Department for Energy and Mining

Criteria for classifying the level of environmental impact of regulated activities

Petroleum and Geothermal Regulatory Guidelines | **004**

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SOUTH AUSTRALIA

Government of South Australia

Department for Energy and Mining

Energy Resources Group

Department for Energy and Mining
Level 4, 11 Waymouth Street, Adelaide SA 5000
GPO Box 320, Adelaide SA 5001

Phone +61 8 8463 3000

Email DEM.Petroleum@sa.gov.au

www.energymining.sa.gov.au/petroleum

South Australian Resources Information Gateway (SARIG)
map.sarig.sa.gov.au

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Cover photo. Producing oil well, Cooper Basin, South Australia. (Photo 417742)

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1 PURPOSE

This document establishes the criteria and framework, for the purpose of Part 12 of the *Petroleum and Geothermal Energy Act 2000*, upon which the level of environmental impact of a regulated activity will be assessed and subsequently classified under section 98 of the Act. Through providing established criteria and guidance on their application, this framework ensures judgements are informed, transparent and auditable.

In the Act, environment is broadly defined to include:

- land, air, water (surface and ground water), organisms and ecosystems
- buildings, structures and cultural artefacts
- productive capacity or potential
- external manifestations of social and economic life
- amenity value of an area.

All references to environment in this document incorporate all these aspects.

Under Part 12 of the Act, the Minister is required to classify the level of environmental impact of regulated activities. Regulated activities – as defined under Part 3 of the Act – are to be classified as potentially low, medium or high impact. The level of environmental impact of a regulated activity will determine the level of consultation required prior to consideration of approval of the related statement of environmental objectives. That is, low impact activity approvals will entail consultation only between relevant government agencies; medium impact activities will entail at minimum 30 business days public consultation process; and high impact activities will be referred for assessment on the basis of an environment impact statement under Part 8 of the *Development Act 1993* (refer to Section 8, Fig. 2).

The criteria outlined in this document can also be used to:

- Guide the preparation of an environmental impact report (EIR), as required under Part 12, section 97 of the Act, by providing a clearer understanding of the type of issues that need to be addressed in the EIR.
- Assist in the environmental assessment of the proposed activity.

1.1 PROFESSIONAL AND VALUE JUDGEMENTS

These criteria are not intended to be a surrogate for value or professional judgements required in the decision-making processes. Rather, the criteria are intended to provide a guide for such decision-making, outlining the issues that need to be considered and the basis upon which such judgements can be made. The need for value judgements and professional input into these judgements is an essential component of any assessment which entails addressing complex and sometimes less discernible issues resulting in environmental impact.

2 DEFINITIONS

Key terms used in this document are defined below.

Activity. Any operation – as defined under Part 3 of the Act – necessary, or incidental, for exploration and production of petroleum or other regulated resources governed by the Act. Such operations include the drilling of wells, the construction and operation of facilities and pipelines, and the undertaking of geophysical surveys.

Consequence. The outcome of a particular event. For example, a consequence of a spill event which contaminates soil could be a reduction in soil fertility and hence agricultural value of the land affected by the activity. A consequence in this context also includes an outcome of a chain of events.

Environment. Includes – as defined under Part 1 of the Act:

- land, air, water (including both surface and underground water), organisms and ecosystems
- buildings, structures and cultural artefacts
- productive capacity or potential
- the external manifestations of social and economic life
- the amenity values of an area.

Event. A normal or an atypical incident which occurs in a particular place at a particular time as a result of an activity which could result in an adverse environmental consequence(s) to the natural, social or economic environments. Where:

- ***Normal incident*** includes those associated with the construction, operation and decommissioning of a work site or facility, including the emissions under normal operating conditions.
- ***Atypical incident*** includes unexpected or unplanned incidents such as injury to a person/people, mechanical failure of equipment and facilities, and emission discharge levels in excess to those under normal operating conditions.

SHORTENED FORMS

EIR	environmental impact report
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
IESC	Independent Expert Scientific Committee (Cth)

3 SUMMARY

Decision-making relating to environmental impact issues – such as the process for the classification of the level of environmental impact of a proposed activity under Part 12 of the Act – involves identifying and quantifying the level of significance of the environmental consequences of a proposed activity. In light of criteria used in other similar documents[1], the classification of the level of environmental impact requires: an assessment of the level of certainty in the predicted environmental consequences associated with an activity; and the degree to which such consequences can be managed. For details, see appendixes.

The criteria proposed here are:

- ***Predictability criterion:*** In terms of the level of certainty in the prediction of adverse consequences of a proposed activity, including the potential events related to the activity which could lead to such consequences and, if relevant, the likelihood of occurrence of the consequences.
- ***Manageability criterion:*** The degree to which the consequences can be avoided or mitigated. This involves, where relevant, consideration of the likelihood of occurrence of the particular consequence(s).

This document outlines the issues that need to be addressed under each of these criteria and provides a framework for determining the level of environmental impact of a proposed activity against these criteria as illustrated in Figure 1.

The key elements of this process are:

- Identifying the events associated with a proposed activity which can lead to adverse environmental consequences.
- Assessing each of these events and their associated consequences against the predictability and manageability criteria.
- Having made this assessment, the environmental significance of each event is then quantified against each criterion on a scale of 1 to 2 for predictability and 1 to 4 for manageability – where 1 represents the least significant and 4 the most significant – referred to as the significance score.
- On the basis of the significance scores for both criteria, the environmental significance of each individual event is then classified as either high, medium or low.

