

RECOMMENDATION REPORT

Surat North CSG Project, Queensland (EPBC 2018/8276)

Recommendation

That the proposed action, to construct, operate and decommission up to 740 coal seam gas (CSG) wells, and associated infrastructure, in the Surat Basin Acreage Development, approximately 20 km west of Wandoan in Queensland be approved subject to the conditions specified below.

Conditions	Relevant paragraph in report
1. For the purpose of the action, the approval holder must not take any activities outside the project area .	1-5, 188
2. The approval holder must not clear more than: <ul style="list-style-type: none"> a) 80 ha of South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat. b) 62 ha of Koala (<i>Phascolarctos cinerus</i>) (combined populations of Qld, NSW and the ACT) habitat. c) 62 ha of Greater Glider (<i>Petauroides volans</i>) habitat. d) 9 ha of Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) threatened ecological community. 	47, 78, 104, 188, 125, 135
3. The approval holder must undertake pre-clearance surveys of areas to be cleared .	46, 74, 77, 103, 118
4. Pre-clearance surveys must be undertaken by a suitably qualified field ecologist and undertaken in accordance with the Department's Survey Guidelines in effect at the time of the pre-clearance survey or other survey methodology endorsed by the Department in writing and provide an assessment of the habitat quality of the areas to be cleared .	
5. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report must be published on the website within 6 months of completion and remain published on the website for the period of approval. The approval holder must notify the Department within five business days of publishing each pre-clearance survey report.	
6. The approval holder must manage impacts to listed threatened species and communities that are known to occur within the project area in accordance with the Significant Species Management Plan (SSMP) .	49, 50, 65, 79, 80, 91, 106, 107, 118, 126, 135, 227
7. If a listed threatened species or community which are not addressed in the SSMP are identified in the project area , the approval holder must revise the SSMP to include management measures to avoid and/or mitigate impacts to that listed threatened species or community and submit, within 3 months of identifying this listed threatened species or community , a copy of the revised SSMP to the Minister for written approval. The approved revised SSMP must be implemented.	
8. The approval holder must manage to reduce/minimise impacts to listed	

<p>threatened species and communities from pest and weed species in accordance with the Biosecurity Control Manual.</p>	
<p>9. The approval holder must undertake the action in accordance with the Remediation, Rehabilitation and Recovery Monitoring Plan.</p>	
<p>10. The approval holder must undertake the action in accordance with the Constraints Planning and Field Development Protocol.</p>	
<p>11. The approval holder must prepare an Offset Management Plan that details the provision of offsets in accordance with the Offset Assessment Guide values. The Offset Management Plan must:</p> <ol style="list-style-type: none"> a) be prepared by a suitably qualified person, and in accordance with the principles of the EPBC Act Environmental Offsets Policy and the Department's Environmental Management Plan Guidelines; b) demonstrate how the offsets compensate for the impacts of the action in accordance with the Offset Assessment Guide values and consistent with the EPBC Act Environmental Offsets Policy; and c) include, but not be limited to: <ol style="list-style-type: none"> i. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses; ii. baseline data and other supporting evidence that documents the presence and baseline quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat within the offset area/s; iii. maps and shapefiles of the offset area/s; iv. specific objectives to demonstrate South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat quality improvement over the life of the approval; v. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat within the offset area/s; vi. key performance indicators to demonstrate the improvement to the quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat within the offset area/s; vii. the nature, timing and frequency of monitoring to determine the success of management actions against key performance indicators; viii. the timing for the provision of an annual monitoring report to the Department. The monitoring report must include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period; 	<p>51-63, 66, 81-89, 92, 108-113, 116, 118, 228</p>

<p>Page 3. x. an assessment of risks that the key performance indicators will not be met and identification of the sources of those risks and strategies for managing them;</p> <p>x. indicative corrective actions that will be implemented in the event monitoring activities indicate key performance indicators are not or are unlikely to be achieved;</p> <p>xi. the roles and responsibilities for implementing the management actions;</p> <p>xii. evidence of consistency with relevant conservation advices, recovery plans and/or threat abatement plans.</p>	
<p>12. The approval holder must not commence Stage 2 unless the Minister has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.</p>	51-63, 66, 81-89, 92, 108-113, 116, 118, 228
<p>13. The approval holder must legally secure the offset area/s proposed in the Offset Management Plan approved by the Minister within 9 months of the date of the Minister's approval of the Offset Management Plan.</p>	
<p>14. The approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the Minister for written approval. The Revised Offset Management Plan must constitute a revision of the approved Offset Management Plan, taking account of all new information, including the results of all pre-clearance surveys. If the residual impact of the action on listed threatened species and communities is greater than that predicted in the approved Offset Management Plan, as demonstrated through the habitat quality assessment of the areas to be cleared, an offset or offsets to compensate for the additional residual impact must be provided. Any additional offset or offsets must be consistent with the EPBC Act Environmental Offsets Policy. The approval holder must implement that Revised Offset Management Plan.</p>	
<p>15. The approval holder must legally secure the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the Minister's approval of the Revised Offset Management Plan.</p> <p>Note 1: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect to impacts to each individual listed threatened species and communities being offset.</p> <p>Note 2: The Minister may determine that offsets approved by the Queensland Government satisfy the requirements for offsetting listed threatened species and communities as long as any required offsets comply with the principles of the EPBC Act Environmental Offsets Policy or an equivalent Queensland Government offsets policy that ensures the maintenance and protection of listed threatened species and communities.</p>	
<p>16. Prior to the use of any drilling fluid compound/s, the approval holder must undertake a chemical risk assessment. The chemical risk assessment must be undertaken in accordance with best practice risk assessment methodology.</p>	156, 164, 228
<p>17. The approval holder must not use any drilling fluid compound/s determined by the best practice risk assessment technology to be high risk until the chemical risk assessment for that drilling fluid compound has been approved in writing by the Minister.</p>	

18. The approval holder must implement the approved chemical risk assessment .	
19. The approval holder must ensure that there is no adverse effect on the function of groundwater dependent ecosystems (GDEs) in, or within 30 km of, the project area as a result of the project.	139-169, 228
20. To ensure there is no impact on the function of GDEs , the approval holder must provide for the approval of the Minister : a) description and location of all identified GDEs ; b) performance criteria ; c) trigger values ; and d) limits .	
21. The description and location of all identified GDEs, performance criteria, trigger values and limits must be submitted to the Minister with an accompanying GDE Program prepared by a suitably qualified water resources expert and accompanied by a peer review undertaken by an independent suitably qualified water resources expert , which explains the scientific basis on which the performance criteria, trigger values and limits have been derived to ensure that Condition 19 will be met. The terms of reference of the peer review must be approved by the Minister in writing. The GDE Program must include, and provide justification of: a) hydrogeological conceptual modelling, including local scale modelling and consideration of cumulative impacts; b) a site-specific risk assessment; c) past and proposed ongoing monitoring; d) proposed mitigation strategy, including corrective action(s) if trigger values and/or limits are reached or exceeded and consideration of cumulative impacts; e) evidence to confirm adverse affects on the function of GDEs have not occurred or are not occurring as a result of Stage 1 and to demonstrate that the proposed trigger values and limits have not been influenced by the commencement of Stage 1 ; and f) proposed reporting.	
22. The approval holder must not commence Stage 2 unless the description and location of all identified GDEs, performance criteria, trigger values and limits have been approved by the Minister in writing.	
23. If the description and location of all identified GDEs, performance criteria, trigger values and limits have not been approved by the Minister in writing within 6 months of the commencement of Stage 1 , the approval holder must cease groundwater extraction until the description and location of all identified GDEs, performance criteria, trigger values and limits are approved by the Minister in writing.	
24. The approval holder must undertake the action in accordance with the approved performance criteria, trigger values and limits .	
25. For each 12 month period following the date of commencement of groundwater extraction , or in accordance with a date otherwise agreed in	

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 Reporting by the **Minister**, the approval holder must submit an outcomes report prepared by a **suitably qualified water resources expert** and accompanied by a peer review undertaken by an **independent suitably qualified water resources expert**, for the written acceptance of the **Minister**. The terms of reference for the peer reviews must be approved by the **Minister** in writing. The approval holder must not **commence the action** unless the terms of reference for the peer reviews have been approved by the **Minister** in writing. Each outcomes report, accompanied by the peer review, must be submitted to the **Minister** within 3 months of the end of the 6 month period that is the subject of the outcomes report.

26. The outcomes report submitted under Condition 25 must include, but not be limited to:

- a) Performance against the approved **trigger values and limits**, including analysis of trends that indicate that reaching or exceeding an approved **trigger value** or **limit** is likely during or before the next reporting period.
- b) Any changes to the existing regulatory arrangements in place to avoid **adverse effects** to the **function of GDEs**, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.

27. The **Minister** may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the **function of GDEs**.

28. If, on the basis of the information provided (or that has not been provided) under Condition 25 and/or Condition 27, and/or other information available to the **Minister**, the **Minister** determines that the action has had, or is likely to have, an **adverse effect** on the **function of GDEs**, the **Minister** may notify the approval holder in writing in accordance with the provisions of Condition 30.

Note 3: The **Minister** may throughout the life of the approval seek advice from experts, or an expert panel. As a consequence, specific matters identified through such advice may need to be addressed in the GDE Program or any outcomes report. Where such advice is sought, the approval holder will be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure reports are based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the approval.

29. If the approval holder detects that a **trigger value** has been reached or exceeded, the approval holder must report this to the **Minister** within two **business days** of the detection. If a **trigger value** is reached or exceeded, the approval holder must submit within 20 **business days** of the detection, any proposed corrective action(s) to the **Minister** in writing and demonstrate that the proposed corrective action(s) will not result in **impacts** beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the **Minister** agrees, in writing, that it will not result in **impacts** beyond the scope of the action.

30. If the approval holder detects that a **limit** has been reached or exceeded, the approval holder must report this to the **Minister** within one **business day** of the detection. The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action within 48 hours of detecting that a **limit** has been reached or exceeded, or of

<p>receiving notification that the Minister has determined that an adverse effect on the function of GDEs has occurred or is likely to occur.</p>	
<p>31. If the approval holder has been required to cease groundwater extraction pursuant to Condition 28, the approval holder must not recommence groundwater extraction until the impact has been reversed, or the Minister has agreed, in writing, that no adverse effect on the function of GDEs has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the Minister in writing. Approval to recommence groundwater extraction may be subject to conditions that the Minister considers reasonable. The Minister may direct the approval holder to implement corrective action(s) at the approval holder's expense.</p>	
<p>32. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all identified GDEs, performance criteria, trigger values and limits for the written approval of the Minister. The revised performance criteria, trigger values and limits must be in accordance with coal seam gas water management guidelines.</p>	
<p>33. The approval holder must notify the Department in writing of the date of commencement of Stage 1 within 10 business days after the date of commencement of Stage 1.</p>	Standard administrative condition
<p>34. If the commencement of Stage 1 does not occur within 5 years from the date of this approval, then the approval holder must not commence Stage 1 without the prior written agreement of the Minister.</p>	Standard administrative condition
<p>35. The approval holder must maintain accurate and complete compliance records.</p>	Standard administrative condition
<p>36. If the Department makes a request in writing, the approval holder must provide electronic copies of compliance records to the Department within the timeframe specified in the request.</p> <p>Note 4: Compliance records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the Department's website or through the general media.</p>	Standard administrative condition
<p>37. The approval holder must:</p> <ol style="list-style-type: none"> submit plans electronically to the Department; publish each plan on the website within 20 business days of the date the plan is approved by the Minister or of the date a revised action management plan is submitted to the Minister or the Department, unless otherwise agreed to in writing by the Minister; exclude or redact sensitive ecological data from plans published on the website or provided to a member of the public; and keep plans published on the website until the end date of this approval. 	Standard administrative condition
<p>38. The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under a plan or conditions of this approval, is prepared in accordance with the Department's Guidelines for biological survey and mapped data (2018) and submitted electronically to the Department in accordance with the requirements of the plan or conditions of approval.</p>	Standard administrative condition

<p>39. ^{Page 7} The approval holder must prepare a compliance report for each 12 month period following the date of commencement of the action, or otherwise in accordance with an annual date that has been agreed to in writing by the Minister. The approval holder must:</p> <ol style="list-style-type: none"> publish each compliance report on the website within 60 business days following the relevant 12 month period; notify the Department by email that a compliance report has been published on the website and provide the weblink for the compliance report within five business days of the date of publication; keep all compliance reports publicly available on the website until this approval expires; exclude or redact sensitive ecological data from compliance reports published on the website; and where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within 5 business days of publication. <p>Note 5: Compliance reports may be published on the Department's website.</p>	Standard administrative condition
<p>40. The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than two business days after becoming aware of the incident or non-compliance. The notification must specify:</p> <ol style="list-style-type: none"> any condition which is or may be in breach; a short description of the incident and/or non-compliance; and the location (including co-ordinates), date, and time of the incident and/or non-compliance. In the event the exact information cannot be provided, provide the best information available. 	Standard administrative condition
<p>41. The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:</p> <ol style="list-style-type: none"> any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future; the potential impacts of the incident or non-compliance; and the method and timing of any remedial action that will be undertaken by the approval holder. 	Standard administrative condition
<p>42. The approval holder must ensure that independent audits of compliance with the conditions are conducted for the 12 month period from the date of this approval and for every subsequent 12 period, or as otherwise requested in writing by the Minister.</p>	Standard administrative condition
<p>43. For each independent audit, the approval holder must:</p> <ol style="list-style-type: none"> provide the name and qualifications of the independent auditor and the draft audit criteria to the Department; only commence the independent audit once the audit criteria have been approved in writing by the Department; and submit an audit report to the Department within the timeframe 	Standard administrative condition

specified in the approved audit criteria.	
44. The approval holder must publish the audit report on the website within 10 business days of receiving the Department's approval of the audit report and keep the audit report published on the website until the end date of this approval.	Standard administrative condition
45. The approval holder may, at any time, apply to the Minister for a variation to an action management plan approved by the Minister under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the EPBC Act . If the Minister approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.	Standard administrative condition
46. The approval holder may choose to revise an action management plan approved by the Minister under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the EPBC Act , if the taking of the action in accordance with the RAMP would not be likely to have a new or increased impact .	Standard administrative condition
47. If the approval holder makes the choice under condition 46 to revise an action management plan without submitting it for approval, the approval holder must: <ul style="list-style-type: none"> a. notify the Department in writing that the approved action management plan has been revised and provide the Department with: <ul style="list-style-type: none"> i. an electronic copy of the RAMP; ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP; iii. an explanation of the differences between the approved action management plan and the RAMP; iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a new or increased impact; and v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 business days after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the Department. b. subject to condition 46, implement the RAMP from the RAMP implementation date. 	Standard administrative condition
48. The approval holder may revoke their choice to implement a RAMP under condition 46 at any time by giving written notice to the Department . If the approval holder revokes the choice under condition 46, the approval holder must implement the action management plan in force immediately prior to the revision undertaken under condition 46.	Standard administrative condition
49. If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the RAMP would be likely to have a new or increased impact , then:	Standard administrative condition

<p>Page 9 condition 46 does not apply, or ceases to apply, in relation to the RAMP; and</p> <p>b. the approval holder must implement the action management plan specified by the Minister in the notice.</p>	
<p>50. At the time of giving the notice under condition 49 the Minister may also notify that for a specified period of time, condition 46 does not apply for one or more specified action management plans.</p> <p>Note 6: conditions 4, 47, 48 and 49 are not intended to limit the operation of section 143A of the EPBC Act which allows the approval holder to submit a revised action management plan, at any time, to the Minister for approval.</p>	Standard administrative condition
<p>51. Within 30 days after the completion of the action, the approval holder must notify the Department in writing and provide completion data.</p>	Standard administrative condition

Definitions:

Adverse effect/s means an exceedance of a **limit** as a result of the project.

Aquatic GDEs means ecosystems dependent on the surface expression of groundwater, including:

- river baseflow systems, aquatic and riparian ecosystems that exist in or adjacent to streams (including the hyporheic zone) which are fed by groundwater; and
- wetlands (aquatic communities and fringing vegetation dependent on groundwater-fed lakes and wetlands), including palustrine and lacustrine wetlands that receive groundwater discharge and spring and swamp ecosystems.

Best practice risk assessment methodology means a risk assessment in accordance with best practice national or international standards and guidelines including, but not limited to:

- a) US EPA (2014). EPA-Expo-Box (A Toolbox for Exposure Assessors), or subsequent revision.
- b) OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management, or subsequent revision.

Biosecurity Control Manual means the *HSSE Risk Control Manual, QCQGC-BX00-ENV-MAN-000002, Revision 4*, May 2018, approved on 15 May 2018, or subsequent revision approved by the **Minister**.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community means the EPBC listed threatened ecological community as described in the *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (2013), or subsequent revision.

Business day/s means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Cease work provisions means a protocol to promptly discontinue all aspects of the action which have the potential to cause any impact to the **function** of **GDEs** and to urgently implement corrective action to reduce **performance criteria** below **limits** and **trigger values**.

Chemical risk assessment means an assessment prepared by a **suitably qualified person** to assess the risk of chemicals used in drilling operations for coal seam gas extraction on **protected matters**.

Clear/ed/ing means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Coal seam gas water management guidelines means any **Departmental** policies, guidance or agreements that relate to coal seam gas water management and/or monitoring.

Commencement of clearing means the first instance of any cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Commence/ment of Stage 1 means the first instance of any specified activity associated with **Stage 1** including clearing of vegetation and **construction** of any infrastructure. **Commencement of Stage 1** does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs;
- ii. install signage and /or temporary fencing to prevent unapproved use of the project area;
- iii. protect environmental and property assets from fire, weeds and pests, including **construction** of fencing, and maintenance of existing surface access tracks; and
- iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters**.

Commence/ment of Stage 2 means the first instance of any specified activity associated with **Stage 2** including clearing of vegetation and **construction** of any infrastructure.

Commencement of groundwater extraction means the first instance of groundwater extraction.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department's** preferred spatial data format is **shapefile**. **Completion data** includes information detailing the date, location, approved project area, and actual total **cleared area/s**, total area and type of **listed and threatened species and communities habitat cleared** within the project area, **listed threatened species and communities habitat quality** within **retention area/s**, actual total **retention area/s**, the type of **listed threatened species and communities habitat** within **retention area/s**, actual total area of **listed threatened species and communities habitat** and the **habitat quality** within the offset area/s required under Conditions 11 and 14.

Completion of the action means all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

- i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;
- ii. consistent with the **Department's Annual Compliance Report Guidelines** (2014);
- iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and
- iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Constraints Planning and Field Development Protocol means the *Constraints Planning and Field Development Protocol – Surat Basin Acreage Revision 2*, November 2017, approved on 4 January 2018, or subsequent revision approved by the **Minister**.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Department/al means the Australian Government agency responsible for administering the **EPBC Act**.

Drilling fluid compound/s means the drilling fluid compound/s that were listed in the **preliminary documentation**, and any drilling fluid compound/s that were not listed in the **preliminary documentation**.

Environmental Management Plan Guidelines means the *Environmental Management Plan Guidelines* (2014), or subsequent revision.

Environmental Offsets Policy means the **EPBC Act Environmental Offsets Policy** (2012), or any subsequent revision, including the Offset Assessment Guide.

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

Function means the groundwater, surface water and ecosystem components (including organisms), processes and benefits/services that characterise and support the occurrence of the **GDE**, including support for biological diversity or species composition.

Greater Glider (*Petauroides volans*) habitat means all areas of Eucalypt forests or woodlands that contain, or have the potential to contain, hollow-bearing trees.

Groundwater Dependent Ecosystem/s (GDE/s) means **Aquatic GDEs, subterranean GDEs and terrestrial GDEs**.

Habitat quality is a measure of how well the **project area** and/or offset area/s supports **listed threatened species and communities** and contributes to its ongoing viability, relative to the baseline **habitat quality** data provided in Offset Management Plan. The measure of habitat quality should include site condition, site context and species individual or population persistence.

High risk means a product or chemical compound whose solubility allows the potential to enter the environment, and/or is considered hazardous based on its health hazard criteria, environmental hazard criteria and whether it has been identified as a pollutant, contaminant or hazardous good under Australian legislation or regulations.

Impact/s/ed means to suffer any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent audit: means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

Independent suitably qualified water resources expert means a person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia, who is independent of the **suitably qualified water resources expert**.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat means any forest or woodland (including remnant, regrowth and modified vegetation communities) containing species that are Koala food trees or any shrub land with emergent Koala food trees.

Legally secure means to secure a covenant or similar legal agreement in relation to a site; to provide enduring protection for the site against development incompatible with conservation.

Limit/s means a threshold greater than a **trigger value** that, should it be reached or exceeded (either through modelling or monitoring), **cease work provisions** will be implemented.

Listed threatened species and communities/listed threatened species or community means a threatened species or ecological community listed under the **EPBC Act** for which this approval has effect including, but not limited to, the:

- a) South-eastern Long-eared Bat (*Nyctophilus corbeni*);
- b) Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT);

c) Greater Glider (*Petauroides volans*); and

d) Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Monitoring data means the data required to be recorded under the conditions of this approval.

New or increased impact means a new or increased environmental impact or risk relating to any **protected matter**, when compared to the likely impact of implementing the action management plan that has been approved by the **Minister** under condition 6, 7, 8, 9 or 10, including any subsequent revisions approved by the **Minister**, as outlined in the *Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017)*.

Offset Assessments Guide values means the offset values for the **EPBC Act** listed threatened South-eastern Long-eared Bat (*Nyctophilus corbeni*), Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) and Greater Glider (*Petauroides volans*), as shown at Attachment C.

Performance criteria means specific parameters, associated with and relevant to GDE **function** that will be monitored to demonstrate that the outcome of no adverse impact is being achieved, measured at a specific time and place.

Plan(s) means any of the documents required to be prepared, submitted, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans, pre-clearance survey reports and/or peer review terms of reference).

Preliminary documentation means the *Surat Basin Acreage Development EPBC 2018/8276 – Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, July 2019, Revision 4*, provided to the Department on 8 July 2019.

Project area means the area enclosed by the red line designated 'Project Area' in Attachment A.

Protected matter means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect.

Remediation, Rehabilitation and Recovery Monitoring Plan means the *QCLNG Gasfields – Remediation, Rehabilitation, Recovery and Monitoring Plan, QCLNG-BX00-ENV-PLN-000026, Revision 2*, October 2011, approved on 20 October 2011 under EPBC Act approval 2008/4398, or subsequent revision approved by the **Minister**.

Retention area/s means an area/s (in hectares) retained within the **project area** to provide current and future habitat for **listed threatened species and communities**.

Reversed means that the **function** of GDEs have been reinstated to their pre-**impact** state and sustained for 10 **business days**.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

Significant Species Management Plan means the *Significant Species Management Plans, QCLNG Gas Field (QCLNG-BX00-ENV-PLN-000010) Revision 0*, January 2014, approved on 5 February 2014, or subsequent revision approved by the **Minister**.

South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat means as described in the *Conservation Advice Nyctophilus corbeni South-eastern Long-eared Bat (2015)*, or subsequent revision.

Stage 1 means the construction and operation of 119 coal seam gas wells with a combined maximum peak rate of groundwater production of 10 ML per day within the area shaded in green designated 'Stage 1' in Attachment B.

Stage 2 means activities associated with the action excluding **Stage 1**.

Subterranean GDEs means aquifer ecosystems, including stygofauna.

Suitably qualified field ecologist means a person who has professional qualifications and at least three years of work experience designing and implementing surveys for **listed threatened species and communities**, and can give an authoritative assessment and advice on the presence of **listed threatened species and communities** using relevant protocols, standards, methods and/or literature. If the person does not have appropriate professional qualifications, the person must have at least five years of work experience designing and implementing surveys for **listed threatened species and communities**.

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

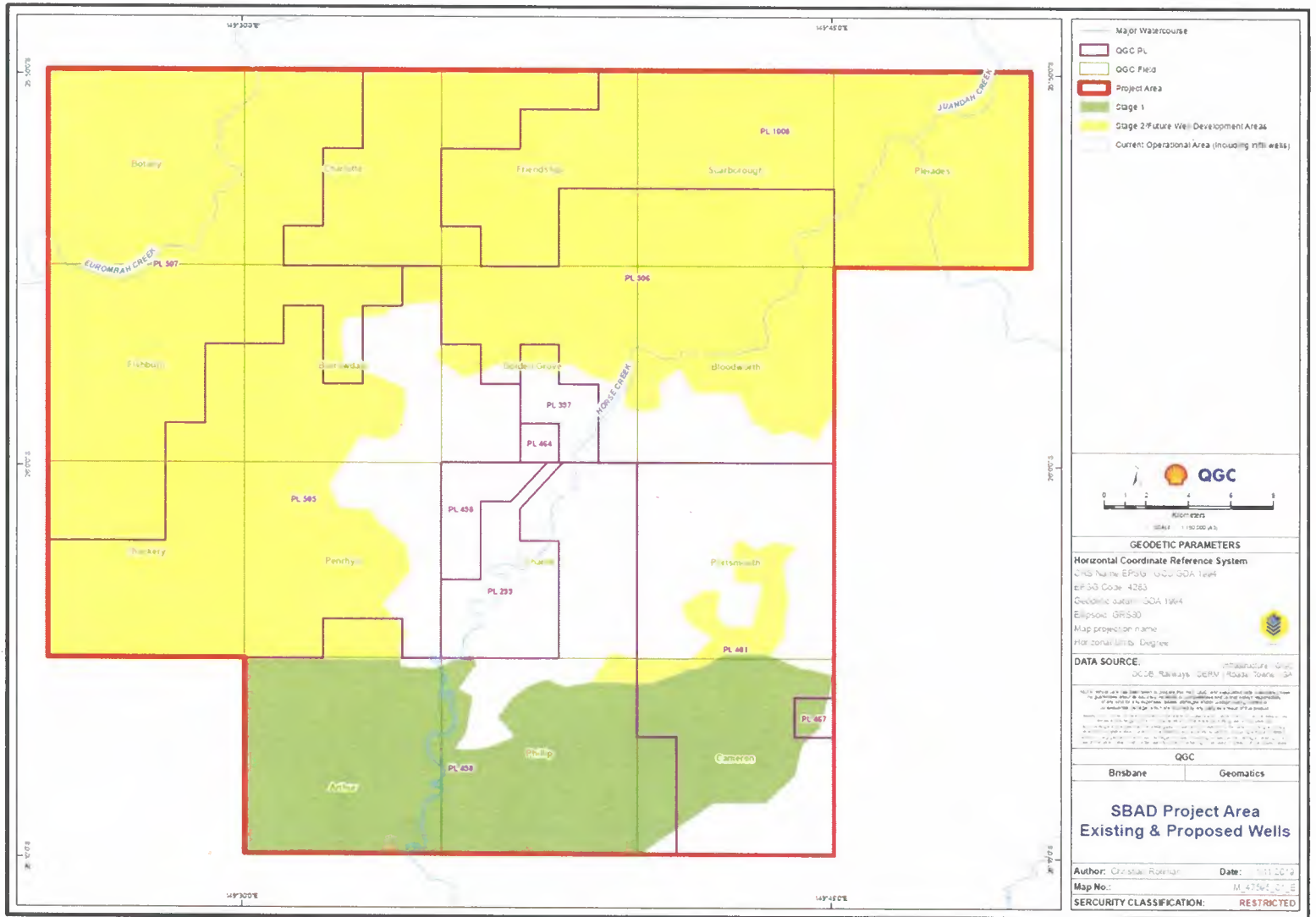
Suitably qualified water resources expert means a person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia.

