

Drilling, Completion and Well Production Testing in the Otway Basin, South Australia



August 2025 DRAFT

## **Revision History (last 3 revisions)**

Revision	Date	Reason for issue	Reviewer/s	Consolidator	Approver
7a	07/02/2025	Updated for 5-year review	Erias		
7b	21/7/2025	5-year review - DRAFT for DEM	СК	CK	CK
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#### 1 Introduction

This Statement of Environmental Objectives (SEO) has been prepared to meet the requirements of Division 4 of the *Energy Resources Act 2000* (ER Act) and Regulation 12 of the *Energy Resources Regulations 2013* (ER Regulations).

#### 1.1 Purpose

The intent of the SEO is to outline the environmental objectives to which drilling, completion and well production testing activities in the onshore South Australian Otway Basin 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 the information provided in the Environmental Impact Report (EIR) (Beach Energy 2025), and are in keeping with the objectives of the Energy Resources 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
  - o are properly managed to reduce environmental damage; and
  - o 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.

Environment is broadly defined in Section 4 of the ER Act to include natural, social, cultural and economic aspects. The environmental objectives outlined in this SEO incorporate the aspects of the environment as defined under the ER Act.

#### 1.2 Scope

Beach Energy Limited (Beach Energy) holds a number of petroleum exploration, production and retention licences under the ER Act in the onshore Otway Basin in the South East of South Australia. **Figure 1** shows the location of Beach Energy's current licence areas. This SEO applies to Beach Energy's drilling, completion and well production testing activities in the Otway Basin in South Australia within Beach licenses that occur with the impact assessment area defined in **Figure 1**. These activities are described in the EIR (Beach Energy 2025) and include:

• well site and access track construction

- drilling
- well completion and workovers associated with a drilling program and typically performed by a drilling rig
- well production testing (both drill stem tests and any well production testing)
- well and zonal decommissioning<sup>1</sup>
- site and access decommissioning and rehabilitation

The following operations are not covered by this SEO:

- seismic exploration activities
- fracture stimulation
- production and processing operations beyond well production testing
- production and processing operations at the Katnook gas plant site
- 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 decommissioning following production
- · field production / processing equipment installation, operation, decommissioning and rehabilitation
- pipeline construction, operation and decommissioning.

This SEO does not cover activities in parks or reserves established under the National Parks and Wildlife Act 1972.

This document updates and supersedes the Statements of Environmental Objectives that have previously been developed to cover drilling, completion and well production testing activities in the region.

#### 1.3 Limitations on Use

This document has been prepared to satisfy the requirements of the *Energy Resources Act 2000* (SA) and *Energy Resources Regulations 2013* (SA), and is to be submitted to the Department of Energy and Mining and the relevant Minister.

Beach does not authorise this document to be used by third parties for any other purpose.

<sup>&</sup>lt;sup>1</sup> Decommissioning of wells is equivalent to 'abandonment', which is an alternative term used in the ER Regulations.

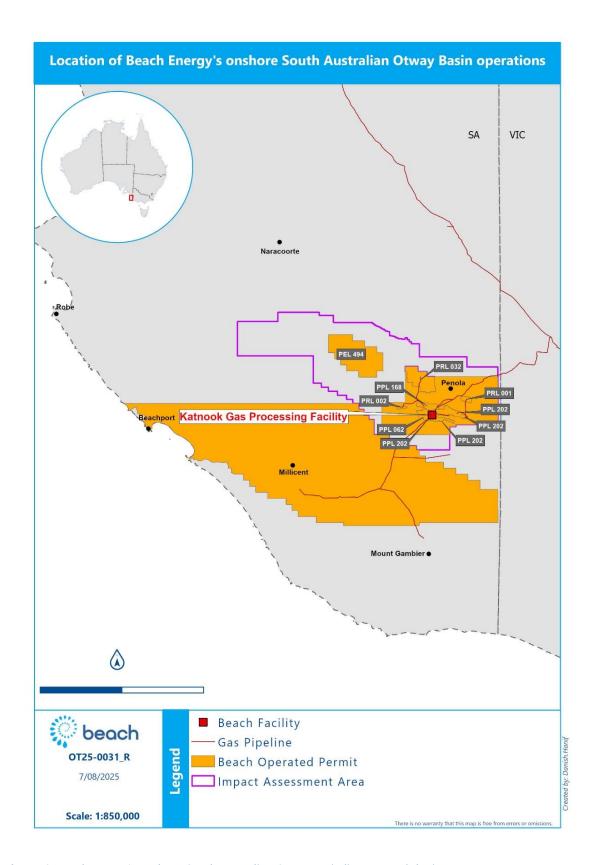


Figure 1: Beach Energy's onshore South Australian Otway Basin licences and the impact assessment area

#### 2 Environmental Objectives and Assessment Criteria

#### 2.1 Objectives

Potential environmental hazards and consequences associated with drilling, completion and well production testing activities in the onshore Otway Basin have been identified in the Environmental Impact Report (Beach Energy 2025). Beach is committed to achieving a range of environmental objectives in regard to these potential hazards.

