

Statement of Environmental Objectives

Onshore Otway Basin Petroleum Production Operations



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February 2024



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1 Introduction

This Statement of Environmental Objectives (SEO) has been prepared to meet the requirements of Section 99 and Section 100 of the South Australian *Petroleum and Geothermal Energy Act 2000* (the PGE Act) and Regulation 12 and Regulation 13 of the *Petroleum and Geothermal Energy Regulations 2013* (the PGE Regulations).

1.1 Purpose

The intent of the SEO is to outline the environmental objectives to which the petroleum production activities will conform.

The objectives of this SEO have been developed from the potential environmental risks and consequences associated with all Beach Energy's activities and operations at the Katnook Gas Processing Facility (KGPF) identified in the Environmental Impact Report EIR (Beach Energy 2024), and are in keeping with the objectives of the PGE Act, which include:

- to establish an effective, efficient and flexible regulatory scheme to enable the exploration for, and the recovery, production, transmission, storage and management of, energy resources that encourages and maintains an appropriate level of competition
- to ensure that energy rights and resources are managed for the benefit of the State
- to ensure that the exploration for, and the recovery, production, transmission, storage and management of, energy resources is carried out safely and is ecologically sustainable
- to ensure that regulated activities that may have adverse effects on the environment—
 - are properly managed to reduce environmental damage; and
 - are carried out in a way that eliminates or limits the risk of significant long term environmental damage
- to ensure as far as reasonably practicable, security of supply for users of natural gas
- to ensure that land adversely affected by regulated activities is properly rehabilitated
- to establish appropriate consultative processes with people directly affected by regulated activities including Aboriginal people and the public generally
- to protect the public from risks inherent in regulated activities.

1.2 Scope

Beach Energy Limited (Beach Energy) holds a number of petroleum exploration, production and retention licences under the PGE Act in the onshore Otway Basin in the South East of South Australia, which encompass assets including the Katnook Gas Processing Facility (KGPF) and associated infrastructure. Figure 1 shows the location of Beach Energy's current licence areas.

This SEO (and the EIR) has been written to address both current and potential future petroleum production activities in the onshore Otway Basin, in order to develop a SEO that will encompass reasonably foreseeable future activities over the lifetime of the SEO.

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This SEO applies to all Beach Energy petroleum production operations in the onshore Otway Basin in South Australia. Operations that are covered by this SEO include:

- production and processing operations at the KGPF site, including potential infrastructure refurbishment and improvement, and produced formation water disposal operations.
- well operations (after drilling has finished) including production completions and workovers, well integrity management, artificial lift and wellhead production equipment, gas well deliquification and downhole decommissioning¹ following production.
- field production / processing equipment installation, operation, decommissioning and rehabilitation.
- pipeline construction, operation and decommissioning.
- construction depots and camps.
- access tracks and pads.
- waste management.
- end of life facility decommissioning / rehabilitation.

These operations are described in detail in the EIR (Beach Energy 2024).

This SEO and corresponding EIR do not apply to:

- well site and access track construction.
- drilling activities.
- down hole decommissioning of wells following drilling.
- restoration of well sites and well access tracks directly following drilling.
- seismic operations.

These activities are covered by other EIRs and SEOs. The relevant SEOs in place at the time of preparation of this document include:

- Statement of Environmental Objectives Drilling, Completion and Well Production Testing in the Otway Basin, South Australia (Beach Energy 2018).
- Statement of Environmental Objectives for Geophysical Activities in the Otway Basin, South Australia (Beach Energy 2021).

Operation of major transmission pipelines in the region not owned by Beach Energy, such as the SEA Gas and the South East South Australia (SESA) pipelines, are not covered by this SEO and the corresponding EIR.

Fracture stimulation activities are not proposed and are not covered by this SEO.

¹ Decommissioning of wells is equivalent to 'abandonment', which is the technical term used in the PGE Regulations.