Survey Guidelines means the *Matters of National Environmental Significance, Significant Impact Guidelines 1.1*, Environment Protection and Biodiversity Conservation Act 1999 (2013), *Survey Guidelines for Australia's threatened bats* (2010), *Survey Guidelines for Australia's threatened birds* (2010), *Survey Guidelines for Australia's threatened frogs* (2010), *Survey guidelines for Australia's threatened fish* (2011), *Survey guidelines for Australia's threatened mammals* (2011), *Survey guidelines for Australia's threatened reptiles* (2011) and species-specific surveys as described in the Department's Species Profile and Threats Database profile for the relevant EPBC Act-listed threatened species.

Terrestrial GDEs means ecosystems partially or wholly dependent on the subsurface presence of groundwater.

Trigger value/s means a threshold for the **performance criteria** that, should it be reached or exceeded (either through modelling or monitoring), the approval holder will implement an appropriate management response such that a **limit** is not reached and the **trigger value** is no longer exceeded.

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.



Attachment C: Offset Assessment Guide values

Relevant protected matter	South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)	Greater Glider (<i>Petauroides volans</i>)
Impact area (ha)	80	62	62
Impact quality (1-10)	6	6	6
Time over which loss is averted (years)	20	20	20
Start area (ha)	280	220	220
Risk of loss without offset (%)	0	0	0
Risk of loss with offset (%)	0	0	0
Confidence in risk of loss result (%)	95	95	95
Time until ecological benefit (years)	20	20	20
Start quality (1-10)	7	7	7
Future quality without offset (1-10)	6	6	6
Future quality with offset (1-10)	8	8	8
Confidence in quality result (%)	90	90	90

Background

Description of the project and location

1. The proposed action is to construct, operate and decommission 740 CSG wells in the QGC Surat Basin Acreage Development (SBAD), approximately 20 km west of Wandoan, Queensland.
2. The proposed action is an intensification of CSG production in an existing 123,500 hectare (ha) CSG field, approved under the EPBC Act on 17 December 2014 (EPBC 2013/7047). The proposed action will add up to 740 wells to the existing approved 460 production wells, taking the gas field to full-field development of up to 1,200 wells. Construction of the proposed action is anticipated to commence as soon as state and Commonwealth approvals are in place and operate until 2060.
3. The SBAD (project area) presently contains CSG wells, gathering lines and trunk lines for gas and water, a field compressor station, in-field water storage and supporting infrastructure – access tracks, electrical and communications infrastructure, borrow pits, laydown areas and drilling camps. The referral states the additional 740 wells will predominantly utilise infill development wherever possible, allowing proposed new wells to be connected into existing infrastructure networks.
4. The proposed action will require the construction, operation and decommissioning of additional 740 wells and the associated access, gathering and incidental infrastructure required to support them. Works are proposed entirely within the boundaries of the SBAD and the proponent proposes to make use of existing, authorised infrastructure, associated approvals and management plans.
5. The final well locations and route selection for gathering pipelines and access tracks within the project area are not yet known. The proponent states the locations will be determined in accordance with their Environmental Constraints Planning and Field Development Protocol (Constraints Protocol, Attachment G1), required to be implemented for their existing approval.
6. Construction activities are:
 - a) construction of well pads and access tracks, drilling and completion of wells, installation of down-hole and surface facilities and potential flare or vent;
 - b) installation of gas and water gathering pipelines; and
 - c) installation of incidental, ancillary and support infrastructure including, but not limited to, access tracks, electrical and communications infrastructure, laydown areas, borrow pits, temporary and mobile drilling camps.
7. Operational activities are:
 - a) well operation and maintenance, stimulation, workovers, flaring and venting (where required);
 - b) gathering system operation and maintenance;
 - c) maintenance of ancillary infrastructure; and
 - d) undertaking all necessary and incidental activities to facilitate operations.

8. Decommissioning/rehabilitation activities are:

- a) all above-ground equipment and infrastructure will be decommissioned and removed from the site as appropriate in accordance with relevant Australian Standards; and
 - b) infrastructure will be rehabilitated to the pre-existing land use, unless required for use by the landholder or overlapping tenure holder.
9. Subsequent to the finalisation of the preliminary documentation, the proponent proposed that the commencement of the proposed action be undertaken in stages to allow development of 119 CSG wells in the southern portion of the project area prior to the Minister's approval of descriptions and locations of groundwater dependent ecosystems, performance criteria, trigger values and limits (as described in the proposed conditions of approval ([Attachment B](#)) and discussed at paragraph 164-168 below). The Department considers that a stage approach to commencement is acceptable.
10. Natural gas and produced brine extracted from within the project area will be transported to the existing Woleebee Creek facilities (EPBC 2008/4398) for further processing and distribution.
11. Produced water from the project will be transported and treated at the Northern Water Treatment Plant (NWTP, EPBC 2007/3668) which has an authorised capacity of 100 ML/d. Once the water is treated at the NWTP, it will be on-supplied to the Glebe Weir Beneficial Use Scheme. The proposal does not include the release of produced water to surface water systems.
12. The proponent has not included this water storage and processing infrastructure in the scope of the referral on the basis that the actions referred and currently approved under other EPBC Act approvals include infrastructure designed to support the operation of up to 1,200 production wells.
13. The proposed action covers 123,500 ha of mostly cleared grazing land in the Brigalow Belt South Bioregion, specifically the Taroom Downs and Southern Downs subregions. These subregions have been extensively cleared, with remnant vegetation typically associated with creek and river banks, property boundaries and road reserves. Over 5,300 ha is mapped by the Queensland Government as remnant vegetation, with nearly 1,900 ha mapped as high-value regrowth, in the form of Eucalypt woodland (*E. populnea*, *E. coolabah*, *E. tereticornis*, *E. crebra* and *E. camaldulensis*), Brigalow (*Acacia harpophylla*), and *Dicanthium* and *Astrelba* grasslands.
14. The project is within the Dawson River Catchment of the Fitzroy Basin. The main watercourses in the project area are Eurombah Creek, Horse Creek and Juandah Creek which are ephemeral and may be reduced to small pools throughout the year. The proponent notes no EPBC Act listed springs have been identified in the project area but groundwater-dependent ecosystems (GDE) occur, including wetland-type vegetation communities and riparian vegetation along Horse Creek itself.
15. The Department notes the proponent's comment that New Hope Group has an application to construct the Taroom Coal Mine Project which is situated in the centre of the project site. A review of the Department's database indicates that the proposal (EPBC 2012/6237) was withdrawn on 3 December 2015.

Controlling provisions, assessment approach and public consultation

16. The proposed action was referred to the Department on 22 August 2018.

- The proposal was published on the Department's website on 23 August 2018 and public comments were invited for 10 business days. Three public submissions were received on the referral from the Western Downs Alliance, Lock the Gate Alliance and The Wilderness Society. The submissions raised the following key issues:
- a) the proposed action should be determined a controlled action for likely significant impacts to listed threatened species and ecological communities, and a water resource;
 - b) the proposed action should be assessed by environmental impact statement;
 - c) information in the referral is out of date and does not provide an accurate understanding of the environment and nature of impacts; and
 - d) the poor environmental record of the proponent.
18. The Department notes the matters raised in public submissions, including reference to the environmental record of the proponent and a non-compliance with state conditions. These matters have been considered in the assessment process and discussed below under 'Other considerations'.
19. On 15 November 2018, a delegate of the Minister determined the proposed action was a controlled action due to likely significant impacts on listed threatened species and communities (sections 18 and 18A) and a water resource (sections 24D and 24E), to be assessed by preliminary documentation (further information required) ([Attachment E1](#)).
20. On 15 November 2018, the Department requested further information from the proponent to allow a full assessment of impacts of the proposed action on listed threatened species and communities, and water resources ([Attachment E2](#)).
21. On 7 December 2018, the proponent submitted the water resource component of the draft preliminary documentation for consideration by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) ([Attachment E3](#)).
22. On 7 February 2019, the IESC provided advice on the water resource component of the draft preliminary documentation ([Attachment E8](#)).
23. On 8 July 2019, the proponent submitted a revised draft preliminary documentation including a response to matters raised by the IESC ([Attachment D](#)).
24. The revised draft preliminary documentation generally met the request for information. However, the Department considered there were outstanding issues, including:
- methodology used to determine the estimated terrestrial impact of the proposed action on listed threatened species and communities, and their habitat;
 - proposed offsets for likely residual significant impacts; and
 - the proponent's response to the IESC advice was considered inadequate.
25. On 31 July 2019, noting the above matters still to be resolved, a delegate of the Minister directed the proponent to publish the draft preliminary documentation and invite public comment for a minimum of 20 business days under section 95A of the EPBC Act ([Attachment E5](#)).
26. On 9 September 2019, the proponent advised the Department that no public comments had been received on the draft preliminary documentation ([Attachment E6](#)). The statutory timeframe for a decision on whether or not to approve the action is 7 November 2019.

State/Territory Assessment and Approval

27. The Queensland regulatory framework allows for the approval of the existing gas field to be amended to include the proposed action. The proponent has applied to the Queensland Department of Environment and Science (DES) to amend the Environmental Authority (EA) under the *Environmental Protection Act 1994* (EP Act) (Qld) for the existing gas field.
28. On 15 October 2018, DES advised the Department that an environmental impact statement is not required for the proposed action under the EP Act and potential impacts will be assessed and managed under the EA application ([Attachment E7](#)).
29. DES was required to make a decision on the amendment to the EA by 4 November 2019; however, this timeframe has been extended. The Queensland Government will be consulted on the proposed approval decision and any proposed conditions of approval. On the basis of the Queensland Government's comments on the proposed approval decision, the two environmental approvals will be aligned where possible.
30. The proposed action will also be subject to a number of other State Government approvals and permits, and must be undertaken in accordance with relevant codes of practice and State Government policies.

Assessment**Mandatory Considerations – section 136(1)(a) Part 3 controlling provisions**

31. Under section 136 of the EPBC Act, in deciding whether or not to approve an action and what conditions to attach to the approval, the Minister must consider matters relevant to any matter protected by the controlling provisions (a matter of national environmental significance [MNES]), so far as they are not inconsistent with any other requirement of Subdivision B, Division 1 of Part 9 of the EPBC Act.
32. The proposed action was determined a controlled action for the following controlling provisions of the EPBC Act:
- listed threatened species and ecological communities (sections 18 and 18A); and
 - a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
33. These controlling provisions are discussed respectively below.
34. The recommended approval decision accounts for the current relevant listed threatened species, conservation advices, threat abatement plans and national recovery plans as confirmed by:
- advice from the Species Policy and Information Section dated 25 October 2019 ([Attachment E10](#)); and
 - the *EPBC Species and Communities Update – 1 November 2019*.

Listed threatened species and ecological communities (sections 18 and 18A)

35. Desktop and targeted field surveys were undertaken on components of the project area in 2012. The preliminary documentation states that additional ecological surveys since this time have been driven by the progressive roll out of infrastructure and permit conditions for the approved project (EPBC 2013/7047). Targeted surveys for Greater Glider have been undertaken on select areas of the project area in response to the requirements of this assessment.

36. The Department's Environmental Reporting Tool (ERT), dated 29 October 2019 (Attachment F1), indicates that a total of 21 listed threatened species and three ecological communities may occur within five kilometres of the proposed action. However, based on the location of the action, likely habitat present in the area and biodiversity of the project area, the Department considers the proposed action is likely to have a residual significant impact on:

- Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – Vulnerable
- Greater Glider (*Petauroides volans*) – Vulnerable
- South-eastern Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable.

37. Based on the lack of species records in the project area, the nature of the species, and the proponent's proposed measures to avoid, mitigate and manage impacts, the Department considers the proposed action is unlikely to have a significant impact on:

- Dulacca Woodland Snail (*Adclarkia dulacca*) – Endangered
- Yakka Skink (*Egernia rugosa*) – Vulnerable
- Ooline (*Cadellia pentastylis*) – Vulnerable
- Belson's Panic (*Homopholis belsonii*) – Vulnerable
- Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions ecological community (Coolibah TEC) – Endangered
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions ecological community (SEVT TEC) – Endangered
- Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community (Brigalow TEC) – Endangered
- The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin ecological community (GAB Springs TEC) – Endangered.

38. All data on the above species and ecological communities have been sourced from the Department's Species Profile and Threats (SPRAT) database, unless otherwise stated. The information in SPRAT includes conservation advices and recovery plans, as well as threat abatement plans where relevant.

39. The Department notes the proponent's view that ecological surveys for the proposal have been undertaken by 'DotEE approved ecologists'. The Department is not in a position to recommend, endorse or otherwise approve the use of specific ecologists.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – Vulnerable

Description

40. A description of the characteristics and range of the Koala can be found in SPRAT: www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=85104.

41. The main threats to the species are loss and fragmentation of habitat, vehicle strike, disease and predation by domestic and feral dogs. Drought and incidences of extreme heat are also known to cause very significant mortality, and post-drought recovery may be substantially impaired by the range of other threatening factors.

42. The preliminary documentation states that evidence of Koala was found during a scouting survey on Charlie Block. A follow-up dedicated Koala survey of Horse Creek and its tributaries was also undertaken in the same area with faecal pellets found along Back Creek, which supports linear bands of open woodland dominated by Queensland Blue Gum (*Eucalyptus tereticornis*) and *E. populnea*. Koala scratches were also noted.
43. Evidence of Koala was also identified in Phillip Block in late 2018. Koala scratches and faecal pellets were observed at one mature Queensland Blue Gum on the south-western edge of remnant vegetation in Mount Organ. Suitable potential habitat for Koalas consists of linear areas of Queensland Regional Ecosystems (REs) 11.3.2 and 11.3.25 along the creeks and Eucalypt woodland and open forest in Mount Organ.

Habitat assessment

44. The preliminary documentation states that potential Koala habitat was found to occur over 3,763 ha of the project area. Suitable habitat is identified based on REs that contain suitable feed tree species (including 11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.10.1, 11.5.1 and 11.5.5) and appropriate connectivity, particularly related to riparian corridors dominated by *Eucalyptus camaldulensis* and Queensland Blue Gum.
45. Using the Koala Habitat Assessment Rating Tool in the *EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (2014) (Koala Referral Guidelines, Attachment F2), the proponent considers the Koala habitat in the project area scores a '6' (out of 10) and therefore habitat critical to the survival of the Koala.
46. However, the preliminary documentation does not include details of how the habitat score on the impact site has been determined, and does not distinguish areas of breeding and foraging habitat. Given the above, and considering the time since the detailed ecological surveys were undertaken in accordance with Departmental guidelines (2011/2012), the Department has some uncertainty around the validity of the habitat quality scores.

Impact assessment

47. The preliminary documentation states the proposed action will result in the loss of a maximum of 62 ha of habitat critical to the survival of the Koala as a result of linear vegetation clearance during construction.
48. The proponent also considers the proposed action may also have indirect impacts on the Koala during construction and operation through fragmentation of habitat, vehicle strike, predation by dogs, weed invasion and altered fire regimes.

Avoidance and mitigation measures

49. The proponent states the final planning and placement of infrastructure will adhere to the Environmental Constraints Planning and Field Development Protocol (Constraints Protocol, Attachment G1). The principles of the Constraints Protocol are to:
- avoid adverse impacts on environmental values where practicably possible;
 - minimise adverse impacts where impacts cannot be reasonably and practicably avoided;
 - implement suitable mitigation and management measures to minimise adverse impacts on environmental values; and

Page 23 Remediate and rehabilitate impacted areas to promote and maintain long-term recovery of affected environments.

50. The proponent will implement measures to mitigate and manage impacts on MNES, including the Koala. These measures are described in the Significant Species Management Plan (Attachment G2). These measures include:

- pre-clearance survey to be undertaken by suitably qualified, experienced and licensed fauna catchers prior to any clearing activities being undertaken. A fauna spotter must also be present during vegetation clearing activity at all time;
- prior to clearing, limits of clearing delineating actual Koala habitat identified during pre-clearance surveys will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;
- clearing is to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas of their own volition;
- sequential clearing coupled with the slow nature of the clearing activities will take into account any variation in landscape features such as rocky escarpments, riparian habitats and steep sloping areas and provide fauna with sufficient time to exit the disturbance area;
- all clearing activities will be carried out in a manner that will avoid the isolation of habitat, habitat features or any noted fauna persisting within the construction areas;
- if a Koala is found prior to or during clearing activities, it must not be forcibly relocated. Any tree that has a Koala present, as well as any tree with its crown overlapping that tree, must not be removed and remain in place until the Koala vacates the tree of its own accord;
- allow a buffer zone distance equal to the height of the tree or surrounding trees (whichever is tallest) or a buffer zone deemed appropriate by the spotter catcher. Clearly mark out this area to ensure contractors and personnel do not clear the trees until vacation by the Koala is confirmed;
- work crews will be briefed on any known and potential environmental constraints occurring in that work location, including any likely significant flora and fauna species, populations and TECs they may encounter;
- any injured fauna shall be transported to a veterinarian or recognised wildlife carer immediately for treatment;
- in areas where threatened fauna species susceptible to be caught in trenches are likely to occur, fauna spotter catchers must inspect and remove any fauna from gathering line and trunkline trenches twice daily (early morning and late afternoon) every day while the trenches are open and have access to the site in all weather. In all other areas fauna spotter catchers shall inspect trenches at least once daily;
- prior to backfilling of the trench, site personnel will check the open trench for trapped fauna and, where required, a fauna spotter catcher will be called to move any fauna to a safe location away from the trench;
- all recorded sightings of Koalas will be reported as part of the project reporting;

- dust suppression measures including road watering and reduced vehicle speeds will be implemented to minimise dust deposition in habitat areas;
- in areas where mulching of cleared vegetation for distribution during rehabilitation may not be undertaken, vegetation shall be stick raked into piles to provide fauna habitat;
- vehicle activities should, where practicable, be restricted to roads, access tracks and hardened surfaces to reduce potential impacts to threatened species; and
- fire management measures shall take into account the need to manage remnant vegetation from frequent and hot fires.

Proposed offsets

51. After implementation of the proposed avoidance, mitigation and management measures, and with consideration of the Significant Impact Guidelines 1.1 (2013), the Department considers the proposed action will have a residual significant impact on the Koala due to the clearance of a maximum of 62 ha of known habitat critical to the survival of the species.
52. To compensate for this residual significant impact, the Department considers the provision of an offset in accordance with the principles of the Department's *EPBC Act Environmental Offsets Policy* (2012) (EPBC Act Offsets Policy, [Attachment F3](#)) is required.
53. The proponent concludes the proposed action will have a significant impact on the Koala and has proposed a 220 ha offset on 'Valkyrie', a 9,636 ha property located in Central Queensland approximately 30 km south of Nebo and 57 km east of Moranbah. Part of the northern boundary of Valkyrie abuts the southern boundary of Dipperu National Park with Bee Creek separating the two properties.
54. The offset liabilities for EPBC 2008/4398, EPBC 2008/4399, EPBC 2013/7047 and EPBC 2015/7463 are also being delivered through offsets on the Valkyrie property.
55. The conditions of approval for the above approved projects requires management actions to be undertaken on the Valkyrie property. The stated management objectives are to:
 - encourage the natural regeneration and maintenance of native flora species that are representative of SEVT and Brigalow ecological communities;
 - improve the quality of threatened fauna habitat within the offset areas;
 - protect the offset area from threats, such as wildfire, inappropriate fire management, livestock grazing, exotic plant invasion and other factors that can lead to land degradation; and
 - provide land management for vegetation recovery and enhanced connectivity.
56. The Department notes that the Valkyrie property is yet to be legally secured through a voluntary declaration under the *Vegetation Management Act 1999* (Qld).
57. The preliminary documentation states that the Valkyrie property contains habitat suitable for all significant residual impacts associated with the referred project, and includes evidence of the Koala.
58. The preliminary documentation states that the Valkyrie property contains habitat for the Koala in the form of Eucalypt woodlands and open forests, riparian forests and woodlands, Eucalypt forested swamps and semi-evergreen vine thickets with emergent Eucalypt species.

59. The proponent will legally secure the offset area through a voluntary declaration under the *Vegetation Management Act 1999* (Qld) and the offset area will be declared as an area of high nature conservation value. The proponent anticipates the offset area will be legally secured within 9 months of the commencement of the action.
60. The proponent notes the Koala has been observed in a number of locations on the Valkyrie property including in riparian woodland along Billy and Bee creeks, Poplar Box woodland near the southern boundary of the property, SEVT and Queensland Blue Gum woodland along Bee Creek.
61. The draft Offset Management Plan (July 2019) provided in the preliminary documentation states that ground-truthing of REs on the Valkyrie property has confirmed the availability of 3,799 ha of Koala habitat that can be used for offsets. The habitat available for Koala offsets on the Valkyrie property is in the form of Eucalypt woodlands and open forests, riparian forests and woodlands, Eucalypt forested swamps and semi-evergreen vine thickets with emergent Eucalypts. The proponent considers this remnant vegetation is in good condition and is of high habitat value for Koalas.
62. The preliminary documentation states that using Queensland Government's *Guide to determining terrestrial habitat quality* (2014, updated April 2017) (Qld Habitat Quality Guide, Attachment F4), determined the quality of the habitat on the impact area to be six (out of 10) and seven (out of ten) for the offset site.
63. The preliminary documentation does not include details of how the habitat score on the impact site has been determined and there is some uncertainty around its applicability given the time since ecological surveys were undertaken on the impact site (2011/2012). As such, the Department is uncertain as to whether the proposed offset amount of 220 ha adequately compensates for the residual significant impacts and meets the principles of the EPBC Act Offsets Policy.

Conservation Advice, Recovery and Threat Abatement Plans

64. The *Approved Conservation Advice for Phascolarctos cinereus (combined populations in Queensland, New South Wales and the Australian Capital Territory)* (2012) (Attachment H1) outlines the priority management actions to support the recovery of the Koala, and is available at: www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=85104.
65. Relevant to the priority management actions, the proponent will implement the Significant Species Management Plan to mitigate and manage impacts on the Koala during construction and operation of the proposed action.
66. Further, the proponent has stated that they will provide an offset in accordance with the EPBC Act Offsets Policy, to be secured under Queensland legislation, to compensate for the clearance of 62 ha of known critical habitat for the species.
67. There is no adopted or made recovery plan or relevant threat abatement plan for the Koala.
68. Proposed conditions of approval and the Department's conclusion in relation to impacts on the Koala, and other listed species utilising the same habitat, is provided at paragraph 118 below.

Greater Glider (*Petauroides volans*) – Vulnerable

Description

69. A description of the characteristics and range of the Greater Glider can be found in SPRAT: www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=254.

70. The main threats to the species are habitat loss and fragmentation, inappropriate fire regimes, timber production and hyper-predation by owls.

Presence

71. Targeted surveys for the Greater Glider were undertaken in May 2019. Greater Gliders were observed at two locations within the project area – in the Brookfield Road reserve within Eucalypt woodland dominated by Coolabah (*E. coolabah*) and in the Burradoo Road reserve within a Eucalypt woodland dominated by Forest Red Gum (*E. tereticornis*).

72. While the individuals recorded were in the western and southern portion of the project area, the preliminary documentation states that the species may occur across areas of remnant vegetation along and adjacent to Eurombah Creek and Horse Creek and their tributaries, where large old trees with abundant hollows occur.

73. The preliminary documentation states that the findings of the May 2019 ecological assessment indicate that the Greater Glider can occur in agricultural districts within linear fragments (riparian and road corridor) provided appropriate feed trees and large old trees with abundant hollows are present.

74. The Department notes that the survey was limited to road reserves within the project area as a result of restrictions on landholder access.

Habitat assessment

75. The preliminary documentation states that potential Greater Glider habitat is estimated to occur over 3,734 ha of the project area. The Department notes the proponent has excluded regrowth vegetation within the project area as Greater Glider habitat due to an absence of hollow-bearing trees.

76. Eucalypt woodland dominated regional ecosystems within the project area considered Greater Glider habitat are REs 11.3.2, 11.3.2c, 11.3.3c, 11.3.4, 11.3.25, 11.3.27, 11.10.7 and 11.10.1.

77. The preliminary documentation states that, using the Qld Habitat Quality Guide, it was determined the quality of the habitat on the impact site to be six (out of 10). However, it does not include details of how the habitat score on the impact site has been determined and therefore the Department has some uncertainty around the validity of the habitat quality scores.

Impact assessment

78. The preliminary documentation states the proposed action will result in the loss of a maximum of 62 ha of habitat for the Greater Glider as a result of linear vegetation clearance during construction.

Avoidance and mitigation measures

79. The proponent is proposing to implement the following measures to mitigate and manage impacts on the Greater Glider:

- dead trees, stags and hollow branches may be windrowed and pulled back onto the row during the rehabilitation stage;
- where reasonably practicable, the timing of clearing operations is selected to minimise impacts on breeding species;

prevent entrapment of fauna in pipes (through night caps) and trenches (fauna ladders/ramps);

- where fencing is required, the use of barbed wire fences will be negotiated with the landholder and avoided wherever reasonably practicable, particularly within areas where glider and bat species are likely to occur;
- checking trenches for trapped fauna before backfilling;
- in all areas, particularly riparian areas, where vegetation is required to be cleared, large trees that provide habitat for fauna will be avoided and retained where reasonably practicable;
- hollow-bearing trees will be felled in a manner that reduces potential for fauna death;
- felled trees will be inspected after felling and fauna will be relocated or receive assistance if injured;
- fauna handlers will be suitably qualified and present to survey for and relocate fauna immediately prior to and during clearing activities (in all locations identified as containing suitable fauna habitat during the pre-clearance surveys); and
- the installation of nest boxes will be considered in areas where hollow-bearing trees must be removed, and relocation of large fallen logs and boulder piles to adjacent habitat to increase sheltering opportunities for displaced animals where it is not feasible to avoid such features during clearing.

