

VICTORIA PETROLEUM N.L.



Cooper Basin Petroleum Production Operations

Statement of Environmental Objectives

September 2008



Produced for:
 Victoria Petroleum NL
 Level 36, Exchange Plaza
 2 The Esplanade
 Perth WA 6000

Ph: (08) 9220 9811
 Fax: (08) 9220 9801

Prepared by:
 RPS Ecos
 ABN 57 081 918 194
 26 Greenhill Road
 Wayville SA 5034

Ph: (08) 8357 0400
 Fax: (08) 8357 0411
rpsecos@rpsecos.com.au
www.rpsecos.com.au



© 2008 RPS Ecos

DOCUMENT CONTROL SHEET						
ENV689 – Victoria Petroleum Production Operations SEO						
Document reference	Revision No.	Revision date	Compiled by	Checked by	Approved by	Comment
689-SEO	A	31Oct06	ZB	SM	SM	Draft issued to client for review
	B	28May07	ZB	DS/CL		Client review - 1
	0	18Apr08	ZB	SM	CL	Issued to PIRSA as draft
	1	08Oct08	ZB	SM	ZB	Incorporation of feedback from Regulators. Issued for use

Contents

1	Introduction	1
1.1	Purpose	1
1.2	Scope	1
2	Environmental Objectives	4
3	Assessment Criteria	5
4	Reporting	6
4.1	Incident Definitions	6
4.1.1	Serious Incidents.....	6
4.1.2	Reportable Incidents	6
4.2	Reporting Requirements	6
5	Definitions	7
6	References	8
7	Glossary	8

Appendix A: Objectives and Assessment Criteria

Appendix B: GAS Criteria for Borrow Pits

1 Introduction

This Statement of Environmental Objectives (SEO) for Victoria Petroleum's Cooper Basin petroleum production operations has been prepared to meet the requirements of Sections 99 and 100 of the South Australian *Petroleum Act 2000* (the Act) and Regulations 12 and 13 of the *Petroleum Regulations 2000*.

1.1 Purpose

The intent of this SEO is to outline the environmental objectives to which Victoria Petroleum's petroleum production activities will conform and the criteria upon which the achievement of these objectives will be assessed.

The objectives of this SEO have been developed on the basis of information and issues identified in the *Cooper Basin Petroleum Production Operation Environmental Impact Report* (Victoria Petroleum 2007) and are in keeping with the objectives of the *Petroleum Act 2000*.

This SEO has been based on the *Beach Petroleum Statement of Environmental Objectives for Cooper Basin Petroleum Production Operations* (Beach 2003), which in turn utilised information from other SEOs including:

- Epic Energy's SEO for Pipeline License No.1 (Epic 2003)
- Santos' SEO for Production and Processing Operations in the Cooper and Eromanga Basins (Santos 2003a)
- Stuart Petroleum's SEO for Petroleum Production at Acrasia Field (Stuart Petroleum 2003).

1.2 Scope

Victoria Petroleum has interests in a number of Petroleum Exploration Licence (PEL) Areas in the South Australian Cooper Basin. Victoria Petroleum also holds a number of Petroleum Production Licences (PPLs) in the area. Figure 1 shows Victoria Petroleum's PPLs and production facilities as at December 2007. The Mirage and Ventura fields shown in Figure 1 are producing oil under PPL 213 and 214 respectively. An Extended Production Test (EPT) is also proposed at the Growler #1 and #2 wellsites (in PEL 104). Further producing wells are likely to be commissioned as a result of Victoria's exploration and drilling programmes.

This SEO applies to all Victoria Petroleum production operations in the South Australian sector of the Cooper and Eromanga basins. Operations that are covered by this SEO are:

- production facility (including extended production test facility) construction, operation, maintenance and abandonment
- produced formation water disposal operations
- flowline construction, operation and abandonment
- road construction, maintenance and restoration
- transport of oil
- waste management.

These operations are described in detail in the Environmental Impact Report (EIR) (Victoria Petroleum 2007).