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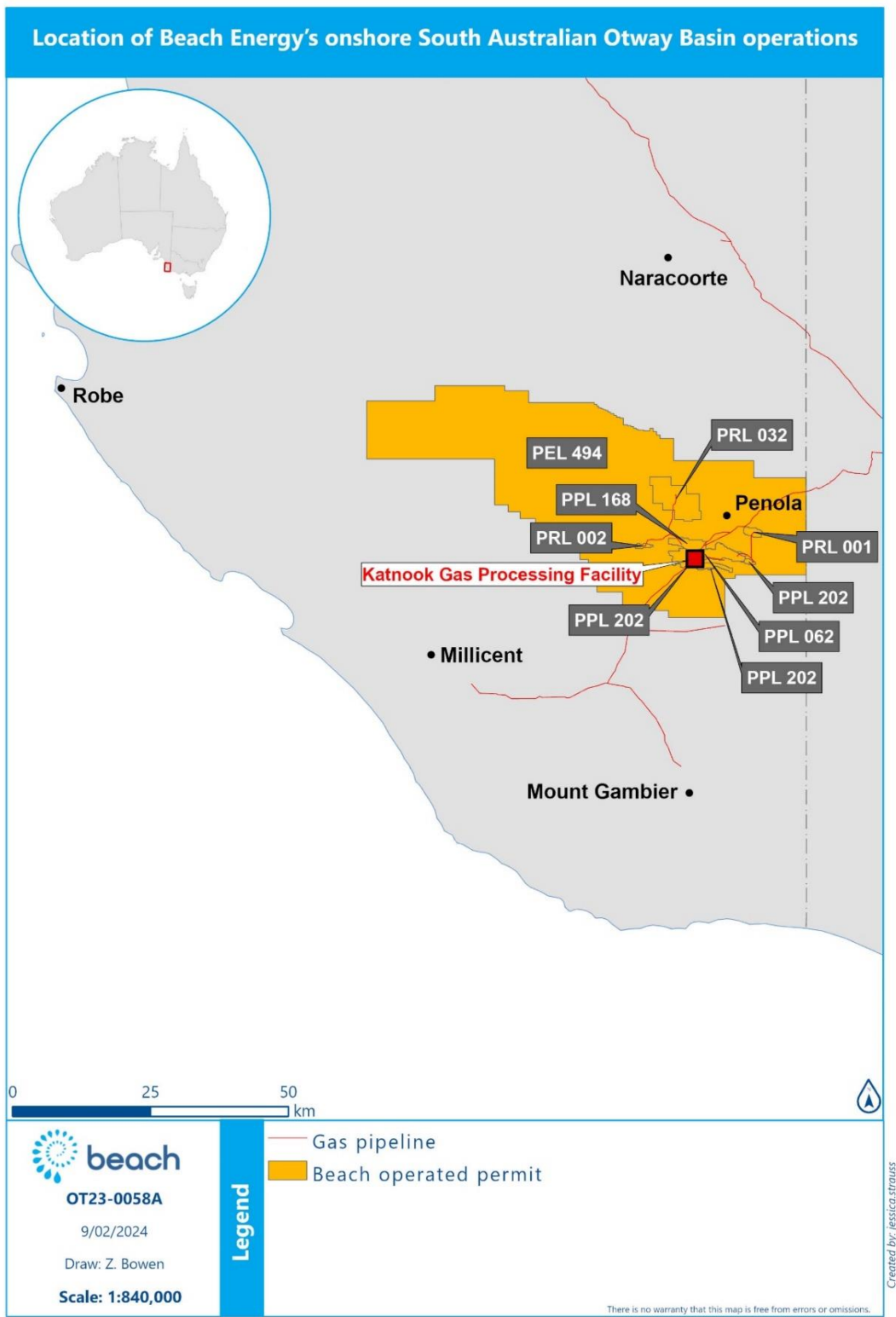


Figure 1: Location of Beach Energy's current South Australian onshore Otway Basin operations

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2 Environmental Objectives

Potential environmental hazards and consequences associated with petroleum production operations in the Otway Basin have been identified in the Environmental Impact Report (Beach Energy 2024). Beach Energy is committed to achieving a range of environmental objectives in regard to these potential hazards.

The objectives for the environmental management of petroleum production operations are provided in Appendix A : Environmental Objectives and Assessment Criteria..

3 Assessment Criteria

The environmental objectives identified in Appendix A 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 unauthorised clearing of native vegetation').
- Defined requirements - the achievement of an objective can be assessed against the implementation of specific procedures or actions required for an activity (e.g. 'Wastes are segregated and transported to an EPA licensed facility for recycling or disposal').
- Scientific studies / monitoring – in some cases, the assessment of the environmental objectives may not be possible in the shorter term and may require longer term monitoring and scientific evaluation. In such cases, assessment criteria may be in the form of longer-term data and information gathering.

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

The management measures listed in the 'Guide to How Objectives can be Achieved' column in Appendix A provide a high-level overview of systems, activities and / or procedures that Beach Energy have developed or implemented to achieve the environmental objectives. Detailed operational procedures (including environmental controls) are contained in Beach Energy's Operations Excellence Management System documentation.

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4 Reporting

It is a requirement under Section 85 of the PGE Act that any 'serious' and 'reportable' incidents, as defined in the PGE Act, must be reported to the Minister.

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

Reportable Incidents must be reported to the Department for Energy and Mining (DEM) on a quarterly basis within one month of the end of the quarter, as per Regulation 32 of the PGE Regulations.

4.1 Incident Definitions

Regulation 12 (2) requires an SEO to identify events that could, if not properly managed or avoided, cause a serious incident or a reportable incident within the meaning of Section 85 of the PGE Act. Table 1 identifies the potential serious and reportable incidents relevant to production activities. These definitions are based on standard definitions for facilities and pipelines developed by DEM, which are intended to expand on definitions provided in Section 85(1) of the PGE Act and Regulation 32(1), and provide consistency for Licensee reporting.

In accordance with Section 85 of the PGE Act and PGE 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.
- (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 is defined in Section 85(1) of the PGE Act as incidents (other than a serious incident) arising from activities conducted under a licence that are classified under the PGE Regulations as a reportable incident. Regulation 32(1) classifies the following as reportable incidents:

- (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.

4.2 Reporting to the EPA

Where applicable, incidents causing or threatening serious or material environmental harm under the *Environment Protection Act 1993* must be reported to the Environment Protection Authority (EPA) in accordance with Sections 83 and 83A of the *Environment Protection Act 1993*.

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The *Environment Protection Act* and its reporting obligation do not apply to:

- petroleum exploration activity undertaken under the PGE Act
- wastes produced in the course of an activity (not being a prescribed activity of environmental significance) authorised by a licence under the PGE Act when produced and disposed of to land within the area of the licence.

