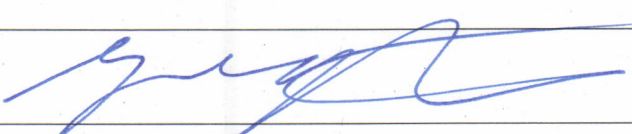


Approval

Arrow Bowen Gas Project (EPBC 2012/6377)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

person to whom the approval is granted	Arrow Energy Pty Ltd
proponent's ABN	ABN: 73 078 521 936
proposed action	To develop, operate and decommission a coal seam gas field in the Bowen Basin, Queensland referred under the EPBC Act on 9 May 2012; and as described in the Arrow Bowen Gas Project Environmental Impact Statement (March 2013) and Supplementary Report (May 2014).
decision	<p>To approve the proposed action for each of the following controlling provisions:</p> <ul style="list-style-type: none">• Listed threatened species and communities (sections 18 and 18A)• Listed migratory species (sections 20 and 20A)• A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
Conditions of approval	This approval is subject to the conditions specified below.
expiry date of approval	This approval has effect until 31 December 2075
Decision-maker	
name and position	The Hon Greg Hunt MP Minister for the Environment
signature	
date of decision	27:10:2014

Conditions of approval

1. The **Minister** may determine that a plan, strategy or program approved by the Queensland Government satisfies a plan, strategy or program required under these conditions.

Disturbance Limits

2. For the purpose of the action, the **approval holder** must not take any action outside the Authorities to Prospect (ATPs) 1103, 1031, 1025, 749, 742 and 759, shown as the Bowen Gas Project Tenements at Attachment A.
3. The action is limited to a maximum of 4,000 coal seam gas production wells and associated infrastructure.
4. The maximum disturbance limits in Table 1 apply to the action to protect those **EPBC listed species and communities** (identified in Table 1) within the **project area**. The **approval holder** must not exceed these maximum disturbance limits.

Table 1: Whole of project maximum disturbance limits

Threatened Species	Maximum disturbance (hectares) to core habitat known and core habitat possible
Black Ironbox (<i>Eucalyptus raveretiana</i>)	258.32
Bluegrass (<i>Dichanthium setosum</i>)	809.59
King Bluegrass (<i>Dichanthium queenslandicum</i>)	1161.23
Ornamental Snake (<i>Denisonia maculata</i>)	1030.31
Squatter Pigeon (<i>Geophaps scripta scripta</i>)	1415.44
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	187.14
Koala (<i>Phascolarctos cinereus</i>) (combined populations of Queensland, New South Wales and the Australian Capital Territory)	2466.04
South-eastern long-eared bat (<i>Nyctophilus corbeni</i>)	2282.57
Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>)	1451.44
Threatened Ecological Communities	Maximum disturbance (hectares)
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	781.16
Weeping Myall Woodlands	198.48
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	871.10
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	107.42

5. To protect those **EPBC listed species and communities** (identified in Table 2) within the **project area** the maximum disturbance limits in Table 2 apply to **Project Phase 1**. The **approval holder** must not exceed these maximum disturbance limits for **Project Phase 1**.

Table 2: Maximum disturbance limits for Project Phase 1

Threatened Species	Maximum disturbance (hectares) to core habitat known and core habitat possible
Black Ironbox (<i>Eucalyptus raveretiana</i>)	21.33
Bluegrass (<i>Dichanthium setosum</i>)	249.84
King Bluegrass (<i>Dichanthium queenslandicum</i>)	429.36
Ornamental Snake (<i>Denisonia maculata</i>)	296.2
Squatter Pigeon (<i>Geophaps scripta scripta</i>)	313.1
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	49.4
Koala (<i>Phascolarctos cinereus</i>) (combined populations of Queensland, New South Wales and the Australian Capital Territory)	376.59
South-eastern long-eared bat (<i>Nyctophilus corbeni</i>)	618.12
Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>)	723.67
Threatened Ecological Communities	Maximum disturbance (hectares)
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	283.92
Weeping Myall Woodlands	79.68
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	278.4
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	97.6

Pre-clearance surveys

6. The approval holder must undertake pre-clearance surveys of proposed disturbance areas.
7. Pre-clearance surveys must be supervised by a suitably qualified person and undertaken in accordance with the Department's survey guidelines in effect at the time of the survey or other survey methodology endorsed by the Department in writing.
8. A report of the outcomes of pre-clearance surveys must be included in annual reporting required by condition 30.