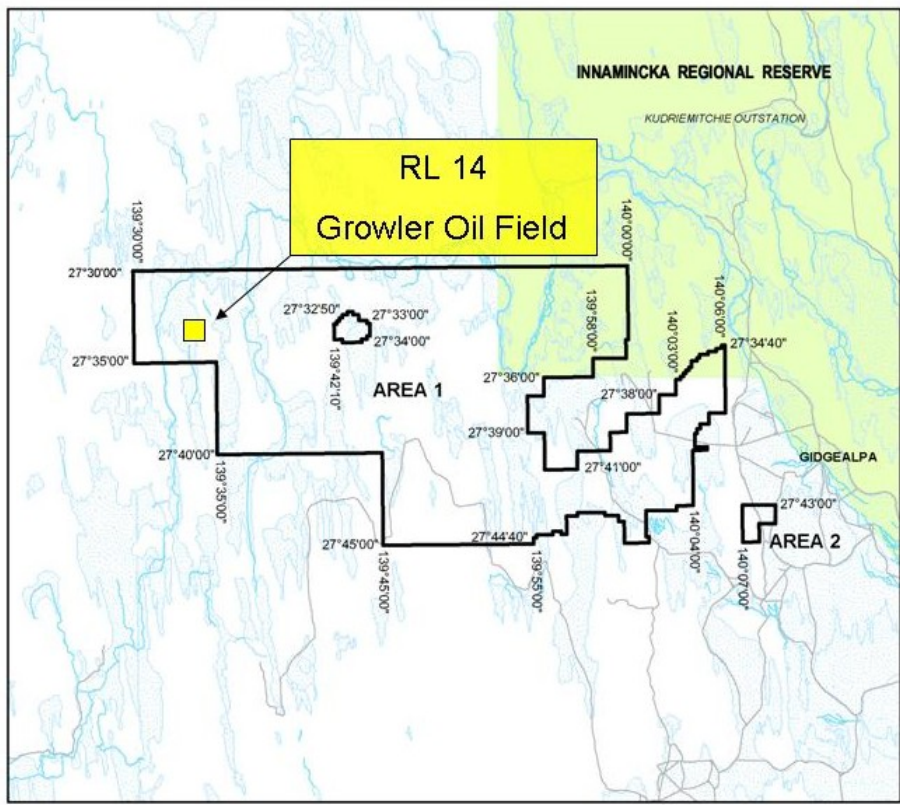
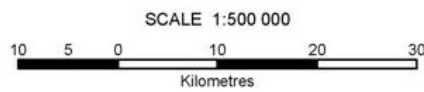
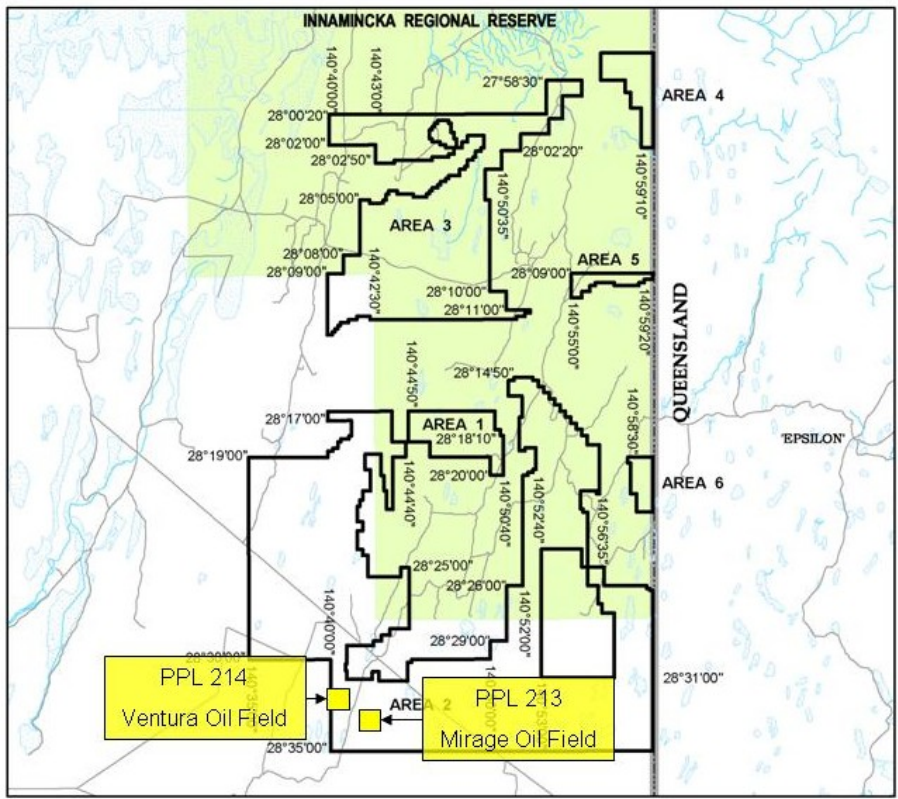
This SEO and corresponding EIR do not apply to exploration activities, drilling activities and sub-surface well/reservoir infrastructure. These activities are covered by the:

- South Australia Cooper Basin Operators Statement of Environmental Objectives: Geophysical Operations (Santos 2006)
- South Australia Cooper Basin Operators Statement of Environmental Objectives: Drilling and Well Operations (Santos 2003b).