Table 1: Incident descriptions

Serious Incidents	Reportable incident
1. A person is seriously injured² 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: a. Damage, disturbance or interference to sites of cultural and / or heritage significance without appropriate permits and approvals.³ b. An escape of petroleum, process substance, 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. 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. d. Any removal of rare, vulnerable or endangered flora and fauna without appropriate permits and approvals.⁴ e. Identification of cross flows between aquifers in natural hydraulic isolation, or uncontrolled flows to the surface. 4. Security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises.⁵ 5. An event that results in a rupture of a pressure containing asset or facility.	1. An escape of petroleum⁹, processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape¹⁰ (other than a serious incident). 2. Any event where an incursion outside a culturally cleared area has occurred or the conditions of a cultural heritage clearance have not been complied with (other than a serious incident). 3. An event that has the potential to compromise the physical integrity of an asset or facility. For example: a. Activity on a pipeline easement with equipment that has been identified⁸ as exceeding the pipeline's penetration resistance, determined in accordance with Australian Standard (AS) 2885. b. Identification of a through-wall defect on a pipeline¹¹ or plant component (other than a serious incident). c. Identification¹² 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). d. Activity on a pipeline easement with equipment or vehicles that have been identified⁸ as exceeding allowable stress limits, determined in accordance with Australian Standard (AS) 2885.

² As per the definition in Section 36 of the *Work Health and Safety Act 2012*.

³ Pursuant to *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*.

⁴ Pursuant to *Native Vegetation Act 1991* (flora) and *National Parks and Wildlife Act 1972* (fauna).

⁵ 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.

⁹ In gaseous, liquid or solid state, as per Petroleum and Geothermal Energy Act definition.

¹⁰ 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.

¹¹ 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.

¹² 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 as defined in AS2885.

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Serious Incidents	Reportable incident
6. A regulated activity⁶ being undertaken in manner that involved or will involve a serious risk to the health or safety of a person emanating from an immediate or imminent exposure to a hazard.⁷ 7. Activity on a pipeline easement where the pipeline is contacted and repair action is required.⁸ 8. An uncontrolled gas release resulting in the activation of emergency response and / or evacuation procedures of an area in or adjacent to the gas release, and / or fire or explosion.	e. An unapproved¹³ excursion outside of critical design or operating conditions / parameters. f. Failure of a critical procedural control in place to reduce a credible threat to low or as low as reasonably practicable (ALARP).¹⁴ g. Identification of a critical barrier failure that could lead to the potential for cross flows between aquifers in natural hydraulic isolation, or uncontrolled flows to the surface. 4. Unauthorised activity on a pipeline easement where the pipeline is contacted but repair action is not required. 5. Malfunction or failure of critical plant or equipment that had (or still has) potential to cause a serious incident.

⁶ Regulated activity as defined in Section 10 of the Petroleum and Geothermal Energy Act.

⁷ Resulting in the issuing of a prohibition notice by SafeWork SA pursuant to Section 195 of the *Work Health and Safety Act 2012*.

⁸ For the case where a detailed assessment is required to determine this, DEM recommends the incident be reported initially and amended at a later date if required.

¹³ "Approval" as per AS2885 definition. Note that there may be situations where excursions are allowable under AS2885.

¹⁴ As per the Safety Management System process articulated in Australian Standard (AS) 2885 or similar risk assessment process.

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5 Glossary

ALARP	as low as reasonably practicable
ANZECC	Australian and New Zealand Environment Conservation Council (in reference to the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000</i>)
AS 1940	Australian Standard AS 1940 :2017 Storage and Handling of Flammable and Combustible Liquids
AS 2885	Australian Standard AS 2885:2008 Pipelines – Gas and liquid petroleum
AS/NZS 3000	Australian Standard/ New Zealand Standard AS/NZS 3000:2018 Electrical installations
BOP	blowout preventer
contamination	As defined by the <i>Environment Protection Act 1993</i> and the <i>National Environment Protection (Assessment of Site Contamination) Measure (1999)</i> amended in 2013
DEM	Department for Energy and Mining
DEW	Department for Environment and Water
EPA	Environment Protection Authority (South Australia)
EIR	Environmental Impact Report prepared in accordance with Section 97 of the <i>Petroleum and Geothermal Energy Act 2000</i> and Regulation 10 of the <i>Petroleum and Geothermal Energy Regulations 2021</i>
ERP	Emergency Response Plan
OEMS	Beach Energy Operations Excellence Management System
minimise	To reduce risk and impacts to as low as reasonably practical (ALARP), considering all other factors e.g. requirements for safe operations and accessibility
NEPM	<i>National Environment Protection (Assessment of Site Contamination) Measure (1999)</i> amended in 2013
LSA Act	<i>Landscape South Australia Act 2019</i>
PFW	produced formation water
SEB	significant environmental benefit
SEO	Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the <i>Petroleum and Geothermal Energy Act 2000</i> and Regulations 12 and 13 of the <i>Petroleum and Geothermal Energy Regulations 2021</i>

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6 References

ANZECC (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment Conservation Council.

Beach Energy (2018). *Statement of Environmental Objectives: Drilling, Completion and Well Production Testing in the Otway Basin, South Australia*. November 2018. Beach Energy, Adelaide SA.

Beach Energy (2024). *Environmental Impact Report Onshore Otway Basin Petroleum Production Operations*. February 2024. Beach Energy, Adelaide SA.

Beach Energy (2021). *Statement of Environmental Objectives for Geophysical Activities in the Otway Basin, South Australia*. April 2021. Beach Energy, Adelaide SA.