EPBC Species Impact Management

9. Prior to the commencement of Project Phase 1, the approval holder must prepare and submit an EPBC Species Impact Management Plan for the Minister's written approval. The EPBC Species Impact Management Plan must include:
 - a. measures that will be taken to avoid, mitigate and manage impacts to EPBC listed threatened species and their habitat during clearance of vegetation, including the involvement of a suitably qualified person at all times during clearance of vegetation;
 - b. measures that will be taken to avoid, mitigate and manage impacts to EPBC listed threatened species and their habitat and to EPBC communities during construction, operation and decommissioning of the action;

- c. a monitoring program to determine the success of mitigation and management measures to ensure adaptive management for the duration of this approval;
 - d. a discussion of relevant **conservation advice, recovery plans and threat abatement plans** and how measures proposed in the EPBC Species Impact Management Plan are consistent with the measures in these documents; and
 - e. details of how the **approval holder** has addressed any residual significant impacts to any **EPBC listed threatened species** and its habitat and/or **EPBC communities** not identified in Table 1, to be offset in accordance with the **EPBC Act Environmental Offsets Policy**.
10. The approval holder cannot **commence Project Phase 1** until an EPBC Species Impact Management Plan has been approved by the **Minister** in writing. The approved EPBC Species Impact Management Plan must be implemented by the **approval holder**.

Offsets

11. The **approval holder** must ensure that environmental offsets comply with the principles of the *EPBC Act Environmental Offsets Policy (2012)*.
12. The **approval holder** may carry out the action in stages. The **approval holder** must deliver environmental offsets for each **Project Phase** related to the residual impacts of each respective **Project Phase** on **EPBC listed threatened species and communities**.
13. The Offset Management Plan may be prepared and submitted to the **Minister** for approval in stages. Each stage of the Offset Management Plan must correspond with a **Project Phase**. A **Project Phase** must not **commence** until an Offsets Management Plan for that phase has been approved by the **Minister**.
14. The Offset Management Plan must include:
- a. details of the minimum offset areas proposed for the residual significant impacts for Project Phase 1 against the maximum disturbance limits set out in Table 2;
 - b. information about how the offset areas provide connectivity with other relevant habitats and biodiversity corridors, including a map depicting the offset areas in relation to other habitats and biodiversity corridors;
 - c. performance and completion criteria for evaluating the management of the offset area, and criteria for triggering remedial action (if necessary);
 - d. a description of the management measures that will be implemented for the protection of **EPBC listed threatened species and communities**, including a discussion of how measures proposed are consistent with the measures in relevant **conservation advice, recovery plans and threat abatement plans**;
 - e. a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;
 - f. a description of potential risks to the successful implementation of the plan, and a description of the contingency measures that would be implemented to mitigate against these risks;
 - g. a timeline for when actions identified in the Offset Management Plan will be implemented for each offset area; and
 - h. the proposed legal mechanism for securing the offset.
15. The **approval holder** must not **commence Project Phase 1** until the Offset Management Plan has been approved by the **Minister** in writing. The approved Offset Management Plan must be implemented by the **approval holder**.