Consequently the following activities are excluded from this EIR and SEO:

- well site and access track construction
- drilling
- well completion
- pre-wellhead production
- artificial lift (including beam pumps, jet pumps and electronic submersible pumps)
- down hole abandonment
- restoration of well sites and access tracks
- seismic operations.

Figure 1: Location of Victoria Petroleum’s Production Operations



2 Environmental Objectives

Potential environmental hazards and consequences associated with production operations in the Cooper and Eromanga Basins have been identified in the Cooper Basin Petroleum Production Operations Environmental Impact Report (Victoria Petroleum 2006). Victoria Petroleum is committed to achieving a range of environmental objectives in regard to these potential hazards.

The objectives for the environmental management of the Victoria Petroleum's production operations are:

Objective	Goal
1. To avoid unnecessary disturbance to third party infrastructure, landholders or land use	1.1 To minimise disturbance or damage to infrastructure / land use and remediate where disturbance cannot be avoided
	1.2 To minimise disturbance to landholders
2. To maintain soil stability / integrity	2.1 To remediate erosion as a result of production operations in a timely manner
	2.2 To prevent soil inversion
	2.3 To minimise and remediate soil disturbance
3. To minimise disturbance to native vegetation and fauna	3.1 To minimise additional clearing of or damage to native vegetation as part of production activities
	3.2 To achieve a significant environmental benefit for vegetation clearance associated with Production Licence activities.
	3.3 To ensure production activities are planned and conducted in a manner that minimises impacts on native fauna
	3.4 To minimise disturbance of aquatic habitats (specifically wetlands, permanent waterholes and flowing water courses)
	3.5 To minimise impacts to listed ¹ species
	3.6 To appropriately rehabilitate disturbed areas not required for production activities.
4. To prevent the introduction or spread of weeds, pathogens and pest fauna	4.1 To prevent the introduction or spread of weeds, pathogens and pest fauna
5. To minimise the impact of the production operations on water resources	5.1 To maintain current surface drainage patterns
	5.2 To minimise impact to aquifers / groundwater volumes and flow patterns
6. To avoid land or water contamination	6.1 To prevent spills occurring and if they occur minimise their impact
	6.2 To remediate and monitor areas of known contamination arising from production activities (salinisation, hydrocarbons, other production chemicals)
	6.3 To ensure that rubbish and waste material is disposed of in an appropriate manner
	6.4 To prevent impacts as a result of hydrotest water and waste water (e.g. washdown water) disposal
	6.5 To ensure the safe and appropriate disposal of grey water (sullage, sewage)
	6.6 To minimise impacts as a result of produced formation water treatment and disposal and restrict to defined areas

¹ Rare, vulnerable or endangered species.

Objective	Goal
	6.7 To minimise impacts as a result of land treatment units and restrict to defined areas
7. To minimise noise due to operations	7.1 To take reasonable practical measures to comply with noise standards
8. To minimise atmospheric emissions	8.1 To minimise atmospheric emissions
	8.2 To minimise the generation of dust
9. To adequately protect cultural heritage sites and values during operations and maintenance	9.1 To ensure that identified cultural heritage sites are not disturbed
10. To minimise the risk to public health and safety	10.1 To adequately protect public safety during normal production operations
	10.2 To avoid fires associated with production activities
	10.3 To prevent unauthorised access to production facilities
11. Minimise impact of emergency situations	11.1 To minimise the impact as a result of an emergency situation or incident
	11.2 To restore any damage that may occur as a result of an emergency situation

3 Assessment Criteria

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

- Defined conditions - objectives for operational activities that can only be managed through the prevention of unacceptable actions (e.g. no new outbreak or spread of weeds reported)
- Defined requirements - the achievement of an objective can be assessed against the implementation of specific procedures or actions required for an activity (e.g. the design and construction of the pipeline must meet the requirements of AS 2885.1—1997 Pipelines—Gas and liquid petroleum).
- Goal Attainment Scaling (GAS) criteria – Environmental objectives requiring visual assessment are likely to be prone to uncertainties of subjective judgement. To minimise this occurring, GAS is used to measure such objectives against a series of criteria described by a written description and/or photographically. GAS is applicable to measuring objectives related to minimisation of disturbances in relation to the construction and rehabilitation of borrow pits (Appendix B).

Appendix A tabulates the objectives, management measures required to meet those objectives and the appropriate assessment criteria to determine if compliance with the objectives has been achieved.