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Appendix A Environmental Objectives and Assessment Criteria

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Table A: Environmental Objectives and Assessment Criteria

Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
1. To minimise disturbance to landholders, land use third party infrastructure, or the local community	1.1 To minimise disturbance or damage to infrastructure / land use and remediate where disturbance cannot be avoided	Compliance with Part 10 of the <i>Petroleum and Geothermal Energy Act</i> (Notice of Entry requirements) Landholders are consulted regarding the location, management and timing of proposed activities. Ongoing landholder liaison during and following operations Activities are restricted to agreed / defined areas All gates left in the condition in which they were found (open / closed) Record of disturbance management through appropriate documentation Incident reporting and corrective actions Facilities, ponds and other areas fenced as appropriate to exclude stock Vehicle access restricted to designated roads and areas Biosecurity procedures implemented as agreed with landholders Training and induction of all personnel and visitors includes information on land use, infrastructure issues and restricted areas and activities During rehabilitation, imported materials are removed from site and soil profiles and contours restored unless otherwise agreed with the landowner Any deterioration of property tracks or infrastructure as a result of activities is rectified	No adverse impact outside agreed disturbance on land use or third party infrastructure as a result of activities Adverse impacts of accidental or unforeseen disturbance to infrastructure or land use resolved to the reasonable satisfaction of the landholder
	1.2 To minimise disturbance to landholders and the local community	Landowners and relevant stakeholders (e.g. local council, industry associations) consulted regarding nature, location and management of proposed activities Timely notification to adjacent landholders / third parties prior to and during new or significant works where appropriate Records of communications with landholders / third parties Reasonable, practical measures implemented to comply with noise standards (e.g. EPA guidelines) where relevant All facilities designed, constructed, operated and maintained in accordance with relevant standards (refer to listing under Objective 6.1) and legislative requirements Noise assessments undertaken as appropriate during design and operation to confirm compliance with legislative requirements	Timely consultation and notification of proposed activities with relevant landowners and stakeholders can be demonstrated Landholder / stakeholder complaints are documented and reasonable steps taken to resolve them can be demonstrated

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Plant and equipment operated and maintained in accordance with manufacturer specifications Construction near residences is scheduled in accordance with EPA recommendations for normal construction working hours as far as practicable All vehicles and equipment conform to appropriate noise control standards Systems in place for logging stakeholder complaints to ensure that issues are addressed as appropriate	
	1.3 To minimise the visual impact of operations	Site activities planned and undertaken to minimise disturbance to landowners and adjacent landholders Landowners and relevant stakeholders (e.g. local council, industry associations) consulted regarding nature, location and management of proposed activities Temporary facilities removed from site promptly following completion of activities, particularly in visible locations High standard of 'housekeeping' is maintained to minimise visual impact Measures such as screening plantings undertaken to minimise visual impact of permanent facilities where appropriate	Operations are restricted to agreed / defined areas Operational sites maintained in clean and tidy condition Operational areas are remediated and rehabilitated to be reasonably consistent with the surroundings (refer to Objective 10)
2. To maintain soil stability / integrity	2.1 To minimise and remediate soil disturbance	Landowners consulted regarding earthworks required, location of proposed activities and appropriate measures to minimise surface damage and to facilitate rehabilitation Separate stockpiling of topsoil and subsurface material during excavation Inspections undertaken as part of regular operations to look for erosion, subsidence or evidence of inversion (e.g. soil discolouration and the success of vegetation return) During rehabilitation areas of compacted soil are ripped (after removal of any imported fill) and before the returning of stockpiled topsoil Soil profile and contours are reinstated following completion of operations	The extent of soil erosion as a result of production operations is consistent with or less than surrounding land No disturbance to soil profiles resulting from activities remains after restoration Operational areas are remediated and rehabilitated to be reasonably consistent with the surroundings (refer to Objective 10)
3. To minimise disturbance to native vegetation and native fauna (including wetland communities)	3.1 To avoid or minimise clearing of native vegetation as part of production activities	Appropriately trained and experienced personnel have assessed or scouted proposed routes or locations to identify and flag significant (or rare, vulnerable or endangered) species and communities (including wetland communities) Native vegetation clearance avoided or minimised by locating sites, tracks or pipelines appropriately	No unauthorised clearing of native vegetation Any sites of rare, vulnerable or endangered species or threatened communities have been identified, flagged and subsequently avoided No rare, vulnerable or endangered flora removed without appropriate permits

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Vegetation (e.g. trees on or adjacent to pipeline easements) is trimmed rather than removed where possible Removal of large trees (including dead trees with hollows) is avoided Areas of low quality native vegetation are avoided unless there are no viable alternatives (e.g. use of adjacent cleared areas) Areas of high quality or significant¹⁵ remnant vegetation or Heritage Agreement Areas are avoided If sites in close proximity to a park or reserve established under the <i>National Parks and Wildlife Act</i> and indirect impacts are likely, consultation is undertaken with DEW to determine appropriate mitigation measures Sites with native vegetation are rehabilitated in consultation with DEM, DEW and other relevant stakeholders	High quality or significant remnant vegetation has not been cleared Activities are not carried out in parks or reserves established under the <i>National Parks and Wildlife Act</i>
	3.2 To achieve a significant environmental benefit for native vegetation clearance	Clearance of native vegetation is undertaken in accordance with Regulation 14 of the <i>Native Vegetation Regulations 2017</i> (i.e. it is undertaken in accordance with a management plan approved by the Native Vegetation Council (NVC) that results in a significant environmental benefit; or payment is made into the Native Vegetation Fund of an amount considered by the Council to be sufficient to achieve a significant environmental benefit) Significant environmental benefit requirement determined using the methodology outlined in the relevant guidelines published by the NVC	Significant environmental benefit for native vegetation clearance approved by DEM (where delegated authority applies) or Native Vegetation Council Significant environmental benefit obligation satisfied / implemented
	3.3 To ensure production activities are planned and conducted in a manner that minimises impacts on native fauna	Implement measures listed under Goal 3.1 above to avoid or minimise impact to native vegetation and native fauna habitat Regularly check excavations to detect and release trapped fauna and provide measures (e.g. fauna ladders and trench plugs) where appropriate to facilitate movement of fauna out of or across excavations If threatened species (e.g. Red-tailed Black-Cockatoos) are detected or likely to occur near the site, seek specialist advice regarding measures to mitigate potential impacts Facilities and ponds and fenced as appropriate to exclude larger fauna	No significant adverse impacts on native fauna as a result of production activities No rare, vulnerable or endangered fauna removed without appropriate permits No native fauna casualties that could have reasonably been prevented through management measures described in the guide

¹⁵ Significant in this context includes listed plant species, listed communities or important fauna habitat. Site-specific assessment by an appropriately qualified specialist would be used to determine whether any native vegetation proposed to be cleared constitutes large trees, high quality vegetation or significant vegetation.