80. The Department notes that the Significant Species Management Plan referenced in the preliminary documentation has not been updated to include mitigation measures for the Greater Glider.

Proposed offsets

81. After implementation of the proposed avoidance and management measures, and with consideration of the Significant Impact Guidelines 1.1 (2013), the Department considers the proposed action will have a residual significant impact on the Greater Glider as a result of the clearance of up to 62 ha of known habitat critical to the survival of the species (i.e. areas necessary for breeding and foraging activities).
82. To compensate for this residual significant impact, the Department considers the provision of an offset in accordance with the principles of the EPBC Act Offsets Policy is required.
83. The proponent concludes the proposed action will have a significant impact on the Greater Glider and has proposed the provision of a 220 ha offset on the Valkyrie property.
84. The preliminary documentation states that the Valkyrie property contains habitat suitable for all significant residual impacts associated with the proposed action in the form of Eucalypt woodlands and open forests, riparian forests and woodlands, Eucalypt forested swamps and semi-evergreen vine thickets with emergent Eucalypt.
85. The proponent will legally secure the proposed offset area through a voluntary declaration under the *Vegetation Management Act 1999* (Qld), which will then be declared as an area of high nature conservation value. The proponent anticipates the proposed offset area will be legally secured within 9 months of commencement of the action.
86. The proponent notes the Greater Glider has been observed in a number of locations on the Valkyrie property, including in the Bee Creek vegetation corridor within riparian SEVT and palustrine wetland.

87. The preliminary documentation states that, using the Qld Habitat Quality Guide, it was determined the quality of the habitat on the impact site to be six (out of 10) and seven (out of 10) for the proposed offset site.
88. The preliminary documentation does not include details of how the habitat score on the impact site has been determined and there is some uncertainty around its applicability given the scope of the May 2019 targeted survey.
89. As such, the Department is uncertain as to whether the proposed offset area of 220 ha adequately compensates for the residual significant impacts and meets the principles of the EPBC Act Offsets Policy.

Conservation Advice, Recovery and Threat Abatement Plans

90. The *Conservation Advice Petauroides voians greater glider* (2016) (Attachment H2) outlines the primary conservation actions to support the recovery of the Greater Glider, and is available at: www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=254.
91. Relevant to the primary conservation actions, the proponent has committed to implementing the Significant Species Management Plan to avoid and manage impacts on the Greater Glider during construction and operation of the proposed action.
92. The proponent has stated that they will provide an offset in accordance with the EPBC Act Offsets Policy, to be secured under Queensland legislation, for the clearance of 62 ha of known Greater Glider habitat.
93. There is no adopted or made recovery plan or relevant threat abatement plan for the Greater Glider.
94. Proposed conditions of approval and the Department's conclusion in relation to impacts on the Greater Glider, and other listed species utilizing the same habitat, is provided at paragraph 118 below.

South-eastern Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable

95. A description of the characteristics and range of the South-eastern Long-eared Bat (SELEB) can be found in SPRAT: www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=83395.
96. The key threats to the species are habitat loss and fragmentation and habitat degradation associated with altered fire regimes, timber extraction, mining and other factors.

Presence and habitat assessment

97. The preliminary documentation states the project area is within the northern portion of the species' potential distribution, with just a small component along the southern border falling within the likely distribution. There are no available records of the species from within, or in close proximity to, the project area. However, there are records available further north and south of the project area in areas featuring large patches of remnant vegetation, such as Condamine, Belington Hut and Barakula State Forests. The nearest record is greater than 50 km southeast of the Project area, in Barakula State Forest.
98. Surveys undertaken within the project area included the use of Anabat sound recorders to capture bat echolocation, and some calls captured during surveys were identified as belonging to the *Nyctophilus* genus. However, the proponent considered that classification of Anabat call recordings to species level was not possible for the genus at the time, so confirmation of the presence/absence of the SELEB is not possible.

99. Since receiving the initial approval to undertake works within the project area in 2013, the proponent has carried out further ecological surveys. These surveys have not included bat trapping and the species is unable to be detected by other survey methods. As a result, the proponent considers the species still has the potential to occur in the project area, despite it not being recorded during recent surveys.
100. The preliminary documentation states that potential habitat within the project area for the species includes remnant vegetation associated with Mount Organ where there is a low density of hollows, open canopy (<20%) and an open understory in the form of remnant vegetation including Spotted Gum and Narrow-leaved Ironbark open forest, Narrow-leaved Ironbark, Clarkson's Bloodwood and White Cypress Pine woodland), with small pockets of RE11.9.5 Brigalow/Belah woodlands.
101. The proponent considers the majority of the area is considered to be low quality habitat for the SELEB, with the areas of Brigalow TEC representing moderate quality habitat.
102. The total area of potential habitat for the species within the project area is estimated by the proponent to be 6,509 ha.
103. The preliminary documentation states that, using the Qld Habitat Quality Guide, it was determined the quality of the habitat on the impact site to be six (out of 10). However, it does not include details of how the habitat score on the impact site has been determined. Given the above, and considering the time since the detailed ecological surveys were undertaken in accordance with Departmental guidelines (2011/2012), the Department has some uncertainty around the validity of the habitat quality scores.

Impact assessment

104. The preliminary documentation states the proposed action will result in the loss of a maximum of 80 ha of habitat for the SELEB as a result of linear vegetation clearance during construction.
105. The proponent also considers potential impacts may occur as a result of disturbance from light and noise during operations and increased likelihood and intensity of fire.

Avoidance and mitigation measures

106. The proponent states the final planning and placement of infrastructure will adhere to the Constraints Protocol and will implement the Significant Species Management Plan to mitigate and manage impacts on the SELEB.
107. The Significant Species Management Plan includes measures to manage potential impacts to the SELEB during construction and operation of the proposal, including, but not limited to:
- all clearing activities to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas;
 - prior to clearing, limits of clearing areas including "no go" zones delineating roost sites identified during pre-clearance surveys will be clearly marked out with appropriate flagging material and/or barricade webbing;
 - pre-clearance survey to be undertaken by suitably qualified, experienced and licensed fauna catchers prior to any clearing activities being undertaken;
 - where the species has been identified in proximity to infrastructure, temporary lighting shall be directed away from light-sensitive areas such as nesting areas and light shades and low lighting must be applied to construction and operational areas where these are

located adjacent to remnant vegetation and other environmentally sensitive areas, where practicable;

- vehicle activities should be restricted to roads, access tracks and hardened surfaces to reduce potential impacts to threatened species;
- fire management measures shall take into account the need to protect remnant vegetation from frequent and hot fires. On site fire management practices shall be in accordance with relevant construction permits and method statements and appropriate dedicated fire fighting equipment will be available at high risk construction sites to manage any fires that may start up and to avoid wildfires breaking out; and
- rehabilitation will be progressively undertaken during construction following backfilling and completion of infrastructure establishment. Natural regeneration of disturbed areas will be encouraged after construction activities and also at the conclusion of the project.

Proposed offsets

108. After implementation of the proposed avoidance, mitigation and management measures, and with consideration of the Significant Impact Guidelines 1.1 (2013), the Department considers the proposed action will have a residual significant impact on the SELEB due to the clearance of up to 80 ha of potential habitat critical to the survival for the species.
109. To compensate for this residual significant impact, the Department considers the provision of an offset in accordance with the principles of the EPBC Act Offsets Policy is required.
110. The proponent concludes the proposed action will have a significant impact on the SELEB and has proposed a 280 ha offset, to be secured under Queensland legislation, on the Valkyrie property.
111. The preliminary documentation states that the Valkyrie property contains habitat suitable for all significant residual impacts associated with the referred project in the form of Eucalypt woodlands and Brigalow open forests.
112. The preliminary documentation states that, using the Qld Habitat Quality Guide, it was determined the quality of the habitat on the impact site to be six (out of 10) and seven (out of 10) for the proposed offset site.
113. The preliminary documentation does not include details of how the habitat score on the impact site has been determined and there is some uncertainty around its applicability. As such, the Department is uncertain as to whether the proposed offset area of 280 ha adequately compensates for the residual significant impacts and meets the principles of the EPBC Act Offsets Policy.

Conservation Advice, Recovery and Threat Abatement Plans

114. The *Conservation Advice Nyctophilus corbeni south-eastern longeared bat* (2015) (Attachment H3) outlines the primary conservation actions to support the recovery of the SELEB, and is available at: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=83395
115. Relevant to the primary conservation actions, the proponent will implement the Significant Species Management Plan to mitigate and manage impacts on the SELEB during construction and operation of the proposed action.
116. The proponent has stated that they will provide an offset in accordance with the EPBC Act Offsets Policy, to be secured under Queensland legislation, for the clearance of 80 ha of habitat for the SELEB.

117. There is no adopted or made recovery plan or relevant threat abatement plan for the SELEB.

Proposed conditions of approval for the Koala, Greater Glider and SELEB

118. To avoid, manage and compensate for impacts on the Koala, Greater Glider and SELEB, the Department recommends the proponent be required to:
- (a) limit the taking of the proposed action to the defined project area (as described in Condition 1);
 - (b) limit the impact on Koala and Greater Glider habitat to no more than 62 ha, and limit the impact on SELEB habitat to no more than 80 ha (as described in Condition 2);
 - (c) address uncertainty regarding the determination of impact site habitat quality scores through a pre-clearance surveys prior to clearing and publish the results of each pre-clearance survey on their public website (as described in Condition 3-5);
 - (d) implement existing, or revised versions of, environment management documents used to manage impacts to listed threatened species and communities associated with the co-located EPBC 2013/7047 approved action i.e. the Constraints Protocol, Biosecurity Control Manual (Attachment G3) and Remediation, Rehabilitation and Recovery Monitoring Plan (Attachment G4) (as described in Condition 6-10); and
 - (e) prepare and submit for the Minister's approval an Offsets Management Plan that provides offsets in accordance with the Offset Assessment Guide values proposed by the proponent in the preliminary documentation, which then must be revised within 50 months of the approval of the Offset Management Plan to take into account the results of all pre-clearance surveys and provide additional offsets if the residual significant impact of the proposed action on listed threatened species and communities is greater than that predicted in the approved Offset Management Plan (as described in Condition 11-15).

Conclusion – Koala, Greater Glider and SELEB

119. The Department considers the proposed action will have a residual significant impact on the Koala and Greater Glider as a result of the loss of 62 ha of suitable habitat, and the SELEB as a result of the loss of 80 ha of suitable habitat.
120. Based on the proposed measures to avoid, mitigate and manage impacts and assuming compliance with the proposed conditions of approval, the Department concludes the proposed action will not have an unacceptable impact on the EPBC Act-listed Koala, Greater Glider and SELEB.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community (Brigalow TEC) – Endangered

Description

121. A description of the characteristics and range of Brigalow TEC can be found in SPRAT: www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=28.
122. The main threats to Brigalow TEC are clearing, inappropriate fire regimes, invasive weeds, pest animals, inappropriate grazing regimes, and climate change.

Presence and habitat assessment

123. The preliminary documentation states there is approximately 1,050 ha of Brigalow TEC in the project site which met the requirements described in the *Approved Conservation Advice*

for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community (2013) (Attachment H4).

124. Brigalow TEC occurs primarily as small, fragmented patches throughout the landscape in the project area. These remnants have generally been left in road reserves or as shade lines in agricultural fields. There are also some patches along creek lines and some higher quality patches associated with Mount Organ.

Impact assessment

125. The preliminary documentation states the proposed action will result in the loss of a maximum of 9 ha of Brigalow TEC as a result of linear vegetation clearance during construction.

Avoidance and mitigation measures

126. The proponent states the final planning and placement of infrastructure will adhere to the Constraints Protocol and will implement the Significant Species Management Plan to mitigate and manage impacts on Brigalow TEC.

Proposed offsets

127. The Department notes that proponent is proposing to compensate for the loss of up to 9 ha of Brigalow TEC through a 60 ha offset proposed on the Valkyrie property. With consideration of the Significant Impact Guidelines 1.1 (2013), the Department considers that a residual significant impact to the Brigalow TEC is unlikely and therefore an offset is not required.

Conservation Advice, Recovery and Threat Abatement Plans

128. The *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (2013) outlines the primary conservation actions to support the recovery of the Brigalow TEC and is available at: <https://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=28>
129. There is no adopted or endorsed recovery plan for the Brigalow TEC.
130. The threat abatement plan relevant to the Brigalow TEC is the *Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads* (2011) (Cane Toad TAP, Attachment H5), and is available from: www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-biological-effects-including-lethal-toxic-ingestion-caused-cane-toads.
131. The aim of the Cane Toad TAP is to minimise the impact of exotic species on biodiversity in Australia and its territories by protecting affected threatened species and preventing further species and ecological communities from being threatened.
132. The Cane Toad TAP notes that there are neither the resources nor an appropriate broad-scale control that can be applied to the management of Cane Toads in a way that would lead to containment and/or eradication of Cane Toads across their range.
133. The Brigalow TEC is identified within the Cane Toad TAP as a threatened ecological community identified as being within the current Cane Toad range; the Cane Toad TAP does not identify threats to the Brigalow TEC from Cane Toads or any management measures for the Brigalow TEC where Cane Toads are present.
134. As such, in considering the Cane Toad TAP the Department recommends that it is not necessary or convenient for protecting the Brigalow TEC to apply any conditions of approval

control the effects of Cane Toads on the Brigalow TEC, and that this approach is not inconsistent with the Cane Toad TAP.

Proposed conditions of approval for Brigalow TEC

135. To manage impacts on the Brigalow TEC, the Department recommends the proponent be required to:
- take the action within the approved project area only (as described in Condition 1);
 - clear no more than 9 ha of Brigalow TEC (as described in Condition 2); and
 - take the action in accordance with the Constraints Protocol, Significant Species Management Plan, Biosecurity Control Manual and Remediation, Rehabilitation and Recovery Monitoring Plan for the duration of the approval (as described in Condition 6-10).

Conclusion – Brigalow TEC

136. Based on the nature of the proposed action, the Department considers the proposed action is unlikely to facilitate the spread of Cane Toads and is therefore not inconsistent with the threat abatement plan as identified in SPRAT.
137. Based on the information available to the Department, the proposed measures to avoid, mitigate and manage impacts, consideration of the Significant Impact Guidelines 1.1 (2013), and assuming compliance with the proposed conditions of approval, the Department concludes the proposed action will not have a residual significant impact on the EPBC Act-listed Brigalow TEC.

Conclusion – listed threatened species and communities

138. Based on the information available to the Department, the measures to avoid, mitigate and manage impacts, and assuming compliance with the proposed conditions of approval, the Department concludes the proposed action will not have an unacceptable impact on listed threatened species and communities (sections 18 and 18A of the EPBC Act).

A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)

Background

139. The proposed project lies in the Surat Cumulative Management Area (CMA) in Queensland, approximately 35 km south-west of Taroom, for which a regional-scale Underground Water Impact Report (UWIR) (2016) has been produced by the Queensland Government Office of Groundwater Impact Assessment (OGIA). The UWIR assesses the cumulative impacts to the Surat Basin and southern Bowen Basin. The project area is in the upper Dawson Catchment, a sub-catchment of the Fitzroy River drainage basin, which flows into the Great Barrier Reef lagoon.
140. The Upper Dawson Catchment area contains extensive but largely ephemeral or intermittent watercourses that flow during periods of summer rainfall and have periods of low to no flow during winter months, when streams and creeks become a series of disconnected pools. The main watercourses in the Upper Dawson Catchment area that either originate or flow through the Surat North leases include Horse Creek, Juandah Creek and Eurombah Creek. Other smaller drainages include Canal Creek, Mud Creek and Mount Organ Creek.
141. The target coal seam for the project (and EPBC 2013/7047) is the Walloon Coal Measures (WCM). The preliminary documentation states that the WCM, from which gas and water is

proposed to be extracted, is generally considered an aquitard on a regional scale, although locally the formation has some aquifer properties and may be utilised for groundwater supply.

142. The primary formations which are water bearing are the Precipice Sandstone, Hutton Sandstone, Springbok Sandstone and Quaternary Alluvium. The preliminary documentation states that the Precipice Sandstone and Hutton Sandstone aquifers are highly utilised for farm supply in the Upper Dawson sub-catchment.
143. The project will involve the maximum extraction of 40 ML/d, with an average of 5 ML/d over the life of the project to 2060 and a total estimated abstraction of 88 GL. While the proponent does not plan to undertake routine hydraulic stimulation as part of the proposed action, it is stated in the preliminary documentation that stimulation may be undertaken to enhance gas extraction. The existing Queensland Government EA includes conditions relating to risk assessments for hydraulic fracturing chemicals and, therefore, the Department considers this impact will be adequately regulated.
144. Brine that is generated from the water treatment process will be stored at existing facilities at Woleebee Creek, which the proponent considers has the capacity to store all brine produced from the existing and the proposed action. The preliminary documentation states the current brine management solution, which is to crystallise the brine into solid salt form and encapsulate it for long-term storage in purpose-built cells, will be sized to accommodate all stored and produced brine volumes.
145. No EPBC Act-listed spring complexes are located within the project area. However, some are located in the surrounds, including Scotts Creek spring, approximately 15 km west of the project boundary, and the Dawson River 8 complex downstream along the Dawson River, approximately 30 km from the project area boundary.
146. The preliminary documentation identifies a number of non-spring based GDEs in the project area:
 - a) remnant regional ecosystems, most notably in the headwaters of Horse Creek and along Juandah Creek downstream from its confluence with Horse Creek;
 - b) riverine wetland regional ecosystems, particularly along Juandah Creek, Horse Creek, Mud Creek, Mount Organ Creek and Eurombah Creek;
 - c) the palustrine wetland regional ecosystem adjacent to Horse Creek and other smaller examples along Eurombah Creek, Duck Creek (a tributary of Horse Creek); and
 - d) lacustrine wetland regional ecosystems along tributaries of Horse Creek, Eurombah Creek, Juandah Creek, Mud Creek and Mount Organ Creek.

Impacts

Groundwater resources

147. In 2018, the proponent commissioned a groundwater flow model (*Groundwater modelling of surface water/groundwater interaction and in support of the Surat Basin Acreage development Project – Water Resources Assessment*, 29 November 2018, (Jacobs Model)) as a component of the preliminary documentation to assess the potential impact of CSG production on shallow groundwater systems in the project area.

148. The Jacobs Model identifies the following impacts to water resources:

Regional groundwater

- a) drawdown in the Lower Springbok Sandstone of 2 m to 10 m is predicted where the formation is at outcrop. Where further confined to the south, beneath the Westbourne Formation, drawdowns of 20 m to 30 m are predicted;
- b) the lower WCM shows drawdown of up to 120 m across the area at the end of the proposed CSG production. Large drawdown gradients are apparent around CSG production areas, showing a limited spread of drawdown in the simulation to 2060. Drawdown of 2 m to 5 m propagates from 8 km to 12 km off tenement; and
- c) in the Upper Hutton Sandstone, drawdown of 10 m is predicted beneath the project area.

Shallow aquifers

- a) there is potential, over 40 years, for CSG depressurisation to propagate vertically through the bulk of the WCM interburden and Springbok Sandstone and impact shallow groundwater levels in the Horse Creek Alluvial aquifer; and
 - b) there is also potential for similar level of impacts to groundwater elevations across the outcrop of the Springbok Sandstone and WCM.
149. The proponent considers the magnitude of any impact on the shallow alluvium depends primarily on the amount of depressurisation within the uppermost productive coal measures and the vertical hydraulic conductivity of material between the uppermost productive coal measures and the alluvium. The results are currently preliminary and represent a relatively early phase in the development of the local scale groundwater model. The Department notes that there is significant uncertainty around the existence of material between the uppermost productive coal measures and the alluvium and its role in restricting the propagation of groundwater drawdown into the alluvium is yet to be demonstrated by the proponent.

Surface water resources

150. In addition to the above, the proponent has also identified the proposed action has the potential to impact on surface water resources as a result of:
- a) changes in water quality from construction of gas-field infrastructure near watercourses;
 - b) changes in water quality and quantity due to changes in connectivity with potentially affected groundwater resources; and
 - c) chemical and/or CSG produced water leaks and spills.

Cumulative impacts

151. The proponent notes that cumulative impact modelling at the regional scale was undertaken by OGIA to provide an estimate of predicted drawdown associated with CSG production from multiple CSG developments. Impacts were modelled for Precipice Sandstone receptors (bores and springs) and for Hutton Sandstone and Boxvale Sandstone sourced springs.
152. The preliminary documentation notes that a key outcome of the UWIR is a continuing low risk of impacts to springs to the north of the project area. The aquifer underlying the Dawson River 8 complex, which has been assigned to the proponent by OGIA, is predicted to experience less than 0.2 m drawdown.

153. The preliminary documentation states that the nature of CSG-related drawdown is generally spatially restricted to the area around the specific production wells of developments, and that modelling of drawdown for both 'project only' and cumulative scenarios demonstrate that within the project area, there is little difference in impact between the two.

154. The preliminary documentation concludes that, based on the relevant assessments, the proposed action will not result in any significant impact on water resources, given that QGC has committed to implement mitigation measures discussed in paragraph 161-162 below.

Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC)

155. On 7 February 2019, the IESC provided advice on the proposed action (Attachment E8). The IESC considers the key potential impacts of the proposal are:

- a) declines in shallow groundwater level due to depressurisation of underlying aquifers and Walloon Coal Measures; and
- b) reductions in water availability to springs, riparian ecosystems, fringing vegetation of a wetland of High Ecological Significance (HES), several REs listed as 'Of Concern' and other GDEs as a result of groundwater depressurisation and drawdown.

156. The IESC also raised the following key issues:

Groundwater

- The modelled drawdown in the Horse Creek alluvium exceeds 20 m in the north of the model after 40 years and is predicted to desaturate the alluvial aquifer. The IESC considers this is likely to result in profound impacts to the ecology of the creek, its riparian zone and subsurface biota;
- no effective mitigation measures are proposed for this spatially extensive and prolonged groundwater drawdown; and
- the total CSG water abstraction from the QGC wells is estimated to be 88 GL by the proponent and 623 GL by the OGIA. This large variation required justification.

Surface water

- The proponent has not provided adequate information to identify or assess the likely impacts or risks to the majority of surface water resources within the zone of likely impacts. The proponent has provided information on the surface water for Horse Creek, but little information is provided on other tributaries of the Dawson River in the project area, including some watercourses that may partly rely on groundwater inputs; and
- The proposed project will contribute, along with impacts from other resource projects and existing land-uses, to downstream sedimentation, altered flow and sediment regimes and reduced alluvial and surface stream flow. The Department expects these issues would be adequately regulated through the Queensland EA.

Salt and brine management

- The IESC remains concerned about the legacy issues of brine management and salt storages, because such long-term storage does constitute a residual risk, particularly from leaks and seepages. Large-scale CSG extraction has been occurring in the region surrounding the project area for approximately five years but a strategy for brine and salt disposal has not yet been determined.

- To enable a robust evaluation of environmental risks posed by these inhibited brine, anti-caking and flocculant chemicals, the proponent should provide a chemical risk assessment for each chemical listed in the draft preliminary documentation. The Department notes that the Queensland EA includes conditions requiring the risk assessment of hydraulic fracturing chemicals; however, there is currently no regulation of drilling chemicals associated with the proposed action.

157. In regard to the IESC's comments on salt and brine management above, the Department considers that the proponent's commitments to store brine at the existing facilities at Woleebee Creek, which are regulated by the Queensland Government under an EA, is sufficient to mitigate the risks associated with the proposed action. The proponent has also committed to continuing to identify new opportunities, technologies and partnerships with other industries and/or governments for salt storage.

158. Further, the IESC noted that similar impacts associated with groundwater drawdown and desaturation of the alluvium appear likely for sections of other creeks in the project area such as Canal, Eurombah and Juandah Creek. These changes in flow regime, saturated alluvial habitat and riparian groundwater-dependent vegetation will further fragment the remaining patches of native vegetation across the landscape, potentially reducing habitat for biota, including some EPBC Act-listed species such as the Koala.

159. The IESC advised that if this impact cannot be effectively avoided or mitigated, the proponent should account for this impact in their assessment of required offsets for water resources and EPBC Act-listed threatened species and communities.

160. The proponent responded to the IESC's advice in the preliminary documentation. The Department notes the proponent has not adequately addressed the matters raised by the IESC including, but not limited to, those relating to:

- how impacts to water resources and EPBC Act-listed threatened species and communities will be monitored and mitigated; and
- the clear quantification of residual significant impacts.

Mitigation and management measures

161. To manage potential impacts to water resources, the proponent has a number of response plans in place, which are components of the Water Monitoring and Management Plan (WMMP) approved under EPBC 2013/7047. The Department notes that these response plans are based on undertaking investigations in response to exceedances of drawdown triggers in the WMMP determined by the proponent. The Department considers the drawdown triggers are arbitrary and are not suitable as early warning drawdown triggers as they are not derived from adequate baseline data. The proponent has committed to working with the Department to develop new early warning triggers values for both the approved and proposed actions.

162. The preliminary documentation states that the proponent is committed to implementing mitigation measures to fully prevent adverse impacts occurring to GDEs as a result of drawdown in shallow alluvium due to groundwater abstraction from the proponent's activities. The proponent considers mitigation may consist of several options to be implemented successively or consecutively. Potential mitigation measures may include the following options:
- a) Shallow aquifer artificial recharge through streamflow augmentation in the creek bed and increase natural rates of seepage to the underlying alluvium through a watercourse with a longer than usual flow period. The preferred water source would be river water abstracted and stored during periods of flood or high water flows and released during periods of low water flows.
 - b) Shallow aquifer artificial recharge the formation of longer-term standing water through the installation of check dams in the creek channel; or check dams involving the construction of a part blockage in the channel either, for example, by gabions or weirs, such that flood water is able to pool behind the obstruction and seep into the creek bed, adding to the shallow groundwater volume.
 - c) Production constraints to create a non-production buffer along creek and alluvium channels so that water level drawdown is reduced to a level, such that there is a negligible risk of causing a water level decline in the alluvium.
163. The Department notes that there is significant uncertainty around the viability of the proposed mitigation measures to adequately mitigate the impacts of groundwater drawdown on GDEs to the extent that the proposal has no adverse impacts on GDEs given that feasibility assessments are yet to be undertaken. The Department also has concerns that the proposed mitigation measures may result in additional impacts to protected matters not considered as part of this proposal.

