



Statement of Environmental Objectives
for the Production and Processing of Petroleum Products
and Associated Activities at the Katnook and Ladbroke
Grove Gas Plants
Otway Basin – South Australia



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Contents

1	Scope & Purpose	1
2	Regulatory Definitions	3
3	Incident Reporting	3
	3.1 Incident Definitions	3
	3.2 Reporting to EPA.....	5
4	Environmental Objectives	5
5	Assessment Criteria	5
	5.1 General.....	5
	5.2 Current Controls	5
6	References	6

Appendix 1: Environmental Objectives and Assessment Criteria

Figures

Figure 1: Location of the Katnook and Ladbroke Grove Gas Plants	2
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Tables

Table 1: Incident Definitions.....	3
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1 Scope & Purpose

This Statement of Environmental Objectives (SEO) fulfils the requirements of Part 12, Division 4 of the *Petroleum and Geothermal Energy Act 2000* (the Act) and Part 3 of the Regulations under the Act. This SEO applies to all regulated activities conducted by Adelaide Energy Limited (ADE) relating to the production and processing of petroleum at the existing Katnook and Ladbroke Grove gas plants and associated facilities and infrastructure (Figure 1) to the point of sale.

This SEO covers all activities and operation of the Katnook and Ladbroke Grove gas plants, associated wells and pipelines to the point of sale in the Penola district, South Australia (Katnook Operation), including:

- Production facility construction, operation, maintenance and abandonment, extended production facility and compressor installations;
- Produced formation water disposal operations;
- Flow line / pipeline operations, maintenance and abandonment.

Note that both drilling operations including casing, well completion and installation of the wellhead from which the gas supply is drawn and pipeline construction are covered by separate SEO's.

This document should be used in conjunction with the accompanying Environmental Impact Report (EIR) (Origin Energy 2002) and Addendum to the EIR (Adelaide Energy 2010) for the Katnook and Ladbroke Grove facilities, pipelines and gas wells, from which the objectives for this SEO are derived. This SEO defines the environmental objectives and assessment criteria against those objectives for the management of identified environmental impacts that could potentially result from conducting regulated and other associated activities at the site.

Under Regulation 14 of the *Petroleum and Geothermal Energy Regulations 2000*, an approved SEO must be reviewed at least once in every five years. This SEO was originally produced for the facility by Origin Energy in 2004 and has been reviewed and updated by Adelaide Energy.