16. Offsets for **Project Phase 1** must be in accordance with the mechanism identified in the Offset Management Plan and must be registered and legally secured in accordance with Queensland legislation prior to **commencement** of any subsequent **Project Phase**.
17. The **approval holder** must prepare and submit an updated Offset Management Plan (required at conditions 13 and 14) for each subsequent **Project Phase**, for approval by the **Minister**. The updated Offset Management Plan must include:
- a. details of the minimum offset areas proposed for the residual significant impacts to the **EPBC listed species and communities** for the relevant **Project Phase**;
 - b. a survey and description of the current condition (prior to any management activities) of each offset area proposed, including existing vegetation (the baseline condition) (including for **Project Phase 1** and each subsequent **Project Phase** for which an update to the Offset Management Plan has been approved). This must include a shapefile of each offset property boundary;
 - c. a map of the location of each **EPBC listed threatened species** and its habitat and **EPBC community** in relation to infrastructure for the relevant **Project Phase**;
 - d. the information required for the Offset Management Plan at conditions 14a to 14h for the relevant **Project Phase**
 - e. an updated Offset Management Plan must demonstrate how the offset builds on offsets already secured for each previous **Project Phase** and will contribute to a larger strategic offset for whole of project impacts.
18. Offsets for each **Project Phase** subsequent to **Project Phase 1** must be registered and legally secured in accordance with Queensland legislation prior to commencement of the next **Project Phase**.
19. The **approval holder** must not commence the next **Project Phase** until the Offset Management Plan, updated for that Project Phase, has been approved by the Minister in writing. The approved Offset Management Plan as updated for each **Project Phase** must be implemented by the **approval holder**.

Water management and monitoring

20. The **approval holder** must not discharge, irrigate or otherwise release **CSG produced water**, wastewater, stormwater or harvested water, into the Isaac River and its tributaries unless the discharge complies with the discharge criteria defined for the site and is in accordance with the requirements of an environmental authority issued under the *Environmental Protection Act 1994* (Qld) for the action.
21. The **approval holder** must submit a Groundwater Management and Monitoring Plan (**GMMP**) for the written approval of the **Minister** who may seek the advice of an **expert panel**. The GMMP must contain:
- a. details of a groundwater monitoring network for the measurement of **impacts** on water resources associated directly or indirectly with the action, including the ability to:
 - (i) provide for the early detection of any changes in the groundwater regime in terms of amplitude and frequency of fluctuations in water pressure, water level and water quality in groundwater systems and changes in connectivity with surface water;
 - (ii) monitor relevant formations to determine hydraulic connectivity and provide for early detection of **impacts** prior to reaching migration pathways to other formations (eg faults and areas of unconformities known to connect two or more formations);

- (iii) monitor potential **impacts** on groundwater dependent ecosystems, including spring based and non-spring based ecosystems, and provide for the early detection of **impacts**;
 - (iv) monitor changes to the **project area** groundwater balance; and
 - (v) monitor changes to water availability for water users and the environment.
- b. details of a baseline monitoring data acquisition program for the approved action;
 - c. a rationale for the design of the monitoring network with respect to the nature of potential **impacts** and the location and occurrence of **matters of national environmental significance**;
 - d. details of proposed early warning indicators, trigger thresholds and limits for detecting impacts on groundwater levels and a description of how and when these measures will be finalised and subsequently reviewed in accordance with the requirements of the **Underground Water Impact Report**;
 - e. details of a risk based exceedance response for the actions the **approval holder** will take, and the timeframes in which these actions will be undertaken, if early warning indicators and trigger threshold values are exceeded;
 - f. details of the timeframe for a regular review of the GMMP in accordance with the requirements of the **Underground Water Impact Report** and subsequent updates of the GMMP, including to incorporate the outcomes of updates to the numerical groundwater model and water balance calculations;
 - g. provisions to make monitoring results publicly available on the **approval holder's** website for the life of the project; and
 - h. provisions to make monitoring data available to the **Department and Queensland Government authorities** (if requested) for inclusion in any cumulative impact assessment, regional water balance model, bioregional assessment or relevant research.
22. The GMMP, including any revised plans, must be peer reviewed by a **suitably qualified water resources expert/s** approved by the **Minister** in writing. A peer review must be submitted to the **Minister** together with the GMMP and a statement from the **suitably qualified water resources expert/s** stating that they carried out the peer review and endorse the findings and the content of the GMMP.
23. The **approval holder** must not commence the extraction of water or coal seam gas until the GMMP has been approved by the **Minister** in writing. The approved GMMP must be implemented by the **approval holder**.
24. The **Minister** may direct in writing that the **approval holder** cease water or gas extraction and/or water discharge or use if an early warning indicator, trigger threshold or limit is exceeded, and if the **Minister** is not satisfied that the action proposed or taken by the **approval holder** will remedy the situation. The **Minister** may direct the **approval holder** to implement alternative action at the expense of the **approval holder**.
25. If the **Minister** has directed in writing that the **approval holder** must cease water or gas extraction and/or water discharge or use pursuant to condition 24 the **approval holder** must not recommence such activities until the **Minister** has given approval in writing for the recommencement of those activities. Approval to recommence activities may be subject to conditions that the **Minister** considers reasonable.