1 ANZECC 1996. *Guidelines and criteria for determining the need for and level of environmental impact assessment in Australia*. Australian and New Zealand Environment and Conservation Council, Canberra.

New South Wales Department of Planning 1995. *Is an EIS required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979*. New South Wales Department of Planning.

- By consideration of the environmental significance of all events, the level of environmental impact of the overall activity is then determined. The reliability of this determination is subject to the professional judgement of the assessor. For this reason, such a determination is considered as a relative estimate and not as an absolute answer. However, making such a determination through the criteria and framework presented in this document ensures judgements are informed, transparent and auditable.

Classification process for the level of environmental impact of an activity

Identify events associated with the proposed activity and any potentially environmentally adverse consequences associated with these events.

PREDICTABILITY CRITERION

Assess the level of certainty in the prediction of the activity events and their associated adverse environmental consequences in relation to their:

- size
- scope
- duration
- likelihood
- stakeholder concerns.

MANAGEABILITY CRITERION

Assess the level to which any adverse consequences for each event can be managed in relation to:

- being avoided
- likelihood of occurring
- duration
- size and scope
- cumulative effects
- stakeholder concerns.

Determine the environmental significance scores for each event against the predictability and manageability criterion (Tables 2 and 4 respectively).

Determine the level of environmental significance (low, medium or high) for each event (environmental significance matrix, Table 5).

Classify level of environmental impact of the overall proposed activity on the basis of the level of environmental significance of each event.

Figure 1

4 EVENTS AND THEIR CONSEQUENCES

To enable an assessment of the environmental significance of a proposed activity to be carried out, two key parameters need to be determined:

- **the individual events associated with the proposed activity**
- **the consequences of those events on the environment.**

4.1 TYPES OF EVENTS

Examples of the types of events that may need to be addressed in the EIR for the proposed activity (as required under Part 12 of the Act) are provided in Appendix 1. Examples are listed under the various aspects of the environment (i.e. natural, social or economic) and under various categories of impacts. This list is provided for guidance and is intended only to give examples of the types of events that should be considered in developing a full list associated with a given activity. It is essential that the likely events of a proposed activity and their associated consequences are assessed on an activity-by-activity basis. The proponent must also consider if the activity has a significant impact on matters of national environmental significance under Division 1 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

4.2 IDENTIFYING CONSEQUENCES

The significance of the environmental impact of an activity, and therefore its level of environmental impact (low, medium or high), is related to the significance of the environmental consequences of the events associated with the proposed activity. Hence, the next stage of the environmental assessment process is to identify the potential consequences of the various events and to then assess the level of impact that these consequences have on the environment. Examples of potential consequences are provided in Appendix 1. Again this is not an exhaustive list, it is provided for guidance only.

5 CRITERIA FOR DETERMINING LEVEL OF ENVIRONMENTAL IMPACT

Having identified the events associated with the proposed activity and their potential consequences, the next step to be addressed is the extent to which these make the proposed activity environmentally significant. In developing the criteria for determining this, the criteria outlined in the Australian and New Zealand Environment and Conservation Council (ANZECC) and New South Wales Department of Planning guidelines for determining the level of environmental impact assessment required on a proposal were considered.

These criteria entail an assessment of the level of certainty in the prediction of an activity's potential environmental consequences (***predictability criterion***), combined with an assessment of the degree to which these consequences can be managed (***manageability criterion***).

5.1 PREDICTABILITY CRITERION

5.1.1 Elements to be considered under the predictability criterion

The predictability criterion involves determining the level of certainty in the prediction of the following elements based on the information in the EIR for each of the events and their potential environmental consequences associated with the activity.

5.1.1.1 Size of event(s) and consequence(s)

For example, the accuracy of the predicted quantity of potential pollution discharge on a unit or total basis, the amount of population, land, fauna and flora disturbed, and the size of the potential consequences of such events.

5.1.1.2 Scope of consequence(s)

For example, the accuracy of the predicted extent to which the potential consequences extend beyond the confines of the area or region of direct disturbance.

5.1.1.3 Duration of event(s) and consequence(s)

This includes the accuracy of the predicted timeframe (i.e. short or long term) over which the event and their potential consequences are expected to last.

5.1.1.4 Likelihood of events

The likelihood at which the events that can potentially result in the consequences are estimated to occur.

5.1.1.5 Stakeholder concerns of event(s) and consequence(s)

The extent to which the stakeholder perceptions, views and concerns of the events and their consequences associated with the activity are **known**.

5.1.2 Assessing against the predictability criterion

As a first step, the level of certainty in the prediction of these issues must be determined and categorised as low or high as defined in Table 1.

The level of certainty for the above elements (Section 5.1.1) for each event are then determined. For ease of assessment, the results can be tabulated as shown in Appendix 2.

5.1.3 Environmental significance against predictability criterion

Once the level of certainty of each of the elements is determined, it is possible to assess the environmental significance of each of the events associated with the activity against the predictability criterion. The environmental significance is determined and assessed as described in Table 2.

The significance score can then be tabled into the 'significance score' column of the predictability criterion table in Appendix 2.

Table 1 Level of certainty in the prediction of activity events and their associated consequences

Certainty level	Certainty criterion
Low	Uncertainty in the prediction of the issue exists. Well informed decision-making is difficult to make.
High	Reasonable certainty in the prediction of the issue. Confidence in making an informed decision is high.

Table 2 Predictability criterion significance score

Significance score	Predictability criterion
1	There is high certainty in the predictability for 3 or more of the issues.
2	There is low certainty in the predictability for 3 or more of the issues.