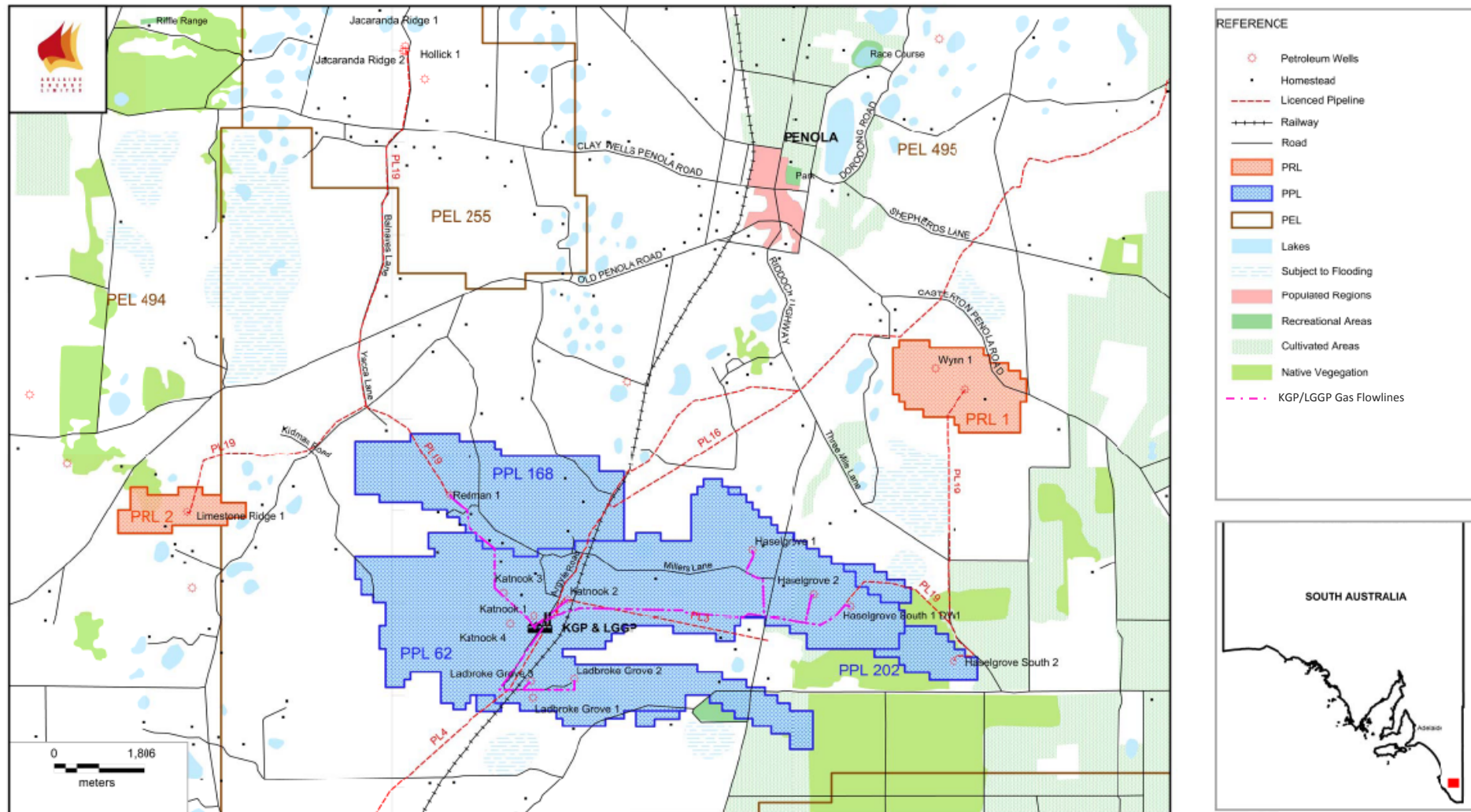


Figure 1: Location of the Katnook and Ladbroke Grove Gas Plants

2 Regulatory Definitions

In the Act, environment is broadly defined to include natural, social, cultural and economic aspects. The environmental objectives outlined in the SEO incorporate all of these aspects.

Pipeline means “a pipe or system of pipes for conveying petroleum or another regulated substance from place to place and includes:

- tanks, vessels, machinery and equipment necessary for, or associated with, its operation;
- a part of a pipeline”.

Within the Operator’s documentation in relation to the Katnook and Ladbroke Grove plants, pipeline is synonymous with flowline, gathering system and metering run.

Petroleum means “a naturally occurring substance consisting of a hydrocarbon or mixture of hydrocarbons in gaseous, liquid or solid state...”

3 Incident Reporting

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

PIRSA has developed a standard set of incident definitions relevant to operation activities (facility and pipeline). These definitions are intended to expand on definitions provided in Section 85(1) of the *Petroleum and Geothermal Energy Act 2000* and Petroleum and Geothermal Energy Regulation 32(1), and provide consistency for Licensee reporting. These definitions are provided in Table 1.

3.1 Incident Definitions

In accordance with Section 85 of the Act and Regulation 32(1):

Serious incident means an incident arising from activities conducted under the licence in which:

- a) a person is seriously injured or killed; or
- b) an imminent risk to public health or safety arises; or
- c) serious environmental damage occurs or an imminent risk of serious environmental damage arises; or
- d) security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises; or
- (e) some other event or circumstance occurs or arises that results in the incident falling within a classification of serious incidents under the regulations or a relevant statement of environmental objectives.