The environmental objectives for drilling, completion and well production testing operations are provided in Appendix A.

#### 2.2 Assessment Criteria and Leading Performance Criteria

The environmental objectives identified in Appendix A are subject to an assessment to measure the level of achievement.

The criteria for each objective are set out in Table 1 and include:

- Assessment criteria each environmental impact event must have defined assessment criteria to enable a determination of whether or not the stated objective has been achieved.
- Leading performance criteria each environmental impact event that relies significantly on a control strategy must have leading performance criteria to provide early warning that control strategies are not working and that the environmental objective or relevant assessment criteria is at risk of not being achieved.

Assessment criteria and leading performance criteria for each environmental objective are set out in Appendix A.

### 3 Reporting

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

**Immediately Reportable Incidents** must be reported to the Minister within 24 hours after the licensee becomes aware of the occurrence of the incident, and comprehensively reported within three months of incident or within period otherwise specified, as per Section 85 of the ER Act and the requirements of ER Regulations 32 (2) and (3). **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 Regulations 32(5) and (6) of the ER Regulations.

#### 3.1 Incident Definitions

Section 85 (3) of the ER Act requires an SEO to identify events that could, if not properly managed or avoided, cause an immediately reportable incident or a reportable incident within the meaning of Section 85 of the ER Act. Table 1 identifies the potential immediately reportable 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(3) of the ER Act and Regulation 32(1), and provide consistency for Licensee reporting.

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

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

- (a) an incident arising from activities conducted under a licence specified in the relevant statement of environmental objectives to be an immediately reportable incident; or
- (b) any other matters brought within the ambit of this definition by the regulations.

**Reportable Incident** is defined in Section 85(1) of the ER Act as incidents (other than an immediately reportable incident) arising from activities conducted under a licence that are classified under the ER 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.

#### 3.2 Reporting to the EPA

Where applicable, incidents causing or threatening serious or material environmental harm as defined under Section 5 of the *Environment Protection Act 1993* (EP Act) must be reported to the Environment Protection Authority (EPA) in accordance with Sections 83 and 83A of the EP Act:

- as soon as reasonably practicable after becoming aware of the harm or threatened harm (Section 83); and
- in writing as soon as reasonably practicable after becoming aware of the existence of site contamination at the site or in the vicinity of the site that affects or threatens water occurring naturally under the ground or introduced to an aquifer or other area under the ground (Section 83A).

The EP Act and its reporting obligations do not apply to:

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

#### 3.3 Cultural Heritage Reporting

Reporting on cultural heritage must be undertaken in accordance with the requirements of the *Aboriginal Heritage Act* 1988 and the *Coroners Act* 2003 as set out below:

- If new Aboriginal sites, objects, or remains are discovered, or new information about them is discovered, this must be reported to AAR <u>as soon as practicable</u> on (08) 8429 9400.
- In the event suspected human skeletal remains are discovered, SAPOL should be contacted immediately on 131 444.

#### Table 1: Incident descriptions

#### **Immediately Reportable Incidents**

#### 1. A person is seriously injured<sup>2</sup> or killed.

- 2. An imminent risk to public health or safety arises.
- Serious environmental damage occurs or an imminent risk of serious environmental damage arises. For example:
  - Damage, disturbance or interference to sites of cultural and / or heritage significance without appropriate permits and approvals.<sup>3</sup>
  - 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.
  - 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.<sup>4</sup>
  - Identification of cross flows between aquifers in natural hydraulic isolation, or uncontrolled flows to the surface.

#### Reportable incident

- An escape of petroleum<sup>9</sup>, processed substance, a chemical or a fuel that affects an area that has not been specifically designed to contain such an escape<sup>10</sup> (other than a immediately reportable incident).
- Any event relating to cultural heritage sites (other than a immediately reportable incident).
- An event that has the potential to compromise the physical integrity of an asset or facility. For example:
  - Activity on a pipeline easement with equipment that has been identified<sup>8</sup> as exceeding the pipeline's penetration resistance, determined in accordance with Australian Standard (AS) 2885.
  - Identification of a through-wall defect on a pipeline<sup>11</sup> or plant component (other than a immediately reportable incident).
  - c. Identification<sup>12</sup> 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 immediately reportable incident).
  - Activity on a pipeline easement with equipment or vehicles that have been identified<sup>8</sup> as exceeding

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<sup>&</sup>lt;sup>2</sup> As per the definition in Section 36 of the Work Health and Safety Act 2012.