The management measures provide a high level overview of Victoria Petroleum's systems, activities and/or procedures to achieve the environmental objectives.

4 Reporting

It is a requirement under Section 85 of the *Petroleum Act 2000* that any incidents that are determined to be 'serious' or 'reportable' incidents must be reported to the Minister.

4.1 Incident Definitions

The following descriptions have been provided to help clarify and elaborate on the definitions given in Section 85(1) of the *Petroleum Act 2000* and Regulation 32(1) of the *Petroleum Regulations 2000*.

4.1.1 Serious Incidents

Section 85(1) of the *Petroleum Act 2000* defines a serious incident as an incident arising from activities conducted under a licence in which:

- a person is seriously injured or killed
- an imminent risk to public health or safety arises
- serious environmental damage occurs or an imminent risk of serious environmental damage arises
- security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas arises.

Regulation 12(2) of the *Petroleum Regulations 2000* requires the SEO to identify specific examples of serious incidents. Pursuant to this, the events listed below are considered to be serious incidents that may arise from production and processing operations:

- detection of pipeline corrosion beyond that for which management procedures are in operation
- unauthorised activity on the pipeline where the pipeline is actually contacted.
- Any spill of fuel, oil or hazardous material which encroaches onto land used for purposes other than petroleum production or into surface water or groundwater supplies
- Any disturbance to sites of heritage significance
- Any removal of rare, vulnerable or endangered flora and fauna species, without appropriate permits and approvals
- pipeline rupture or failure
- Explosion or fire at any facility or pipeline.

4.1.2 Reportable Incidents

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

- An unintended escape of petroleum, a processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape;
- An incident identified as a reportable incident under the relevant statement of environmental objectives.

Pursuant to Regulation 32 (1) the following incidents are considered to be reportable incidents:

- Oil or hazardous material spill that encroaches outside an area specifically designed to contain such spills
- A reasonable complaint from a landowner as a result of productions
- Introduction of weed species to production area
- Any detected unauthorised access to production facilities and associated infrastructure
- Any other non-compliance with SEO objectives.

4.2 Reporting Requirements

Serious Incidents must be reported to the Minister as soon as practicable after the occurrence, as per Section 85 of the *Petroleum Act 2000* and Regulation 32 of the *Petroleum Regulations 2000*.

Reportable Incidents must be reported to PIRSA on a quarterly basis within 1 month of the end of the quarter, as per Regulation 32 of the *Petroleum Regulations 2000*.

5 Definitions

Definitions of the terms used in the SEO are provided below.

Consistent with surrounding land/area	A qualitative assessment of land condition on the reinstated area to determine if condition of the area is similar to that of adjacent land (i.e. soil, vegetation, landform)
Easement	For the purpose of this SEO, an easement is considered to be a corridor for road or flowline construction
Infrastructure	Physical assets which are built on the land (e.g. roads, power poles, fences, railway, troughs, gates, dams, other services)
Landholder	Owner or occupier of the land
Minimise	To reduce as far as reasonably practical, considering all other factors e.g. requirements for safe operations and accessibility
Production operations	<p>Any production activity associated with the construction, operation, maintenance and abandonment, including:</p> <p>Production Facilities</p> <ul style="list-style-type: none"> ▪ Product separation and storage ▪ Product load-out ▪ Transport of product (trucking) ▪ Produced formation water ▪ Land treatment units ▪ Temporary product storage pits ▪ Venting ▪ Storage and use of diesels, oils and chemicals ▪ Hazardous waste treatment and disposal ▪ Inspection and Testing <p>Flowlines</p> <ul style="list-style-type: none"> ▪ Vegetation clearance ▪ Earthworks ▪ Welding ▪ Cathodic Protection ▪ Hydrostatic testing ▪ Pigging & integrity testing ▪ Flowline surveys <p>Ancillary facilities/Activities</p> <ul style="list-style-type: none"> ▪ Camp ▪ Road networks ▪ Domestic waste disposal ▪ Erosion Control ▪ Vegetation Control ▪ Weed Control (if required) ▪ Oil spill risk, spill site restoration and emergency response
Spill	Uncontrolled or unplanned release or discharge of a hydrocarbon, chemical or hazardous substance
Timely manner	Timeframe agreeable to Victoria Petroleum and impacted third party, that considers all external factors e.g. weather constraints and accessibility

6 References

Beach Petroleum (2003) *Statement of Environmental Objectives for Cooper Basin Petroleum Production Operations*. Beach Petroleum, Adelaide.