Reportable incident means:

- a) an 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; and
- b) an incident identified as a reportable incident under the relevant Statement of Environmental Objectives.

Table 1: Incident Definitions

Serious Incidents	Reportable Incidents
<ol style="list-style-type: none"> 1. A person is seriously injured¹ or killed. 2. An imminent risk to public health or safety arises. 3. Serious environmental damage occurs or an imminent risk of serious environmental damage arises. For example: <ol style="list-style-type: none"> a) Disturbance to sites of cultural and/or heritage 	<ol style="list-style-type: none"> 1. An escape of petroleum⁷, processed substance¹², a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape⁸ (other than a serious incident). 2. An event that has the potential to compromise the physical integrity of an asset or facility. For example:

Serious Incidents	Reportable Incidents
<p>significance without appropriate permits and approvals².</p> <p>b) An escape of petroleum, process substance¹², a chemical or a fuel to a water body, or to land in a place where it is reasonably likely to enter a water body by seepage or infiltration, or onto land that affects the health of native flora and fauna species.</p> <p>c) Detection of a declared weed, animal/plant pathogen or plant pest species that has been introduced or spread as a direct result of activities.</p> <p>d) Any removal of rare, vulnerable or endangered flora and fauna without appropriate permits and approvals³.</p> <p>4. Security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises⁴.</p> <p>5. An event that compromises the physical integrity of an asset or facility. For example:</p> <p>a) Identification of a through-wall defect on a pipeline⁵ or plant component.</p> <p>b) Pipeline rupture.</p> <p>6. Unauthorised activity on a pipeline easement where the pipeline is contacted and repair action is required⁶.</p> <p>7. An uncontrolled gas release resulting in the activation of gas detection alarms and/or emergency response and/or evacuation procedures of an area in or adjacent to the gas release, and/or fire or explosion.</p>	<p>a) Unauthorised activity on a pipeline easement with equipment that has been identified⁶ as exceeding the pipeline's penetration resistance, determined in accordance with Australian Standard (AS) 2885.</p> <p>b) Identification⁹ of a partial through-wall defect (e.g. through visual inspection, inline inspection, non-destructive testing) that requires repair or replacement action, or a reduction of the Maximum Allowable Operating Pressure, to maintain safe operation (other than a serious incident).</p> <p>c) Unauthorised activity on a pipeline easement with equipment or vehicles that have been identified⁶ as exceeding allowable stress limits, determined in accordance with AS2885.</p> <p>d) An unapproved¹⁰ excursion outside of critical design or operating conditions/parameters.</p> <p>e) Failure of a critical procedural control in place to reduce a credible threat to low or as low as reasonably practicable (ALARP).¹¹</p> <p>3. Unauthorised activity on a pipeline easement where the pipeline is contacted but repair action is not required.</p> <p>4. Malfunction or failure of critical plant or equipment that had (or still has) potential to cause a serious incident.</p>

Notes:

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

² Pursuant to *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*

³ Pursuant to *Native Vegetation Act 1991* (flora) and *National Parks and Wildlife Act 1972* (fauna).

⁴ That is, after taking into account relevant factors on a day and rights and obligations under contracts, a significant curtailment of firm service that detrimentally impacts or is likely to impact upon the security of electricity supply to South Australia or to gas supplies to a significant number of commercial and/or domestic gas users in SA

⁵ As per Petroleum and Geothermal Energy Act definition, the term 'pipeline' includes tanks, machinery and equipment necessary for, or associated with, operation of the pipeline.

⁶ For the case where a detailed assessment is required to determine this, PIRSA recommends the incident be reported initially and amended at a later date if required.

⁷ In gaseous, liquid or solid state, as per Petroleum and Geothermal Energy Act definition.

⁸ An area assigned during a Hazard and Operability Process (HAZOP) study as a hazardous area for the purpose of gas venting, and designed as such, is considered to be an area specifically designed to contain a gas escape.