5.2 MANAGEABILITY CRITERION

This criterion focuses on the extent to which the potential environmental consequences can be either avoided or minimised in terms of size, scope and duration. It is based on the recognition that minimising the environmental impact of an activity primarily entails managing the environmental consequence(s) of those activities by either avoiding them in the first place or by mitigating them to as low as reasonably practical. That is, any event will have an impact of some sort on the natural, social or economic aspects of the environment within which it occurs. However, the severity of the impact(s) depends on the extent to which the consequences to the environment can be eliminated or minimised. Therefore, the manageability criterion assesses the level to which the environmental consequences of each event can be either avoided or mitigated, and should be assessed based on the event occurring, and independently of the results of the predictability criterion.

5.2.1 Elements to be considered under the manageability criterion

In assessing the level to which the environmental consequences can be managed, all of the elements discussed below (Sections 5.2.1.1 to 5.2.1.6) may need to be addressed.

Table 3 outlines some basic questions which can be used to address these issues which, for ease of reference, can be summarised as shown in Appendix 3.

Table 3 Questions for addressing issues under manageability criterion

Issue	Questions
Avoidance of consequence	Can the potential adverse environmental consequence be avoided; or is there no such consequence? (Yes or No)
Likelihood of event	What is the probability of an event occurring which may result in the adverse environmental consequence(s)? (Low, medium or high on the basis of the results of the risk assessment carried out in accordance with the relevant standards.)
Duration of consequence	Are the consequences likely to be short, medium or long term?
Size and scope	Can the consequences be managed so as to be small or confined to a designated area (small or confined) If they are not small or confinable, are the consequences potentially catastrophic(wide scoping and irreversible)?
Cumulative effects	Is it likely that the potential consequences of the proposal, in conjunction with those of other existing activities, are likely to pose a higher and unacceptable risk to the environment than if the individual activities were carried out on their own? Whole-of-region cumulative consequences should be taken into consideration for specific activities.
Stakeholder concerns	Is there any major concern of other stakeholders on any of the consequences of the proposed activity?

5.2.1.1 Avoidance of consequences

The extent to which the consequences of the various events associated with the activity can be totally avoided. This should be considered independently of the results of the predictability criterion assessment. For example, should an event occur (regardless of its predictability), such as soil contamination due to an oil spill, it could pose consequences to the local environment such as a reduction in soil fertility. If the consequence to the local environment is managed through avoidance measures, such as appropriate bunding and spill management procedures, then it could be said that consequences are being appropriately avoided and therefore of low significance against the criterion.

5.2.1.2 Likelihood of consequence occurring

The likelihood or probability of a consequence occurring must also be addressed. For example, in the event that an oil pipeline crossing at a waterway ruptured, resulting in an oil spill into the waterway, a possible consequence could be inconsumable water to the local community or ecosystem. If the likelihood of such a consequence occurring has been managed so as to be very low and acceptable to other stakeholders, then it could be said that this is being managed appropriately and therefore of low significance against this criterion. An assessment of such likelihood would normally entail a detailed risk assessment carried out in accordance with recognised standards[2].

5.2.1.3 Duration of consequences

Whether the consequences can be managed to be short term needs to be addressed – short term needs to be defined in the context of the environment within which the potential consequences are likely to occur. That is, concepts such as the resilience of the environment would come into consideration.

5.2.1.4 Size and scope

The extent to which the size and scope of the consequences can be managed, for example, area of land, amount of flora and fauna or number of people affected by an activity. The size and intensity of the impacted environment relative to the undisturbed surroundings. Also, whether the consequences are potentially catastrophic in terms of human and environmental wellbeing, for example, wide in scope and irreversible consequences.

5.2.1.5 Cumulative effects

This includes any cumulative effects of the consequences. For example, the consequence of an activity individually may not pose a significant environmental risk but with an increased occurrence of that activity, or when taking into consideration existing activities, the collective potential consequence may be very significant in a particular region.

5.2.1.6 Stakeholder concerns

The level of severity of the environmental consequences as perceived by stakeholders. The perception of a particular environmental consequence may vary dependent upon a number of factors, for example, land use, location and political/community sensitivities.

2 Such standards include:

Australian and New Zealand Standard AS/NZS 2885.1–2018, *Pipelines – Gas and liquid petroleum: Part 1: Design and construction*.

Australian/New Zealand Standard ISO 31000:2009, *Risk management – Principles and guidelines*.

5.2.2 *Environmental significance against manageability criterion*

Once the potential environmental consequences have been addressed in relation to the above elements (Sections 5.2.1.1–5.2.1.6), the level of environmental significance of each of the events associated with the proposed activity can then be assessed against the manageability criterion. As with the predictability criterion, the environmental significance for the manageability criterion is assessed as described in Table 4.

The significance score can then be entered into the 'significance score' column of the manageability criterion table in Appendix 3.

A step-by-step outline of the use of Tables 3 and 4 to assess the level of environmental significance for each of the events associated with the proposed activity against the manageability criterion is suggested as follows.

Step 1

The event can be considered as being of low significance where potential adverse consequences can be totally avoided; or where there are no adverse consequences associated with the events of the activity; or where there is a low likelihood of an event occurring which would lead to adverse consequences being realised. In this case a significance **score of 1** should be assigned.

Step 2

Where potentially adverse consequences cannot be totally avoided or where their likelihood of being realised is not low, consideration needs to be given to the duration and the size and scope of the consequences. If the consequences can be managed to occur only for short term and are confined within a small area – in the context of the environment within which they will occur – then a significance **score of 2** should be assigned.