Epic Energy (2003) *Statement of Environmental Objectives Pipeline Licence No. 1*. March 2003.

PIRSA (1998) *Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia*. Dept. for Primary Industries and Resources South Australia, April 1998. Adelaide, SA.

Santos (2003a). *South Australian Cooper Basin Operators Statement of Environmental Objectives: Production and Processing Operations, October 2003*. Santos Ltd, Adelaide

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

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

Stuart Petroleum (2003). *Statement of Environmental Objectives: Petroleum Production at Acrasia Field, Cooper Basin, SA*. November 2003. Stuart Petroleum NL, Adelaide.

Victoria Petroleum (2007) *Cooper Basin Petroleum Production Operation Environmental Impact Report*. December 2007.

7 Glossary

AS 2885	Australian Standard AS 2885 Pipelines – Gas and liquid petroleum
EPA	Environment Protection Authority (South Australia)
EIR	Environmental Impact Report prepared in accordance with Section 97 of the <i>Petroleum Act 2000</i> and Regulation 10
EMP	Environmental Management Plan
EMS	Environmental Management System
ERP	Emergency Response Plan
EPT	Extended Production Test
LTU	Land Treatment Units
PEL	Petroleum Exploration Licence
Pig	Device inserted into a pipe to clean the internal sections of a pipe or to detect damage or metal loss within the pipe
PIRSA	Primary Industries and Resources, South Australia
PPL	Petroleum Production Licence
SEO	Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the <i>Petroleum Act 2000</i> and Regulations 12 and 13
TPH	Total Petroleum Hydrocarbons

Appendix A: Objectives and Assessment Criteria

Objectives and Assessment Criteria²

Objective	Goal	Guide to How Objectives are Achieved³	Assessment Criteria
1. To avoid unnecessary disturbance to third 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 / third party prior to & during new or significant works. Procedures in the EMS and PIRSA ⁴ 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 the satisfaction of the landholder/owner or as near as practicable to undisturbed condition.
	1.2 To minimise disturbance to landholders	Records of communications with adjacent landholders / third parties. Record of disturbance management through appropriate documentation.	No unresolved reasonable landholder/third party complaints. Landholder activities not restricted or disturbed as a result of activities unless by prior arrangement.
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 (e.g. monitor for salinisation/erosion effects).	The extent of soil erosion is consistent or less than surrounding land.
	2.2 To prevent soil inversion	Contractor to indicate top soil/subsoils 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).

² Assessment criteria have been developed to be "black and white". Professional judgement is required to assess whether non-compliance is minor or major. It is necessary to ensure that adequate information is available to enable this judgement to be made.

³ This column is provided for information only. Under the *Petroleum Act 2000*, only objectives and assessment criteria are approved

⁴ PIRSA (1998) *Field Guide for the Environmental Assessment of Abandoned Petroleum Wellsites in the Cooper Basin, South Australia*.

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
	2.3 To minimise and remediate soil disturbance	<p>Restrict activities (including vehicle access) to production areas and associated infrastructure and easements.</p> <p>Minimise area required for safely undertaking activities in accordance with procedures.</p> <p>Plan and assess proposed activities to minimise impact.</p> <p>Design and construct roads with drainage features (e.g. culverts and offtakes) to minimise erosion and sedimentation.</p> <p>Rip areas of compacted soil (except on gibber plains and tableland environments) to assist rehabilitation.</p> <p>Restored borrow pits to have topsoil / overburden replaced and pit re-profiled where necessary to prevent erosion.</p> <p>Contractor to indicate that soil profiles appropriately reinstated following the rehabilitation of earthworks/excavations.</p>	<p>No production activities undertaken on salt lakes, steep tableland land systems or wetland land systems (as defined in the EIR).</p> <p>Abandoned areas (e.g. borrow pits) are remediated and rehabilitated to be reasonably consistent with the surrounding area.</p> <p>0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B).</p>
3. To minimise disturbance to native vegetation and fauna	3.1 To minimise additional clearing of or damage to native vegetation as part of production activities	<p>Planning and assessment of proposed activities to minimise impact.</p> <p>Avoid significant or priority vegetation and ensure proposed routes have been scouted for significant vegetation and wildlife habitats by appropriately trained and experienced personnel.</p> <p>Use existing cleared areas for laydowns and turn-arounds.</p> <p>Consideration of sensitive vegetation during vegetation trimming and / or clearing activities.</p> <p>Vegetation trimmed rather than cleared where possible.</p> <p>Minimise area required for safely undertaking activities in accordance with procedures.</p>	<p>Vegetation clearing is in accordance with the <i>Native Vegetation Act 1991</i>.</p> <p>Vegetation clearing is limited to previously disturbed areas or areas assessed to be of lowest sensitivity.</p> <p>No rare, vulnerable or endangered flora removed without appropriate permits.</p> <p>No production activities undertaken on salt lakes, steep tableland land systems or wetlands land systems (as defined in the EIR).</p> <p>0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B).</p>
	3.2 To achieve a significant environmental benefit for vegetation clearance associated with Production Licence activities.	Undertake appropriate activities to achieve compliance with significant environmental benefit criteria agreed by the Native Vegetation Council or Delegate.	<p>Significant environmental benefit work undertaken in a timely manner.</p> <p>Native Vegetation Council signoff on significant environmental benefit.</p>