⁹ For reporting purposes, the incident is considered to have occurred at the time that a decision is made to repair or replace the defect, or reduce the Maximum Allowable Operating Pressure.

¹⁰ "Approval" as per AS2885 definition. Note that there may be situations where excursions are allowable under AS2885.

¹¹ As per the Safety Management System process articulated in Australian Standard (AS) 2885.1-2007, or similar risk assessment process.

¹² 'Substance' includes those listed in Part 1 of Schedule 4 of the *Environment Protection (Water Quality) Policy 2003*

3.2 Reporting to EPA

Where applicable, incidents causing or threatening serious or material environmental harm under the *Environment Protection Act 1993* must be reported to the EPA in accordance with section 83 of the Environment Protection Act. Katnook Gas Plant and Ladbroke Gove Gas Plant operate under EPA Licence 23644.

The reporting obligation under the Environment Protection Act does not apply to petroleum exploration activity undertaken under the *Petroleum and Geothermal Energy Act 2000* or wastes produced in the course of an activity authorised by a licence under the *Petroleum and Geothermal Energy Act 2000* when disposed of to land within the area of the licence.

4 Environmental Objectives

The objectives of Section 95 of the Act include:

- ensure that regulated activities that have (actually or potentially) adverse effects on the environment are properly managed to reduce environmental damage as far as reasonably practicable; and
- eliminate as far as reasonably practicable risk of significant long term environmental damage; and

ensure that land adversely affected by regulated activities is properly rehabilitated.

The Environmental Impact Report (EIR) identified potentially hazardous events within the Katnook and Ladbroke Grove operation, and detailed the extent to which environmental aspects would be impacted within existing mitigation measures, should a hazardous event occur. Using the results of impact assessment, a set of environmental objectives has been developed for current operating conditions.

The environmental objectives and assessment criteria were developed based on considerable experience in conducting the regulated activities covered by this SEO. Results of various studies and research projects undertaken on the environmental impacts of these activities in this region were also considered.

These objectives are listed in Appendix 1.

5 Assessment Criteria

5.1 General

The criteria for measuring the achievement of the environmental objectives for each of the activity types covered by this SEO will take the form of objective evidence comprising clearly identifiable outcomes e.g. "no spills", "no contamination of groundwater", "no injuries to the public". The achievement of the prescribed assessment criteria is a regulatory requirement by which compliance will be monitored and enforced.

Assessment criteria are listed against the relevant objectives in Appendix 1.

5.2 Current Controls

As a guide to how the assessment criteria and hence the objectives will be achieved, the controls implemented by the licensee to ensure this are also listed against each of the relevant objectives in Appendix 1. These controls are not intended to be a mandatory regulatory requirement, they are provided to give a guide and demonstration of the measures implemented to ensure compliance. These could be used as proactive measures by the regulator to judge the likelihood of compliance by the licensee.

6 References

Adelaide Energy (2007). Statement of Environmental Objectives - Drilling, Completion and Initial Production Testing, PEL 255, Otway Basin, South East South Australia. Adelaide Energy Ltd, May 2007.

Adelaide Energy (2010). Addendum to the Environmental Impact Report for the Production and Processing of Petroleum Products and Associated Activities at the Katnook and Ladbroke Grove Gas Plants, Otway Basin – South Australia. December 2010

Origin Energy (2002). Environmental Impact Report for the Production and Processing of Petroleum Products and Associated Activities at the Katnook and Ladbroke Grove Gas Plants, Otway Basin – South Australia. Origin Energy Resources Limited, September 2002.

Origin Energy (2004). Statement of Environmental Objectives for the Production and Processing of Petroleum Products and Associated Activities at the Katnook and Ladbroke Grove Gas Plants, Otway Basin – South Australia. Origin Energy Resources Limited, December 2004.