Proposed conditions of approval for water resources

164. To avoid, manage and mitigate impacts on water resources, the Department recommends the proponent be required to:
- a) undertake a chemical risk assessment for drilling fluid compounds in accordance with best practice risk assessment methodology and, should any drilling fluid compound be determined 'high risk', submit the risk assessment to the Minister for approval (as described in Condition 16-18) to address both the IESC's and the Department's Chemical and Biotechnology Assessments Section's ([Attachment E4](#)) concerns regarding chemicals as discussed in paragraph 156;
 - b) adhere to their commitment of 'no impact on GDEs' (as presented in the proponent's own proposed conditions of approval ([Attachment E9](#))) through compliance with appropriate descriptions and locations of identified GDEs, performance criteria, trigger values and limits approved by the Minister that measure the impacts of the action against the baseline condition (as described in Condition 19-20) and the following supporting requirements:
 - c) the proposed descriptions and locations of identified GDEs, performance criteria, trigger values and limits must be submitted with an accompanying GDE Program, prepared and peer reviewed by suitably qualified water resources experts, which explains the scientific basis on which the descriptions and locations of GDEs, performance criteria, trigger values and limits are based. The GDE Program must provide justification of appropriate

key factors that determine the suitability of the proposed descriptions and locations of GDEs, performance criteria, trigger values and limits (as described in Condition 21-24).

- d) to ensure no impact on GDEs is occurring, the approval holder must submit a 6-monthly outcomes report, prepared and peer reviewed by suitably qualified water resources experts, which includes statements on the performance (and predicted future performance) against the approved trigger values and limits and any changes to existing regulatory arrangements to avoid impacts on GDEs (as described in Condition 25-26);
- e) to ensure the adequate information has been provided in the outcomes report, the approval holder may be requested, by the Minister, to provide additional information to substantiate an outcomes report or to verify the risk of impacts to GDEs (as described in Condition 27).
- f) on the basis of the information provided (or not provided) under Condition 25 and/or 26, and/or other information available, the Minister may determine an impact has occurred, is occurring or is likely to occur and notify the approval holder (as described in Condition 28);
- g) the approval holder must report any instance of reaching or exceeding an approved trigger value to the Minister within two business days of the detection and submit proposed corrective action(s) to the Minister within 20 business days of the detection, accompanied by demonstration, to the Minister's satisfaction, that the proposed corrective action(s) will not result in impacts beyond the scope of the action (as discussed in paragraph 163) (as described in Condition 29);
- h) the approval holder must report instance of reaching or exceeding an approved limit to the Minister within one business day of the detection and cease groundwater extraction associated with the action, and the co-located EPBC 2013/7047 approved action, within 48 hours of the detection or receiving notification from the Minister under Condition 27 that it has been determined that an impact has occurred, is occurring or is likely to occur (as described in Condition 30);
- i) the approval holder must not recommence groundwater extraction until the impact on GDEs has been reversed to the pre-impact state and sustained for 10 business days and the Minister has approved the recommencement of groundwater extraction in writing (as described in Condition 31);
- j) to ensure that no impact on GDEs continues to be demonstrated in accordance with best practice principles, the approval holder must submit revised descriptions and locations of GDEs, performance criteria, trigger thresholds and limits, determined in accordance with Departmental policies, guidance or agreements relating to CSG water management and/or monitoring relevant at the time, for the Ministers approval (as described in Condition 32).

165. The Department recommends requiring the proponent implement a 35 km buffer zone around the project area within which no impacts on GDEs must occur to ensure that Scotts Creek and the Dawson River, both EPBC Act-listed spring complexes, are not impacted by the proposed action.

166. The Department considers, in line with the proponent's proposed conditions (Attachment E9), that a staged approach to commencement of the action is acceptable given the risk of impact associated with Stage 1 activities within the southern extent of the project area being unlikely within the specified maximum timeframe for the descriptions and locations of GDEs, performance criteria, trigger thresholds and limits approval (6 months

after commencement of Stage 1). This is predominately due to the thickness of the Westbourne Formation in this area restricting the propagation of groundwater drawdown within the alluvium, and current levels within the Springbok Sandstone (from two bores) indicating no changes to water levels. At the time of submission of the descriptions and locations of GDEs, performance criteria, trigger thresholds and limits to the Minister for approval, the proponent will be required to provide evidence to the Minister to demonstrate that no impacts have occurred or are occurring and that Stage 1 activities have not influenced the proponent's determination of the proposed description and location of GDEs, performance criteria, trigger values and limits.

167. The Department considers that, while the proponent has not addressed all of the key issues identified by the IESC, the conditions described above will ensure that the potential impacts identified (in paragraph 155) will be adequately avoided (and mitigated, if necessary) if the proposed action is taken in compliance with the outcomes-based condition (and supporting conditions) relating to no impacts on GDEs.

168. Given the above and the proponent's commitment to have no impacts on GDEs, the Department does not consider offsets for water resources are necessary for the proposed action.

Conclusion – water resources, in relation to coal seam gas development and large coal mining development

169. Noting the proponent's commitment to have no impact on GDEs as a result of gas and water extraction activities, considering the proposed measures to mitigate and manage impacts, and assuming compliance with the proposed conditions of approval, the Department concludes the potential impacts of the proposed action will be adequately managed to an extent that it will not have an unacceptable impact on water resources in relation to a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E).

Economic and social matters – section 136(1)(b)

170. Under section 136 of the EPBC Act, in deciding whether or not to approve an action and what conditions to attach to the approval, the Minister must consider economic and social, so far as they are not inconsistent with any other requirement of Subdivision B, Division 1 of Part 9 of the EPBC Act. The Department has considered economic and social matters in the assessment of the proposed action and in recommending the approval of the proposed action.

171. The preliminary documentation provides a discussion of the economic and social matters relating to the proposed action ([Attachment D](#)). In particular, the proponent states the proposed action will result in the creation or sustainment of employment for up to 350 people in regional Queensland and continue to generate further business opportunities for local suppliers. No public comments were received on the proposed action identifying adverse social or economic impacts as a result of the proposed action.

172. The preliminary documentation states the proposed action will ensure that the socio-economic benefits generated by the existing Surat CSG Project (EPBC 2013/7047) will continue, in the form of direct and indirect employment, taxes and royalties.

Factors to be taken into account

173. In considering the above matters, under section 136(2) of the EPBC Act, the Minister must take the following factors into account:

- (a) the principles of ecologically sustainable development (section 136(2)(a)) and the precautionary principle (section 391(2));
- (b) the final preliminary documentation given to the Minister under section 95B of the EPBC Act, and this recommendation report given to the Minister under section 95C of the EPBC Act (section 136(2)(c));
- (c) any other information the Minister has on the relevant impacts of the proposed action (section 136(2)(e));
- (d) any relevant comments given to the Minister in accordance with an invitation under section 131, 131AA or 131A of the EPBC Act (sections 136(2)(f) and 131AA(6));
- (e) any relevant advice obtained by the Minister from the IESC in accordance with section 131AB of the EPBC Act (section 136(2)(fa)); and
- (f) any information in a notice given to the Minister under section 132A of the EPBC Act.

Principles of ecologically sustainable development section 136(2)(a) and the precautionary principle (section 391(2))

174. In deciding whether or not to approve the taking of an action and the conditions to attach to an approval, section 136(2)(a) of the EPBC Act provides that you are required to take into account the principles of ecologically sustainable development (ESD). The principles of ESD, as defined in Part 1, section 3A of the EPBC Act, are:
- (a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;
- (b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- (c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- (d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;
- (e) improved valuation, pricing and incentive mechanisms should be promoted.
175. In addition, section 391 of the EPBC Act provides that you must take into account the precautionary principle in deciding whether or not to approve the taking of an action. The precautionary principle requires that, if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
176. This recommendation report and the preliminary documentation (Attachment D) contain information on the long-term and short-term economic, environmental, social and equitable considerations that are relevant to the decision and are presented for your consideration.
177. The Department has considered the biodiversity principle and ecological integrity in relation to relevant MNES and in recommending that the proposed action be approved. The Department considers the proponent's commitments to avoid and mitigate the impacts of the proposed action, particularly the implementation of existing management plans, and the

recommended proposed conditions of approval, allow for the proposed action to not have serious or irreversible impacts on biological diversity and ecological integrity.

178. The Department considers the costs of avoidance and mitigation measures for any relevant impacts provide appropriate pricing and incentive mechanisms for the protection of MNES.
179. Overall, the Department considers there is sufficient information to conclude the proposed action is unlikely to have unacceptable impacts on MNES if it is undertaken in accordance with the proponent's commitments to avoid, mitigate and compensate for the impacts of the proposed action and the proposed conditions of approval.

Preliminary documentation, and the recommendation report, relating to the proposed action (section 136(2)(bc))

180. In accordance with section 136(2)(bc)(i), the final preliminary documentation relating to the action has been given to the Minister (Attachment D) under section 95B(1) of the EPBC Act.
181. In accordance with section 136(2)(bc)(ii), this document forms the recommendation report relating to the action given to the Minister in accordance with section 95C of the EPBC Act.

Any other information the Minister has on the relevant impacts of the action (section 136(2)(e))

182. No comments were received on the draft preliminary documentation (Attachment E2).

Any relevant comments given to the Minister in accordance with an invitation under section 131, 131AA or 131A (section 136(2)(f) and section 131AA(6))

183. Letters notifying and inviting comment from the proponent, Minister for Resources and Northern Australia, Minister for Agriculture and Water Resources, Minister for Indigenous Affairs and Queensland DES on the proposed decision are at Attachment C for your signature.
184. The above parties will be given 10 business days to comment on the proposed decision and conditions of approval. Any comments received in response to these invitations will be included in the final decision briefing package for consideration.

Any relevant advice obtained by the Minister from the IESC in accordance with section 131AB (section 136(2)(fa))

185. Advice from the IESC on this proposed action is available at Attachment E8 and an analysis of this advice is included in the Assessment section above.

Any information given to the Minister in accordance with a request under section 132A (section 136(2)(g))

186. To date, the Minister has not requested a notice under section 132A of the EPBC Act.
187. The Minister may reconsider the possible application of section 132A when the final decision on whether or not to approve the taking of the proposed action is made and what conditions, if any, to attach to an approval.

Other considerations

Person's environmental history (section 136(4))

188. In deciding whether or not to approve the taking of the proposed action, and what conditions to attach to the approval, the Minister may, under section 136(4) of the EPBC Act, consider

whether the person proposing to take the action is a suitable person to be granted an approval, having regard to:

- the person's history in relation to environmental matters;
- if the person is a body corporate – the history of its executive officers in relation to environmental matters; and
- if the person is a body corporate that is a subsidiary of another body or company (the parent body) – the history in relation to environmental matters of the parent body and its executive officers.

189. The preliminary documentation states QGC Pty Ltd notified the Qld State environmental regulator of a release of brine from its Water Treatment Plant brine pipeline which was not in accordance with its corresponding Environmental Authority. In response to this incident, the Qld environmental regulator continued with legal proceedings and found QGC to be in non-compliance with two conditions of its Environmental Authority. No conviction was recorded.

190. The Department has conducted a search of its compliance database to determine whether the proponent has an adverse compliance history in respect of the EPBC Act. On 31 October 2019 (Attachment E11), the Department's Office of Compliance has advised that QGC Pty Ltd has been issued with eight Infringement Notices for contravening conditions of approval:

- 15 April 2011 – QGC Pty Ltd were served with three infringement notices (s497/s142B offence EPBC Act) to the value of \$6,600 (total value \$19,800) for breach of EPBC approval conditions relating to their LNG project. The company commenced operations before a management plan had been approved.
- 25 June 2012 – QGC Pty Ltd were issued three infringement notices (s497/s142B offence EPBC Act) valued at \$6,600 each for breach of approval conditions. The fines totalled \$19,800.
- 18 July 2014 – QGC Pty Ltd were issued with two infringement notices totalling \$20,400 for breaching conditions of approval for EPBC 2008/4398. Condition 31 required QGC Pty Ltd to secure offsets by 22 October 2013; and Condition 34 required QGC Pty Ltd to secure a Rehabilitation Area offset of at least 700 hectares by 22 October 2013.

191. Considering the above and the proposed conditions of approval, especially those pertaining to reporting and auditing requirements, the Department considers QGC Pty Ltd is a suitable person to be granted an approval.

Considerations in deciding on conditions (section 134)

Section 134(1)

192. In accordance with section 134(1), the Minister may attach a condition to the approval of the action if he or she is satisfied that the condition is necessary or convenient for:

- protecting a matter protected by a provision of Part 3 for which the approval has effect (whether or not the protection is protection from the action); or
- repairing or mitigating damage to a matter protected by a provision of Part 3 for which the approval has effect (whether or not the damage has been, will be or is likely to be caused by the action).

193. In accordance with section 134(2), the Minister may attach a condition to the approval of the action if he or she is satisfied that the condition is necessary or convenient for:

- protecting from the action any matter protected by a provision of Part 3 for which the approval has effect; or
- repairing or mitigating damage that may or will be, or has been, caused by the action to any matter protected by a provision of Part 3 for which the approval has effect.

194. Section 134(2) does not limit section 134(1).

195. As discussed in the Assessment section above, and in the Department's proposed decision briefing package, all proposed conditions of approval are necessary or convenient to protect, repair and/or mitigate impacts on a matter protected by provision of Part 3 for which the approval has effect.

Section 134(3)

196. Section 134(3) provides examples of the kinds of conditions that the Minister may attach to an approval. The Department has recommended a number of proposed conditions consistent with this section of the EPBC Act.

197. The Department considers the proposed conditions of approval at Attachment B are within the scope of the Minister's powers under section 134 of the EPBC Act.

Section 134(4)

198. In accordance with section 134(4), in deciding whether to attach a condition to an approval, the Minister must consider:

- any relevant conditions that have been imposed, or the Minister considers are likely to be imposed, under a law of a State or self-governing Territory or another law of the Commonwealth on the taking of the action;

199. The Queensland EA is yet to be amended to include the expansion of works associated with the proposed action. Therefore, the Queensland Government is yet to set conditions of approval relating to the proposed action. However, the Department has considered the condition attached to the existing EA. The Department has drafted a letter for your signature to invite the Queensland DES to provide comment on your proposed conditions to allow for conditions of approval to be aligned across the two environmental approvals where possible.

(aa) information provided by the person proposing to take the action or by the designated proponent of the action;

200. All relevant information provided by the proponent has been included in the Department's proposed decision briefing package to consider in deciding whether to attach the proposed conditions of approval. The proponent will be given 10 business days to comment on the proposed decision and conditions of approval. The comments provided by the proponent will be included in the final approval decision briefing package for consideration.

- the desirability of ensuring as far as practicable that the condition is a cost effective means for the Commonwealth and a person taking the action to achieve the object of the condition.

201. The Department considers the proposed conditions of approval will be cost effective for both the proponent and Commonwealth, and will ensure that MNES are protected over time.

**Requirements for decisions about listed threatened species and communities
(section 139)**

202. In deciding whether or not to approve for the purposes of a subsection of section 18 or section 18A the taking of an action, and what conditions to attach to such an approval, the Minister must not act inconsistently with:

(a) Australia's obligations under:

- (i) the Biodiversity Convention; or
- (ii) the Apia Convention; or
- (iii) CITES; or

(b) a recovery plan or threat abatement plan.

203. If:

(a) the Minister is considering whether to approve, for the purposes of a subsection of section 18 or section 18A, the taking of an action; and

(b) the action has or will have, or is likely to have, a significant impact on a particular listed threatened species or a particular listed threatened ecological community;

- the Minister must, in deciding whether to so approve the taking of the action, have regard to any approved conservation advice for the species or community.

The Biodiversity Convention

204. The Biodiversity Convention is available at:

<http://www.austlii.edu.au/au/other/dfat/treaties/ATS/1993/32.html>.

205. The objectives of the Biodiversity Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Consideration

206. The proposed action was assessed by preliminary documentation which included a process for public review and comment. A revised draft preliminary documentation was also published voluntarily by the proponent for public review and comment.

207. The preliminary documentation identified the impacts of the proposed action on MNES and included commitments to avoid, mitigate and manage those impacts. These commitments are discussed in the Assessment section above.

208. In addition to the commitments proposed by the proponent, the Department has recommended proposed conditions of approval which require avoidance, mitigation and management, and offset measures, for relevant MNES. The proposed conditions of approval require information related to the proposed action to be publically available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

209. The Department considered the Biodiversity Convention's ultimate aim of conservation of listed threatened species and communities in the wild when recommending the proposed conditions of approval.
210. The Department considers that, taking into account the information in the preliminary documentation, the proponent's avoidance, mitigation and management measures, and the proposed conditions of approval, the proposed action will not have an unacceptable impact on listed threatened species and communities.
211. As such, the Department is satisfied that the approval of the proposed action, and the proposed conditions of approval, are not inconsistent with Australia's obligations under the Biodiversity Convention.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

212. CITES is available at: www.austlii.edu.au/au/other/dfat/treaties/ATS/1976/29.html.
213. CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Consideration

214. The Department is satisfied that the approval of the proposed action, and the proposed conditions of approval, are not inconsistent with CITES as the proposed action does not involve international trade in fauna or flora.

Convention on the Conservation of Nature in the South Pacific (Apia Convention)

215. The Apia Convention is available at:
<http://www.austlii.edu.au/au/other/dfat/treaties/ATS/1990/41.html>.
216. The Apia Convention encourages the creation of protected areas which together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species), as well as superlative scenery, striking geological formations, and regions and objects of aesthetic interest or historic, cultural or scientific value.

Consideration

217. The Apia Convention was suspended with effect from 13 September 2006. While this Convention has been suspended, Australia's obligations under the Convention have been taken into consideration.
218. The Department is satisfied that the approval of the proposed action, and the proposed conditions of approval, are not inconsistent with Australia's obligations under the Apia Convention.

Recovery Plans and Threat Abatement Plans

219. As stated in the Assessment section above, there are no recovery plans relevant to making the recommendations for each listed threatened species and ecological communities discussed above.
220. The threat abatement plan relevant to the proposed action and assessment are at [Attachment H](#).
221. Given the discussion at paragraph 130-133 above, the Department is satisfied the approval of the proposed action, and the proposed conditions of approval, are not inconsistent with

threat abatement plan above. Further, the Department has considered all relevant threat abatement plans and is satisfied the approval of the proposed action, and proposed conditions of approval, are not inconsistent with these statutory documents.

Conservation Advice

222. The approved conservation advices relevant to the proposed action and assessment are at Attachment H and below:

- a. Department of Sustainability, Environment, Water, Population and Communities (2012). *Approved Conservation Advice for Phascolarctos cinereus (combined populations in Queensland, New South Wales and the Australian Capital Territory)*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from: www.environment.gov.au/biodiversity/threatened/species/pubs/197-conservation-advice.pdf.
- b. Threatened Species Scientific Committee (2016). *Conservation Advice Petauroides volans greater glider*. Canberra: Department of the Environment. Available from: www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-20160525.pdf.
- c. Threatened Species Scientific Committee (2015). *Conservation Advice Nyctophilus corbeni south-eastern long-eared bat*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83395-conservation_advice-01102015.pdf
- d. Department of the Environment (2013). *Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservation-advice.pdf>

223. As discussed in the Assessment section above, the Department has had regard to the approved conservation advices relevant to the proposed action and has given consideration to the likely impacts of the proposed action on listed threatened species and communities throughout this recommendation report. For those reasons, the Department considers the approval of the proposed action, and proposed conditions of approval, are not inconsistent with the above conservation advices.

Minister not to consider other matters

224. In deciding whether or not to approve the taking of an action, and what conditions to attach to an approval, the Minister must not consider any matters that you are not required or permitted, by Subdivision B, Division 1, Part 9 of the EPBC Act, to consider.

Condition-setting Policy

225. The Department has considered the likely scope and severity of the impacts to MNES, and the proposed avoidance, mitigation and management measures, and determined it is likely the proposed action will result in a residual significant impact on the Koala, Greater Glider and SELEB.

226. The Department considers environmental offsets in accordance with the EPBC Act Offsets Policy are required to compensate for the residual significant impact on the Koala, Greater Glider and SELEB as a result of the proposed action.

227. Further, the Department considers the proponent is required to implement the Constraints Protocol, Significant Species Management Plan, Biosecurity Control Manual and Remediation, Rehabilitation and Recovery Monitoring Plan to ensure the proponent's commitments and proposed avoidance, mitigation and management measures are implemented to protect relevant listed threatened species and communities from direct and indirect impacts.
228. The Department considers that appropriate monitoring and reporting is required to ensure the proponent achieves their commitment of no adverse impacts on GDEs. The Department also considers that risk assessments of high risk drilling fluid compounds is necessary for the protection of water resources, in line with advice received from the IESC.
229. Accordingly, the Department considers it is necessary and convenient to apply proposed conditions of approval to the proposed action, as detailed in Attachment B.
230. In applying this analysis, the Department has had regard to the *EPBC Act Condition-setting Policy* (2016).
231. Advice from the Department's General Counsel Branch was also sought on the proposed conditions. The advice received is at Attachment E12 and has been considered in drafting the proposed conditions of approval.

Duration of approval

232. The proponent states the proposed action is to expand the existing CSG mining operations for the Surat North CSG Project until 2060.
233. The Department recommends the approval remain valid until 2082 to allow sufficient time for the completion of construction, operation and decommissioning of the proposed action, the implementation of measures to protect MNES and the conservation benefit of the required environmental offset to be realised.

Conclusion

234. The Department considers the impacts of the proposed action on relevant MNES will not be unacceptable, provided the proposed action is undertaken in accordance with the proposed avoidance, mitigation and management measures described in the preliminary documentation, and assuming compliance with the proposed conditions of approval.
235. Having considered all matters and factors required to be considered under the EPBC Act in deciding whether or not to approve the action, the Department recommends the proposed action be approved, subject to the proposed conditions of approval.

PROPOSED APPROVAL

Surat North CSG Project, Queensland (EPBC 2018/8276)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). Note that section 134(1A) of the **EPBC Act** applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	QGC Pty Limited
ACN of approval holder	089 642 553
Action	To construct, operate and decommission up to 740 coal seam gas wells, and associated infrastructure, in the Surat Basin Acreage Development, approximately 20 km west of Wandoan in Queensland (see EPBC Act referral 2018/8276).

Proposed Approval decision

My decisions on whether or not to approve the taking of the action for the purposes of each controlling provision for the action are as follows.

Controlling Provisions

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve
Coal seam gas or large coal mining development impact on water resources	
Section 24D	Approve
Section 24E	Approve

Period for which the approval has effect

This approval has effect until 31 December 2082.

Decision-maker

Name and position	Andrew McNee Assistant Secretary of Assessments and Governance Branch Department of the Environment and Energy
Signature	PROPOSED DECISION DO NOT SIGN
Date of decision	PROPOSED DECISION - DO NOT DATE

Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

Project Area

1. For the purpose of the action, the approval holder must not take any activities outside the **project area**.

Disturbance Limits

2. The approval holder must not **clear** more than:
 - a) 80 ha of **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat**.
 - b) 62 ha of **Koala (*Phascolarctos cinerus*) (combined populations of Qld, NSW and the ACT) habitat**.
 - c) 62 ha of **Greater Glider (*Petauroides volans*) habitat**.
 - d) 9 ha of **Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community**.

Pre-clearance Surveys

3. The approval holder must undertake pre-clearance surveys of areas to be **cleared**.
4. Pre-clearance surveys must be undertaken by a **suitably qualified field ecologist** and undertaken in accordance with the **Department's Survey Guidelines** in effect at the time of the pre-clearance survey or other survey methodology endorsed by the **Department** in writing and provide an assessment of the **habitat quality** of the areas to be **cleared**.
5. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report must be published on the **website** within 6 months of completion and remain published on the **website** for the period of approval. The approval holder must notify the **Department** within five **business days** of publishing each pre-clearance survey report.

Listed Threatened Species and Communities Management Plans

6. The approval holder must manage **impacts to listed threatened species and communities** that are known to occur within the **project area** in accordance with the **Significant Species Management Plan (SSMP)**.
7. If a **listed threatened species or community** which are not addressed in the **SSMP** are identified in the **project area**, the approval holder must revise the **SSMP** to include management measures to avoid and/or mitigate **impacts to that listed threatened species or community** and submit, within 3 months of identifying this **listed threatened species or community**, a copy of the revised **SSMP** to the **Minister** for written approval. The approved revised **SSMP** must be implemented.
8. The approval holder must manage to reduce/minimise **impacts to listed threatened species and communities** from pest and weed species in accordance with the **Biosecurity Control Manual**.
9. The approval holder must undertake the action in accordance with the **Remediation, Rehabilitation and Recovery Monitoring Plan**.
10. The approval holder must undertake the action in accordance with the **Constraints Planning and Field Development Protocol**.

Environmental Offsets

11. The approval holder must prepare an Offset Management Plan that details the provision of offsets in accordance with the **Offset Assessment Guide values**. The Offset Management Plan must:

- a) be prepared by a **suitably qualified person**, and in accordance with the principles of the **EPBC Act Environmental Offsets Policy** and the **Department's Environmental Management Plan Guidelines**;
 - b) demonstrate how the offsets compensate for the **impacts** of the action in accordance with the **Offset Assessment Guide values** and consistent with the **EPBC Act Environmental Offsets Policy**; and
 - c) include, but not be limited to:
 - i. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses;
 - ii. baseline data and other supporting evidence that documents the presence and baseline quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** within the offset area/s;
 - iii. maps and **shapefiles** of the offset area/s;
 - iv. specific objectives to demonstrate **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** quality improvement over the life of the approval;
 - v. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** within the offset area/s;
 - vi. key performance indicators to demonstrate the improvement to the quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** within the offset area/s;
 - vii. the nature, timing and frequency of monitoring to determine the success of management actions against key performance indicators;
 - viii. the timing for the provision of an annual monitoring report to the **Department**. The monitoring report must include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period;
 - ix. an assessment of risks that the key performance indicators will not be met and identification of the sources of those risks and strategies for managing them;
 - x. indicative corrective actions that will be implemented in the event monitoring activities indicate key performance indicators are not or are unlikely to be achieved;
 - xi. the roles and responsibilities for implementing the management actions;
 - xii. evidence of consistency with relevant conservation advices, recovery plans and/or threat abatement plans.
12. The approval holder must not **commence Stage 2** unless the **Minister** has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.
 13. The approval holder must **legally secure** the offset area/s proposed in the Offset Management Plan approved by the **Minister** within 9 months of the date of the **Minister's** approval of the Offset Management Plan.
 14. The approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the **Minister** for written approval. The Revised Offset

Management Plan must constitute a revision of the approved Offset Management Plan, taking account of all new information, including the results of all pre-clearance surveys. If the residual **impact** of the action on **listed threatened species and communities** is greater than that predicted in the approved Offset Management Plan, as demonstrated through the **habitat quality** assessment of the areas to be **cleared**, an offset or offsets to compensate for the additional residual **impact** must be provided. Any additional offset or offsets must be consistent with the **EPBC Act Environmental Offsets Policy**. The approval holder must implement that Revised Offset Management Plan.