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
	3.3 To ensure production activities are planned and conducted in a manner that minimises impacts on native fauna	<p>Planning and assessment of proposed activities to minimise impact.</p> <p>In event of earthworks, open trenches are monitored daily.</p> <p>Borrow pits are restored to minimise water holding capacity where agreements are not in place with stakeholders.</p> <p>No domestic pets allowed at camps or worksites.</p> <p>No feeding of wildlife (e.g. dingoes).</p> <p>Within Regional Reserves, adhere to speed limits as set under <i>National Parks and Wildlife Act 1972</i>.</p>	<p>Native fauna casualties associated with operations restricted to as low as reasonably practical.</p> <p>Vegetation clearing is limited to previously disturbed areas or areas assessed to be of lowest sensitivity.</p> <p>0, +1 or +2 GAS criteria for borrow pit construction and rehabilitation are attained (Appendix B).</p>
	3.4 To minimise disturbance of aquatic habitats (specifically wetlands, permanent waterholes and flowing water courses)	<p>Obtain regulatory approval prior to undertaking disturbance in aquatic habitat (initial contact to be made with PIRSA during the planning process).</p> <p>Planning and assessment of proposed activities to minimise impact .</p>	<p>Works in aquatic habitats (e.g. flowing watercourses) have been approved by PIRSA.</p>
	3.5 To minimise impacts to listed ⁵ species	<p>Sites assessed for presence of listed (i.e. rare, vulnerable or endangered) species prior to commencement of activities.</p> <p>Records of the locations of any listed species recorded and provided to DEH.</p> <p>Consultation with DEH prior to clearing/impacting identified listed species.</p> <p>Compliance with the <i>Draft South Australian Arid Lands Biodiversity Strategy</i>.</p>	<p>Impacts to listed species will not result in a move to a higher risk category (i.e. compliance with Goal 1 of Strategy <i>No Species Loss - A Nature Conservation Strategy for South Australia 2007-2017</i>).</p> <p>Refer to Goal 3.1.</p>

⁵ Rare, vulnerable or endangered species.

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
	3.6 To appropriately rehabilitate disturbed areas not required for production activities.	Disturbance management to facilitate regrowth in rehabilitated areas. Follow-up rehabilitation work was undertaken where natural regeneration was inadequate. Installation and monitoring of photo points.	Species abundance and distribution on the reinstated areas is reasonably 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). No reasonable complaints received from landholders in relation to regrowth of vegetation in disturbed areas.
4. To prevent the introduction or spread of weeds, pathogens and pest fauna	4.1 To prevent the introduction or spread of weeds, pathogens and pest fauna	Vehicles and machinery cleaned and inspected before entry into the Cooper Basin. 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). Implementation of control measures of weeds and pathogens on easement and liaison with the regional NRM Board and the landholder as necessary. Records of outbreaks found, weed control activities and photo-monitoring of significant outbreaks. Vehicle cleaning/washdown register.	The presence of weeds and pathogens was consistent with or better than adjacent land. No new outbreak or spread of weeds reported as a result of production activities.
5. To minimise the impact of the production operations on water resources	5.1 To maintain current surface drainage patterns	Installation of culverts, etc where appropriate. 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 roads, easements, drainage is maintained similar to pre-existing conditions. No impediment of watercourses.
	5.2 To minimise impact to aquifers / groundwater volumes and flow patterns	The volume/flow of water extracted is monitored and recorded.	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.