Well construction and hydraulic fracturing

26. In the event that **hydraulic fracturing** is required, no more than 1,000 of the total coal seam gas production wells may be **hydraulically fractured**.

27. The **approval holder** must ensure that gas wells are constructed, operated and decommissioned in accordance with best practice principles in the **Queensland Code of Practice for Construction and Abandoning CSG wells**.

General

28. Within 20 business days after the **commencement** of the action, the **approval holder** must advise the **Department** in writing of the actual date of **commencement**.
29. The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plans, reports or strategies required by this approval, and make them available upon request to the **Department**. The annual report (condition 30) must state all confirmed cases of non-compliance along with details of any remedial actions. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.
30. Within three months of every 12 month anniversary of the **commencement** of the action, the **approval holder** must publish a report on its website for the life of the approval outlining how they have been compliant with the conditions of this approval over the previous 12 months, including the implementation of any management plans, strategies or programs as specified in the conditions. The **approval holder** must also provide in this report:
- a. a reconciliation of **actual impacts** against whole of project maximum disturbance limits for **EPBC listed threatened species and communities** listed in Table 1;
 - b. the number and spatial distribution of boreholes where **hydraulic fracturing** is expected to occur or has occurred; and
 - c. details of constituent components of **hydraulic fracturing** agents used and any other reinjected fluid(s), their toxicity as individual substances and as total effluent toxicity and ecotoxicity.
31. The approval holder must provide documentary evidence to the Department providing proof of the date of publication of any non-compliance with any of the conditions of this approval at the same time as the report required at condition 30 is published.
32. The **approval holder** must notify the **Department** in writing of potential non-compliance with any condition of this approval as soon as practical and in any event within ten business days of becoming aware of the potential non-compliance. The notice provided to the **Department** under this condition must specify:
- a. the condition which the **approval holder** has potentially breached;
 - b. the nature of the potential non-compliance;
 - c. when and how the **approval holder** became aware of the non-compliance;
 - d. how the non-compliance will affect the anticipated **impacts** of the approved action, in particular how the non-compliance will affect the **impacts** on the **matters of national environmental significance**;
 - e. the measures the approval holder will take to address the **impacts** of the non-compliance on the **matters of national environmental significance** and rectify the non-compliance; and
 - f. the time by when the **approval holder** will rectify the non-compliance.

33. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The audit must not commence unless and until the **Minister** has approved the independent auditor and audit criteria. The audit report must address the criteria to the satisfaction of the **Minister**.
34. If the **approval holder** wishes to carry out any activity other than in accordance with the management plans as specified in the conditions, the **approval holder** must submit to the **Department** for the **Minister's** written approval a revised version of that management plan. The approval holder must not **commence** the varied activity until the **Minister** has approved the varied management plan. The **Minister** will not approve a varied management plan unless the revised management plan would result in an equivalent or improved environmental outcome over time. If the **Minister** approves the revised management plan, that management plan must be implemented in place of the management plan originally approved.
35. If the **Minister** believes that it is necessary or convenient for the better protection of EPBC Act listed threatened species, listed migratory species or water resources to do so, the **Minister** may request that the **approval holder** make specified revisions to the management plans specified in the conditions and submit the revised management plan for the **Minister's** written approval. The **approval holder** must comply with any such request within the timeframe specified by the **Minister**. The revised approved management plan must be implemented. Unless the **Minister** has approved the revised management plan, then the person taking the action must continue to implement the management plan originally approved, as specified in the conditions.
36. If, at any time after five years from the date of this approval, the **approval holder** has not **commenced** the action, then the **approval holder** must not **commence** the action without the written agreement of the **Minister**.
37. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved by the **Minister** and remain available on that website for the life of the approval.