Table 4 Manageability criterion significance score

Significance score	Manageability criterion
1	Adverse consequences of the various events associated with the proposed activity can be totally avoided, or it is highly unlikely that the events will ever occur.
2	Adverse consequences can be managed to be short term and confined and/or they are considered insignificant in terms of duration, size and scope relative to the surroundings.
3	Adverse consequences are not short term and confined and consequences are considered significant in terms of duration and/or size and scope; and/or significant due to cumulative effects; and/or there is high stakeholder concern regarding the severity of the consequences.
4	Consequences are potentially catastrophic. Catastrophic in this context means wide scope and long term, or irreversible consequences such as death or serious injury to individuals, or permanent adverse change to the environment.

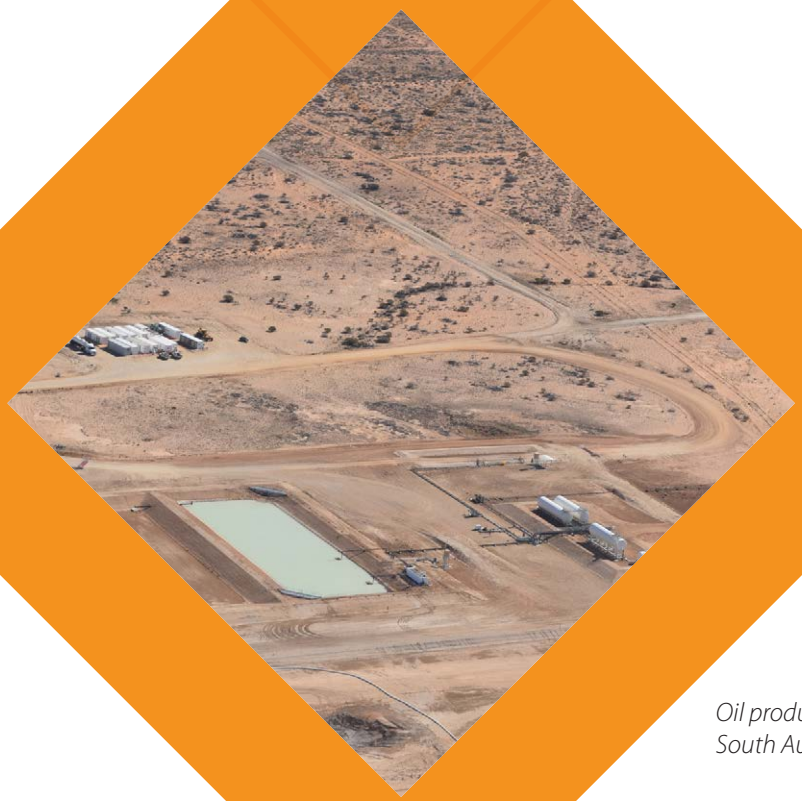
Step 3

If the consequences are not short term and confined within a small area, then the question of whether or not they are considered significant in terms of duration and/or size and scope relative to surroundings must be asked. The cumulative effects of the consequences of the event with an increased occurrence of that activity, or in conjunction with existing activities also needs to be considered, as does stakeholder concern regarding the severity of the consequences.

Where the consequence of an event is considered significant in terms of duration and/or size and scope, **or** the cumulative effects of the consequence of an event are considered to pose a significant risk to the environment, **or** there is high stakeholder concern regarding the severity of the consequences of the event, a significance **score of 3** should be assigned. If not, a significance **score of 2** remains.

Step 4

In the case where the consequences are potentially catastrophic in terms of being wide in scope and irreversible such as death or serious injury to individuals, or permanent adverse change to the environment, then a significance **score of 4** should be assigned.



Oil production facility in construction, Cooper Basin, South Australia. (Photo 417741)

6 ENVIRONMENTAL SIGNIFICANCE

From the significance scores for the predictability and manageability criteria, the level of environmental significance for each of the potential events associated with the proposed activity can then be determined as either high, medium or low on the basis of the environmental significance matrix presented in Table 5.

Where adverse environmental consequences can be avoided or where it is very unlikely that an event will occur which would result in such consequences (i.e. a score of 1 against the manageability criterion), then the significance of the individual event associated with the proposed activity can be considered to be low regardless of the predictability score.

Where considered appropriate, the significance matrix provided in Table 5 can be developed in consultation with other stakeholders so as to set the three levels of significance at other positions within the matrix.

Table 5 Matrix for determining level of environmental significance

		Manageability criterion			
	Scores	**1**	**2**	**3**	**4**
Predictability criterion	**1**				
	2				

High *Medium* *Low*

Petroleum exploration wellsite, Officer Basin, South Australia. (Photo 417740)

7 CLASSIFYING ACTIVITY ENVIRONMENTAL IMPACT

For ease of reference, the environmental significance assigned to each event can be tabulated with the significance scores for predictability and manageability criterion as shown in Appendix 4. The level of environmental significance assigned to each individual event can be used to determine the overall level of environmental impact of the proposed activity as required under Part 12 of the Petroleum and Geothermal Energy Act. A guide for this determination is outlined below.

LOW ENVIRONMENTAL IMPACT

For those proposals where the environmental significance of **greater than 95%** of their associated events has been assessed as low using the environmental significance matrix (Table 5), then the overall level of environmental significance should be considered low. Under Part 12 of the Act, such proposals should be classified as **low impact** activities by the Minister.