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
<p>6. To avoid land or water contamination</p>	<p>6.1 To prevent spills occurring and if they occur minimise their impact</p>	<p>All production facilities and flowlines are designed and constructed in accordance with relevant standards.</p> <p>Containment of all fuel, oil, hazardous substances and liquid waste in appropriate vessels/containment areas.</p> <p>Bunded areas in accordance with EPA guidelines 080/07 <i>Bunding and Spill Management</i>.</p> <p>Bunded areas must have sufficient freeboard (e.g. to hold a 1:100 year, 24 hour rainfall event).</p> <p>Appropriate spill response equipment is available on site.</p> <p>Tanker load-out area lined with clay unless the site soil is found to have a high clay content and low permeability, with appropriate bunding to contain spills.</p> <p>Roads and causeways designed to minimise risk of vehicle accident and appropriate safety signage installed (e.g. at access to public roads).</p> <p>Fuel and chemical handling and emergency response procedures included in staff training, implemented and reviewed periodically.</p> <p>Transport procedures and restrictions to achieve compliance with EMS (including no transport in wet conditions and no wet wheel fording).</p> <p>Prevention program including inspection, maintenance and pigging where appropriate.</p> <p>Patrols to look for evidence of soil discolouration, vegetation or fauna death.</p> <p>Production operations will cease in event of imminent flood inundation. In floodplain land systems, the following will be undertaken well in advance of Cooper Creek flooding:</p> <ul style="list-style-type: none"> ▪ 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 to higher ground or off-site. <p>Production facilities designed to avoid spread of hydrocarbons during inundation due to localised rainfall (e.g. appropriately sized/elevated bunds).</p> <p>Fencing of contaminated areas if threat is posed to stock or</p>	<p>No evidence of any spills or leaks to areas not designated to contain spills.</p> <p>Compliance with the <i>Environment Protection Act 1993</i>, Australian Standard 1940 and the Australian Dangerous Goods Code.</p>

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
		wildlife. Spill response/cleanup procedures, requiring spills to be: <ul style="list-style-type: none"> ▪ Contained ▪ Reported ▪ Cleaned-up ▪ Cause investigated and corrective and/or preventative action implemented. Incident record system (preventative and post incident review). Spills/contamination remediated in consultation with regulatory agencies and landholder.	
	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 for PFW disposal ponds. 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. Removal of contaminated soil off site or 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.

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
	6.3 To ensure that rubbish and waste material is disposed of in an appropriate manner	<p>Minimise generation of waste where practicable.</p> <p>Provide suitable bins for the collection and storage of wastes and collect all waste in one area at each camp site.</p> <p>Ensure bins are not accessible by wildlife.</p> <p>Design and operation of any domestic waste disposal facility in accordance with EPA licence and guidelines.</p> <p>Regular patrols undertaken to look for evidence of rubbish, spills (soil discolouration).</p> <p>Waste disposal records, chemical manifests. Appropriately licensed contractors used for any hazardous waste disposal and records are maintained for all hazardous waste disposal.</p> <p>All transported waste is adequately secured to the vehicle.</p> <p>All waste disposal to occur as appropriate on site (grey water) or at an appropriately licensed facility (domestic or industrial waste).</p>	<p>No evidence of rubbish or litter on easements or at facilities.</p> <p>Waste material is contained and disposed of in accordance with EMS procedures and the <i>Environment Protection Act 1993</i>.</p> <p>Evidence of waste tracking certificates for prescribed wastes.</p> <p>Evidence of compliance with any waste disposal licence conditions (e.g. EPA licence).</p>
	6.4 To prevent impacts as a result of hydrotest water and waste water (e.g. washdown water) disposal	<p>Water disposed of in a manner that prevented discharge or runoff to watercourses or environmentally sensitive areas.</p> <p>Water discharged onto stable ground, with no evidence of erosion as a result of discharge.</p> <p>Records on source of water and discharge method/location</p> <p>Use of biocides and toxic chemicals are kept to a minimum and where practicable UV-degradable biocides (e.g. TPHS) shall be used.</p> <p>Water containing biocides or deleterious chemicals disposed of to appropriate contained area (e.g. pond, pit).</p> <p>Appropriate assessment of hydrostatic test water quality to determine disposal method.</p> <p>Inspection of water disposal sites for evidence of water entering a watercourse or environmentally sensitive area.</p>	<p>Discharge water meets appropriate ANZECC and EPA criteria for point of disposal.</p> <p>No evidence of impacts to soil, water and vegetation as a result of water disposal (i.e. soil erosion, dead vegetation, water discoloration).</p>