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Measures to facilitate escape of smaller fauna from ponds or below-ground structures provided where required (e.g. geofabric or textile matting 'ladders') Routine surveillance monitoring undertaken to detect fauna incursions into facilities or ponds. Fauna mortality (if it occurs) to be captured by incident reporting system and advice from an ecologist sought if required	
4. Avoid the introduction or spread of weeds, pest animals and pathogens as a consequence of regulated activities	4.1 To ensure that the presence of weeds, pest animals or pathogens is consistent with or better than pre-disturbance conditions and adjacent land	Appropriate consultation regarding weeds or pathogens carried out with landholders and Limestone Coast Landscape Board officers Biosecurity procedures implemented as agreed with landholders Vehicles and equipment entering the region or moving between sites (especially from weed or pathogen infested areas into non-infested areas) assessed for the risk of transporting weeds and pathogens and cleaned down where appropriate Records of vehicle or equipment inspections and cleaning will be kept for auditing Paving materials are sourced from licensed quarries that are free of weeds Operational sites monitored on a regular basis for new weed species / infestations, and treated as necessary in accordance with requirements of the landholder, and if appropriate the Limestone Coast Landscape Board Records of detection, monitoring or eradication of weeds or pathogens introduced by activities are kept and available for review	The presence of weeds, pest animals or pathogens is consistent with or better than pre-disturbance conditions and adjacent land or where this is not the case, a management plan is implemented promptly Declared plants occurring as a result of regulated activities are reported and managed in accordance with the <i>Landscape South Australia (LSA) Act</i> and applicable plans
5. To minimise the impact of production activities on water resources	5.1 To maintain current surface drainage patterns and to minimise impact to surface water features	Sites, tracks and pipelines are located to avoid surface water features as far as practicable and to maintain pre-existing water flows Temporary drainage depressions / culverts installed where required Landowners or infrastructure owners consulted regarding requirements for crossings of drainage channels Sediment and erosion control measures (e.g. sediment fences) installed where necessary (e.g. if in close proximity to drains or surface water features) Pipeline trench water disposed to land consistent with relevant guidelines (e.g. <i>Environment Protection (Water Quality) Policy 2015</i> requirements and ANZECC guidelines). Discharged water not allowed to flow beyond the intended receiving area or into any watercourses or areas where it may enter surface water unless it has been appropriately assessed Landholder approval obtained prior to disposal of pipeline trench water to land	For pipeline easements and other reinstated excavations, surface drainage profiles restored to a state that is reasonably consistent with pre-existing conditions and the surrounding area All regulated activities are located and constructed to maintain pre-existing water flows to minimise impact to surface water features as far as practicable No new 'water affecting activities' (as defined under the LSA Act) are undertaken unless relevant permits have been obtained

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Any area artificially elevated via pad or access track construction is lowered to original ground level during rehabilitation by removal of paving material unless otherwise agreed with the landowner Relevant permits (e.g. for water affecting activities under the LSA Act) obtained where required	
	5.2 To minimise impact to aquifers / groundwater volumes and flow patterns	The volume of produced formation water extracted is monitored, recorded and reported Water extraction for use in production operations (e.g. water supply) is in accordance with water licence Water usage is reviewed periodically and management strategies implemented to reduce overall water usage where practical) Trench plugs installed where necessary to prevent longitudinal water flow within backfilled pipeline trench. Refer to Objective 6.8 (well integrity) regarding prevention of crossflow in aquifers	Water Allocation Plan and water licence conditions are complied with No uncontrolled flow to the surface (i.e. no free flowing bores) Landholder complaints regarding impact on groundwater users are documented and reasonable steps taken to resolve them can be demonstrated
6. To minimise land and water contamination	6.1 To prevent spills and leaks occurring and if they occur minimise their impact	All facilities designed, constructed, operated and maintained in accordance with relevant standards (e.g. AS 3000, AS 1940, AS 2885, AS 4041, ASME/ANSI B31.3, AS 1200, AS 3788, hazardous area compliance to AS 60079 series) and legislative requirements Location, design and operation of facilities is consistent with the requirements of the Environment Protection (Water Quality) Policy 2015 Site stormwater managed to avoid off-site impacts Implementation of appropriate chemical and fuel storage and handling procedures (e.g. bunding and signage) in accordance with relevant legislation, standards and guidelines, including AS 1940, EPA guideline 080/16 Bunding and Spill Management and the Australian Dangerous Goods Code (ADG) Implementation of appropriate measures during maintenance and decommissioning to prevent release of hazardous materials Safety, testing, maintenance and inspection procedures implemented	No adverse impact to land use or native vegetation and native fauna outside operational sites due to an escape of petroleum, processed substance, chemical or fuel No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or solid wastes to surface water and/or groundwater Any escape of petroleum, processed substance, chemical or fuel to land is either immediately contained and removed or assessed in accordance with NEPM ¹⁶ guidelines and remediated in a timely manner