<sup>&</sup>lt;sup>3</sup> Pursuant to *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*.

<sup>&</sup>lt;sup>4</sup> Pursuant to Native Vegetation Act 1991 (flora) and National Parks and Wildlife Act 1972 (fauna).

<sup>&</sup>lt;sup>9</sup> In gaseous, liquid or solid state, as per ER Act definition.

<sup>&</sup>lt;sup>10</sup> 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.

<sup>&</sup>lt;sup>11</sup> As per ER Act definition, the term 'pipeline' includes tanks, machinery and equipment necessary for, or associated with, operation of the pipeline.

<sup>&</sup>lt;sup>12</sup> 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.

#### **Immediately Reportable Incidents**

- Security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises.<sup>5</sup>
- An event that results in a rupture of a pressure containing asset or facility.
- A regulated activity<sup>6</sup> 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.<sup>7</sup>
- Activity on a pipeline easement where the pipeline is contacted and repair action is required.<sup>8</sup>
- An uncontrolled regulated substance release or malfunction or failure of critical plant or equipment resulting in the activation of emergency response or evacuation procedures, fire, or explosion.

#### Reportable incident

- allowable stress limits, determined in accordance with Australian Standard (AS) 2885.
- e. An unapproved<sup>13</sup> excursion outside of critical design or operating conditions / parameters.
- Failure of a critical procedural control in place to reduce a credible threat to low or as low as reasonably practicable (ALARP).<sup>14</sup>
- 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.
- Unauthorised activity on a pipeline easement where the pipeline is contacted but repair action is not required.
- Malfunction or failure of critical plant or equipment that had (or still has) potential to cause a immediately reportable incident.

<sup>&</sup>lt;sup>5</sup> 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.

<sup>&</sup>lt;sup>6</sup> Regulated activity as defined in Section 10 of the Energy Resources Act.

<sup>&</sup>lt;sup>7</sup> Resulting in the issuing of a prohibition notice by SafeWork SA pursuant to Section 195 of the Work Health and Safety Act 2012.

<sup>&</sup>lt;sup>8</sup> 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.

<sup>&</sup>lt;sup>13</sup> "Approval" as per AS2885 definition. Note that there may be situations where excursions are allowable under AS2885.

<sup>&</sup>lt;sup>14</sup> As per the Safety Management System process articulated in Australian Standard (AS) 2885 or similar risk assessment process.

#### 4 List of Abbreviations

Abbreviation	Definition			
ALARP	as low as reasonably practicable			
ANZECC	Australian and New Zealand Environment Conservation Council (in reference to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000)			
CFS	Country Fire Service			
Contamination	As defined by the Environment Protection Act 1993 and the National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013			
DEM	Department for Energy and Mining (DEM) (regulator of the Energy Resources Act)			
EIR	Environmental Impact Report prepared in accordance with Section 97 of the Energy Resources Act 2000.			
EPA	Environment Protection Authority (South Australia)			
minimise	To reduce as far as reasonably practical, considering all other factors e.g. requirements for safe operations and accessibility			
NEPM	National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013			
SEO	Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the <i>Energy Resources Act 2000</i> and Regulations 12 and 13 of the <i>Energy Resources Regulations 2013</i>			

#### 5 References

Beach Energy (2025). *Environmental Impact Report: Drilling, Completion and Well Production Testing in the Otway Basin, South Australia.* August 2025. Beach Energy, Adelaide SA (DRAFT).

Beach Energy (2025). Statement of Environmental Objectives Onshore Otway Basin Petroleum Production Operations. May 2025. 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.

## 6 Document information and history

#### Document custodian group

Title	Name/s
Drilling and Completions	Brad Muir

#### Document history

Rev	Date	Changes made in first document	Reviewer/s	Consolidator	Approver
0	04/10/2013	Issued for submission	S. Milne	S. Milne	S. Milne
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2	13/11/2013	Final DMITRE comments addressed	B. White	S. Milne	S. Milne
3	26/11/2018	5 year review update – draft for internal review	S.Milne	Z.Bowen M.Mackie	T. Flowers
4	03/12/2018	Issued for public consultation	B. White S. Milne	R. Scullion	T. Flowers
5	11/04/2019	Updated following receipt of public submissions	B. White S. Milne R. Scullion	R. Scullion	T. Flowers
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7	09/08/2019	Updated following formal consultation	S. Milne T. Flowers M. Mackie	R.Scullion	M.Mackie
7a	07/02/2025	5-year review update, issue for internal review	Erias	C.King	
7b	14/7/2025	5-year review – DRAFT for DEM review	C.King	C.King	C.Green
7с	11/8/2025	5-year review – revision to address DEM review. Draft released for consultation	C King	C King	B Muir