MEDIUM ENVIRONMENTAL IMPACT

For those proposals where the environmental significance of **at least 5%** of their associated events has been assessed as either medium or high (but less than 5% high), the overall environmental significance should be considered medium. Under Part 12 of the Act, such proposals should be classified as **medium impact** activities by the Minister. Activities that significantly impact matters of national environmental significance under Division 1 of the EPBC Act will trigger, at minimum, a medium environmental impact classification or higher.

HIGH ENVIRONMENTAL IMPACT

For those proposals where the environmental significance of **at least 5%** of their associated events has been assessed as high, the overall environmental significance should be considered high. Under Part 12 of the Act, such proposals should be classified as **high impact** activities by the Minister and should be referred for assessment under Part 8 of the Development Act.

8 CONSULTATION REQUIRED PRIOR TO APPROVAL

The activity classification of the environmental impact as low, medium or high through the environmental significance assessment determines the level of consultation required prior to consideration of approval of the relevant statement of environmental objectives.

Agreement on the activities level of overall environmental impact will be made in close consultation with the Environment Protection Authority South Australia and Department for Environment and Water for low and medium impact activities and with the Department of Planning, Transport and Infrastructure for medium and high impact activities. More detail on this process is captured in relevant administrative arrangements between agencies.

In accordance with the Petroleum and Geothermal Energy Act and Petroleum and Geothermal Energy Regulations 2013, low impact activities will involve consultation only between government agencies; medium impact activities will involve a 30 business day public consultation process; and high impact activities will be referred for environment impact statement assessment under Part 8 of the Development Act.

An overview of the complete consultation process is summarised in Figure 2, extracted from the guide to *Licensing and approvals process for exploration, retention and production activities in South Australia* (PDF 169 kB) on the Petroleum website.

8.1 COAL SEAM GAS

In the instance where an activity involves a coal seam gas project, the project will be referred to the Commonwealth Independent Expert Scientific Committee (IESC) on Coal Seam Gas and Large Coal Mining Development to align with a national partnership agreement and South Australian protocol for the referral process.

The South Australian protocol states that:

- The relevant authority will refer all coal seam gas project applications and all project applications which require the preparation of an environmental impact statement under Part 8 of the Development Act to the IESC for advice.
- These projects will be referred when a draft EIR/statement of environmental objectives or environmental impact statement is available.
- The relevant authority will refer project applications to the IESC in a manner consistent with the IESC information guidelines.

Further information:

- National partnership agreement and IESC, including the South Australian protocol for referral of coal seam gas projects to the committee.
- IESC information guidelines which can assist in the development of a licensees EIR.