¹⁶ National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Fuel and chemical handling and emergency response procedures included in training, implemented and reviewed periodically Appropriate spill containment and clean-up equipment located on site Spills or leaks are immediately reported and clean up actions initiated Affected areas fenced if threat is posed to stock or wildlife Any contaminated soil either be treated in-situ or removed for treatment / disposal at an EPA approved facility Assessment and remediation of uncontained spills with larger scale impact (e.g. release of fluid to land outside fenced areas, or any volume to water) is consistent with the <i>National Environment Protection (Assessment of Site Contamination) Measure</i> and relevant SA EPA guidelines Maintain a register of spills and / or leaks and implement corrective actions based on analysis of spill events <u>Well operations</u> Blowout preventers (BOP) installed where appropriate. Regular BOP drills, testing, certification, and maintenance Tanks used for onsite storage of fluids generated during completions and workover activities Appropriate containment installed at well sites (e.g. for gas well skids) <u>Production testing / flaring</u> Production tanks located in lined bunded areas Separator tank used during production testing to separate any produced liquids from gas before gas is sent to a vertical flare <u>Condensate tanker load-out</u> Tanker load-out in lined area, with appropriate bunding to contain spills Construction and operation of filling systems, storage tanks and the tankers in accordance with AS 1940 Personnel attendance at all times during tanker filling	

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	6.2 To remediate and monitor any areas of contamination arising from production activities	Areas of potential contamination (e.g. from spills or leaks, including serious or reportable incidents as outlined in Section 4) assessed to determine level of contamination, and appropriate remediation measures developed in accordance with criteria developed with the principles of the <i>National Environment Protection Measure</i> for contaminated sites, and in consultation with DEM and EPA Use of groundwater monitoring bores where there is an identified risk to groundwater. 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 Stockpiled contaminated soil is appropriately contained and treated / disposed of in a timely manner	Contaminated sites are assessed and rehabilitated (where required) using a risk-based approach, consistent with the principles of the NEPM ¹⁷
	6.3 To ensure that rubbish and waste material is disposed of in an appropriate manner	EPA's Waste Hierarchy model (avoid, reduce, reuse, recycle, recover, treat, dispose) should be complied with and waste management undertaken with regard to the <i>Environment Protection (Waste to Resources) Policy 2010</i> Covered bins are provided for the collection and storage of wastes. All loads of rubbish are covered during transport to an approved waste facility Waste streams are segregated on site and transported to appropriately licensed facilities to maximise waste recovery, reuse and recycling Hazardous wastes handled in accordance with relevant legislation and standards Licensed contractors used for waste transport	Wastes are segregated and transported to an EPA licensed facility for recycling or disposal Reasonable steps are taken to securely contain waste prior to removal from site
	6.4 To prevent impacts as a result of hydrotest water, site stormwater and washdown water disposal	Assessment of hydrotest water prior to disposal to land is undertaken to ensure that its quality is consistent with relevant guidelines (e.g. <i>Environment Protection (Water Quality) Policy 2015</i> requirements and ANZECC guidelines) for the disposal site. Discharged water not allowed to flow beyond the intended receiving area or into any watercourses or areas where it may enter surface water Landholder approval obtained prior to disposal of hydrotest water to land	No evidence of significant impacts to soil, water and vegetation as a result of water disposal (e.g. soil erosion, dead vegetation, water discolouration) No unauthorised discharge of hydrotest water and washdown water to a watercourse or an area reasonably likely to enter surface water

¹⁷ *National Environment Protection (Assessment of Site Contamination) Measure (1999)* amended in 2013

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Hydrotest water disposed in existing lined and fenced pond, or to bunded tanks for off-site treatment or disposal at an approved facility where disposal to land is not appropriate Use of biocides and toxic chemicals are kept to a minimum. If biocides are necessary UV-degradable or biodegradable biocides used where practicable Use of aerators / spray bars, geotextile etc. to prevent soil erosion at discharge point where uncontaminated hydrotest water is released to land Stormwater ponds are designed and constructed with regard to EPA Guideline 509/18 Wastewater lagoon construction Stormwater ponds are operated to maintain adequate freeboard	
	6.5 To ensure the safe and appropriate disposal of wastewater (sewage)	All wastewater is disposed in accordance with the <i>South Australian Public Health (Wastewater) Regulations 2013</i> Monitoring and maintenance of the wastewater system at the Katnook facility undertaken on a quarterly basis Wastewater system pumped out on an 'as required' basis by a licensed waste removal contractor and disposed of at a licensed facility Any necessary wastewater system approvals are obtained	All wastewater is disposed in accordance with the <i>South Australian Public Health (Wastewater) Regulations 2013</i>
	6.6 To prevent impacts as a result of produced formation water treatment and disposal	Produced formation water treatment and disposal in accordance with Beach approved procedures in OEMS and requirements of <i>Environment Protection Act 1993</i>, <i>Environment Protection (Water Quality) Policy 2015</i> and <i>Landscape South Australia Act 2019</i> Any ponds in produced water disposal service are constructed using appropriate materials and suitable design criteria including adequate freeboard, depths, leak detection systems, lining and bunding Any ponds in produced water disposal service are designed and constructed with regard to <i>EPA Guideline 509/18 Wastewater lagoon construction</i> Any ponds in produced water disposal service are operated to maintain adequate freeboard Storage tanks (where used) have appropriate overflow prevention and containment systems Install monitoring bores and conduct regular water quality monitoring Minimise use of process chemicals (e.g. biocides, emulsion breakers) and use biodegradable or UV degradable chemicals where available	No evidence of overflow or leakage of produced formation water from PFW ponds, tanks, bunds or vessels Refer to Assessment Criteria under Objective 6.1