## Appendix A Environmental Objectives, Leading Performance Criteria and Assessment Criteria

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
Public health and safety	Minimise risks to the health and safety of the	PHS1 unauthorised access by third parties	Control measures implemented from commencement of construction.	Reasonable measures implemented to ensure no risks to health and safety of the public.
	public associated with drilling, completion and		Rehabilitation conducted in a timely manner after completion of operations.	No injuries, incidents or adverse health impacts involving the public from drilling, completion or
	well production testing activities (OB-01)		Inspection schedule established to check appropriate control measures have been	well production testing activities that could have been reasonably prevented by the operator.
			implemented.	No unauthorised access reported.
			Records of inductions established.	
		PHS2 vehicles on public roads	Control measures implemented from beginning of construction.	Reasonable measures implemented to ensure no risks to health and safety of the public.
			Stakeholder engagement and complaints reporting systems in place.	No injuries, incidents or adverse health impacts involving the public from drilling, completion or well production testing activities that could have been reasonably prevented by the operator.
			Records of ongoing communication and actions implemented with relevant public authorities	
			maintained.	No traffic incidents reported.
			Records of inductions established.	
		PHS3 fire from activities.	Control measures implemented from beginning of construction.	Reasonable measures implemented to ensure no risks to health and safety of the public.
			Engagement with local Emergency Service Providers prior to commencement.	No injuries, incidents or adverse health impacts involving the public from fire as a result of
			Pre-start audit conducted of fire management control measures.	drilling, completion or well production testing activities that could have been reasonably
			Inspection schedule established for regular maintenance of fire management equipment.	prevented by the operator.  No fires reported.
			Regular review and/or update of the Emergency Response Plan.	
			Records of inductions established.	

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
		PHS4 loss of well integrity (e.g. casing or cement failure).	Wells designed, constructed, operated and maintained in accordance with Beach's Drilling and Completions Technical Standards and Well	Reasonable measures implemented to ensure no risks to health and safety of the public.  No injuries, incidents or adverse health impacts
			nspection schedule established to check we appropriate control measures have been be	involving the public from drilling, completion or well production testing activities that could have been reasonably prevented by the operator.
				No identified loss of well integrity e.g. casing or cement failure.
			A well decommissioning completion report is prepared demonstrating compliance with decommissioning program.	
		PHS5 well control incidents (e.g. blowout or kick).	Wells designed, constructed, operated and maintained in accordance with Beach's Well	Reasonable measures implemented to ensure no risks to health and safety of the public.
			Engineering and Construction Management System (WECS) Standards and Well Integrity Standards (WIS).	No injuries, incidents or adverse health impacts involving the public from drilling, completion or well production testing activities that could have
			Inspection schedule established to check appropriate control measures have been implemented.	been reasonably prevented by the operator.  No reported well control incidents such as blowout or kick.
			Regular review and/or update of the Emergency Response Plan.	blowdet of kick.
	Avoid disturbance to sites	H1 Aboriginal cultural sites	Aboriginal heritage risk assessment to be	Aboriginal heritage sites identified and avoided.
and non-Aboriginal)	of cultural and heritage significance due to	cance due to les requiring soil	completed prior to each disturbance activity.  Pre earthworks checklist completed.	Unexpected finds are reported in accordance with procedures.
	disturbance (OB-02)		Known sites marked out using flagging tape or other methods to avoid disturbance prior to and throughout operations.	Damage, disturbance or interference to any Aboriginal sites, objects and remains (all as defined under the <i>Aboriginal Heritage Act 1988</i> )
			Procedures in place to ensure any unexpected finds are appropriately managed and reported in accordance with regulatory requirements:	has been avoided unless authorisation has been obtained under the Act.
			<ul> <li>Any Aboriginal heritage sites, objects and remains discovered during operations</li> </ul>	

