8116 7267
Facsimile: 08 8116 7578

Santos

30 May 2007

Mr Chris Carty
Exploration Manager
Great Artesian Oil and Gas Limited
Level 2, Walker House
161 Walker Street
NORTH SYDNEY NSW 2060

Dear Chris

Re: Smegsy Compliance

Santos, as operator of the South Australian Cooper Basin Joint Venture confirms that the operation of the Smegsy 1 and the associated pipeline complies with the South Australian Cooper Basin Joint Venture Statement of Environmental Objectives: Production and Processing Operations, AS 2885, Santos Procedures and the APIA Code of Environmental Practice.

With the shut-in of Smegsy 1, arrangements are being finalised between Santos and Great Artesian to fill the Smegsy pipeline with corrosion inhibited fluid.

I trust this letter provides the necessary information you require. If you have any queries please do not hesitate to contact myself

Yours sincerely

Peter Pihir
Commercial Adviser
Santos Limited