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		Any evaporation ponds in produced water disposal service are within the fenced facility area to prevent wildlife and stock access Record fauna entrapment if it occurs and implement appropriate preventative measures if required	
	6.7 To minimise impacts of gas well deliquification	Tanks used for on-site storage of water generated during gas well unloading Gas / fluid stream may be flared rather than vented to minimise emissions where possible Consideration of weather conditions (e.g. wind direction) when planning activities	Gas well deliquification does not result in contamination of soil, surface water and / or shallow groundwater resources
	6.8 To maintain well integrity to minimise loss of aquifer pressure and prevent aquifer contamination	Appropriate controls implemented during initial drilling of wells (under the Drilling SEO) including casing design, casing centralisation program, pressure testing and casing certification, cement slurry and pumping schedule design, QA / QC during cement job execution, cement bond logs run where appropriate and remedial cementing undertaken where logs indicate an unacceptable risk Downhole production equipment and wellhead equipment designed to meet pressure, temperature, operational stresses and loads. Pressure testing, either inflow (negative test) or positive testing to be performed on barrier envelopes / components where feasible Periodic well integrity processes in place for whole of life well monitoring and management Monitoring programs implemented (e.g. through well logs, pressure measurements / testing and, or corrosion monitoring programs) to aid in the assessment of wellbore barrier conditions Where monitoring identifies potential issues, working within Beach Management Systems, risk assessment undertaken to identify hazards / scenarios and propose recommendations and mitigation controls where appropriate to reduce or monitor risk Casing annulus pressures are routinely checked and reported, if accessible Implementation of appropriate emergency / spill response procedures <u>Downhole decommissioning following production</u> Downhole decommissioning carried out to meet worst case expected loads and downhole environmental conditions	No aquifer contamination as a result of production activities There is no uncontrolled flow to surface (e.g. blow out) Appropriate barriers exist to protect separate aquifer systems and / or hydrocarbon reservoirs that are typically in natural hydraulic isolation from each other Well decommissioning program submitted to the satisfaction of DEM prior to well decommissioning

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		Appropriate controls implemented and verified to prevent crossflow, contamination or further pressure reduction occurring in line with industry standards Pressure testing and / or negative inflow testing performed on barrier envelopes / components where feasible Inhibited fluid placed between barriers where applicable Operational reports for barrier installation and testing submitted and retained Competent and appropriately qualified staff and contractors are appointed to undertake downhole decommissioning of wells	
7. To minimise the risk to public health and safety	7.1 To protect public health and safety during production operations	All facilities designed, constructed, operated and maintained in accordance with relevant standards (see Objective 6.1) Risk assessments applied at design and during the asset life to identify threats and controls to mitigate risks All pipelines are designed, constructed, operated and maintained in accordance with relevant standards¹⁸ including installation of appropriate warning signage and appropriate external interference protection measures Necessary measures (e.g. security fencing, signage) taken to prevent the public accessing facilities, well sites or waste relating to the sites All reports of unauthorised activity are reported and investigated Development, implementation and periodic review of emergency response procedures Emergency procedures implemented and personnel trained Safe work permit system Incident record system (preventative and post incident review) <u>Use of Roads</u> Warning signage and traffic management measures installed where appropriate Driver behaviour and vehicle speed limits to be included in compulsory induction	Reasonable measures implemented to ensure no injuries or health risks to the public No injuries, incidents or adverse health impacts involving the public from regulated activities that could have been reasonably prevented by the operator

¹⁸ Relevant standards include AS 2885, AS 2832.1 and associated documentation/processes including Safety Management Study, Pipeline Integrity Management Plan, Pipeline Management System and Remaining Life Review

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Vehicle speed limits to be observed Landholders, local councils, potentially affected residents and emergency services will be informed of significant transport movements All required authorisations (e.g. local council, DIT, police) obtained where required for movement of oversize loads along public roads, including joint inspections of roads before and after transport moves if necessary Significant transport movements to detour around town centres where possible	
	7.2 To avoid uncontrolled fires associated with production activities	All facilities are designed, constructed, operated and maintained in accordance with relevant standards (refer Objective 6.1) Establishment of appropriate emergency / spill response procedures for explosion or fire Erection of signage and, where required, fencing to delineate restricted / hazardous areas Safety equipment on site such as portable gas detection meters carried by field personnel and contractors where appropriate Appropriate fire fighting equipment at all facilities and appropriate firebreaks are maintained Liaison undertaken with CFS regarding operations to ensure fire concerns are addressed and any <i>Fire and Emergency Services Act 2005</i> requirements are met (e.g. permits for 'hot work' on fire ban days if required)	No uncontrolled operations related fires
8. Air pollution and greenhouse gas emissions reduced to as low as reasonably practical	8.1 To minimise atmospheric emissions	All facilities designed, constructed, operated and maintained in accordance with relevant standards and legislative requirements (e.g. <i>Environment Protection (Air Quality) Policy</i>) Assessments undertaken as appropriate during design and operation to confirm compliance with legislative requirements Plant and equipment operated and maintained in accordance with manufacturer's specifications Venting activities are managed and minimised with preference to flare rather than vent where feasible Consideration of weather conditions (e.g. wind direction) prior to commencing planned venting activities Flaring activities are actively managed and reduced to operational necessity	Emissions minimised by implementation of reasonable practical measures during design and operation as outlined in the guide to how objectives can be achieved column Modelling or monitoring (where appropriate) of atmospheric emissions from production facilities demonstrate that legislative requirements are met