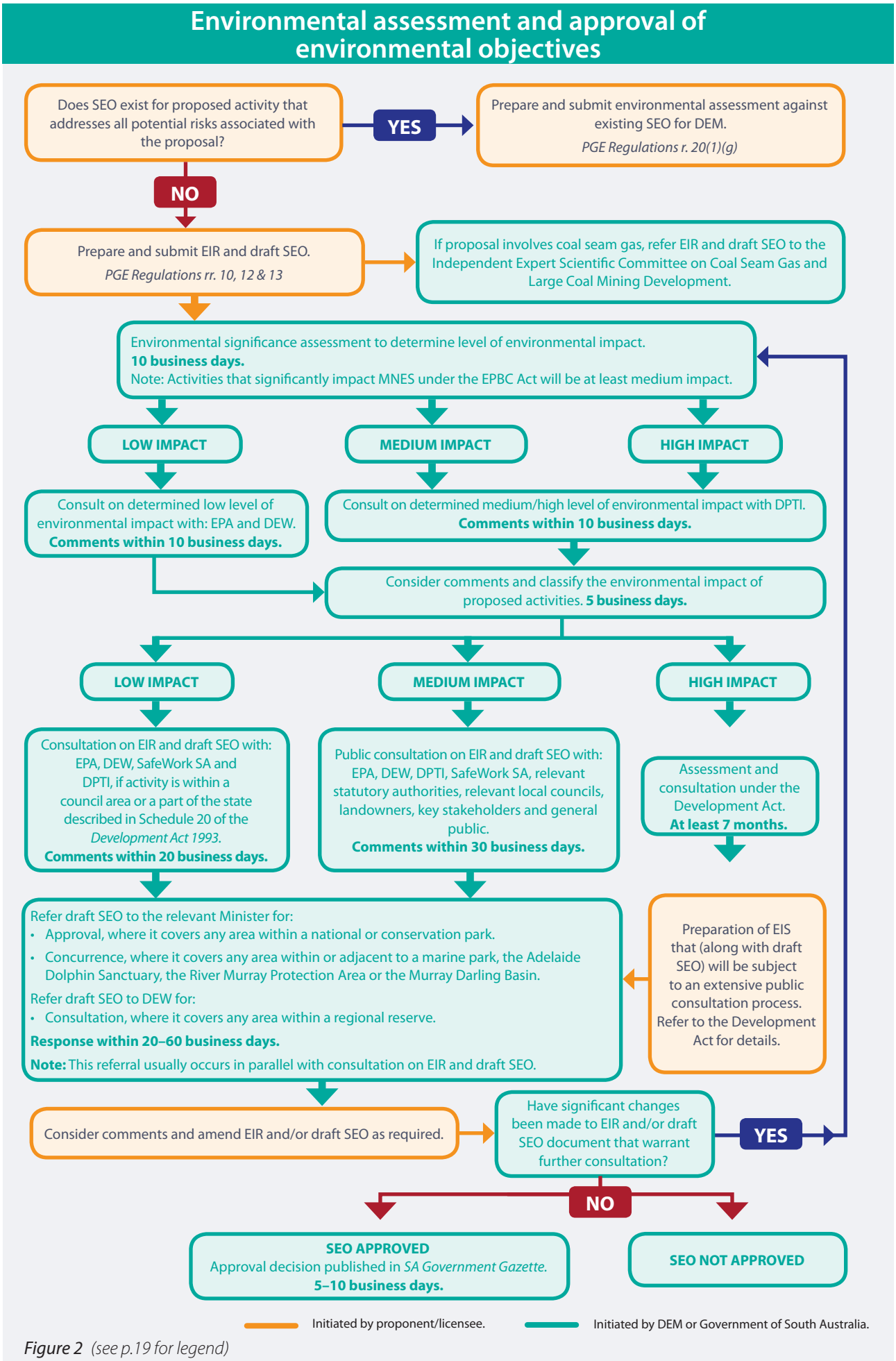


Figure 2 *(see p.19 for legend)*

LEGEND

DEW	Department for Environment and Water
DEM	Department for Energy and Mining
DPTI	Department of Planning, Transport and Infrastructure
EIS	environment impact statement
EIR	environmental impact report
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
MNES	matters of national environmental significance
PGE Regulations	Petroleum and Geothermal Regulations 2013
SEO	statement of environmental objectives

8.2 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the EPBC Act it is a requirement to refer an action if it is likely to have a significant impact on the environment and/or a matter of national environmental significance, including:

- world heritage properties
- national heritage places
- wetlands of international importance (often called 'Ramsar')
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- Great Barrier Reef Marine Park
- nuclear actions
- water resource, in relation to coal seam gas development and large coal mining development.

Significant impact guidelines for matters of national environmental significance under the EPBC Act are on the Commonwealth Department of the Environment and Energy website.

Relevant approval/conditions for 'controlled actions' and 'non-controlled actions' under the EPBC Act are required if the relevant EIR scope captures regulated activities under the Petroleum and Geothermal Energy Act that are likely to have a significant impact on the environment and/or matters of national environmental significance.

9 CONSULTATION OF REVIEWED CRITERIA FOR THESE GUIDELINES

Under section 11(3) of the Petroleum and Geothermal Energy Regulations, the Minister must, in establishing or reviewing the criteria under section 98 of the Petroleum and Geothermal Energy Act, consult with relevant government departments, agencies and instrumentalities, and other relevant persons or groups, as determined by the Minister. The government departments consulted and their comments are provided in Appendix 5.

APPENDIX 1

Examples of events and their environmental consequences

This list is provided for guidance only and is not intended to be exhaustive. Each proposal will need to be assessed individually to determine its potential environmental consequences.

Aspect of environment	Category of impact	Type of event	Likely consequence
Natural	***Soil***	Soil earthworks.	Reduction in visual amenity of area; increased erosion; soil inversion.
		Change of soil quality (e.g. contamination due to spills, salinisation).	Reduction in soil fertility.
	Air	Emissions to air (e.g. dust, smoke, greenhouse gases) .	Health risk to local community; greenhouse effect; impacts to vegetation health.
	Surface and ground water	Water extraction.	Water shortage to local community, agriculture and ecosystem.
		Spills into water bodies (e.g. oil or chemical spills).	Inconsumable water to the local community and ecosystem.
		Altering drainage patterns.	Reduced water capacity of natural water bodies; increased soil erosion; impacts to vegetation.
	Fauna	Disturbing terrestrial or aquatic species.	Endangering species; displacing species.
		Disturbing animal habitats.	Changes to fauna patterns; barriers to fauna movements.
	Flora	Disturbing native flora.	Threaten biological diversity.
		Clearing native vegetation.	Destroy fauna habitats; threaten biodiversity.
	Sensitive area	Disturbance of national or conservation parks.	Loss of conservation value.

Aspect of environment	Category of impact	Type of event	Likely consequence
		Disturbance of world heritage area.	Loss of world heritage value of area.
		Disturbance of areas under national or international registers/ conventions.	Loss of register/convention values.
Social	***Community resource***	Use of public resources.	Degradation of public infrastructure.
		Change in land use.	Disadvantage groups within the community; loss of recreational amenity of a region.
		Change visual attribute of an area.	Reduction in aesthetic and recreational value of area.
	Cultural	Change demographic structure of an area.	Changes to community makeup; changes in community cultural identity and values.
	Heritage	Disturbance to natural or man-made features of an area.	Changes to aesthetic value of area; changes to historical value of area.
		Disturbance to Aboriginal sites.	Loss of Aboriginal affiliation with an area.
	Community health	Air emissions.	Health problems in the community.
		Noise and vibration.	Discomfort to local community.
		Water contamination.	Health risk to local community.
		Potentially hazardous operations (e.g. high pressure pipelines, hazardous substance storage).	Health and safety risk to local community.

Aspect of environment	Category of impact	Type of event	Likely consequence
		Cumulative changes in local community due to development.	Mental health risk to local community.
Economic	***Community welfare***	Altering economy of a region.	Changes to the standard of living in the region; economic independency of a region altered.
		Altering employment rate within a region.	Changes to the standard of living; social instability/stability.
	Natural resource	Disturbance of natural resources of other industries in the region (e.g. fish habitats associated with local fishing industry).	Changes in employment levels; changes in level of variability of other industries.
		Altering existing land use.	Changes to land value; changes to industry types within region.