Appendix 1:

Environmental Objectives and Assessment Criteria

Objectives	Current Controls (“Guide to how objectives can be achieved”)	Assessment Criteria
1. Avoid surface water, groundwater and soil contamination	<p>Regular inspection of pond liner integrity</p> <p>Monitoring of groundwater through monitoring bores</p> <p>Monitor existing trees on site for change in status</p> <p>Monitor and undertake downhole survey of wells to check integrity of cement bonding and tubing strings and casings</p> <p>Monitor casing and tubing pressures</p> <p>All fuel, oil and chemicals are stored, handled and transported (including bunding of all tanks and storage vessels) in accordance with appropriate standards and guidelines e.g. Australian Standard AS 1940, Australian Dangerous Goods (ADG) Code and EPA guideline 080/07 <i>Bunding and Spill Management</i></p> <p>Operating procedures for condensate and chemical handling and chemical management plan in operation</p> <p>Regular inspection of bunding</p> <p>Regular inspection and maintenance of pipelines in accordance with appropriate standards or industry best practice and Pipeline Operation and Maintenance Manual (POMM)</p> <p>Regular patrols undertaken to look for evidence of erosion, abnormal vegetation growth or death.</p> <p>Appropriate spill response equipment is available on site with personnel trained in spill response procedures</p> <p>Spills or leaks immediately reported and clean up actions initiated</p> <p>Waste management plan in operation</p> <p>Wastes disposed of in accordance with Environment Protection Act and EPA licence</p> <p>Septic tank regularly pumped out and transported by licensed waste contractor for appropriate off-site disposal</p> <p>Adherence to the <i>Environment Protection (Water Quality) Policy 2003</i> for wastewater storage, where relevant</p> <p>Water injection from evaporation ponds into Katnook-1 undertaken and monitored in accordance with EPA licence and approved Environmental Monitoring Plan (including monitoring of injection volumes, salinity and</p>	<p>No contamination of surface water, groundwater or soil as a result of operation activities</p> <p>No spills outside areas designed to contain them</p> <p>No crossflow behind casing in production wells</p> <p>Water reinjection from evaporation ponds in compliance with EPA licence conditions</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) or pipeline operation/ maintenance</p> <p>All domestic wastes are disposed of in accordance with EPA licensing requirements</p> <p>No evidence of rubbish or litter on easement or at facilities.</p> <p>For excavations, surface drainage profiles restored</p> <p>For existing easement, drainage is maintained to pre-existing conditions or better</p>

Objectives	Current Controls (“Guide to how objectives can be achieved”)	Assessment Criteria
	<p>casing pressures)</p> <p>Produced formation water (PFW) trucked out from ponds if required</p> <p>Records of spill events and corrective actions are maintained in accordance with company procedures</p>	
<p>2. Minimise disturbance to native vegetation and native fauna</p>	<p>Vegetation clearing is limited to previously disturbed areas (ie fire tracks, grazing or cleared farming land) or areas assessed to be of lowest sensitivity</p> <p>New facilities designed to minimise native vegetation clearance</p> <p>Where deemed necessary, photographic evidence may be recorded prior to clearing of native vegetation and after rehabilitation to enable impact trends in operational activities to be monitored</p> <p>Vegetation trimmed rather than cleared where possible</p> <p>Consideration of significant / sensitive vegetation during planning of activities</p> <p>Work (or payment to the Native Vegetation Fund) undertaken to achieve a ‘significant environmental benefit’ where clearance of native vegetation occurs, as required by Native Vegetation Regulation 5(1)(zd)</p> <p>New facilities and well sites designed to minimise harm to native fauna</p> <p>Regular monitoring of open excavations to remove trapped fauna</p>	<p>Species abundance and distribution on reinstated areas is consistent with the surrounding area (assessment will take into account that regrowth is a time and rainfall dependent process)</p> <p>‘Significant environmental benefit’ obligations for native vegetation clearance satisfied / implemented.</p> <p>No rare, vulnerable or endangered fauna removed without appropriate permits</p> <p>No removal of habitat for rare, vulnerable or endangers fauna without appropriate permits</p> <p>Native fauna injuries and casualties due to operations are restricted to as low as reasonably practical</p> <p>Site rehabilitation results in native vegetation to be consistent with surrounding area</p>