15. The approval holder must **legally secure** the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the **Minister's** approval of the Revised Offset Management Plan.

Note 1: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect to impacts to each individual **listed threatened species and communities** being offset.

Note 2: The **Minister** may determine that offsets approved by the Queensland Government satisfy the requirements for offsetting **listed threatened species and communities** as long as any required offsets comply with the principles of the **EPBC Act Environmental Offsets Policy** or an equivalent Queensland Government offsets policy that ensures the maintenance and protection of **listed threatened species and communities**.

Chemical Risk Assessment

16. Prior to the use of any **drilling fluid compound/s**, the approval holder must undertake a **chemical risk assessment**. The **chemical risk assessment** must be undertaken in accordance with **best practice risk assessment methodology**.
17. The approval holder must not use any **drilling fluid compound/s** determined by the **best practice risk assessment technology** to be **high risk** until the **chemical risk assessment** for that **drilling fluid compound** has been approved in writing by the **Minister**.
18. The approval holder must implement the approved **chemical risk assessment**.

Water Resources Monitoring and Management

19. The approval holder must ensure that there is no **adverse effect** on the **function of groundwater dependent ecosystems (GDEs)** in, or within 30 km of, the **project area** as a result of the project .
20. To ensure there is no **impact** on the **function of GDEs**, the approval holder must provide for the approval of the **Minister**:
 - a) description and location of all identified **GDEs**;
 - b) **performance criteria**;
 - c) **trigger values**; and
 - d) **limits**.
21. The description and location of all identified **GDEs**, **performance criteria**, **trigger values** and **limits** must be submitted to the **Minister** with an accompanying GDE Program prepared by a **suitably qualified water resources expert** and accompanied by a peer review undertaken by an **independent suitably qualified water resources expert**, which explains the scientific basis on which the **performance criteria**, **trigger values** and **limits** have been derived to ensure that Condition 19 will be met. The terms of reference of the peer review must be approved by the **Minister** in writing. The GDE Program must include, and provide justification of:
 - a) hydrogeological conceptual modelling, including local scale modelling and consideration of cumulative impacts;
 - b) a site-specific risk assessment;
 - c) past and proposed ongoing monitoring;

- d) proposed mitigation strategy, including corrective action(s) if **trigger values** and/or **limits** are reached or exceeded and consideration of cumulative impacts;
 - e) evidence to confirm **adverse affects** on the **function** of **GDEs** have not occurred or are not occurring as a result of **Stage 1** and to demonstrate that the proposed **trigger values** and **limits** have not been influenced by the **commencement of Stage 1**; and
 - f) proposed reporting.
22. The approval holder must not **commence Stage 2** unless the description and location of all identified **GDEs**, **performance criteria**, **trigger values** and **limits** have been approved by the **Minister** in writing.
 23. If the description and location of all identified **GDEs**, **performance criteria**, **trigger values** and **limits** have not been approved by the **Minister** in writing within 6 months of the **commencement of Stage 1**, the approval holder must cease groundwater extraction until the description and location of all identified **GDEs**, **performance criteria**, **trigger values** and **limits** are approved by the **Minister** in writing.
 24. The approval holder must undertake the action in accordance with the approved **performance criteria**, **trigger values** and **limits**.
 25. For each 12 month period following the date of **commencement of groundwater extraction**, or in accordance with a date otherwise agreed in writing by the **Minister**, the approval holder must submit an outcomes report prepared by a **suitably qualified water resources expert** and accompanied by a peer review undertaken by an **independent suitably qualified water resources expert**, for the written acceptance of the **Minister**. The terms of reference for the peer reviews must be approved by the **Minister** in writing. The approval holder must not **commence the action** unless the terms of reference for the peer reviews have been approved by the **Minister** in writing. Each outcomes report, accompanied by the peer review, must be submitted to the **Minister** within 3 months of the end of the 6 month period that is the subject of the outcomes report.
 26. The outcomes report submitted under Condition 25 must include, but not be limited to:
 - a) Performance against the approved **trigger values** and **limits**, including analysis of trends that indicate that reaching or exceeding an approved **trigger value** or **limit** is likely during or before the next reporting period.
 - b) Any changes to the existing regulatory arrangements in place to avoid **adverse effects** to the **function** of **GDEs**, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.
 27. The **Minister** may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the **function** of **GDEs**.
 28. If, on the basis of the information provided (or that has not been provided) under Condition 25 and/or Condition 27, and/or other information available to the **Minister**, the **Minister** determines that the action has had, or is likely to have, an **adverse effect** on the **function** of **GDEs**, the **Minister** may notify the approval holder in writing in accordance with the provisions of Condition 30.
- Note 3:** The **Minister** may throughout the life of the approval seek advice from experts, or an expert panel. As a consequence, specific matters identified through such advice may need to be addressed in the GDE Program or any outcomes report. Where such advice is sought, the approval holder will be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure reports are based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the approval.
29. If the approval holder detects that a **trigger value** has been reached or exceeded, the approval holder must report this to the **Minister** within two **business days** of the detection. If a **trigger value** is reached or exceeded, the approval holder must submit within 20 **business days** of the detection, any proposed corrective action(s) to the **Minister** in writing and demonstrate that the

proposed corrective action(s) will not result in **impacts** beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the **Minister** agrees, in writing, that it will not result in **impacts** beyond the scope of the action.

30. If the approval holder detects that a **limit** has been reached or exceeded, the approval holder must report this to the **Minister** within one **business day** of the detection. The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action within 48 hours of detecting that a **limit** has been reached or exceeded, or of receiving notification that the **Minister** has determined that an **adverse effect** on the **function of GDEs** has occurred or is likely to occur.
31. If the approval holder has been required to cease groundwater extraction pursuant to Condition 28, the approval holder must not recommence groundwater extraction until the **impact** has been **reversed**, or the **Minister** has agreed, in writing, that no **adverse effect** on the **function of GDEs** has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the **Minister** in writing. Approval to recommence groundwater extraction may be subject to conditions that the **Minister** considers reasonable. The **Minister** may direct the approval holder to implement corrective action(s) at the approval holder's expense.
32. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all identified **GDEs**, **performance criteria**, **trigger values** and **limits** for the written approval of the **Minister**. The revised **performance criteria**, **trigger values** and **limits** must be in accordance with **coal seam gas water management guidelines**.

Part B – Standard administrative conditions

Notification of date of commencement of Stage 1

33. The approval holder must notify the **Department** in writing of the date of **commencement of Stage 1** within 10 **business days** after the date of **commencement of Stage 1**.
34. If the **commencement of Stage 1** does not occur within 5 years from the date of this approval, then the approval holder must not **commence Stage 1** without the prior written agreement of the **Minister**.

Compliance records

35. The approval holder must maintain accurate and complete **compliance records**.
36. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note 4: Compliance records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department's** website or through the general media.

Preparation and publication of plans

37. The approval holder must:
 - a. submit **plans** electronically to the **Department**;
 - b. publish each **plan** on the **website** within 20 **business days** of the date the **plan** is approved by the **Minister** or of the date a revised action management plan is submitted to the **Minister** or the **Department**, unless otherwise agreed to in writing by the **Minister**;
 - c. exclude or redact **sensitive ecological data** from **plans** published on the **website** or provided to a member of the public; and
 - d. keep **plans** published on the **website** until the end date of this approval.
38. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a **plan** or conditions of this

approval, is prepared in accordance with the **Department's Guidelines for biological survey and mapped data** (2018) and submitted electronically to the **Department** in accordance with the requirements of the **plan** or conditions of approval.

Annual compliance reporting

39. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:
- a. publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;
 - b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within five **business days** of the date of publication;
 - c. keep all **compliance reports** publicly available on the **website** until this approval expires;
 - d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and
 - e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within 5 **business days** of publication.

Note 5: Compliance reports may be published on the **Department's** website.

Reporting non-compliance

40. The approval holder must notify the **Department** in writing of any: **incident**; non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than two **business days** after becoming aware of the **incident** or non-compliance. The notification must specify:
- a. any condition which is or may be in breach;
 - b. a short description of the **incident** and/or non-compliance; and
 - c. the location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.
41. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying:
- a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;
 - b. the potential impacts of the **incident** or non-compliance; and
 - c. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

42. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted for the 12 month period from the date of this approval and for every subsequent 12 period, or as otherwise requested in writing by the **Minister**.
43. For each **independent audit**, the approval holder must:
- a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;

- b. only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and
 - c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.
44. The approval holder must publish the audit report on the **website** within 10 **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.

Revision of action management plans

45. The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister** under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the **EPBC Act**. If the **Minister** approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.
46. The approval holder may choose to revise an action management plan approved by the **Minister** under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the RAMP would not be likely to have a **new or increased impact**.
47. If the approval holder makes the choice under condition 46 to revise an action management plan without submitting it for approval, the approval holder must:
- a. notify the **Department** in writing that the approved action management plan has been revised and provide the **Department** with:
 - i. an electronic copy of the RAMP;
 - ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;
 - iii. an explanation of the differences between the approved action management plan and the RAMP;
 - iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a **new or increased impact**; and
 - v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 **business days** after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the **Department**.
 - b. subject to condition 46, implement the RAMP from the RAMP implementation date.
48. The approval holder may revoke their choice to implement a RAMP under condition 46 at any time by giving written notice to the **Department**. If the approval holder revokes the choice under condition 46, the approval holder must implement the action management plan in force immediately prior to the revision undertaken under condition 46.
49. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the RAMP would be likely to have a **new or increased impact**, then:
- a. condition 46 does not apply, or ceases to apply, in relation to the RAMP; and
 - b. the approval holder must implement the action management plan specified by the **Minister** in the notice.
50. At the time of giving the notice under condition 49 the **Minister** may also notify that for a specified period of time, condition 46 does not apply for one or more specified action management plans.

Note 6: conditions 4, 47, 48 and 49 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised action management plan, at any time, to the **Minister** for approval.

Completion of the action

51. Within 30 days after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

In these conditions, except where contrary intention is expressed, the following definitions are used:

Adverse effect/s means an exceedance of a **limit** as a result of the project.

Aquatic GDEs means ecosystems dependent on the surface expression of groundwater, including:

- river baseflow systems, aquatic and riparian ecosystems that exist in or adjacent to streams (including the hyporheic zone) which are fed by groundwater; and
- wetlands (aquatic communities and fringing vegetation dependent on groundwater-fed lakes and wetlands), including palustrine and lacustrine wetlands that receive groundwater discharge and spring and swamp ecosystems.

Best practice risk assessment methodology means a risk assessment in accordance with best practice national or international standards and guidelines including, but not limited to:

- a) US EPA (2014). EPA-Expo-Box (A Toolbox for Exposure Assessors), or subsequent revision.
- b) OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management, or subsequent revision.

Biosecurity Control Manual means the *HSSE Risk Control Manual, QCQGC-BX00-ENV-MAN-000002, Revision 4*, May 2018, approved on 15 May 2018, or subsequent revision approved by the **Minister**.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community means the EPBC listed threatened ecological community as described in the *Approved Conservation Advice for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community* (2013), or subsequent revision.

Business day/s means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Cease work provisions means a protocol to promptly discontinue all aspects of the action which have the potential to cause any impact to the **function** of **GDEs** and to urgently implement corrective action to reduce **performance criteria** below **limits** and **trigger values**.

Chemical risk assessment means an assessment prepared by a **suitably qualified person** to assess the risk of chemicals used in drilling operations for coal seam gas extraction on **protected matters**.

Clear/ed/ing means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Coal seam gas water management guidelines means any **Departmental** policies, guidance or agreements that relate to coal seam gas water management and/or monitoring.

Commencement of clearing means the first instance of any cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Commence/ment of Stage 1 means the first instance of any specified activity associated with **Stage 1** including clearing of vegetation and **construction** of any infrastructure. **Commencement of Stage 1** does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs;
- ii. install signage and /or temporary fencing to prevent unapproved use of the project area;
- iii. protect environmental and property assets from fire, weeds and pests, including **construction** of fencing, and maintenance of existing surface access tracks; and
- iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters**.

Commence/ment of Stage 2 means the first instance of any specified activity associated with **Stage 2** including clearing of vegetation and **construction** of any infrastructure.

Commencement of groundwater extraction means the first instance of groundwater extraction.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department's** preferred spatial data format is **shapefile**. **Completion data** includes information detailing the date, location, approved project area, and actual total **cleared area/s**, total area and type of **listed and threatened species and communities** habitat **cleared** within the project area, **listed threatened species and communities** habitat **quality** within **retention area/s**, actual total **retention area/s**, the type of **listed threatened species and communities** habitat within **retention area/s**, actual total area of **listed threatened species and communities** habitat and the **habitat quality** within the offset area/s required under Conditions 11 and 14.

Completion of the action means all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

- i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;
- ii. consistent with the **Department's Annual Compliance Report Guidelines (2014)**;
- iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and
- iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Constraints Planning and Field Development Protocol means the *Constraints Planning and Field Development Protocol – Surat Basin Acreage Revision 2*, November 2017, approved on 4 January 2018, or subsequent revision approved by the **Minister**.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Department/al means the Australian Government agency responsible for administering the **EPBC Act**.

Drilling fluid compound/s means the drilling fluid compound/s that were listed in the **preliminary documentation**, and any drilling fluid compound/s that were not listed in the **preliminary documentation**.

Environmental Management Plan Guidelines means the *Environmental Management Plan Guidelines* (2014), or subsequent revision.

Environmental Offsets Policy means the **EPBC Act Environmental Offsets Policy** (2012), or any subsequent revision, including the Offset Assessment Guide.

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

Function means the groundwater, surface water and ecosystem components (including organisms), processes and benefits/services that characterise and support the occurrence of the **GDE**, including support for biological diversity or species composition.

Greater Glider (*Petauroides volans*) habitat means all areas of Eucalypt forests or woodlands that contain, or have the potential to contain, hollow-bearing trees.

Groundwater Dependent Ecosystem/s (GDE/s) means **Aquatic GDEs, subterranean GDEs and terrestrial GDEs**.

Habitat quality is a measure of how well the **project area** and/or offset area/s supports **listed threatened species and communities** and contributes to its ongoing viability, relative to the baseline **habitat quality** data provided in Offset Management Plan. The measure of habitat quality should include site condition, site context and species individual or population persistence.

High risk means a product or chemical compound whose solubility allows the potential to enter the environment, and/or is considered hazardous based on its health hazard criteria, environmental hazard criteria and whether it has been identified as a pollutant, contaminant or hazardous good under Australian legislation or regulations.

Impact/s/ed means to suffer any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent audit: means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

Independent suitably qualified water resources expert means a person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia, who is independent of the **suitably qualified water resources expert**.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT habitat means any forest or woodland (including remnant, regrowth and modified vegetation communities) containing species that are Koala food trees or any shrub land with emergent Koala food trees.

Legally secure means to secure a covenant or similar legal agreement in relation to a site; to provide enduring protection for the site against development incompatible with conservation.

Limit/s means a threshold greater than a **trigger value** that, should it be reached or exceeded (either through modelling or monitoring), **cease work provisions** will be implemented.

Listed threatened species and communities/listed threatened species or community means a threatened species or ecological community listed under the **EPBC Act** for which this approval has effect including, but not limited to, the:

- a) South-eastern Long-eared Bat (*Nyctophilus corbeni*);
- b) Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT);
- c) Greater Glider (*Petauroides volans*); and
- d) Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Monitoring data means the data required to be recorded under the conditions of this approval.

New or increased impact means a new or increased environmental impact or risk relating to any **protected matter**, when compared to the likely impact of implementing the action management plan that has been approved by the **Minister** under condition 6, 7, 8, 9 or 10, including any subsequent revisions approved by the **Minister**, as outlined in the *Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017)*.

Offset Assessments Guide values means the offset values for the **EPBC Act** listed threatened South-eastern Long-eared Bat (*Nyctophilus corbeni*), Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) and Greater Glider (*Petauroides volans*), as shown at Attachment C.

Performance criteria means specific parameters, associated with and relevant to GDE **function** that will be monitored to demonstrate that the outcome of no adverse impact is being achieved, measured at a specific time and place.

Plan(s) means any of the documents required to be prepared, submitted, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans, pre-clearance survey reports and/or peer review terms of reference).

Preliminary documentation means the *Surat Basin Acreage Development EPBC 2018/8276 – Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, July 2019, Revision 4*, provided to the Department on 8 July 2019.

Project area means the area enclosed by the red line designated 'Project Area' in Attachment A.

Protected matter means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect.

Remediation, Rehabilitation and Recovery Monitoring Plan means the *QCLNG Gasfields – Remediation, Rehabilitation, Recovery and Monitoring Plan, QCLNG-BX00-ENV-PLN-000026, Revision 2*, October 2011, approved on 20 October 2011 under EPBC Act approval 2008/4398, or subsequent revision approved by the **Minister**.

Retention area/s means an area/s (in hectares) retained within the **project area** to provide current and future habitat for **listed threatened species and communities**.

Reversed means that the **function** of GDEs have been reinstated to their pre-**impact** state and sustained for 10 **business days**.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

Significant Species Management Plan means the *Significant Species Management Plans, QCLNG Gas Field (QCLNG-BX00-ENV-PLN-000010) Revision 0*, January 2014, approved on 5 February 2014, or subsequent revision approved by the **Minister**.

South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat means as described in the *Conservation Advice Nyctophilus corbeni South-eastern Long-eared Bat (2015)*, or subsequent revision.

Stage 1 means the construction and operation of 119 coal seam gas wells with a combined maximum peak rate of groundwater production of 10 ML per day within the area shaded in green designated 'Stage 1' in Attachment B.

Stage 2 means activities associated with the action excluding **Stage 1**.

Subterranean GDEs means aquifer ecosystems, including stygofauna.

Suitably qualified field ecologist means a person who has professional qualifications and at least three years of work experience designing and implementing surveys for **listed threatened species and communities**, and can give an authoritative assessment and advice on the presence of **listed threatened species and communities** using relevant protocols, standards, methods and/or literature. If the person does not have appropriate professional qualifications, the person must have at least five years of work experience designing and implementing surveys for **listed threatened species and communities**.

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

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

Survey Guidelines means the *Matters of National Environmental Significance, Significant Impact Guidelines 1.1*, Environment Protection and Biodiversity Conservation Act 1999 (2013), *Survey Guidelines for Australia's threatened bats (2010)*, *Survey Guidelines for Australia's threatened birds (2010)*, *Survey Guidelines for Australia's threatened frogs (2010)*, *Survey guidelines for Australia's threatened fish (2011)*, *Survey guidelines for Australia's threatened mammals (2011)*, *Survey guidelines for Australia's threatened reptiles (2011)* and species-specific surveys as described in the Department's Species Profile and Threats Database profile for the relevant EPBC Act-listed threatened species.

Terrestrial GDEs means ecosystems partially or wholly dependent on the subsurface presence of groundwater.

Trigger value/s means a threshold for the **performance criteria** that, should it be reached or exceeded (either through modelling or monitoring), the approval holder will implement an appropriate management response such that a **limit** is not reached and the **trigger value** is no longer exceeded.

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

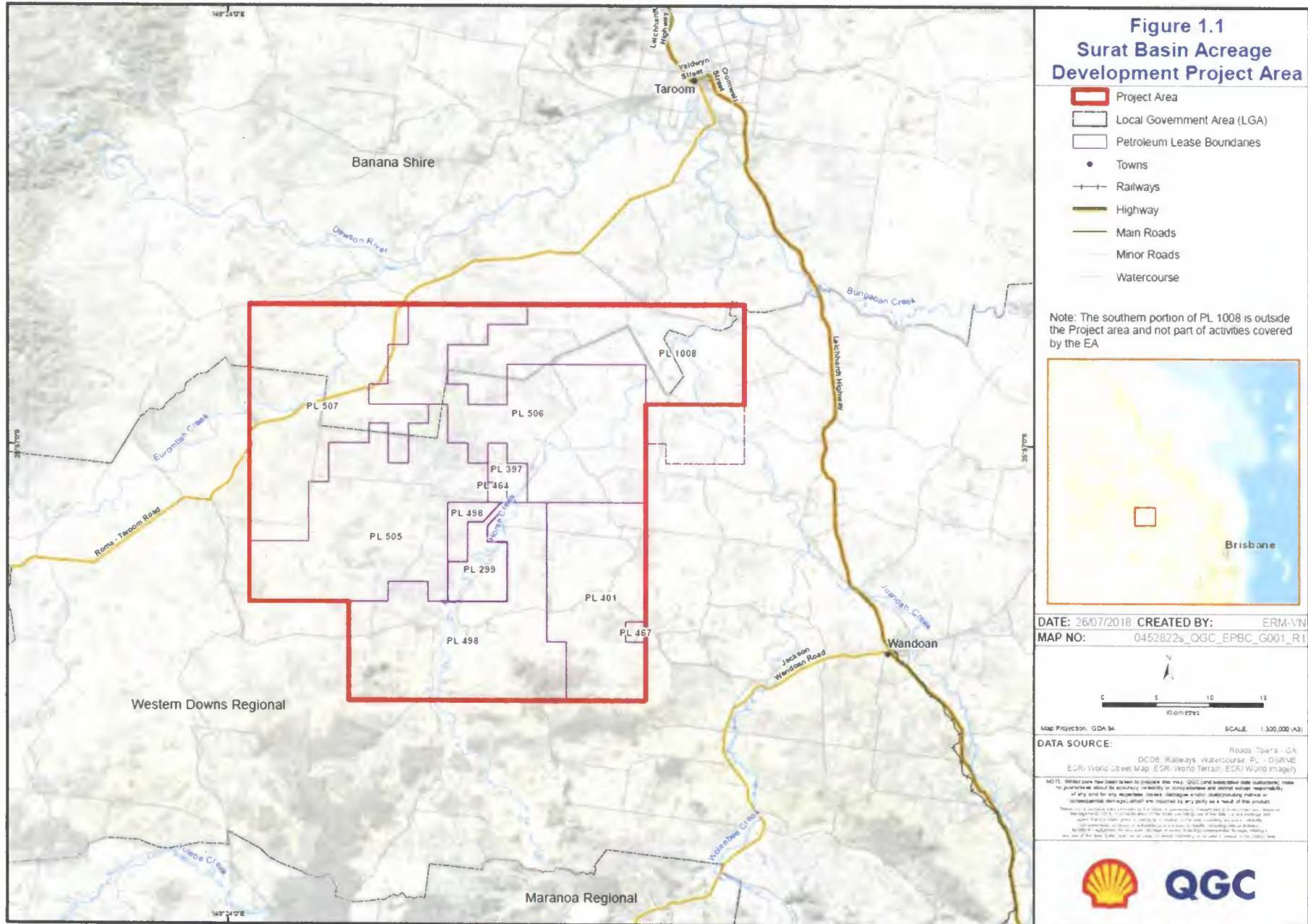
ATTACHMENTS

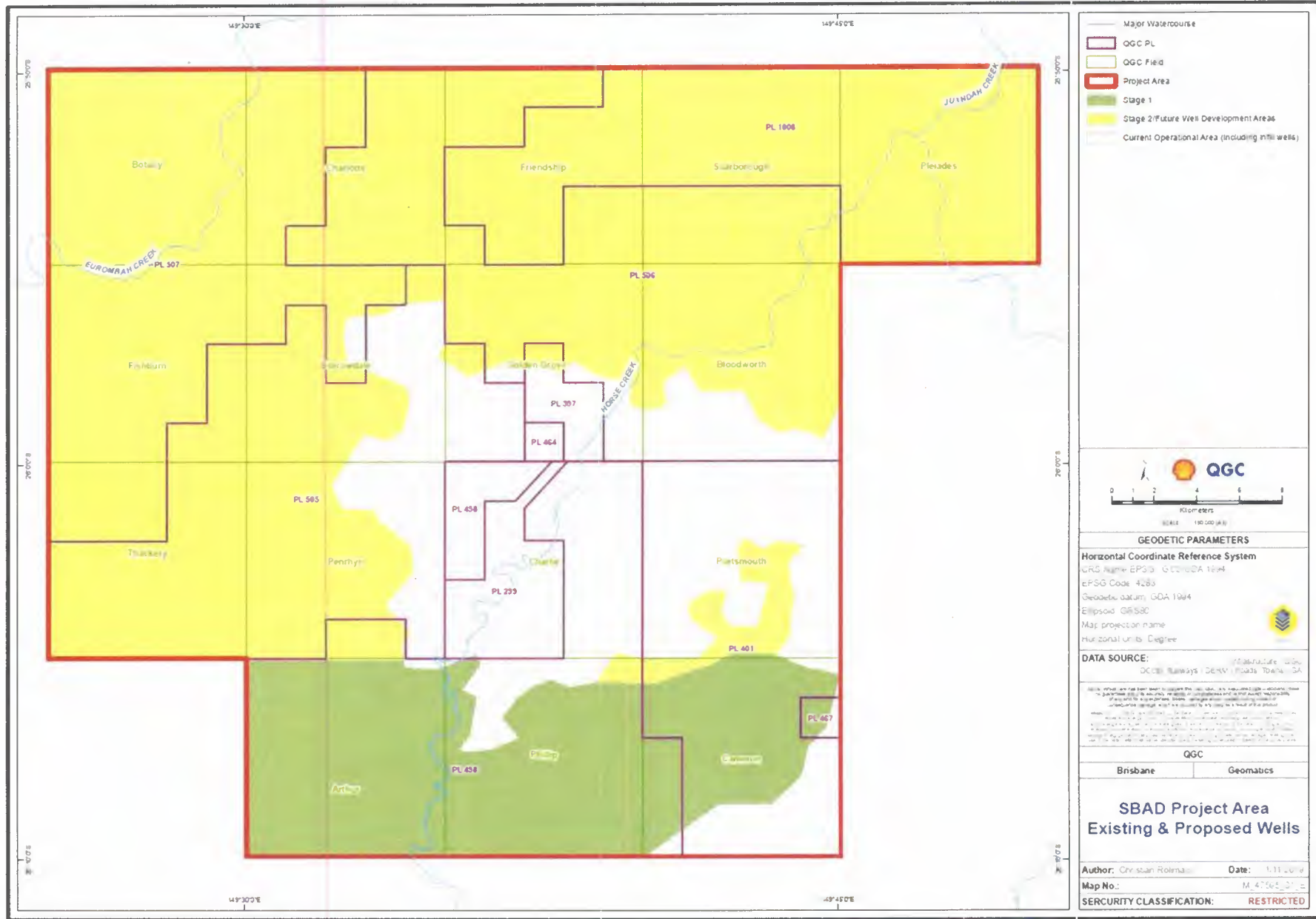
Attachment A: Project Area

Attachment B: Stage 1

Attachment C: Offset Assessment Guide values

PROPOSED





Attachment C: Offset Assessment Guide values

Relevant protected matter	South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)	Greater Glider (<i>Petauroides volans</i>)
Impact area (ha)	80	62	62
Impact quality (1-10)	6	6	6
Time over which loss is averted (years)	20	20	20
Start area (ha)	280	220	220
Risk of loss without offset (%)	0	0	0
Risk of loss with offset (%)	0	0	0
Confidence in risk of loss result (%)	95	95	95
Time until ecological benefit (years)	20	20	20
Start quality (1-10)	7	7	7
Future quality without offset (1-10)	6	6	6
Future quality with offset (1-10)	8	8	8
Confidence in quality result (%)	90	90	90

Senator the Hon Bridget McKenzie
Minister for Agriculture
Parliament House
CANBERRA ACT 2600

Dear Minister McKenzie

**Invitation to comment on proposed approval decision
Surat North CSG Project, Qld**

I am writing to you in relation to a proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. The above proposal was referred and assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for its impacts on listed threatened species and communities (sections 18 and 18A) and a water resource, in relation to coal seam gas development (sections 24D and 24E). I am proposing to approve this proposal. My proposed decision is attached.