APPENDIX 2

Predictability criterion table

Step 1 Each of the events of the proposed activity and their associated consequences are assessed against certainty (low or high as described in Table 1, Section 5.1.2) in the prediction of:

- size
- scope
- duration
- likelihood
- stakeholder concerns.

Step 2 Significance score of 1 or 2 is assigned for each event using Table 2, Section 5.1.3.

Predictability criterion	Size	Scope	Duration	Frequency	Stakeholder concerns	Significance score
NATURAL ENVIRONMENTAL IMPACTS						
Soil impacts						
Earthworks						
Contamination (e.g. spills)						
Air impacts						
Air emissions						
Surface/ground water impacts						
Water extraction						
Water contamination						
Altering drainage and/or flow direction patterns						
Fauna impacts						
Disturbance to species						
Disturbance to habitats						
Flora impacts						
Disturbing native flora species*						
Clearing extensive areas of native vegetation						

Predictability criterion	Size	Scope	Duration	Frequency	Stakeholder concerns	Significance score
Sensitive area impacts						
Disturbance to national parks						
Disturbance to world heritage areas						
Disturbance of areas under national and/or international registers/conventions						
Significant impacts to matters of national environmental significance as defined under the EPBC Act						
SOCIAL IMPACTS						
Community resource impacts						
Public infrastructure						
Land use or changes in land use						
Changes to visual attributes of area						
Cultural impacts						
Changes to demographic structure of area						
Heritage impacts						
Disturbance to natural features						
Disturbance to man-made features						
Disturbance to Aboriginal sites						
Community health impacts						
Air quality changes						
Noise and vibration						
Changes to water quality						
Hazardous operations introduced						

Predictability criterion	Size	Scope	Duration	Frequency	Stakeholder concerns	Significance score
ECONOMIC IMPACTS						
Community welfare impacts						
Wealth and employment						
Natural resource impacts						
Disturbance of natural resources of other industries						
Altering existing land use						

* Include dust/air emissions, soil contamination, introduction and increase in weeds, and surface/ground water changes as potentially impacting on native flora. To satisfy the requirements under the Native Vegetation Regulations 2017, the mining industry and Department for Energy Mining (as a delegate of the Native Vegetation Council) must consider the 'indirect' impacts to native vegetation as a result of regulated mining activities when determining the required significant environmental benefit offset. These impacts include such things as weed/pest invasion, dust impacts and changes in hydrology.

APPENDIX 3
Manageability criterion table

Step 1 The associated consequences of each of the impacts are assessed against the following issues:

- extent to which they can be avoided
- likelihood of events occurring which result in the impacts being realised
- duration
- size and scope the consequences
- cumulative effects of the consequences
- stakeholder concerns.

Step 2 Each of these issues are addressed using the questions given in Table 3, Section 5.2.1.

Step 3 A significance score of 1 to 4 is assigned for each impact using Table 4, Section 5.2.2.

Predictability criterion	Avoidance	Likelihood	Duration	Size and scope	Cumulative effects	Stakeholder concerns	Significance score
NATURAL ENVIRONMENTAL IMPACTS							
Soil impacts							
Earthworks							
Contamination (e.g. spills)							
Air impacts							
Air emissions							
Surface/ground water impacts							
Water extraction							
Water contamination							
Altering drainage and/or flow direction patterns							

Predictability criterion	Avoidance	Likelihood	Duration	Size and scope	Cumulative effects	Stakeholder concerns	Significance score
Fauna impacts							
Disturbance to species							
Disturbance to habitats							
Flora impacts							
Disturbing native flora species							
Clearing extensive areas of native vegetation							
Sensitive area impacts							
Disturbance to national parks							
Disturbance to world heritage areas							
Disturbance of areas under national and/or international registers/ conventions							
Significant impacts to matters of national environmental significance as defined under the EPBC Act							
SOCIAL IMPACTS							
Community resource impacts							
Public infrastructure							
Land use or changes in land use							
Changes to visual attributes of area							
Cultural impacts							
Changes to demographic structure of area							
Heritage impacts							
Disturbance to natural features							
Disturbance to man-made features							
Disturbance to Aboriginal sites							

Predictability criterion	Avoidance	Likelihood	Duration	Size and scope	Cumulative effects	Stakeholder concerns	Significance score
Community health impacts							
Air quality changes							
Noise and vibration							
Changes to water quality							
Hazardous operations introduced							
ECONOMIC IMPACTS							
Community welfare impacts							
Wealth and employment							
Natural resource impacts							
Disturbance of natural resources of other industries							
Altering existing land use							

APPENDIX 4

Activity environmental significance table

Environmental significance	**Predictability criterion score 1–2** (Table 2, Section 5.1.3)	**Manageability criterion score 1–4** (Table 4, Section 5.2.2)	**Level of environmental significance** **H** high; **M** medium; **L** low (Table 5, Section 6)
NATURAL ENVIRONMENTAL IMPACTS			
Soil impacts			
Earthworks			
Contamination (e.g. spills)			
Air impacts			
Air emissions			
Surface/ground water impacts			
Water extraction			
Water contamination			
Altering drainage and/or flow direction patterns			
Fauna impacts			
Disturbance to species			
Disturbance to habitats			
Flora impacts			
Disturbing native flora species			
Clearing extensive areas of native vegetation			
Sensitive area impacts			
Disturbance to national parks			
Disturbance to world heritage areas			
Disturbance of areas under national and/or international registers/ conventions			