Objectives	Current Controls (“Guide to how objectives can be achieved”)	Assessment Criteria
3. Avoid the spread of weeds and pathogens	<p>Regular patrols undertaken to look for evidence of weeds/pathogens on production site and adjacent land (if weeds found on production facility or easement but not adjacent land, implement reasonable control to prevent spread)</p> <p>Vehicles and machinery kept free of soil and plant material and washed down where required (e.g. after operating in an area of known weed infestation)</p> <p>Vehicles remain on existing tracks as far as possible</p> <p>Liaison with landholders to identify weed/pathogen issues</p> <p>Personnel remain observant and monitor for ‘different’ plants or new weed occurrences</p> <p>Weed Management Plans are implemented where new weeds identified</p> <p>Control measures implemented where necessary, in consultation with landholders and the NRM Board and/or local council.</p>	<p>No new weed/pathogen or pest infestations due to site activities reported</p> <p>The presence of weeds and pathogens at facility sites and on pipeline easements is consistent with or better than adjacent land</p> <p>No new introduction or spread of weeds, pathogen or pest plants and animals due to operational activities</p>
4. Avoid disturbance to sites of Aboriginal and European heritage significance	<p>Consultation and site inspection before any new areas disturbed or if operations occurring outside known surveyed areas</p> <p>Implement appropriate protocols for dealing with accidental discovery of heritage material during operations</p> <p>Activities restricted to operational areas</p> <p>Site examined by relevant aboriginal claimant group for cultural heritage material prior to work on areas not previously cleared</p>	<p>No unauthorised disturbance to Aboriginal or European heritage areas</p>
5. Minimise the risk to the public and other third parties	<p>All employees, contractor personnel and visitors complete a safety induction prior to commencement of work in the field</p> <p>Signage in place to warn third parties of access restrictions to operational areas, with particular warnings when potentially dangerous operations are being undertaken</p> <p>‘Dial before you dig’ number available and widely advertised.</p> <p>Clear identification of the pipeline by signs installed in accordance with AS2885.</p> <p>Security measures in place to prevent unauthorised access</p> <p>Fences and warning signs are maintained in good order</p> <p>Permit to Work system in place for staff and contractors in any dangerous</p>	<p>Reasonable measures implemented to ensure no injuries or incidents involving the public or third parties</p>

Objectives	Current Controls (“Guide to how objectives can be achieved”)	Assessment Criteria
	<p>work situations</p> <p>All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards</p> <p>Incident reporting system in place for recording injuries, accidents and near misses, with implementation of appropriate corrective actions and regular review</p> <p>Regular maintenance of all facilities to prevent failure</p> <p>Facilities and pipelines compliant with relevant standards, including AS-2885 pipeline standards</p> <p>Ensure all drivers are appropriately trained</p> <p>Regular communication with landholders</p> <p>HSEMS in place and regularly reviewed and updated</p> <p>Effective Emergency Response Plan (ERP) and procedures are in place and reviewed annually with exercises conducted at a minimum of every two years</p>	