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Objective	Goal	Guide to How Objectives can be Achieved	Assessment Criteria
		Flaring during production testing kept to minimum length of time necessary Reporting of emissions in accordance with statutory requirements (e.g. NPI and NGER requirements)	
	8.2 To minimise the generation of dust	Landowners and relevant stakeholders (e.g. local council, industry associations) consulted regarding nature, location and management of proposed activities Compliance with relevant speed restrictions on access roads and tracks If necessary, unsealed roads will be sprayed with water as required to minimise dust generation.	Any stakeholder complaints related to dust nuisance are documented and reasonable steps taken to resolve them can be demonstrated
9. To adequately protect areas of cultural and heritage significance and values during operations and maintenance	9.1 No damage, disturbance or interference to Aboriginal and non-Aboriginal heritage sites, objects, remains and places unless prior approval under relevant legislation obtained	Cultural heritage inspection of proposed activity areas undertaken with the relevant Aboriginal heritage group Where necessary, areas of cultural and heritage significance or exclusion zones in the vicinity of work site flagged and / or fenced off to prevent damage, disturbance and interference Cultural heritage issues covered in inductions. Key personnel (e.g. supervisors, machinery operators) receive appropriate cultural heritage training Procedures consistent with the relevant obligations under the <i>Aboriginal Heritage Act</i> are in place to appropriately report and respond to any areas of significance discovered during operations Records of sites forwarded to the Aboriginal Heritage Branch in compliance with the <i>Aboriginal Heritage Act</i> Records relating to sites of cultural heritage significance kept and available for audit Heritage site registers and Heritage Branch, DEW, consulted regarding the location of non-indigenous heritage sites where appropriate	In the event the conditions of a cultural heritage clearance are not complied with, the incident is appropriately reported ¹⁹ , investigated and remediated in consultation with the relevant Aboriginal heritage group Damage, disturbance or interference to any Aboriginal sites, objects and remains (all as defined under the <i>Aboriginal Heritage Act 1988</i>) is avoided unless authorisation has been obtained under the <i>Aboriginal Heritage Act 1988</i> Any Aboriginal heritage sites, objects and remains discovered during operations have been appropriately reported and responded to, consistent with the <i>Aboriginal Heritage Act 1988</i> Non-Aboriginal heritage sites identified and avoided No impact to non-Aboriginal heritage places and related objects protected under the <i>Heritage Places Act 1993</i> unless approval has been obtained under the <i>Heritage Places Act 1993</i>

¹⁹ This may include compliance with reporting obligations pursuant to s20 of the *Aboriginal Heritage Act 1988*.

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10. Rehabilitate operational areas to agreed standards	10.1 Rehabilitate operational areas to agreed standards	<u>Contaminated Site Remediation</u> Refer to Objective 6.2 <u>Production Facility Decommissioning</u> The following steps will typically be undertaken unless otherwise agreed with the regulator and stakeholders: • surface structures removed, and re-used / recycled where appropriate • waste removed, and recycled where appropriate (refer to Objective 6.3) • foundations removed where appropriate or levelled and covered (the standard to which they will be restored will be defined as a result of stakeholder consultations) • work performed by accredited contractor • sites assessed for potential contamination and treatment / remediation undertaken if necessary • disturbed areas re-contoured to approximate pre-existing contours, natural drainage restored and compaction relieved (e.g. by scarification or ripping where appropriate) to promote rainwater infiltration and enhance seed capture and germination. Stockpiled topsoil will be re-spread. Active re-seeding will be undertaken where necessary. <u>Pipeline Decommissioning</u> Pipeline decommissioning undertaken in accordance with AS 2885. The following steps will typically be undertaken unless otherwise agreed with the regulator and stakeholders: • all aboveground pipes and supports assessed for the condition of the pipe for either salvage or for dismantling and re-use • all underground pipe work cut-off (at a minimum depth of 750mm below the natural surface or at pipeline depth), removed and blinded below the surface • all aboveground signs and markers removed • all pipeline protection systems removed to allow the pipeline to degrade in-situ • pipelines may be filled with grout or another inert material prior to decommissioning where subsidence is a potential issue (e.g. under main	<u>Contaminated Site Remediation</u> Refer to Objective 6.2 <u>Production Facility Decommissioning</u> Site rehabilitation undertaken in accordance with site-specific decommissioning and reinstatement plan as agreed with relevant stakeholders and regulators Surface structures are removed and the ground surface re-contoured consistent with pre-existing contours unless alternative agreement is reached with the regulator and stakeholders Refer to assessment criteria for Objectives 1, 2, 3 and 6 <u>Pipeline Decommissioning</u> Attainment of the following (unless otherwise agreed with stakeholders and approved by the regulatory authority): • No evidence of waste, redundant equipment / infrastructure or signs and markers on decommissioned pipelines Refer to assessment criteria for Objectives 1, 2, 3 and 6 <u>Well Decommissioning Following Production</u> Refer to Objective 6.8 Surface structures are removed and the ground surface re-contoured consistent with pre-existing contours unless alternative agreement is reached with the regulator and stakeholders <u>Rehabilitation of Sites with Native Vegetation</u> Rehabilitation of sites with native vegetation is undertaken in accordance with commitments and conditions of original approval of significant environmental benefit

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		roads) (Note: subsidence is not generally an issue with small diameter pipelines such as those that connect wells to the gas plant) • monitoring and auditing of decommissioned pipelines undertaken • all pipelines which are partially or wholly left in-situ accurately mapped and recorded. • records prepared and submitted to the appropriate authority. <u>Well Decommissioning Following Production</u> Refer to Objective 6.8 <u>Rehabilitation of Sites with Native Vegetation</u> Sites with native vegetation are rehabilitated in consultation with DEM, DEW and other relevant stakeholders	