Environmental significance	Predictability criterion score 1–2 (Table 2, Section 5.1.3)	Manageability criterion score 1–4 (Table 4, Section 5.2.2)	Level of environmental significance H high; M medium; L low (Table 5, Section 6)
Significant impacts to matters of national environmental significance as defined under the EPBC Act			
SOCIAL IMPACTS			
Community resource impacts			
Public infrastructure			
Land use or changes in land use			
Changes to visual attributes of area			
Cultural impacts			
Changes to demographic structure of area			
Heritage impacts			
Disturbance to natural features			
Disturbance to man-made features			
Disturbance to Aboriginal sites			
Community health impacts			
Air quality changes			
Noise and vibration			
Changes to water quality			
Hazardous operations introduced			
ECONOMIC IMPACTS			
Community welfare impacts			
Wealth and employment			
Natural resource impacts			
Disturbance of natural resources of other industries			
Altering existing land use			

> Through providing established criteria and guidance on their application, this framework ensures judgements are informed, transparent and auditable.

APPENDIX 5

Consultation of reviewed criteria for classifying the level of environmental impact of regulated activities

Under section 11(2) of the Petroleum and Geothermal Energy Regulations the Minister must review the criteria under section 98 of the Petroleum and Geothermal Energy Act for the assessment of the environmental impact of regulated activities at least once every 5 years.

This document – *Criteria for classifying the level of environmental impact of regulated activities* – was provided to the following agencies for comment in 2018 when undertaking this 5 yearly review:

- Environment Protection Authority
- Department for Environment and Water
- Department of Planning Transport and Infrastructure.

The following comments were received and incorporated.

2018 review comments	Action
Replace 'Department of Environment, Water and Natural Resources' with 'Department for Environment and Water'.	Done.
Replace 'altering drainage patterns' with 'altering drainage and/or flow direction and patterns' in Appendixes 2, 3 and 4.	Done.

2018 review comments	Action
The matrix for determining level of environmental significance (Table 5) shows that a significance rating of low can be achieved with a manageability score of 1 and a predictability score of 5. This seems counterintuitive given that the criteria relate a predictability score of 5 to extreme uncertainty. In a risk framework, elevated uncertainty is correlated with increased risk since the possibility of more severe consequences cannot be ruled out. Should the same principle apply for these criteria?	Both Table 4 manageability criterion and Table 2 predictability criterion have been reworded to better reflect appropriate weighting between manageability and predictability.
Table 5 shows that there is no difference between predictability scores of 1 and 2, and for scores 3, 4 or 5 from the point of view of environmental significance. Similarly there is no difference between manageability scores of 2 and 3. This suggests that the matrix could be simplified without losing any resolution with respect to the assessment outcome.	Table 5 has been amended and now includes 4 scores for manageability and 2 scores for predictability: ■ Manageability scores for 2 and 3 were combined and wording reflected in Table 4 and Section 5.2.2 ■ Predictably scores for 1 and 2, and for 3, 4 and 5 were also combined and wording/changes reflected in Tables 1 and 2 and Section 5.1.3.
Section 7 'Classifying environmental impact' includes guidelines for aggregating multiple environmental significance scores into a single environmental impact rating but no specific criteria. This could lead to increased subjectivity of the final determination – particularly when there is variance in the scores. It is suggested that more robust criteria be developed – e.g. how many medium or high scores are needed to elevate the final impact score from low to medium or high.	An adjusted scoring method/wording has been included to remove subjectivity in that: ■ Low environmental impact = greater than 95% of events have been scored as low. ■ Medium environmental impact = at least 5% of events have been scored as medium/high, with high not exceeding 5%. ■ High environmental impact = at least 5% of events have been scored as high.
The document is not clear on how the activity/events are identified. Are they copied from risk assessments provided by proponents?	The criteria are used to assess the environmental significance of an activity based on an EIR. The content of an EIR is captured under regulation 10, which is outside the scope of this document.
It is suggested that clearer definitions or principles are provided regarding some elements of the criteria. For example: ■ Likelihood – probability over what timeframe and scale? What is low versus high probability? ■ Duration – what is short, medium and long term? ■ Size and scope – what are criteria for descriptors like 'catastrophic', 'small', 'confined'?	Adequately covered in Sections 5.2.1.1 to 5.2.1.6

2018 review comments	Action
The criteria and process outlined in this document appear to be loosely aligned with AS/NZS ISO 31000 risk management standard. Is there benefit in adjusting language and concepts to make the criteria and process a more direct implementation of this standard?	AS/NZS ISO 31000 risk management standard was cited in the development of the current criteria. The recent edits in the current review hopefully address overall concerns with language and concepts.
Determination of the predictability criterion significance score involves all of the elements considered. The same, however, does not appear to be the case in the determination of the manageability criterion significance score. It is not obvious where all of the issues in Table 3 are considered in the significance score in Table 4. Consider providing additional comment/explanation on the logic for determining the significance score relating to the issues in Table 3.	The key predictability and manageability criterion within both Table 2 and Table 4 have been reviewed with minor changes to reflect correct weighting.
Section 5.2.1.1. The avoidance of consequence issue is a 'yes' or 'no' answer and it is not clear in the text how this is determined.	Current wording has adequate explanation to determine if avoidance can occur.

CONTACT

Energy Resources Division

Department for Energy and Mining
Level 4, 11 Waymouth Street, Adelaide SA 5000
GPO Box 320, Adelaide SA 5001

P +61 8 8463 3000

E DEM.Petroleum@sa.gov.au

www.energymining.sa.gov.au/petroleum

SOUTH AUSTRALIA

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