Objectives	Current Controls (“Guide to how objectives can be achieved”)	Assessment Criteria
<p>6. Avoid disturbance to stakeholders and their associated infrastructure.</p>	<p>Develop good ongoing communication with stakeholders</p> <p>Timely notification to landholders / third parties prior to and during new or significant works where appropriate</p> <p>Access confined to production areas (and associated infrastructure and easements) or access routes agreed with landholders</p> <p>Formal access agreements where appropriate, outlining the legal responsibility of Adelaide Energy Limited and landholders</p> <p>All gates left in the condition in which they were found</p> <p>Fencing to be maintained in good order to prevent stock access</p> <p>Soil profiles restored at excavations i.e. topsoil stockpiled separately and respread following backfill following pipeline maintenance and emergency dig-ups</p> <p>Annual land survey to look for soil discolouration, success of vegetation return as an indicator</p> <p>Regular patrols of ROW and leases to identify new weeds, evidence of soil inversion, subsidence or erosion or evidence of pipeline leaks (dead vegetation)</p> <p>Unavoidable or accidental disturbance to infrastructure restored to the satisfaction of the landholder/owner or as near as reasonably practicable to the undisturbed condition</p>	<p>No unresolved reasonable complaints from stakeholders.</p> <p>No un-remediated subsidence due to pipeline maintenance operations</p> <p>No new evidence of subsoil on surface due to pipeline maintenance operations</p> <p>No new evidence of soil compaction due to pipeline maintenance operations</p> <p>Soil is consistent with the surrounding areas and no unresolved reasonable complaints from stakeholders</p> <p>The extent of soil erosion on the easement is consistent with surrounding land.</p>
<p>7. Minimise atmospheric emissions</p>	<p>Ongoing service and maintenance of operation facilities</p> <p>Operations conducted in accordance with appropriate industry accepted standards</p> <p>Continually review and improve operations</p> <p>Emergency response procedures in place in case of a gas leak</p> <p>Use of water trucks and sprayers if necessary for dust suppression</p>	<p>Compliance with the <i>Environment Protection Act 1993</i></p> <p>No reasonable stakeholder complaints left unresolved</p> <p>Reasonable practical measures implemented in design and operation to minimise emissions</p>

Objectives	Current Controls (“Guide to how objectives can be achieved”)	Assessment Criteria
8. Minimise impact of noise due to operations	<p>Regular maintenance of plant and equipment</p> <p>Facility design, equipment specification and operational activities have taken reasonable practical measures to comply with noise requirements under the <i>Environment Protection Act 1993 and EPA (Noise) Policy 2007</i></p> <p>Monitoring of noise levels and implementation of controls where deemed necessary (e.g. reasonable complaints)</p> <p>Reasonable practical measures implemented in design and operation to minimise noise emissions</p>	<p>No reasonable stakeholder complaints left unresolved</p> <p>Noise emissions comply with EPA requirements</p>
9. Remediate and rehabilitate operational areas to agreed standards	<p>Rehabilitation/abandonment plans for surface activities will be developed in consultation with relevant stakeholders</p> <p>The following steps will typically be undertaken unless otherwise agreed with the regulator and stakeholders:</p> <ul style="list-style-type: none"> ▪ Wells securely abandoned (in accordance with the relevant drilling SEO e.g. Adelaide Energy 2007) ▪ Surface structures, above-ground pipe work and marker signs removed ▪ Buried pipelines cleaned and allowed to degrade in-situ in accordance with AS2885 or industry best practice at time of abandonment ▪ Waste removed and recycled where appropriate ▪ Disturbed areas re-contoured to pre-existing contours, natural drainage restored and compaction relieved (e.g. by scarification or ripping where appropriate) ▪ Remediation of site contamination (if present) and EPA notification in accordance with Section 83A of the <i>Environmental Protection Act 1993</i> 	<p><u>Production Facility Abandonment</u></p> <ul style="list-style-type: none"> ▪ Surface structures are removed and the ground surface re-contoured to approximate pre-existing contours unless alternative agreement is reached with the regulator and stakeholders. ▪ Contaminated sites are remediated in accordance with criteria developed with the principles of the National Environment Protection Measure for contaminated sites and in consultation with the EPA <p><u>Pipeline Abandonment</u></p> <p>Attainment of the following (unless otherwise agreed with stakeholders and approved by the regulatory authority):</p> <ul style="list-style-type: none"> ▪ No evidence of waste, redundant equipment / infrastructure or signs and markers on abandoned pipelines ▪ Refer to criteria for contaminated site remediation under this objective (above)