Definitions

Approval holder: means the person to whom the approval is granted or any person acting on their behalf, or to whom the approval is transferred under section 145B of the EPBC Act.

Commenced/commencement: means any physical disturbance, including clearance of native vegetation, new road work and the establishment of well sites to develop the gas field **project area**. Commencement does not include:

- a) minor physical disturbance necessary to undertake pre-clearance surveys or establish monitoring programs or geotechnical investigations; or
- b) activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development only if such activities will have no adverse impact on **matters of national environmental significance**.

Core habitat known means core habitat for a species known from recent records (since 1980) or confirmed sightings, generally buffered by a one kilometre radius. Core habitat known may also include remnant regrowth or regrowth vegetation with areas where known sightings have occurred (as defined in the rules for habitat mapping for individual species in the *Arrow Bowen Gas Project Supplementary Report to the Environmental Impact Statement Appendix J* (May 2014)).

Core habitat possible: means areas of potential habitat with a number of features or values known to contribute to, or be important for the occupation of the species (as defined in the rules for habitat mapping for individual species in the *Arrow Bowen Gas Project Supplementary Report to the Environmental Impact Statement Appendix J* (May 2014)).

Conservation advice: means an conservation advice approved by the Minister under the EPBC Act.

CSG produced water means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas.

Department: means the Australian Government Department administering the **EPBC Act**.

Department's survey guidelines: means:

Matters of National Environmental Significance, Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999 - <http://www.environment.gov.au/epbc/publications/nes-guidelines.html>.

Survey Guidelines for Australia's Threatened Frogs, Threatened Birds, Threatened Fish, Threatened Mammals, Threatened Reptiles and Threatened Bats: <http://www.environment.gov.au/epbc/guidelines-policies.html>.

EPBC/ EPBC Act: means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

EPBC Act Environmental Offsets Policy: means the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (October 2012) including the Offsets Assessment Guide.

EPBC community: means an endangered ecological community listed under the EPBC Act.

EPBC listed threatened species: means a threatened flora or fauna species listed under the EPBC Act.

EPBC listed threatened species and communities means an **EPBC listed threatened species** and **EPBC community**.

Expert panel: means an expert panel agreed to by the Minister.

Hydraulic fracturing/fractured means a well-stimulation technique in which rock is fractured by a hydraulically pressurised liquid.

Impact: is as defined in section 527E of the EPBC Act.

Matters of national environmental significance means matters protected by Division 1 of Part 3 of the **EPBC Act**.

Minister: means the Minister administering the **EPBC Act** and includes a delegate of the Minister.

Project area: means the area identified as the project area shown as the Bowen Gas Project Tenements shown in Attachment A.

Pre-clearance surveys means surveys that are undertaken for **EPBC listed threatened species and communities** for all areas of the **project area** that are to be disturbed by project activities.

Project Phase means the development phases of the project which are to be a duration of no more than 5 years and confirmed by the **approval holder** prior to the completion of each **Project Phase**.

Project Phase 1 means the period of no more than 5 years from **commencement**.

Queensland Code of Practice for Construction and Abandoning CSG wells means the Queensland Department of Natural Resources and Mines' code of practice for constructing and abandoning coal seam gas wells and associated bores in Queensland at <https://mines.industry.qld.gov.au/assets/petroleum-pdf/code-of-practice-csg-wells-and-bores.pdf>, as amended from time to time.

Queensland Government authorities means authorities who have a role in regulating activities relating to water resources.

Recovery plan: means a recovery plan made or adopted by the Minister under the EPBC Act.

Suitably qualified person means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.

Suitably qualified water resources expert/s: means a natural person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 (ten) years relevant experience in water resources assessment, including at least one year of experience in Australia.

Threat abatement plan: means a threat abatement plan made or adopted by the Minister under the EPBC Act.

Underground Water Impact Report means the underground water impact report required to be prepared under the *Water Act 2000* (Qld) to manage impacts of underground water extraction by petroleum tenure holders (including coal seam gas tenure holders).

Bowen Gas Project Tenements