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
	6.5 To ensure the safe and appropriate disposal of grey water (sullage, sewage)	All wastewater disposed in accordance with the <i>Public and Environmental Health (Waste Control) Regulations 1995</i> (i.e. the waste water disposal system must either comply with the <i>Standard for the Construction, Installation and Operation of Septic Tank Systems in SA</i> or be operated to the satisfaction of the Department of Health). Treated sewage wastewater disposed of onto land, well away from any place from which it is reasonably likely to enter any waters in compliance with the <i>Environment Protection (Water Quality) Policy 2003</i> .	No evidence of non-compliance with local or state government regulations.
	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 approved procedures in EMS and accepted industry standards. Site ponds appropriately ⁶ 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/evaporation ponds and 10mg/L in freeform evaporation ponds or natural disposal areas. No evidence of overflow of product from interceptor pit. No evidence of hydrocarbon contamination immediately adjacent to bunded ponds. Disposal of treated PFW restricted to defined areas in accordance with activity approval conditions.
	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 and PIRSA and EPA approvals/requirements. No installation of land treatment units (LTU's) within Regional Reserves. 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 land treatment units.

⁶ 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.

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
7. To minimise noise due to operations	7.1 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 <i>Environment Protection Act 1993</i> No unresolved reasonable complaints
8. To minimise atmospheric emissions	8.1 To minimise atmospheric emissions	Conduct all production activities in accordance with procedures. Continual review and improvement of operations. Identify and implement strategies to minimise volumes if needed.	Reasonable practical measures implemented in design and operation to minimise emissions.
	8.2 To minimise the generation of dust	Incident record system (preventative and post incident review). Develop and implement procedures (vehicle movement, dust suppression, etc.).	No reasonable complaints received. No dust related injuries recorded.
9. To adequately protect cultural heritage sites and values during operations and maintenance	9.1 To ensure that identified cultural sites are not disturbed	Site examined by relevant aboriginal claimant group for cultural heritage material prior to work on areas not previously cleared. Records of site locations and exclusion areas within information systems.	Proposed construction areas and access tracks surveyed by relevant Native Title claimant group. Any new sites identified are recorded and reported to appropriate authority. No impact to identified sites.
10. To minimise the risk to public health and safety	10.1 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.

Objective	Goal	Guide to How Objectives are Achieved ³	Assessment Criteria
	10.2 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.
	10.3 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. Access tracks disguised where possible to discourage third party access.	No unauthorised activity.
11. Minimise impact of emergency situations	11.1 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.
	11.2 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).

Appendix B: GAS for Borrow Pits

Goal Attainment Scaling (GAS) Criteria for Borrow Pits

Objectives	Goals	Goal Exceeded +2	Goal Exceeded +1	Goal Attained 0	Minor Shortfall - 1	Significant Shortfall - 2
CONSTRUCTION						
Minimise impacts on vegetation	Perennial vegetation clearance minimised	No trees or vegetation removed	No trees were removed, only vegetation	Trees and vegetation were removed where removal could not have been avoided	Trees with trunk diameters between 20 & 50cm were removed where removal could have been avoided Unflagged listed species removed	Trees with trunk diameters >50cm were removed where removal could have been avoided Flagged listed species removed
Protect sites of natural, scientific, or heritage significance	Avoid sites	Sites identified, flagged and avoided by 100m	Sites identified, flagged and avoided by 30m	Sites identified, flagged and avoided		Sites disturbed
Minimise visual impacts	Site pit appropriately	Borrow pit not visible from road	Borrow pit shielded from road by utilizing screening vegetation or landform	Borrow pit more than 10m from road or 50m from public road Visible from road due to lack of screening vegetation	Borrow pit less than 10m from road or less than 50m from public road	Borrow pit less than 5m from road or less than 20m from public road
REHABILITATION						
Minimise impacts on vegetation	Acceptable revegetation after rainfall	Vegetation type and density indistinguishable from surrounding landscape	Vegetation type and density only slightly distinguishable from surrounding landscape	Perennial grasses and shrubs revegetated, type consistent with surroundings. Some bare patches still present Vegetation cover uniform over base and sides of pit	Revegetation localised on the base of the pit but none or very little on the sides of the pit	No revegetation evident
Minimise impact on soil	Minimise erosion	No erosion anywhere on the pit	Insignificant erosion along the sides of the pit	Minor erosion along the sides of the pit	Moderate erosion	Severe erosion evident
Minimise visual impacts	Borrow pit effectively re-contoured and ripped	Pit contours indistinguishable from surrounding landscape. Access ripped	Pit contours blend well into surrounding landscape, although still evident	Pit sides battered and ripped along the contour, but pit outline visible Topsoil and vegetation respread over disturbed area	Pit sides battered but not ripped	No re-contouring of pit has occurred – pit sides are very steep Topsoil and vegetation not respread
Site to be left in a clean and tidy condition	Rubbish removed			No evidence of litter	Small items of litter present on site	Large items of litter present