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
			have been appropriately reported and responded to, consistent with the <i>Aboriginal Heritage Act 1988</i>	
			<ul> <li>Any discovery of potential human remains has been immediately reported to the Coroner or SAPOL, as required by the Coroner's Act 2003.</li> </ul>	
			Records of inductions established.	
		H2 non-Aboriginal cultural sites	Heritage risk assessment to be completed prior to disturbance activities.	Non-Aboriginal heritage sites identified and avoided.
			Known sites marked out using flagging tape or other methods to avoid disturbance prior to and throughout operations.	No impact to non-Aboriginal heritage places and related objects protected under the <i>Heritage Places Act 1993</i> unless approval has been
			Procedures in place to ensure any unexpected finds are appropriately managed.	obtained under the Act.
			Records of inductions established.	
Soil	Minimise disturbance to and avoid contamination of soil (OB-03)	S1 erosion, inversion, compaction	Consultation with landholders conducted when relevant prior to construction and prior to rehabilitation.	Areas with soil impacted from earthworks are rehabilitated at earliest opportunity after completion of operations.
	Ensure timely and effective rehabilitation of adversely		Impacts to soil from earthworks are confined to the smallest areas possible.	Soil profiles and contours are consistent with surrounding land after rehabilitation.
	affected land (OB-04)	S2 localised contamination	Inspection schedule established to demonstrates	Records indicate no spills or leaks occurred.
		of soil - spills and leaks	implementation of control measures such as fuel storage and handling and waste disposal.	In the event of a spill or leak, control measures were followed, and the incident was reported.
			Records of inductions established.	Any escape of petroleum, processed substance,
			All wastewater disposed of in accordance with the South Australian Public Health (Wastewater) Regulations 2013.	chemical or fuel to land is either immediately contained and removed for disposal at an appropriately licenced facility or assessed in accordance with NEPM <sup>15</sup> guidelines and remediated in a timely manner.

<sup>&</sup>lt;sup>15</sup> National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013

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Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
			Fuel and chemical storage areas will be in accordance with EPA guidelines 080/16 Bunding and Spill Management	Any irrigation of waste water to meet Environment Protection (Water Quality) Policy 2015 requirements and ANZECC criteria).
		S3 contamination of soil - well control incidents	Wells designed, constructed, operated and maintained in accordance with Beach's Drilling and Completions Technical Standards and Well Integrity Framework.  Inspection schedule established to check appropriate control measures have been implemented.	No well control incidents.  Any escape of petroleum, processed substance, chemical or fuel to land is either immediately contained and removed for disposal at an appropriately licenced facility or assessed in accordance with NEPM <sup>16</sup> guidelines and remediated in a timely manner.
		S4 contamination of soil - loss of well integrity	Record of compliance with well construction and maintenance techniques.  Recording periodic review efforts (as described in controls).	No loss of well integrity.  No contamination of soil in the result of a loss of well integrity incident.  Any escape of petroleum, processed substance, chemical or fuel to land is either immediately contained and removed for disposal at an appropriately licenced facility or assessed in accordance with NEPM <sup>17</sup> guidelines and remediated in a timely manner.  No subsidence of soil as a result of a loss of well integrity incident.
Groundwater	Minimise loss of aquifer pressures and avoid aquifer contamination (OB- 05) Avoid contamination of shallow groundwater resources (OB-06)	GW1 contamination, salinisation, crossflow, or loss of pressure of groundwater -drilling	Wells designed, constructed, operated and maintained in accordance with Beach's Well Engineering and Construction Management System (WECS) Standards and Well Integrity Standards (WIS).  All fuel and oil storage facilities meet requirements of AS 1940-2017: The storage and handling of flammable and combustible liquids.	No groundwater contamination as a result of drilling, completion or well production testing activities.  No uncontrolled flow to surface (e.g. blow out)., No spills, leaks or other storage or handling incidents of contaminating wastes.  No impact on other groundwater users due to water extraction activities.

<sup>&</sup>lt;sup>16</sup> National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013

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<sup>&</sup>lt;sup>17</sup> National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
		GW2 contamination of groundwater - radioactive	Records of well design and construction including placement and verification of barriers are maintained.  Inspection schedule established to check appropriate control measures have been implemented.  Inspection schedule established to assess compliance with all industry and regulatory	Water Allocation Plan and water licence conditions are complied with.  Appropriate barriers in place to protect separate groundwater systems and / or hydrocarbon reservoirs that are typically in natural hydraulic isolation from each other.  No identified groundwater contamination as a result of drilling, completion or well production
		source loss	standards.  Equipment records kept of radioactive sources/tools on site.	testing activities.  Appropriate barriers exist to protect separate groundwater systems and / or hydrocarbon reservoirs that are typically in natural hydraulic isolation from each other.
		GW3 contamination, over- pressurisation or crossflow of groundwater - loss of well integrity	Wells designed, constructed, operated and maintained in accordance with Beach's Drilling & Completion Technical Standards, and Well Integrity Management Framework.  Compliance with all industry and regulatory standards.  Inspection schedule established to check appropriate control measures have been implemented.	See assessment criteria for GW1.  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.
		GW4 localised contamination of groundwater - spills or leaks	Wells designed, constructed, operated and maintained in accordance with Beach's Drilling & Completion Technical Standards, and Well Integrity Management Framework.  Inspection schedule established to demonstrate implementation of control measures such as fuel storage and handling and waste disposal.  Records of inductions established.  All wastewater disposed of in accordance with	No identified groundwater contamination as a result of drilling, completion or well production testing activities.  No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or solid wastes to surface water and/or groundwater.
			the South Australian Public Health (Wastewater) Regulations 2013 and where appropriate with	