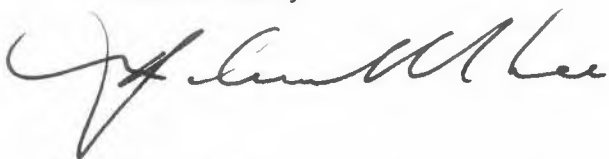
I understand that you may have administrative responsibilities relating to the action. I invite you to provide comments on my proposed decision within 10 business days of the date of this letter, including on any matters of economic or social concern that should be considered consistent with the principles of ecologically sustainable development.

Please quote the title of the action and EPBC reference, as shown at the beginning of this letter, in any correspondence. You can send information to us:

by letter Post Approvals Strategies Section
 Assessments and Governance Branch
 Department of the Environment and Energy
 GPO Box 787
 CANBERRA ACT 2601

by email PA.Strategies@environment.gov.au

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

5 November 2019

The Hon Ken Wyatt AM MP
Minister for Indigenous Australians
Parliament House
CANBERRA ACT 2600

Dear Minister Wyatt

**Invitation to comment on proposed approval decision
Surat North CSG Project, Qld**

I am writing to you in relation to a proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. The above proposal was referred and assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for its impacts on listed threatened species and communities (sections 18 and 18A) and a water resource, in relation to coal seam gas development (sections 24D and 24E). I am proposing to approve this proposal. My proposed decision is attached.

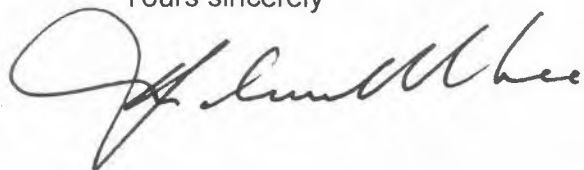
I understand that you may have administrative responsibilities relating to the action. I invite you to provide comments on my proposed decision within 10 business days of the date of this letter, including on any matters of economic or social concern that should be considered consistent with the principles of ecologically sustainable development.

Please quote the title of the action and EPBC reference, as shown at the beginning of this letter, in any correspondence. You can send information to us:

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by email PA.Strategies@environment.gov.au

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

5 November 2019



s. 47F(1)

Manager – Access
QGC Pty Ltd
GPO Box 3107
BRISBANE QLD 4001

Dear **s. 47F(1)**

**Invitation to comment on proposed approval decision
Surat North CSG Project, Qld**

I am writing to you in relation to your proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. The proposed action was referred and assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for its impacts on listed threatened species and communities (sections 18 and 18A) and a water resource, in relation to coal seam gas development (sections 24D and 24E).

I am proposing to approve the proposed action subject to conditions.

My proposed decision of approval is attached. In accordance with the EPBC Act, I invite you to provide comments on my proposed decision of approval, including the conditions which I propose to attach, within 10 business days of the date of this letter.

Please quote the title of the action and EPBC reference, as shown at the beginning of this letter, in any correspondence. You can send comments to:

by letter Post Approvals Strategies Section
 Assessments and Governance Branch
 Department of the Environment and Energy
 GPO Box 787
 CANBERRA ACT 2601

by email PA.Strategies@environment.gov.au

If you have any questions about this decision, please contact the Director of Post Approvals Strategies Section, **s. 22(1)(a)(ii)**, by email to **s. 22(1)(a)(ii)** @environment.gov.au, or telephone **s. 22(1)(a)(ii)** and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

Andrew McNee
Assistant Secretary
Assessments and Governance Branch

5 November 2019

s. 47F(1)

Director
Impact Assessment and Operational Support
Department of Environment and Science
GPO Box 2454
BRISBANE QLD 4001

Dear s. 47F(1)

**Invitation to comment on proposed approval decision
Surat North CSG Project, Qld**

I am writing to you in relation to a proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. The above proposal was referred and assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for its impacts on listed threatened species and communities (sections 18 and 18A) and a water resource, in relation to coal seam gas development (sections 24D and 24E). I am proposing to approve this proposal. My proposed decision is attached.

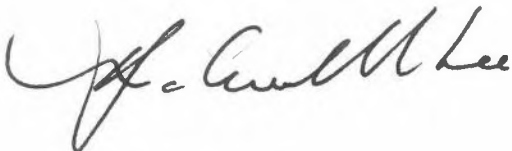
As delegated contact for the Hon Leeanne Enoch MP, Queensland Minister for the Environment and the Great Barrier Reef, Minister for Science and Minister for Arts, I invite you to provide comments on my proposed decision within 10 business days of the date of this letter, including on any matters of economic or social concern that should be considered consistent with the principles of ecologically sustainable development.

Please quote the title of the action and EPBC reference, as shown at the beginning of this letter, in any correspondence. You can send information to us:

by letter Post Approvals Strategies Section
Assessments and Governance Branch
Department of the Environment and Energy
GPO Box 787
CANBERRA ACT 2601

by email PA.Strategies@environment.gov.au

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

5 November 2019

Senator the Hon Matt Canavan
Minister for Resources and Northern Australia
Parliament House
CANBERRA ACT 2600

Dear Minister Canavan

**Invitation to comment on proposed approval decision
Surat North CSG Project, Qld**

I am writing to you in relation to a proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. The above proposal was referred and assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for its impacts on listed threatened species and communities (sections 18 and 18A) and a water resource, in relation to coal seam gas development (sections 24D and 24E). I am proposing to approve this proposal. My proposed decision is attached.

I understand that you may have administrative responsibilities relating to the action. I invite you to provide comments on my proposed decision within 10 business days of the date of this letter, including on any matters of economic or social concern that should be considered consistent with the principles of ecologically sustainable development.

Please quote the title of the action and EPBC reference, as shown at the beginning of this letter, in any correspondence. You can send information to us:

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 CANBERRA ACT 2601

by email PA.Strategies@environment.gov.au

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

5 November 2019

The Hon David Littleproud MP
Minister for Water Resources, Drought,
Rural Finance, Natural Disasters and
Emergency Management
Parliament House
CANBERRA ACT 2600

Dear Minister Littleproud

**Invitation to comment on proposed approval decision
Surat North CSG Project, Qld**

I am writing to you in relation to a proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. The above proposal was referred and assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for its impacts on listed threatened species and communities (sections 18 and 18A) and a water resource, in relation to coal seam gas development (sections 24D and 24E). I am proposing to approve this proposal. My proposed decision is attached.

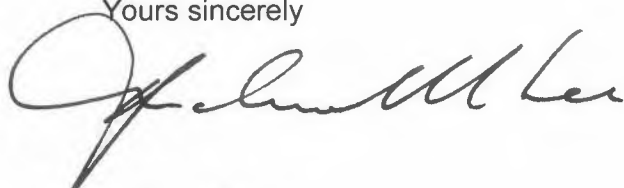
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Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

5 November 2019



**Notification of
REFERRAL DECISION AND DESIGNATED PROPONENT — Controlled action
DECISION ON ASSESSMENT APPROACH — Preliminary documentation**

Surat North CSG Project, Queensland (2018/8276)

This decision is made under section 75 and section 87 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

proposed action	To construct, operate and decommission up to 740 coal seam gas wells, and associated infrastructure, in the Surat Basin Acreage Development, approximately 20 km west of Wandoan in Queensland (see EPBC Act referral 2018/8276).
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decision on proposed action	The proposed action is a controlled action. The project will require assessment and approval under the EPBC Act before it can proceed.
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relevant controlling provisions	<ul style="list-style-type: none">• Listed threatened species and communities (sections 18 & 18A)• A water resource, in relation to coal seam gas development and large coal mining development (sections 24D & 24E)
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designated proponent	QGC Pty Ltd ACN: 089 642 553
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assessment approach	The proposed action will be assessed be preliminary documentation.
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Decision-maker

Name and position	James Barker Assistant Secretary Assessments and Governance Branch
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Signature

date of decision	15 / 11 / 2018
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Surat North CSG Project, Surat Basin Acreage Development, Queensland (EPBC 2018/8276)

Additional information required for assessment by preliminary documentation

The delegate of the Minister for the Environment determined the Surat North CSG Project is likely to have a significant impact on listed threatened species and communities (sections 18 and 18A), and water resources (sections 24D and 24E) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

It has also been determined the project will be assessed by preliminary documentation. Information about the project and its relevant impacts, as outlined in the referral documentation and provided in response to the below, is to be provided in the preliminary documentation.

General Content, Format and Style

The preliminary documentation, which includes the referral information and the additional information described below, must be a stand-alone document that should contain sufficient information to avoid the need to search out previous or supplementary reports. The preliminary documentation should take into consideration the EPBC Act Significant Impact Guidelines 1.1 and EPBC Act Significant Impact Guidelines 1.3, available at: www.environment.gov.au/epbc/guidelines-policies.html.

The document must enable interested stakeholders and the Minister to easily understand the consequences of the project on matters of national environmental significance (MNES). Information provided in the document should be objective, clear, succinct, avoid technical jargon and, where appropriate, be supported by maps, plans, diagrams, data or other descriptive detail.

Detailed technical information, studies or investigations necessary to support the information in the stand-alone document must be included as appendices. It is recommended that any additional supporting documentation and studies, reports or literature not normally available to the public from which information has been extracted be made available at appropriate locations during the period of public display of the preliminary documentation. The proponent should also make sure the preliminary documentation is made available on the Internet.

If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the Department of the Environment and Energy (the Department) on the preferred presentation of that material before submitting it to the Minister for approval for publication for public comment.

The level of analysis and detail in the stand-alone document should reflect the level of significance of the expected impacts on MNES. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment must be discussed.

The document should be written so that any conclusions reached can be independently assessed. To this end, all sources must be appropriately referenced using the Harvard standard of referencing. The reference list should include the address of any Internet webpages used as data sources.

The preliminary documentation must include a list of persons and agencies consulted and the names of, and work done by, the persons involved in preparing the preliminary documentation.

Maps, diagrams and other illustrative material should be included in the preliminary documentation. The document should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour. The proponent should consider the format and style of the document appropriate for publication on the Internet. The capacity of a website to store data and display the material may have some bearing on how the document is constructed.

The stand-alone document must include a copy of this request for information and a cross-reference table indicating where the information fulfilling this request is included in the preliminary documentation.

Specific Content of the Additional Information

1 Habitat Assessment – Listed threatened species and communities

The Department considers the project is likely to have a significant impact on:

- Koala (*Phascolarctos cinereus*) (combined population of Qld, NSW and the ACT) – Vulnerable
- Greater Glider (*Petauroides volans*) – Vulnerable
- Dulacca Woodland Snail (*Adclarkia dulacca*) – Endangered
- Corben's Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable
- Yakka Skink (*Egernia rugosa*) – Vulnerable
- Ooline (*Cadellia pentastylis*) – Vulnerable
- Belson's Panic (*Homopholis belsonii*) – Vulnerable
- Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community (Brigalow TEC) – Endangered
- Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions ecological community (Coolibah TEC) – Endangered
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions ecological community (SEVT TEC) – Endangered
- The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin ecological community (GAB Springs TEC) – Endangered

In order to undertake a robust assessment of the nature and scale of the likely impacts of the project, the preliminary documentation must include a detailed habitat assessment of suitable habitat for all listed threatened species and ecological communities listed above.

The habitat assessments must be informed by desktop and recent field surveys (in accordance with Departmental guidelines or best practice surveys), and with reference to relevant Departmental documents (e.g. approved Conservation Advices, Recovery Plans, draft referral guidelines and Listing Advices), including the Species Profile and Threats (SPRAT) Database, published research, and other relevant sources.

Attach all relevant ecological surveys referenced in the referral and preliminary documentation as supporting documents to the preliminary documentation.

Further, the preliminary documentation must identify and describe known historical records of the listed threatened species and ecological communities on the project site and in the broader region. All known records must be supported by an appropriate source (i.e. Commonwealth and

State databases, published research, publicly available survey reports, etc.), the year of the record and a description of the habitat in which the record was identified.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) and Greater Glider (*Petauroides volans*) – Vulnerable

The habitat assessments for the Koala and Greater Glider must include, at a minimum, the following:

- discussion of the vegetation composition and structure (i.e. known food trees [Koala] and tree species with the potential to contain hollows [Greater Glider]);
- discussion of habitat use specifications (e.g. breeding, foraging, dispersal, shelter, etc.); and
- total area (in hectares) and quality of suitable habitat.

Dulacca Woodland Snail (*Adclarkia dulacca*) – Endangered

The habitat assessment for the Dulacca Woodland Snail must include, at a minimum, the following:

- discussion of the vegetation composition and structure, and relationship with EPBC Act threatened ecological communities (including regrowth) (i.e. vegetation types and microhabitat features);
- discussion of habitat use specifications (e.g. shelter, feeding, etc.);
- feeding requirements (i.e. humidity, moisture, food sources, etc.); and
- total area (in hectares) and quality of suitable habitat.

Corben's Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable

The habitat assessment for the Corben's Long-eared Bat must include, at a minimum, the following:

- discussion of the vegetation composition and structure (i.e. tree species with the potential to contain hollows, bark features, dead trees/limbs and tree fissures);
- discussion of habitat use specifications (e.g. roosting, foraging, dispersal, etc.);
- foraging requirements (i.e. insects, foraging distances, vegetation types, etc.);
- discussion of other bat species on the project site and immediate area that are likely to have similar foraging requirements; and
- total area (in hectares) and quality of suitable habitat.

Yakka Skink (*Egernia rugosa*) – Vulnerable

The habitat assessment for the Yakka Skink must include, at a minimum, the following:

- discussion of the vegetation composition and structure (i.e. vegetation types and microhabitat features);
- discussion of habitat use specifications (e.g. shelter and refuge, etc.);
- known important habitat and suitable habitats for the species; and
- total area (in hectares) and quality of important and suitable habitats.

Ooline (*Cadellia pentastylis*) – Vulnerable

The habitat assessment for Ooline must include, at a minimum, the following:

- discussion of the vegetation composition and structure, and relationship with EPBC Act threatened ecological communities (including regrowth) (i.e. specific vegetation types, suitable soils, water requirements, etc.); and
- total area (in hectares) and quality of suitable habitat.

Belson's Panic (*Homopholis belsonii*) – Vulnerable

The habitat assessment for Belson's Panic must include, at a minimum, the following:

- discussion of the vegetation composition and structure, and relationship with EPBC Act threatened ecological communities (including regrowth) (i.e. specific vegetation types, suitable soils, water requirements, etc.);
- elevation of the project site; and
- total area (in hectares) and quality of suitable habitat.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community – Endangered

The habitat assessment for Brigalow TEC must include, at a minimum:

- assessment (in a cross-reference table) of the vegetation composition against the key diagnostic characteristics and condition thresholds for Brigalow TEC; and
- total area (in hectares) and quality of Brigalow TEC.

Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions ecological community – Endangered

The habitat assessment for Coolibah TEC must include, at a minimum:

- assessment (in a cross-reference table) of the vegetation composition against the key diagnostic characteristics and condition thresholds for Coolibah TEC; and
- total area (in hectares) and quality of Coolibah TEC.

Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions ecological community – Endangered

The habitat assessment for SEVT TEC must include, at a minimum:

- description of the key biotic and abiotic features (e.g. vegetation composition, soil and water requirements, climatic requirements, etc.) as described in the national recovery plan for SEVT TEC;
- discussion of relevant Queensland Regional Ecosystems that make up SEVT TEC; and
- total area (in hectares) and quality of SEVT TEC.

The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin ecological community – Endangered

The habitat assessment for the GAB Springs TEC must include, at a minimum:

- detailed baseline description of the ecological composition and condition of each discharge point (i.e. morphology, groundwater source, flow rates and depth, temperature, chemistry, soil requirements, flora and fauna, etc.);
- discussion of relevant Queensland Regional Ecosystems that make up the GAB Springs TEC; and
- size (in hectares) and quality of each suitable discharge point associated with the GAB Springs TEC.

Detailed mapping of suitable habitat for all listed threatened species and ecological communities must be included in the preliminary documentation, and must:

- be specific to the habitat assessment undertaken for each listed threatened species and ecological community (i.e. not illustrate relevant Queensland Regional Ecosystems only);
- include an overlay of the project disturbance footprint;
- include known records of individuals derived from desktop analysis and/or field surveys; and
- be provided separately as attachments in JPEG format.

2 Impact Assessment – Listed threatened species and communities

All impacts, including direct, indirect and consequential, on the above listed threatened species and ecological communities and/or their habitat must be assessed in accordance with relevant Departmental policies and guidelines, and the SPRAT Database.

The preliminary documentation must include an assessment of the likely impacts on the above listed threatened species and ecological communities associated with the vegetation clearance, construction (including trenching activities), operational/maintenance and (if relevant) decommissioning components of the project.

This section must include a discussion of the methodology used to identify the impacts to suitable habitat for the above listed threatened species and ecological communities, when planning and determining the likely placement of all infrastructure associated with the project.

For each threatened ecological community, the total direct impact (in hectares) to each identified patch must be provided in the preliminary documentation.

3 Impact Assessment – Water resources

The Department considers the project is likely to impact on water resources as a result of groundwater drawdown and depressurisation, groundwater contamination from well drilling activities and changes to surface water and groundwater quality. The preliminary documentation must include all data used to support the impact assessment of likely impacts on water resources.

Groundwater and groundwater-dependent ecosystems (GDEs)

In order to undertake a robust assessment of the project's likely impacts on groundwater and GDEs (including EPBC Act listed springs, riparian vegetation and habitat features for listed threatened species and ecological communities), the preliminary documentation must include:

- a detailed baseline description of the ecological composition and condition of all GDEs within and reasonably outside the extent of predicted groundwater drawdown;
- details of the methodology used to determine the baseline description of all GDEs within and reasonably outside the extent of predicted groundwater drawdown;
- mapping which identifies the locations of all GDEs;
- an assessment of the likely impacts of the project on groundwater resources;
- an assessment of the likely impacts of the project on GDEs within and reasonably outside the extent of predicted groundwater drawdown;
- details of the mitigation and monitoring measures that will be implemented to ensure that the impacts of the project on groundwater resources and GDEs are appropriately identified and managed;
- details of thresholds or triggers for the implementation of management responses; and
- an assessment of the expected or predicted effectiveness of the mitigation measures.

The impacts, including direct, indirect and consequential, on groundwater resources and GDEs must be assessed in accordance with relevant Departmental policies and guidelines, and the SPRAT Database.

Groundwater contamination from drilling chemicals

In order to undertake a robust assessment of the likely impacts of drilling chemicals on MNES, the preliminary documentation must include a chemical risk assessment of the chemicals to be used in coal seam gas extraction in accordance with best practice national or international standards and guidelines including, but not limited to:

- US EPA (2014). EPA-Expo-Box (A Toolbox for Exposure Assessors), available at: www.epa.gov/expobox.
- OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management, available at: www.oecd.org/env/ehs/risk-assessment/environmental-risk-assessment-toolkit.htm.

The chemical risk assessment must include, but not limited to:

- a description and timing (i.e. number of wells per year) of the proposed drilling activities, including if the wells are to be drilled horizontally and/or vertically, and if hydraulic fracturing is required;
- a complete list of chemicals to be used in coal seam gas extraction for the project, which must include:
 - chemical name;
 - CAS registry number;
 - likely quantities;
 - concentrations; and
 - the chemical's general purpose and function.
- consideration of the chemical life-cycle under specific site conditions both at the surface and subsurface;

- identification of potential hazards and a discussion on hazard characterisation;
- discussion of MNES receptors that have the potential to be impacted by drilling chemicals;
- an exposure assessment to examine the potential risk on MNES from using drilling chemicals, including consideration of exposure pathways and outcomes of contaminant transport modelling at both the surface and subsurface;
- mitigation and management measures proposed to be undertaken by the proponent to mitigate and manage the potential impacts of each listed chemical on MNES;
- details of a monitoring and reporting framework to support an adaptive management approach; and
- details of a risk assessment process for new drilling fluid compound/s, if not identified and assessed during the assessment of this project, which have the potential to impact on MNES.

The risk assessment must be peer reviewed by a suitably qualified chemical risk assessment expert/s and include a statement that they carried out the peer review of the findings of the chemical risk assessment and evaluated the adequacy of the proposed monitoring, mitigation and management measures.

All relevant supporting documentation, including data, other Commonwealth and State government approvals and management plans, and material safety data sheets (MSDS) for each listed chemical, must be included as attachments to the preliminary documentation to support the risk assessment.

Cumulative impacts

The Department considers the project will likely contribute to cumulative groundwater impacts in the Surat Basin, as the project is an intensification of an existing gas field.

The preliminary documentation must identify and address cumulative impacts, where potential project impacts are in addition to existing impacts of other activities (including known potential future expansions or developments by the proponent and other proponents in the region).

This cumulative impact assessment must reference and consider the cumulative impact assessment of the Surat and southern Bowen Basin within the Queensland Government Office of Groundwater Impact Assessment's 2016 Underground Water Impact Report (2016 UWIR).

CSG produced water and brine management

The Department notes existing infrastructure (including brine ponds) approved under existing EPBC Act approvals will be used for the processing of natural gas and produced water, and the disposal of waste (i.e. brine) for this project. The Department considers there is insufficient information regarding the capability of the existing approved gas, water and waste management facilities to process and manage the water, gas and waste material associated with this project.

The preliminary documentation must identify the existing approved gas, water and waste management facilities to be used to process and manage the water, gas and waste material associated with this project. The preliminary documentation must demonstrate that the existing approved facilities have the capability and capacity to manage the water, gas and waste material associated with this project.

All relevant supporting documentation, including data, must be included as attachments to the preliminary documentation to support this discussion.

Referral to the IESC

The Department is required to submit the project to the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC). The Information Guidelines for the IESC advice on coal seam gas and large coal mining development proposals (Guidelines) outlining the requirements for submission to the IESC can be found at:

www.iesc.environment.gov.au/publications/information-guidelines-independent-expert-scientific-committee-advice-coal-seam-gas.

The proponent must complete the checklist in the Guidelines to ensure the information requirements for the IESC consideration have been addressed. The IESC will provide comment on the groundwater modelling presented in the preliminary documentation.

The proponent must include the IESC advice and a response to the IESC advice in the preliminary documentation prior to submitting the preliminary documentation to the Minister for approval to publish the preliminary documentation for public comment.

4 Avoidance, Safeguards and Mitigation Measures

The preliminary documentation must include detailed descriptions of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of the project on MNES. The proposed measures should be based on best available practices, appropriate standards and supported by scientific evidence. The preliminary documentation must include:

- proposed measures to be undertaken to avoid and mitigate the relevant impacts of the project on MNES, including those required through other Commonwealth, State and local government approvals;
- an assessment of the expected or predicted effectiveness of the proposed measures;
- any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved conservation advices, and a discussion on how the proposed measures are not inconsistent with relevant recovery plans and threat abatement plans;
- details of ongoing management, including monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed measures;
- details on measures, if any, proposed to be undertaken by State and local government, including the name of the agency responsible for approving each measure; and
- information on the timing, frequency and duration of the measures to be implemented.

Appropriate measures may be detailed on the SPRAT Database for relevant listed threatened species and ecological communities. All proposed measures should consider the 'S.M.A.R.T' principle:

- S – Specific (what and how)
- M – Measurable (baseline information, number/value, auditable)
- A – Achievable (timeframe, money, personnel)
- R – Relevant (conservation advices, recovery plans, threat abatement plans)
- T – Time-bound (specific timeframe to complete)

5 Environmental Offsets

The preliminary documentation must include an assessment of the likelihood of residual significant impacts occurring on relevant MNES, after avoidance, mitigation and management measures have been applied. If it is determined that a residual significant impact is likely, include a draft Offset Management Strategy (attached to the preliminary documentation) that provides, at a minimum:

- details of the environmental offset/s (in hectares) for residual significant impacts of the project on relevant MNES, and/or their habitat;
- details of how the environmental offset/s meets the requirements of the Department's EPBC Act Environmental Offsets Policy (2012) (EPBC Act Offset Policy), including the Offsets Assessments Guide, available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy;
- details of a strategy for the staging of environmental offset/s for each project stage (if proposed);
- details of appropriate offset area/s (including a map) to compensate for the residual significant impact on relevant MNES, and/or their habitat;
- information about how the proposed offset/s area provides connectivity with other relevant habitats and biodiversity corridors; and
- details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the offset area/s against development incompatible with conservation.