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria	
			regard to the EPA Septage Management Guideline (EPA 247/20).		
Surface water	Minimise disturbance to drainage patterns and avoid contamination of	SW1 disturbance to natural drainage patterns	In the event of contamination, surface waters are tested and assessed against relevant water quality parameters.	Well leases and access tracks are located and constructed to maintain pre-existing water flows as far as practicable.	
	surface waters (OB-07)		Site inspections schedule established and undertaken to ensure that surface water controls are working effectively.	No new 'water affecting activities' (as defined under the Landscape Act) are undertaken unless relevant permits have been obtained.	
				Landholder complaints regarding impact on surface water users are documented and reasonable steps taken to resolve them can be demonstrated.	
		SW2 sedimentation of surface waters	Records of any disturbances to surface water drainage patterns have been kept.	Well leases and access tracks are located and constructed to maintain pre-existing water flows	
			Site inspections schedule established and	as far as practicable.	
			undertaken to ensure that surface water controls are working effectively.	No new 'water affecting activities' (as defined under the Landscape Act) are undertaken unless	
			Complaints register is available to landowners	relevant permits have been obtained.	
			and any complaints are resolved appropriately.	Landholder complaints regarding impact on surface water users are documented and reasonable steps taken to resolve them can be demonstrated.	
		SW3 contamination of	Wells are design, construction, operated and	No well control incidents.	
		surface water – well control incidents	maintained in accordance with Beach's Drilling and Completions Technical Standards and Well Integrity Framework	No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or solid wastes to surface water.	
			Records of any disturbances to surface water quality have been kept.	Landholder complaints regarding impact on surface water users are documented and	
				Inspection schedule established to check appropriate control measures have been implemented.	reasonable steps taken to resolve them can be demonstrated.
			Stakeholder engagement and complaints reporting systems in place.		

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
		SW4 contamination of surface water - downhole drilling issues	Wells are design, construction, operated and maintained in accordance with Beach's Drilling & Completion Technical Standards, and Well Integrity Management Framework.	No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or solid wastes to surface water and/or groundwater.
			Inspection schedule established to check appropriate control measures have been implemented.	No identified surface water contamination as a result of drilling, completion or well production testing activities.
			In the event of contamination, surface waters are tested and assessed against relevant water quality parameters.	Landholder complaints regarding impact on surface water users are documented and reasonable steps taken to resolve them can be demonstrated.
		SW5 contamination of surface water - loss of well integrity	Wells are design, construction, operated and maintained in accordance with Beach's Drilling & Completion Technical Standards, and Well Integrity Management Framework.	No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or solid wastes to surface water and/or groundwater.
			Inspection schedule established to check appropriate control measures have been implemented.	No identified surface water contamination as a result of drilling, completion or well production testing activities.
			In the event of contamination, surface waters are tested and assessed against relevant water quality parameters.	Landholder complaints regarding impact on groundwater users are documented and reasonable steps taken to resolve them can be demonstrated.
		SW6 uncontrolled release of water and hydrocarbon to	Wells are design, construction, operated and maintained in accordance with Beach's Drilling &	No uncontrolled flow to the surface (i.e. no free-flowing bores).
		surface	Completion Technical Standards, and Well Integrity Management Framework.	No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or
			Inspection schedule established to check appropriate control measures have been	solid wastes to surface water and/or groundwater.
			implemented.	Landholder complaints regarding impacts are
			In the event of contamination, surface waters are tested and assessed against relevant water quality parameters.	documented and reasonable steps taken to resolve them can be demonstrated.