If available, include a draft Offsets Management Plan (attached to the preliminary documentation) which also provides (where possible):

- a field validation survey and baseline description of the current condition (prior to any management activities) of the offset area/s, including existing vegetation, for relevant MNES, and/or their habitat;
- a description and map (including shapefiles) to clearly define the location and boundaries of the proposed offset area/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the MNES that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares);
- a description of the management measures (including timing, frequency and duration) that will be implemented in the offset area/s;
- a discussion of how proposed management measures take into account relevant approved conservation advices and are consistent with the measures contained in relevant recovery plans and threat abatement plans;
- completion criteria and performance targets for evaluating the effectiveness of the Offset Management Plan implementation, and criteria for triggering corrective actions;
- a program to monitor, report on and review the effectiveness of the Offset Management Plan;

- a description of potential risks to the successful implementation of the environmental offset/s, and contingency measures that would be implemented to mitigate against these risks; and
- details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the offset area/s against development incompatible with conservation.

The draft Offset Management Plan must be prepared by a suitably qualified person and in accordance with the Department's Environmental Management Plan Guidelines (2014), available at: www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines.

6 Ecologically Sustainable Development (ESD)

The preliminary documentation must include a discussion of how the project will conform to the principles of ESD. To assist you, the National Strategy for Ecologically Sustainable Development (1992) is available at: www.environment.gov.au/about-us/esd/publications/national-esd-strategy.

7 Environmental Record of Person(s) Proposing to take the Action

The preliminary documentation must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

- the person proposing to take the action; and
- for an action for which a person has applied for a permit, the person making the application.

If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

8 Social and Economic Matters


The preliminary documentation must include a discussion and analysis of the social and economic impacts of the project, both positive and negative. Economic and social impacts should be considered at the local, regional and national levels. Matters of interest may include:

- details of any public consultation activities undertaken, including any consultation with Indigenous stakeholders, and their outcomes;
- projected economic costs and benefits of the project (in dollars), including the basis for their estimation through cost/benefit analysis or similar studies; and
- employment opportunities expected to be generated by the project (including construction and operational phases).

REQUEST FOR ADVICE

Summary			
Requesting agency/agencies	Australian Government Department of Environment and Energy		
Project title	Surat North CSG Project	Proponent	QGC Pty Ltd
Reference no.	2018/8276	State	Queensland
Project stage	Proponent has submitted draft preliminary documentation (PD) for an adequacy review.		
Timing	For 30-31 January 2019 IESC meeting. IESC advice and proponent's response to the IESC advice will be incorporated into the draft PD (no statutory timeframe). The proponent will subsequently be directed to publish the draft PD (including the response to the IESC advice) for public comment.		
	<p>The draft PD, including the referral, and response to additional information request in relation to impacts on water resources. Relevant sections of the draft PD for this request include:</p> <ul style="list-style-type: none"> • Referral <ul style="list-style-type: none"> ○ 2018-8276 Referral-Attach-mnes impact assessment report rev 0.pdf ○ 2018-8276 Referral-Attach-sbad figures part 1.pdf ○ 2018-8276 Referral-Attach-sbad figures part 2.pdf • Surat North CSG Project—draft Preliminary Documentation <ul style="list-style-type: none"> ○ 2018-8276 Assessment-Draft PD-MNES Rev1-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att C-Likelihood Of Occurrence Assessment-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att D-Aquatic ecology Pt 1-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att D-Aquatic ecology Pt 2-13Dec18.pdf 		
Documentation	<ul style="list-style-type: none"> ○ 2018-8276 Assessment-Draft PD-Att D-Aquatic ecology Pt 3-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att F(i)-Chemical register rev3-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att F(ii)-Inhibited brine chemical assessment-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att F(iii)-Flocculation chemical assessment-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att F(iv)-Lost circulation materials chemical assessment-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att G-Joint industry CSG ecotox report-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att H-SSMPs-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att I(i)-SBAD Water Resources Assessment (IESC)-13Dec18.pdf ○ 2018-8276 Assessment-Draft PD-Att I(ii)-IESC Checklist-13Dec18.pdf 		

Advice from Geoscience Australia 2018-8276 Referral-Decision-Att F-Comment-Geoscience Australia			
All documents are available in <u>SPIRE</u> .			
Description of the proposed project			
Development type	<input checked="" type="checkbox"/> Coal Seam Gas	<input type="checkbox"/> Open cut coal mine	<input type="checkbox"/> Underground coal mine
	<input type="checkbox"/> Other	Site	<input type="checkbox"/> New <input checked="" type="checkbox"/> Expansion
Operational life	41 years	Scale	Up to 740 wells
Geological basin	Surat Basin	Coal resource	Walloon Coal Measures
Assessment of impacts to water resources			
Surface water catchment	Dawson River catchment of the Fitzroy Basin	Groundwater basin	Great Artesian Basin
Key water related assets	<ul style="list-style-type: none"> • Surface water resources <ul style="list-style-type: none"> ○ Dawson River ○ Horse Creek ○ Juandah Creek ○ Canal Creek ○ Mud Creek ○ Mount Organ Creel ○ Eurombah Creek • Groundwater dependent ecosystems (GDEs) <ul style="list-style-type: none"> ○ Nine spring complexes outside the project footprint ○ Wetlands • Farm-water bores 		
Relevant water management policies, regulations or information	<ul style="list-style-type: none"> • Water Act 2000 (Qld) • Environment Protection Act 1994 (Qld) • Water Supply (Safety and Security) Act 2008 (Qld) • Environmental Protection (Water) Policy 2009 (Qld) • ANZECC and ARMCANZ guidelines 2000 • Water Resource (Great Artesian Basin) Plan 2006 • Surat Cumulative Management Area (Qld) • Surat North Water Monitoring and Management Plan (QGC) • Joint Industry Plan (QGC) • OGIA Spring Impacts Management System (Qld) • Constraints protocol (QGC) 		
Key issues	<p>The proposed action is an intensification of an existing CSG gasfield. Presently there are 460 CGS production wells (the majority of which are operational) within the project footprint. The proposed action will add up to an additional 740 CGS wells, taking the total to up to 1200 CSG wells.</p> <p>The Department raised a number of concerns about the proposed action's likely impacts to water resources during the referral stage. Following the referral decision, the Department requested the following additional information from the proponent to inform the assessment process:</p> <ul style="list-style-type: none"> • accuracy and reliability of modelled predictions of impacts, including groundwater drawdown, to water resources; 		

	<ul style="list-style-type: none"> • potential for impact to the endangered <i>Community of native species dependent on natural discharge of groundwater from the Great Artesian Basin</i> ecological community; • effectiveness of management and mitigation measures proposed to address impacts to water resources from the proposed action. • contribution to cumulative impacts to water resources. • changes to groundwater quality associated with drilling chemicals and potentially hydraulic fracturing. • changes to surface water and groundwater quality through inappropriate storage and management of co-produced water and associated waste products (salt and brine) • changes to surface water quality through intentional and unintentional discharge to surface water. <p>The proponent's response to the request for additional information has been provided in the draft PD.</p>		
Request for Advice			
<p>Question 1: Does the Committee consider the key potential risks and impacts of the proposed action on water resources have been adequately identified and assessed, including through the development of numerical and conceptual modelling? If not, what additional work does the Committee consider is required to identify and assess the key risks and impacts of the proposed action on water resources?</p> <p>Question 4: Does the Committee consider the proposed monitoring, mitigation and management measures are adequate to monitor, mitigate and manage impacts on water resources? If not, what additional measures does the Committee consider are required to monitor, mitigate and manage impacts on water resources?</p> <p>Question 5: Does the Committee consider there is adequate consideration of the proposed action's contribution to cumulative impacts associated with other mining activities and coal seam gas production in the area? If not, what additional work does the Committee consider is required to adequately consider the proposed action's contribution to cumulative impacts?</p>			
Contact information			
Agency contact officer/s	<p>s. 22(1)(a)(ii) , Director, Queensland North Assessments section Ph: s. 22(1)(a)(ii) Email: s. 22(1)(a)(ii) @environment.gov.au</p>		
	<p>s. 22(1)(a)(ii) , Assessment Officer, Queensland North Assessments section Ph: s. 22(1)(a)(ii) Email: s. 22(1)(a)(ii)s@environment.gov.au</p>		
Approval			
Agency Delegate	<p>James Barker, Assistant Secretary, Assessments and Governance Branch Ph: 02 6274 2694</p>		
Signature		Date	14/12/18

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Friday, 12 April 2019 3:01 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: RE: 2018-8276 Surat North CSG Project - adequacy of chemicals assessment [SEC=OFFICIAL]

Hello s. 22(1)(a)(ii)

We have reviewed the chemical assessments for the Shell-QGC Surat North CSG project. To determine the risk of chemicals used in CSG operations we require a determination of the hazard of the chemicals and the exposure (likelihood and extent). To better understand the exposure, the fate of the chemicals is also required, so that determination may be made on which environmental compartment (water, air, soil), will be most affected, and for how long.

The hazard assessments for the chemicals appear to be scientifically sound and reliable. The information on the chemicals is drawn from relevant peer-reviewed literature or from NICNAS publications or publications by comparable chemical regulators (e.g. ECHA, US OSHA). Where measured data is unavailable, the assessors have used internationally recognised models such as ECOSAR.

The information on environmental fate is generally scientifically sound, but it is not as thorough as the hazard information. To be fair, there is often less information available on environmental fate than on hazard. But, we believe that some more attention to this area is necessary because it is important for the risk assessment (as described above).

The discussion of exposure scenarios for the various use patterns is inconsistent. For some uses, such as hydraulic stimulation chemicals, there is so much detail that it is isn't clear what the critical issues are. For others, such as flocculation chemicals, the reader is referred to a previous report and there isn't even a summary to identify key issues. Additionally, it isn't clear whether there is any meaningful differentiation between the exposure pathways for drilling vs hydraulic stimulation. In short, it is difficult to identify where the critical points are in the exposure pathways.

Golder have described their risk assessment methodology in general terms (e.g. section 5.3.4 of the MNES Report). However, it is unclear how the chemicals were actually assessed for different use patterns, or how the volumes of chemicals were accounted for. It appears that the risk assessments were dominated by the hazard characteristics of the chemicals and it is unclear how the fate and exposure scenarios were incorporated. We note that the IESC has also expressed reservations about ambiguities and a lack of transparency in some areas of the chemical risk assessments (item 16 – IESC Advice to the Decision Maker).

We think that you should also be aware that, we recently met with s. 22(1)(a)(ii) (from your office) and two representatives from Santos to revise to the Terms of Reference and the methodology for Santos' risk assessments of CSG chemicals. The two day meeting was focused on developing a simpler, more reliable and more transparent approach to chemical risk assessments so that we could move away from the previous system of overly complicated, burdensome and opaque assessments. The problems that are apparent in the Shell/QGC risk assessment are the same as the problems Santos was facing. We consider that the revised risk assessment methodology would assist other operators, such as Shell-QGC, to produce chemical risk assessments that are simpler, more reliable and easier to understand. We suggest that you discuss this approach with s. 22(1)(a)(ii). It is in the Department's interests to set consistent requirements for chemical risk assessments for all commercial operators in the CSG industry.

We also suggest that you may wish to discuss this matter with s. 22(1)(a)(ii) from Assessments and Post Approval Strategy, who has also been significantly involved in CSG.

As always, we are happy to discuss these issues.

Regards

s. 22(1)(a)(ii)

s. 22(1)(a)(ii)

A/g Director New Industrial Chemicals Team

Chemicals and Biotechnology Assessments Section

Chemicals Management Branch | Environment Standards Division

Department of the Environment and Energy

GPO Box 787 Canberra ACT 2601

T: s. 22(1)(a)(ii) | E: s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)



The Department acknowledges the traditional owners of country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past and present.

From: s. 22(1)(a)(ii)

Sent: Friday, 5 April 2019 1:24 PM

To: s. 22(1)(a)(ii)

Cc: s. 22(1)(a)(ii)

Subject: 2018-8276 Surat North CSG Project - adequacy of chemicals assessment [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

Thanks for the chat just now.

To confirm – we’re assessing the above CSG project under the EPBC Act and are in the process of reviewing the proponent’s assessment documentation. We’ve obtained [advice from the IESC](#) who raised concerns about the proponent’s chemicals assessment. As such, we are hoping your section could help us out with reviewing the relevant sections of the documentation and providing us with some comments addressing the adequacy of the proponent’s chemicals assessment.

I appreciate you’re resource limited like us, so any help you can provide is greatly appreciated. We need to provide comments back to the proponent before Easter, so we would appreciate receiving your comments by COB Friday 12 April if possible.

I’ve linked the relevant sections of the proponent’s assessment documentation below:

[Main document-MNES Rev2-4Mar2019.pdf](#)

[Draft PD-Att G-\(i\) Chemical Register Rev3-4Mar2019.pdf](#)

[Draft PD-Att G-\(ii\) Inhibited Brine Chemical Assessment-4Mar2019.pdf](#)

[Draft PD-Att G-\(iii\) Flocculation Chemical Assessment-4Mar2019.pdf](#)

[Draft PD-Appendix D-Stimulation Chemicals Risk Assessment-4Mar2019.pdf](#)

[Draft PD-Att G-\(iv\) Lost Circulation Materials Chemical Assessment-4Mar2019.pdf](#)

[Draft PD-Att H-Joint Industry CSG Ecotox Report-4Mar2019.pdf](#)

Happy to discuss

Cheers,

s. 22(1)(a)(ii)

Queensland North Assessments

Environment Standards Division

Department of the Environment and Energy

GPO Box 787 CANBERRA, ACT 2601

T s. 22(1)(a)(ii)

Note to media: Unless otherwise agreed, the information contained in this email is for background only and is not for attribution.

s. 47F(1)

Manager - Access
QGC Pty Ltd
PO Box 3107
BRISBANE QLD 4001

Dear **s. 47F(1)**

**Direction to publish (and amended fee schedule) – preliminary documentation
Surat North CSG Project, Queensland (EPBC 2018/8276)**

I am writing to you in relation to your proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland. On 15 November 2018, a delegate of the Minister decided that the proposed action is a controlled action and it requires assessment and a decision about whether approval should be given under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

You are now required to publish the information you have provided to the Department on the proposed action **within 20 business days of the date of this letter**. This allows for public consultation on the potential impacts of the proposed action. The information must be available for comment for 20 business days and during this time any third parties can comment on the proposed action. Detailed directions on what information you need to publish and where to publish are attached to this letter.

Public comments will come directly to you so that you have an opportunity to address any issues raised. You are then required to provide the Department with:

- a copy of all public comments received (if any);
- a summary of each of the comments (if any) and how you have addressed each of them; and
- a revised version of the draft preliminary documentation with any changes or additions needed to take account of the public comments (if any); or
- if no public comments are received, a written statement to that effect.

Once you have provided the Department with this information, you will then need to publish the summary of comments and your responses, together with the original draft preliminary documentation including any changes or additions made in response to the published comments (or a notice which meets the requirements of the relevant provisions of Part 16.03 [5 – 7] of the *Environment Protection and Biodiversity Conservation Regulations 2000* [EPBC Regulations]), **within 10 business days**.

Cost recovery fees

Please note, under subsection 520(4A) of the EPBC Act and the EPBC Regulations your assessment is subject to cost recovery.

Please find attached a revised fee schedule for your proposal and note that these fees have not changed/changed. An invoice for Stage 3 and Stage 4 is also enclosed.

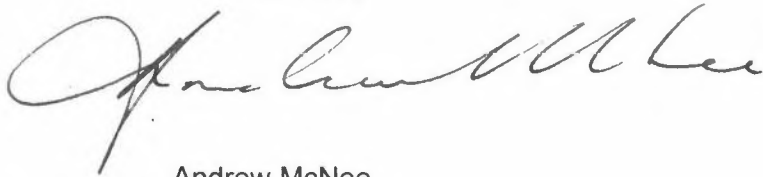
Please note the fee for Stage 3 must be paid before the Department can review the finalised preliminary documentation and provide guidelines on how to publish this. Stage 4 must be paid before the Department can decide whether the proposed action can be approved or not.

If you disagree with the fee schedule provided, you may apply under section 514Y of the EPBC Act for reconsideration of the method used to calculate the fee. The application for reconsideration must be made within 30 business days of the date of the fee schedule and can only be made once in respect of a fee. Further details regarding the reconsideration process and an application form for reconsideration can be found on the Department's website at: <http://www.environment.gov.au/protection/environment-assessments/assessment-and-approval-process/refer-proposed-action>.

The assessment process will commence once the Department has received the final preliminary documentation, including any public comments and the responses to them. A decision on whether the proposed action can be approved or not would generally be expected within 40 business days of that time, unless further information is required.

If you have any questions about the assessment process or this decision, please contact the project manager, s. 22(1)(a)(ii), by email to s. 22(1)(a)(ii) @environment.gov.au or telephone s. 22(1)(a)(ii) and quote the EPBC reference number at the top of this letter.

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

31 July 2019

s. 22(1)(a)(ii)

From: s. 47F(1) @shell.com
Sent: Monday, 9 September 2019 1:41 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii) Andrew McNee; s. 47F(1) @shell.com; s. 47F(1) @shell.com; SDA-Environment-Admin@shell.com
Subject: RE: 2018-8276 Surat North CSG Project, Qld [SEC=OFFICIAL]
Attachments: 20190909_DoEE no comments letter_signed.pdf

Good afternoon s. 22(1)(a)(ii)

Sorry to hear you're unwell – hopefully it's short-lived and you're back on your feet ASAP. I called to update you on QGC's invitation for public comments given this period closed last Friday (06/09/2019).

Following receipt of the direction to publish (see emails below), QGC:

- Uploaded the PD and the approved notice to it's website on 07/08/2019;
- Published the approved notice in "The Courier Mail" and "The Chinchilla News and Murilla Advertiser", both on 08/08/2019; and
- Made available hard copies of the PD at QGC's Brisbane office (1 x copy), DES's Brisbane office (2 x copies) and Wandoan Library (2 x copies) from 09/08/2019.

I can confirm that no public comments were received by QGC between 09/08/2019 and 06/09/2019. In accordance with the Act, please find attached a letter to this effect.

In accordance with 95B(4), QGC will be required to publish a notice within 10 business days. Can you please provide a copy of the template for this notice so that I can make the necessary arrangements.

Finally, I will make payment for the Stage 3 fees this afternoon, allowing the commencement of the relevant period of 40 business days.

When you're back in the office, please don't hesitate to give me a call if you'd like to discuss anything further.

Many thanks,

s. 47F(1)

s. 47F(1)

Tenures & Permits Advisor

QGC Pty Limited
275 George Street
Brisbane
QLD 4001
Australia
Tel: s. 47F(1)
Website: shell.com.au

From: s. 22(1)(a)(ii)
Sent: Monday, 5 August 2019 10:13 AM
To: s. 47F(1) J QGC-IGA/Q/A/AT

Cc: s. 22(1)(a)(ii)

Subject: FW: 2018-8276 Surat North CSG Project, Qld [SEC=OFFICIAL]

Hi s. 47F(1)

The attached notice has been approved by s. 22(1)(a)(ii) Director of Queensland Assessments South (in s. 22(1)(a)(ii) absence). Also, for your information, the Department has now received payment of the Stage 2 fees. Stage 3 fees will need to be paid before we start the 40 business day assessment process.

Regards, s. 22(1)(a)(ii)

From: s. 47F(1) @shell.com [mailto:s. 47F(1) @shell.com]
Sent: Thursday, 1 August 2019 4:57 PM
To: s. 22(1)(a)(ii) @environment.gov.au>
Cc: s. 22(1)(a)(ii) @environment.gov.au>; SDA-Environment-Admin@shell.com
Subject: RE: 2018-8276 Surat North CSG Project, Qld [SEC=OFFICIAL]

Thanks very much s. 22(1)(a)(ii)

Given the details are now finalised, I've updated the draft notice previously provided for DoEE's review so that it includes applicable dates. Note that I've also confirmed that we will have hard copies of the PD available for public viewing placed at the Wandoan Public Library (rather than QGC Community Information Centre) to ensure compliance with the regulations.

Can you please authorise this version of the notice (attached) so I can arrange for its publication in both the Courier Mail and the Chinchilla News on **Thursday 8 August 2019**. I'll also arrange to have the invoice for Stage 2 paid prior to this date.

Regards,
s. 47F(1)

s. 47F(1)

Tenures & Permits Advisor

QGC Pty Limited
shell.com.au

From: s. 22(1)(a)(ii) @environment.gov.au>
Sent: Thursday, 1 August 2019 3:40 PM
To: s. 47F(1) QGC-IGA/Q/A/AT <s. 47F(1) @shell.com>
Cc: s. 22(1)(a)(ii) @environment.gov.au>
Subject: 2018-8276 Surat North CSG Project, Qld [SEC=OFFICIAL]

Hi s. 47F(1)

The delegate has now made the decision to direct QGC Pty Ltd to publish a notice seeking public comment on the draft preliminary documentation.

Prior to this publication, QGC is required to pay the Stage 2 fees.

Please find attached:

- correspondence from the delegate advising of the direction to publish

- updated cost recovery fee schedule (please note that fees for components M, N and O are unchanged)
- invoices for Stages 2, 3 and 4 (please note that stages 3 and 4 will need to be paid before the Department commences the 40 business day assessment process)

Following completion of the public comment period, QGC Pty Ltd is required to address any comments received or advise the Department that no comments have been received. QGC will then be required to republish the notice (amended to state the material is for information only) and continue to make the final PD available. There is no timeframe in the EPBC Act as to how long the information should remain. We usually advise that it should remain for the same period as the public comment period (i.e 20 business days).

If you have any questions, please give me a call.

Regards

s. 22(1)(a)(ii)

Assistant Director
Assessments and Governance Branch
Environment Standards Division
Australian Government Department of the Environment and Energy

s. 22(1)(a)(ii)

[@environment.gov.au](mailto:environment.gov.au)

Ph: s. 22(1)(a)(ii)

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Department of
Environment and Science

Ref: 101/0003368.007

15 October 2018

s. 22(1)(a)(ii)

Queensland North Assessments Section
Assessments and Governance Branch
Department of the Environment and Energy
GPO Box 787
CANBERRA ACT 2601

Dear **s. 22(1)(a)(ii)**

Invitation to comment on referral EPBC 2018/8276 – Surat North CSG Project, Qld

I refer to my previous letter dated 3 September 2018, regarding whether the above action will be assessed in a manner described in Schedule 1 of the *Agreement between the Commonwealth of Australia and the State of Queensland (the Bilateral Agreement)*, developed under Section 45 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBA Act). In that letter, I advised you that the Department of Environment and Science (DES) had not yet received an application for an environmental authority (EA) application for the project under the *Queensland Environmental Protection Act 1994* (EP Act) but has received a draft application for a pre-lodgement meeting.

I now advise that DES has recently received an EA application for the project and the on the 12 October 2018, DES decided that an EIS is not required for the project. The potential impacts of the project to be assessed and managed under the EA application.

Should you have any further enquiries, please contact me on telephone **s. 47F(1)**

Yours sincerely

s. 47F(1)

Director, Impact Assessment and Operational Support

Level 9
400 George Street Brisbane
GPO Box 2454 Brisbane
Queensland 4001 Australia
Telephone + **s. 47F(1)**
Facsimile + 61 7 3330 6876
Website www.des.qld.gov.au
ABN 66 540 294 485

Advice to decision maker on coal seam gas project

IESC 2018-100 Surat North CSG Project (EPBC 2018/8276) – Expansion

Requesting agency	The Australian Government Department of the Environment and Energy
Date of request	14 December 2018
Date request accepted	14 December 2018
Advice stage	Assessment

The Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (the IESC) provides independent, expert, scientific advice to the Australian and state government regulators on the potential impacts of coal seam gas and large coal mining proposals on water resources. The advice is designed to ensure that decisions by regulators on coal seam gas or large coal mining developments are informed by the best available science.

The IESC was requested by the Australian Government Department of the Environment and Energy to provide advice on the QGC Pty Ltd's Surat North CSG Project in Queensland. This document provides the IESC's advice in response to the requesting agency's questions. These questions are directed at matters specific to the project to be considered during the requesting agency's assessment process. This advice draws upon the available assessment documentation, data and methodologies, together with the expert deliberations of the IESC, and is assessed against the IESC Information Guidelines (IESC, 2018).

Summary

As set out in the Preliminary Documentation (PD), QGC Pty Ltd proposes to add 740 wells to the existing 400 wells at their Surat North CSG field. The proposed project lies in the Surat Cumulative Management Area (CMA) in Queensland, approximately 35 km south-west of Taroom. The project area is in the upper Dawson Catchment, a sub-catchment of the Fitzroy River drainage basin, which flows into the Great Barrier Reef lagoon.

The Surat CMA contains existing and proposed large-scale CSG developments. Modelling of cumulative groundwater impacts within the Surat CMA is undertaken by the Office of Groundwater Impact Assessment (OGIA) who publish their findings in Underground Water Impact Reports (UWIRs). The proposed project is incorporated in modelling undertaken for the most recent UWIR, which assumes 1335 wells in the project area, rather than the now planned approximately 1200. There are two mining leases

that overlap parts of the project area: one a subsidiary of Glencore for open cut coal mining east of the project area and the other by Taroom Coal for open cut coal mining in the centre of the project area.

Key potential impacts from this project are:

- declines in shallow groundwater level due to depressurisation of underlying aquifers and Walloon Coal Measures; and
- reductions in water availability to springs, riparian ecosystems, fringing vegetation of a wetland of High Ecological Significance (HES), several Regional Ecosystems listed as 'Of Concern' (Queensland) and other groundwater-dependent ecosystems (GDEs) as a result of groundwater depressurisation and drawdown.

The IESC strongly recommends that the proponent makes more effective use of existing data and information collected before and during the existing project to address the following:

- utilise the existing production data from the life of the project as an opportunity to improve both the regional and local groundwater models;
- demonstrate how they intend to monitor and manage impacts (including cumulative impacts) to water resources and EPBC Act-listed threatened species and communities from groundwater drawdown in the alluvium, and illustrate the likely efficacy of this methodology using existing available historic data;
- quantify residual impacts (after accounting for avoidance and mitigation measures) to water resources, EPBC Act-listed threatened species and communities, and migratory species from groundwater drawdown in the alluvium and explain how these impacts will be offset;
- expand modelling of drawdown in the alluvium to cover potential impacts to surface flow and sediment regimes of Canal, Eurombah and Juandah Creeks, and to GDEs (including riparian and terrestrial vegetation), to enable a robust impact assessment;
- describe how impending water level changes in springs will be identified early and mitigated to prevent impacts, should future model predictions (including cumulative effects with other operations) indicate potential for significant changes to spring source aquifers, and illustrate the likely efficacy of this methodology using historical data; and
- demonstrate how they intend to monitor and manage changes to surface water and groundwater quality as a result of inappropriately stored or unintentionally released drilling chemicals, co-produced water and brine. There is also limited information in relation to the transportation of the co-produced water, the exact location of the water treatment facilities, the water treatment process, transportation and any discharges under the existing Glebe Weir Beneficial Use Agreement.