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
		contamination of surface quality have been kept.  water - spills and leaks Inspection schedule established for h substance and waste storage to chec appropriate control measures have b	Records of any disturbances to surface water quality have been kept.	No unauthorised discharge or escape of petroleum, processed substance, chemical, fuel or liquid or solid wastes to surface water.  Landholder complaints regarding impacts are documented and reasonable steps taken to resolve them can be demonstrated.
			Inspection schedule established for hazardous substance and waste storage to check that appropriate control measures have been implemented.	
			In the event of contamination, surface waters are tested and assessed against relevant water quality parameters.	
Air Quality / Greenhouse Gas	Minimise reduction in air quality (OB-08)	AQ1 dust generation	Stakeholder engagement and complaints reporting systems in place.	Dust generation reduced by implementation of reasonable practical measures.
	Minimise atmospheric		Records are kept of any air quality complaints.	Landholder / stakeholder complaints are
	emissions (OB-09)		Records of water use for dust suppression are kept.	documented and reasonable steps taken to resolve them can be demonstrated.
		C1 contribution to climate change through greenhouse gas emissions (including flaring)	All facilities designed, constructed, operated and maintained in accordance with relevant standards and legislative requirements (e.g. Environment Protection (Air Quality) Policy).	Emissions minimised by implementation of reasonable practical measures during design and operation.
			Equipment operated and maintained in accordance with manufacturer's specifications.	
			Inspection schedule established to check appropriate control measures have been implemented.	
			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).	
Existing land use and infrastructure	Minimise disturbance to existing land users and infrastructure (OB-10)	LU1 disturbance to land use (including livestock)	Well sites have been chosen to reduce potential for noise and light impacts to surrounding properties.	No adverse impact (outside agreed disturbance / compensation areas) on land use as a result of activities

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
			Consultation and notification of activities has been conducted and recorded.  Consultation with CFS and local government regarding upcoming activities and proposed mitigations.  Stakeholder engagement and complaints reporting systems in place.	Adverse impacts of accidental or unforeseen disturbance to infrastructure or land use resolved to the reasonable satisfaction of the landholder 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.  No uncontrolled fires initiated as a result of drilling, completion and well production testing activities
		LU2 damage to third party infrastructure	Consultation and notification of activities has been conducted and recorded prior to activity commencement.  Inspection of roads has been conducted and recorded.  Consultation with local council regarding upcoming activities and proposed mitigations.  Stakeholder engagement and complaints reporting systems in place.	No adverse impact (outside agreed disturbance / compensation areas) on land use as a result of activities  Adverse impacts of accidental or unforeseen disturbance to infrastructure or land use resolved to the reasonable satisfaction of the stakeholder.  Timely consultation and notification of proposed activities with relevant stakeholders can be demonstrated.  Stakeholder complaints are documented and reasonable steps taken to resolve them can be demonstrated
Native Fauna	Minimise disturbance to native fauna and fauna habitat (OB-11)	NF1 disturbance, injury or death of fauna – earthworks, weeds	Locations of well sites chosen to reduce the potential for noise impacts to threatened/listed species.  Noise production avoided or altered during important times or seasons for nearby threatened species.  Flagging and boundary markers in place during clearing activities.	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

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
			Any threatened or listed species in area to be cleared have been identified in surveys from experienced personnel.  No earthworks have been conducted in parks and reserves established under the National Parks and Wildlife Act.  Any injury or mortality of native fauna has been recorded and reported immediately.  Records kept on weed management, detection and monitoring efforts, vehicle inspections.  Consultation with landholders and Landscape Board conducted prior to construction.  Existing weed species managed according to the Landscape Board plan.  Inspection schedule established to check appropriate control measures have been implemented.	High quality or significant 18 remnant vegetation has not been cleared  Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act  No significant adverse impacts on native fauna through any stage of construction, drilling or well production testing.  No native fauna casualties that could have reasonably been prevented through the management measures.  The presence of weeds, pest animals or pathogens is consistent with or better than predisturbance 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 Landscape South Australia Act 2019 (Landscape Act) and applicable Landscape Board plans.
		NF2 disturbance, injury or death of fauna -fire	Fire breaks constructed if necessary in fire season.  Regular review and/or update of the Emergency Response Plan.  Any fire-related fauna injuries or deaths are recorded and reported immediately.  Continued engagement with CFS.	No uncontrolled fires initiated as a result of drilling, completion and well production testing activities
		NF3 disturbance, injury or death of fauna -vehicle strike	Appropriate speed limits and signage have been established.  Driver training has been conducted for workers.	Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act

<sup>&</sup>lt;sup>18</sup> Significant in this context includes listed plant species, listed communities or important fauna habitat

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Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
				No significant adverse impacts on native fauna through any stage of construction, drilling or well production testing.
				No native fauna casualties that could have reasonably been prevented through the implementation of management measures.
		NF4 disturbance, injury or	Wells designed, constructed, operated and	No well control incidents.
		death of native fauna - well control incidents	maintained in accordance with Beach's Drilling and Completions Technical Standards and Well Integrity Framework.	Activities are not carried out in parks or reserves established under the <i>National Parks and Wildlife Act</i>
			Inspection schedule established to check appropriate control measures have been implemented.	No recorded significant adverse impacts on native fauna through any stage of construction, drilling or well production testing.
				No recorded native fauna casualties that could have reasonably been prevented through the management measures.
		NF5 disturbance, injury or death of native fauna - wastes, spills and leaks	Inspection schedule established to check that appropriate control measures are in place for the management of wastes, chemicals, fuel and oil.	drilling or well production testing that could have
			Records of audit results are kept.	been reasonably been prevented through the implementation of management measures.
			All fuel and oil storage facilities meet requirements of AS 1940-2017: The storage and handling of flammable and combustible liquids.	No spills or leaks or other storage and handling incidents of chemicals, hazardous materials or
			All wastewater disposed of in accordance with the South Australian <i>Public Health (Wastewater)</i> <i>Regulations 2013</i> and where appropriate with regard to the EPA Septage Management Guideline (EPA 247/20).	wastes.  Any escape of petroleum, processed substance, chemical or fuel is either immediately contained and removed for disposal at an appropriately licenced facility or assessed in accordance with NEPM[1] guidelines and remediated in a timely manner.
				All wastewater is disposed in accordance with regulatory requirements.

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
Native vegetation	Minimise disturbance to native vegetation (including wetland communities) (OB-12) Ensure timely and effective rehabilitation of adversely affected land (OB-04)	NV1 damage to native vegetation and wildlife habitats - earthworks	Inspection schedule established to check appropriate control measures have been implemented.  Sites are selected to avoid disturbance to native vegetation.  Flagging and boundary markers in place during clearing activities.  Any sites of threatened or listed species in area to be cleared have been identified in surveys from experienced personnel and avoided where possible.  No earthworks have been conducted in parks and reserves established under the National Parks and Wildlife Act.  Vegetation is trimmed rather than cleared where possible.	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.  High quality or significant remnant vegetation has not been cleared.  Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act.
		NV2 damage to native vegetation and wildlife habitats - spills and leaks	Inspection schedule established to check appropriate control measures have been implemented.  Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act.	Records of sites indicate no spills or leaks occurred.  In the event of a spill or leak, control measures were followed, and the incident was reported.  Any escape of petroleum, processed substance, chemical or fuel to land is either immediately contained and removed for disposal at an appropriately licenced facility or assessed in accordance with NEPM <sup>19</sup> guidelines and remediated in a timely manner.  Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act.

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<sup>&</sup>lt;sup>19</sup> National Environment Protection (Assessment of Site Contamination) Measure (1999) amended in 2013

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
		NV3 damage to native vegetation and wildlife	Fire breaks constructed if necessary in fire season.	No uncontrolled fires initiated as a result of drilling, completion and well production testing
		habitats - fire	Regular review and/or update of the Emergency Response Plan.	activities
			Engagement with the CFS.	
			Appropriate permits in place at the commencement of activities.	
			Any fire-related vegetation damage of threatened or listed species is recorded and reported immediately.	
		NV4 loss of vegetation and habitat - weeds, pests and	Records kept on weed management, detection and monitoring efforts, vehicle inspections.	The presence of weeds, pest animals or pathogens is consistent with or better than pre-
		plant pathogens	Consultation with landholders and Landscape Board conducted prior to construction.	disturbance conditions and adjacent land or where this is not the case, a management plan is
		Existing weed species managed according to the Landscape Board plan.	implemented promptly  Declared plants occurring as a result of regulated	
			Inspection schedule established to check appropriate control measures have been implemented.	activities are reported and managed in accordance with the Landscape South Australia Act 2019 (Landscape Act) and applicable Landscape Board plans.
General Amenity	Minimise the impact of	GA1 general amenity impact - visual	Consultation with landholders.	Well site maintained in a clean and tidy
	operations on general amenity (OB-13)		Stakeholder engagement and complaints reporting systems in place.	condition.  Restored well site contours and colour blend with
	Ensure timely and effective rehabilitation of adversely affected land (OB-04)		Inspection schedule established to check appropriate control measures have been implemented.	the surroundings.
			Activities remain in designated areas.	
			Prompt removal of drill rigs and camps following activity completion.	
		GA2 general amenity impact - noise emissions	Consultation with landholders and local community prior to work.	No complaints relating to noise emissions.

Environmental Element	Objective/s	Potential Impact Event	Leading Performance Criteria	Assessment Criteria
			Stakeholder engagement and complaints reporting systems in place.	Landholder / stakeholder complaints are documented and reasonable steps taken to
			High noise emitting activities planned to occur during daylight hours where possible.	resolve them can be demonstrated
		GA3 general amenity impact - light pollution	Landholders, local councils, potentially affected residents and emergency services will be	No complaints regarding light emissions or flaring from local community.
			informed of significant activities such as rig mobilisation and demobilisation.	Landholder / stakeholder complaints are documented and reasonable steps taken to
			Any lighting required has been positioned to minimise light emanating from the well site.	resolve them can be demonstrated.
			Inspection schedule established to check appropriate control measures have been implemented.	
			Stakeholder engagement and complaints reporting systems in place.	