Context

The current project proposes the infill development of 740 coal seam gas (CSG) wells and associated infrastructure within an existing gas field (123,290 ha) containing approximately 400 wells (PD, MNES, pp 2). The proposed action is within the existing petroleum lease boundary of the Surat North Development (EPBC 2013/7047) which was approved on 17 December 2014. The existing Surat North Development involved the construction of 400 CSG extraction wells for which the IESC previously provided advice in April 2014 (IESC 2014-042).

Broadly, the IESC advice on the existing operations suggested that the proponent should verify the conceptual hydrogeological model, conduct field assessment and mapping of GDEs as well as

groundwater – surface water interactions and account for springs and spring depletion in the groundwater model as the project progressed.

The IESC notes that both the OGIA model and the UWIR for the Surat Basin have been updated since the IESC advice in 2014. These updates have addressed some of the information gaps noted in IESC 2014-042. However, the assessment documentation provided by the proponent for the proposed Surat North expansion provides limited field verification of surface and groundwater connectivity, only desktop mapping of GDEs, and few details on existing water quality.

The area of the currently proposed project contains fragments of *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed endangered Brigalow (Brigalow (*Acacia harpophylla*) dominant and co-dominant), Coolibah (Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions) ecological communities along Eurombah and Horse Creeks, and small pockets of semi-evergreen vine thickets (Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions) near the south-eastern boundary. As 94 % of the project area is grazed (PD, MNES, pp 14), fragments of native vegetation are particularly important for the conservation of extant biodiversity and supporting ecological processes.

No EPBC Act-listed spring complexes are located within the project area. However, some are located in the surrounds, including Scotts Creek spring approximately 15 km west of the project boundary and the Dawson River 8 complex downstream along the Dawson River approximately 30km from the project area boundary.

The total CSG water abstraction from the QGC wells is estimated to be 88 GL by QGC and 623 GL by OGIA. This large variation requires justification. Most co-produced water will be supplied to the Woleebee Creek Water Treatment Plant (WTP) facilities where it will be supplied to the Glebe Weir Beneficial Use Scheme, operated by SunWater (PD, MNES Impact Assessment Report, p. 30). Existing water and brine storage ponds will be utilised at the WTP facilities and the brine will be crystallised into salt form, and encapsulated for long-term storage in purpose-built cells.

Response to questions

The IESC's advice, in response to the Department of the Environment and Energy's specific questions, is provided below.

Question 1: Does the Committee consider the key potential risks and impacts of the proposed action on water resources have been adequately identified and assessed, including through the development of numerical and conceptual modelling? If not, what additional work does the Committee consider is required to identify and assess the key risks and impacts of the proposed action on water resources?

Groundwater

1. The IESC commends the general approach to use a local-scale numerical groundwater model to complement OGIA's regional-scale groundwater model. This approach allows the OGIA model to be used for regional-scale and cumulative impact predictions, for which it is designed, whereas risks and impacts associated with the proposed project can be assessed using the local-scale model. The proponent's assessment of cumulative impacts is discussed further in response to Question 3.
2. The local-scale model of the area around Horse Creek (hereafter, the Jacobs model) is intended to investigate changes to saturation within the Horse Creek alluvium, based on depressurisation predicted by the 2016 OGIA model. The IESC considers that this aim is appropriate, but suggests that the modelling should be expanded to include the alluvium associated with Canal, Eurombah and Juandah Creeks, and other areas where GDEs may occur. Alluvium in these creeks is likely to be subject to similar drawdown to the Horse Creek alluvium, with associated risks to GDEs and surface

waters (see paragraphs 4-6). To model these systems in a robust manner would also require an expansion of the groundwater monitoring network. However, preliminary predictions from an expanded model prior to the collection of new monitoring data would still provide some insights into potential impacts.

3. The Jacobs model has several shortcomings. This results in a less complete assessment of, and reduced confidence in, likely impacts based upon the information available. There is, however, the opportunity for the proponent to utilise the existing production volume data for the life of the project to make improvements to the Jacobs model and provide related justification. To address these limitations and improve confidence in the Jacobs model, the IESC suggests the model should be revised and model documentation updated. This revision should consider:
 - a. the nature and positioning of the boundary conditions;
 - b. how the predicted depressurisation from the OGIA model is implemented in this model;
 - c. reconciliation of predicted abstraction production volumes from the Jacobs model with those of the OGIA model (water balance);
 - d. justification of model parameters, including hydraulic conductivity, storativity and recharge values;
 - e. developing a calibrated model;
 - f. accounting for the spatial variation in surface water-groundwater interaction that appears to be present, based on the surface water-groundwater interaction study and groundwater chemistry data (PD, Water Resources Assessment, App. M.);
 - g. site-specific data for Canal, Eurombah and Juandah Creeks, and other areas where GDEs may occur. This would include additional monitoring bores in the other creeks' alluvium to define aquifer characteristics and conducting field tests to assess the degree of interaction between the creeks and the alluvial groundwater levels, in particular the hydraulic conductivity;
 - h. incorporating an uncertainty analysis and additional sensitivity analysis (beyond the two scenarios presented in the PD). The IESC has recently published an explanatory note on uncertainty analysis (Middlemis and Peeters 2018), which provides useful guidance;
 - i. providing estimates of the likely increase in zero-flow days in the three creeks as a result of drawdown in the alluvium; and,
 - j. an independent peer-review of the model.

Surface water

4. The proponent has not provided adequate information to identify or assess the likely impacts or risks to the majority of surface water resources within the zone of likely impacts. Although the proponent has provided information on the surface water for Horse Creek, little information is provided on the other tributaries of the Dawson River in the project area, including some watercourses that may partly rely on groundwater inputs. It is also noted that information collected during the existing project has not been presented to support assertions of the relationships between groundwater and surface water in creeks other than Horse Creek.
5. The IESC notes that the proponent is required to collect additional water quality data, monitor for suspended solids and turbidity, and conduct visual observations of visible slicks and sheens for the presence of hydrocarbons as per the Water Monitoring and Management Plan for the existing project

(PD, Water Resources Assessment, App. A). The proponent has not provided these data, nor is there sufficiently detailed analysis of these data to support the proponent's claim that there will be no risks or impacts to the surface water resources in the proposed project area.

6. To assess the impacts and risks to the surface water resources in the project area, the IESC suggests that the proponent provides a detailed assessment of water quality, measured at multiple times during the flowing, flooding and pool phases in Horse Creek and the other tributaries of the Dawson River in the project area, and should consider:
 - a. monitoring a broader range of water quality parameters and comparing current water quality to guideline values such as the ANZG 2018 Guidelines for aquatic ecosystem protection for 95% of species to assess the condition of the current water quality in the creeks and the Dawson River;
 - b. assessing water and sediment concentrations of potential chemical contaminants, including arsenic, barium, zinc, copper, lead, manganese, mercury and hydrocarbons;
 - c. monitoring the surface water during both dry (including in remnant pools that may be crucial habitats or refuges for some aquatic biota) and wet seasons, while also monitoring water quality (see paragraph 22);
 - d. drawing on times-series data, for example, from Water Observations from Space (WOfS) (<http://www.ga.gov.au/scientific-topics/earth-obs/case-studies/water-observations-from-space>) to more accurately determine the presence of water in the watercourses over time;
 - e. developing a comprehensive risk assessment of potential impacts on in-stream, riparian and associated GDEs downstream of the proposed project. This risk assessment should include an ecohydrological conceptual model illustrating potential pathways and mechanisms of effects of alterations in surface flows, groundwater exchanges and in-stream water quality. This conceptual model would help the proponent to justify strategies proposed to manage and mitigate potential impacts; and,
 - f. undertaking flood modelling to determine the risks of unplanned releases from water-gathering systems and storage ponds including interactions with CSG well heads, exposed trunklines and other associated infrastructure. Images from WOfS may add value in calibrating this modelling (e.g. Mueller et al. 2016).

Co-produced water quality

7. The proponent has indicated that there will be no releases of flowback or co-produced water into local surface water systems. However, treated and untreated ("to a suitable water quality") co-produced water may be used for project activities such as dust suppression, washdown facilities and emergency services. The proponent has only provided "typical" water quality data at the producing wells (Walloon Coal Measures groundwater) and not the range of volumes and concentrations for each parameter from their sampling. These data should be provided to confirm that the quality of the untreated and treated water will not degrade the environmental values of water resources near the location of these activities, especially in the long term. Further details on monitoring for water quality to ensure co-produced water does not pose a risk to the downstream environment are provided in response to Question 2.

Salt and brine management

8. The IESC remains concerned about the legacy issues of brine management and salt storages, because as such long-term storage does constitute a residual risk, particularly from leaks and seepages. Large-scale CSG extraction has been occurring in the region surrounding the project area

for approximately five years but a strategy for brine and salt disposal has not yet been determined. Without a long-term plan for permanent disposal, this remains an unmitigated risk. The IESC considers that if the plan is for long-term storage, a strategy should be developed and implemented now to prevent long-term legacy impacts. The long-term storage facilities should be adequately designed in terms of liners or compacted beds, and appropriate cover design and monitoring. Brine may also include other contaminants, such as metals, hydrocarbons and radionuclides, particularly if filtration plant solids are disposed of in the brine ponds.

Ecology

9. The IESC notes that the GDE Atlas (Commonwealth of Australia, 2018) and the Queensland WetlandInfo (State of Queensland, 2018) online resources both show the presence of wetlands and other potential GDEs within and near the proposed project area, including downstream along the Dawson River where creeks enter into it.
10. The modelled drawdown in the Horse Creek alluvium exceeds 20 m in the north of the model after 40 years and is predicted by the proponent to desaturate the alluvial aquifer (PD, Attachment M, Water Resources Assessment, p. 99). The IESC considers this is likely to result in profound impacts to the ecology of the creek, its riparian zone and subsurface biota. This groundwater drawdown and alluvial desaturation are very likely to sever subsurface (hyporheic) flowpaths below Horse Creek and cause localised extinctions of alluvial stygofauna that have been collected at this site (PD, Surface Water Assessment, App. O). It is also likely to lead to the loss of deep-rooted groundwater-dependent vegetation such as riparian trees that access this water when the creek is dry. The loss of riparian vegetation will permanently affect fauna that use this vegetation as a corridor for movement and as a refuge during drought conditions. There will also be a loss of shade to the stream while flowing, or isolated pools during no-flow periods, accelerating evaporation and heating the water to levels that may exceed the tolerances of some native aquatic biota. Additionally, the loss of saturated alluvium will lead to a reduction in stream flow volume in transiently gaining sections of the creek, decreasing the duration of periods of flow and persistence of pools, further reducing the availability and quality of aquatic habitat.
11. Similar impacts associated with groundwater drawdown and desaturation of the alluvium appear likely for sections of other creeks in the project area such as Canal, Eurombah and Juandah Creek. These changes in flow regime, saturated alluvial habitat and riparian groundwater-dependent vegetation will further fragment the remaining patches of native vegetation across the landscape, potentially reducing habitat for biota, including some threatened species such as koalas (*Phascolarctos cinereus*), that are listed under the EPBC Act as vulnerable in this region. If this impact cannot be effectively avoided or mitigated, the proponent should account for this impact in their assessment of required offsets for water resources and EPBC Act-listed migratory and threatened species and communities.
12. Areas of riverine and palustrine wetlands (and wetland management areas (Figure 4.7 p. 64, PD MNES) occur along the major watercourses in the project area, including Horse, Canal, Eurombah and Juandah Creeks and their tributaries. Two of these wetlands are listed as HES but the proponent does not present detailed ecological data on seasonal variation in their aquatic biota and water quality (discussed below in paragraph 14).
13. The proponent concludes, for example, that one of the wetlands (Perretts Road Wetland) is unlikely to be groundwater-fed, although its fringing vegetation may depend on groundwater. However, the proponent has not provided enough data to support this conclusion. Satellite imagery, from Water Observations from Space (WOfS) (<http://www.ga.gov.au/scientific-topics/earth-obs/case-studies/water-observations-from-space>) can be used to determine, over time, the presence of water in the wetland. Fringing vegetation implies that potential groundwater drawdown from the project will adversely affect the ecology of the wetland, in turn potentially affecting listed migratory and other

species that rely on it for habitat and food. Without sufficient information to the contrary, the IESC considers the Perretts Road Wetland is potentially a GDE, typical of a semi-arid/arid zone wetland as being shallow and dry during the dry season but contains water during the wet season despite no rainfall, runoff or overland flow. These temporal changes in the water level may be the result of different rates of evapotranspiration in the fringing vegetation during the wet and dry seasons. The proponent needs to gather sufficient ecological data (including measurements of groundwater-dependence of dominant vegetation) to assess the potential risks and impacts of groundwater drawdown on this and the other wetlands and wetland management areas illustrated in Figure 4.7 (including those downstream and where groundwater drawdown is predicted).

Chemicals

14. To assess the interactive effects of mixtures of chemicals, direct toxicity assessments (DTA) can be used. The proponent has provided a joint industry report on the ecotoxicity of CSG hydraulic fracturing fluids (2018), which included testing of formation waters, source waters, hydraulic stimulation fluids and flowback waters from the Surat and Bowen Basins using acute and chronic freshwater toxicity tests. However, the fluids, waters and locations tested were not identified in the report, limiting its usefulness to assess the risk of the proposed CSG expansion. To derive ecotoxicity trigger values (i.e. dilutions of these waters that would protect 95% of aquatic species if there was an environmental release) acute data have been converted to chronic data using experimentally-derived acute-to-chronic ratios ranging from 0.3 to 432 (PD, Attachment G, Joint Industry Report, Appendix F). This confounds comparison of the toxicity of the flowback waters compared to source or formation waters, and how this changes over time. Conclusions about the relative toxicity of each fluid or water did not take into account the large confidence limits around the trigger values, so this report should be peer reviewed and revised.
15. The proponent has stated that the target coal seams are anticipated to have sufficiently high permeability to allow the flow of gas without any need for well stimulation. Although the proponent does not plan routine hydraulic stimulation as part of the project, it is stated that stimulation may be undertaken to enhance gas extraction (PD, Water Resource Assessment, p. 18). Additionally, chemicals will be used in the inhibited brine and as anti-caking agents as part of well construction and as flocculants to remove sediment during well production. Of these 17 additional chemicals, 15 have not been previously assessed as part of the drilling and hydraulic fracturing chemicals risk assessments.
16. The risk of these additional chemicals has been assessed using the methods previously used to assess drilling and hydraulic fracturing chemicals (Golder, 2014 and PD, App. F). However, the human and environmental risk assessment contains several ambiguities.
 - a) How were human health hazard bands defined and assigned? The rating scale (between 0 and 4) is not defined but may be based on the Inventory Multi-Tiered Assessment and Prioritisation approach. However, this is different from the A-D rankings used in the National Industrial Chemicals Notification and Assessment Scheme risk assessment.
 - b) How were toxicity scores in the Persistence, Bioaccumulation and Toxicity (PBT) assessment determined as half scores (e.g. 1.5) when the method documented for scoring toxicity in Golder (2014) only gives three rankings: 1 (low), 2 (moderate) and 3 (high)? While a hazard index is defined, the derivation of this for each chemical and the scores are not provided.
 - c) How have the five inhibited brine proprietary chemicals been assessed? As these have not been identified, this lack of transparency severely hampers the ability of regulators and the community to assess their risk.

17. To enable a robust evaluation of environmental risks posed by these inhibited brine, anti-caking and flocculant chemicals, the proponent should provide a chemical risk assessment for each chemical listed in the PD that:
- a) states the identity and expected concentrations of each chemical;
 - b) states risk quotients for individual chemicals and hazard indices for mixtures;
 - c) is transparent about the approach used to calculate human health and environmental risk; and,
 - d) outlines an approach that will be followed to assess toxicity where direct toxicity assessment (DTA) data are not available.

Question 2: Does the Committee consider the proposed monitoring, mitigation and management measures are adequate to monitor, mitigate and manage impacts on water resources? If not, what additional measures does the Committee consider are required to monitor, mitigate and manage impacts on water resources?

Groundwater

As detailed previously (See paragraphs 1-3), the limitations in the groundwater modelling constrains the ability of the IESC to provide advice to this question.

18. The key potential impact from the proposed project to water resources is groundwater drawdown. The predicted footprints of groundwater drawdown are substantial, noting the lack of coincidence between the drawdown contours and the area of the proposed project, with the maximum extent of drawdown of more than two metres extending tens of kilometres beyond the project area in the Springbok Sandstone (year 2110) and Upper Hutton Sandstone (year 3000). Apart from the impact on these two aquifers, the drawdown is likely to lead to desaturation of the alluvial aquifer which supports GDEs such as stygofauna and terrestrial vegetation along creek lines (PD, Water Resources Assessment) as well as impacting flows in several creeks (see response to Question 1). No effective mitigation measures are proposed for this spatially extensive and prolonged groundwater drawdown. Given the depth and extent of drawdown predicted in the alluvium, and the likely impacts on stygofauna, aquatic biota and groundwater-dependent vegetation described in response to Question 1, the IESC considers that there are likely to be material risks to water resources such as Horse Creek and its riparian vegetation. Similar risks and impacts are likely for other watercourses in the project area, especially those with transient reliance on alluvial groundwater.
19. The proponent has an extensive monitoring network of 24 bores along Horse Creek. The IESC considers that this is appropriate for detecting changes in groundwater levels associated with drawdown and recharge along this creek and for refining the Jacobs groundwater model. The proponent should detail the anticipated frequency of future monitoring (PD, Water Resource Assessment, p. 83 states the frequency of monitoring will decrease over time) and the parameters that will be measured to refine the model and to test predicted levels of drawdown as the proposed CSG wells progressively come into production. Water level data should be collected continuously with pressure transducers.
20. As discussed in response to Question 1, the IESC considers that drawdown in the alluvium associated with transiently gaining sections of Canal, Eurombah and Juandah Creeks are likely to affect the stygofauna, aquatic biota and groundwater-dependent vegetation in a similar way to that predicted in Horse Creek. As detailed in paragraph 3g, the proponent should install a series of monitoring bores in these other creeks to provide information on groundwater levels, quality and hydraulic properties to support the establishment of baseline conditions before the proposed project occurs. This should include pump tests to derive hydraulic conductivity data suitable to support the

development of a numerical groundwater model (or expansion of the Jacobs model) to evaluate likely drawdown in the alluvium and to guide strategies for avoidance or mitigation of potential impacts.

Surface water

21. The IESC notes the documentation provided by the proponent relies partly on studies assessing the impacts to water resources used for the approved project (EPBC 2013/7047). On this basis, the proponent asserts that a significant impact on surface water resources is unlikely because similar impacts have already been assessed in existing monitoring and management plans for the initial 400 CSG wells and already approved. However, the IESC does not consider that any compelling evidence has been provided to support this assertion. This is in part because the differentiation between existing and proposed projects is not clear making it difficult to assess impacts of the proposed project in isolation.
22. The IESC notes that some surface water quality data is tabulated in PD App. H. However, the data are not compared to guidelines nor is comment made on background concentrations that may exceed guidelines. In addition, there is poor clarity in use of units (assumed to be mg/L) and whether all data are dissolved or total metals in all tables. The proponent has concentrated primarily on the surface water assessment for Horse Creek and provided information dated from 2012 and 2014. Given the proposed project is an intensification of a current development, the proponent's surface water assessment should be supported by the recently collected data, as outlined in the Water Resource Assessment (Attachment A, p. 77). Data need to be presented for Horse Creek and the other tributaries in the project area including Dawson River, Canal Creek, Eurombah Creek and Juandah Creek, and should also be matched with flow data collected during and preceding water quality sampling.
23. The proponent acknowledges that increased erosion and surface water flow disturbance may result from ground clearance, physical obstructions and increased run-off due to ground compaction, and that this flow disturbance and altered water quality could impact vegetation communities and fauna, particularly EPBC Act-listed migratory species around natural wetlands (PD, MNES, p. 73). The proponent should include a sediment and erosion monitoring and management plan in the Water Management Plan for the infrastructure construction associated with the project including river crossings, well pads, trunklines and pipelines which will result in areas of surface disturbance that will be prone to erosion. Such plans should be supported by modelling of the relevant flood regime and include extreme events. Erosion is discussed further in response to Question 3.

Co-produced water

24. As outlined by the proponent, co-produced water will be treated using the existing approved Woleebee Creek Water Treatment Plant (WTP) facilities located near Woleebee Creek. The IESC notes that treated water will be managed under the existing Glebe Weir Beneficial Use Agreement and any volumes generated under this project are already included in the EPBC 2013/7047 approval (PD, Water Resource Assessment, p. 25). However, specific details of the exact location of the approved Woleebee Creek facilities, how the co-produced water will be transported to the Woleebee creek facilities, the approved existing storage ponds, and the design and details of the trunklines and crossings to connect to the existing infrastructure have not been provided by the proponent in the documentation. To determine the efficacy of the existing facilities in managing and mitigating the potential impacts of the proposed larger project, the IESC considers the following further information is required:
 - a. plans or maps showing the location of the WTP and storage ponds in relation to the new project area;
 - b. the capacity of the existing storage ponds;

- c. the design and construction of trunklines;
 - d. the locations where the trunklines will intercept watercourse crossings and works on the floodplain; and,
 - e. the inclusion of appropriate soil erosion and drainage/watercourse management plans.
25. The IESC considers a quantitative water balance is essential (IESC 2018). The proponent has not provided a quantitative water balance including the additional co-produced water from the additional CSG wells for the proposed project. Although the proponent has outlined that the WTP has an authorised capacity of 100 ML/d and has sufficient capacity to treat the water produced from the project area and accommodate the water produced from the additional proposed wells (PD, Water Resource Assessment, p.15), a quantitative water balance should be provided covering current and proposed activities. This should include:
- a. quantitative data supporting the water balance to allow an independent assessment of the methods, data and veracity of the model results;
 - b. water balance predictions for the duration of water production for the existing and proposed project, which take into account a range of climate and weather scenarios;
 - c. assurance that the proponent is the only user of the facilities and, if not, provide reassurance the WTP will be able to treat the co-produced water if the facility is used by other companies;
 - d. details on the water volumes being treated for the new project area, including the water quality data of the untreated water and treated water after reverse osmosis;
 - e. analyses of the potential volumes of salt and brine produced by the proposed project;
 - f. an assessment of the model's sensitivity to parameter changes; and,
 - g. details on storage pond capacity.
26. The proponent has provided insufficient water quality data (apart from typical concentrations for well heads from Walloon Coal Measures groundwater) to allow the IESC to determine the appropriateness of the proposed water quality monitoring, management and mitigation measures. It would be expected that any analysis of management of co-produced water would be supported by detailed water balance modelling. However, the documentation provided does not indicate that any such modelling has been undertaken. Residual risks could be managed by monitoring and the use of a Trigger Action Response Program.

Ecology

27. The IESC considers that additional surveys are needed to validate the proponent's predictions that the project presents a low risk to GDEs. This is particularly true for terrestrial GDEs and associated wetland management areas (see paragraphs 9-13), many of which currently lack monitoring programs capable of detecting alterations in groundwater levels and water quality, fluctuations in biota (including EPBC Act-listed species and components of endangered ecological communities) and changes to water regimes in surface and alluvial systems.
28. The Aquatic Ecology Assessment from May 2012 (PD, Attachment D), the Terrestrial Ecology Assessment from 2014 (PD, Attachment A) and several more recent desktop surveys (PD, Attachment C) of the project area are not sufficient to support the proponent's predictions of limited to no impacts to EPBC Act-listed species and threatened ecological communities. The limited field surveys that have been conducted are once-off sampling events that date back to either 2012 and 2014, and do not capture the temporal variations in species distribution and community composition

likely in this region. More recent on-ground surveys need to be conducted by the proponent across the whole project area, encompassing both dry and wet seasons, to provide a reliable baseline against which to test predictions about ecological responses to the likely impacts of the proposed expansion. These data, together with refined conceptual models of long-term responses downstream and across the zone of maximum groundwater drawdown, would support development of appropriate management measures to avoid or reduce impacts to surface waters, GDEs and associated biota, some of which are likely to be threatened species or communities.

Question 3: Does the Committee consider there is adequate consideration of the proposed action's contribution to cumulative impacts associated with other mining activities and coal seam gas production in the area? If not, what additional work does the Committee consider is required to adequately consider the proposed action's contribution to cumulative impacts?

Groundwater and springs

29. In the Surat CMA, impacts on EPBC Act-listed springs are managed under the Joint Industry Plan for Springs Monitoring and Management (JIP) and the Queensland Government Spring Impact Management System. The proponent concludes, based on the OGIA model, that the proposed project will not have a cumulative impact on groundwater drawdown of more than 0.2 m on any EPBC Act-listed springs for which they have been assigned responsibility under the JIP. The Dawson 8 spring complex is the only listed spring likely to be impacted and for which the proponent has been assigned responsibility for monitoring and management but the OGIA model predicts an impact of less than 0.2 m. The IESC applauds the collaborative approach among operators in the Surat CMA in developing the JIP but is concerned that the proposed project has the potential to contribute to cumulative impacts to Scotts Creek spring approximately 15 km west of the project area. The proponent has not described the project's potential contribution to the predicted cumulative impact to this spring, nor on spring-fed watercourses that contribute to flow in the Dawson River downstream (see paragraph 30).
30. The IESC notes the OGIA model is subject to periodic updates, which result in refinement to impact predictions. The current version of the OGIA model does not include uncertainty analysis. Although the sources of the springs are attributed in the existing UWIR (though this requires further confirmation for a number of springs), it is still not clear whether the regional model is able to evaluate the potential impacts on springs in this circumstance. Further information on the source and volume of spring flows, including an assessment using environmental tracers and other suitable field methods to identify flow sources across multiple strata, could provide further information for the assessment of cumulative groundwater impacts. The use of isotope hydrology is recommended. This is now an established and relatively low cost technique that can be used to estimate the relative contributions of groundwater and surface water to a waterbody.
31. The proponent has also not clearly explained how impacts would be avoided or mitigated should monitoring or future predictions show greater impacts to listed springs.

Surface water

32. The proposed project will contribute, along with impacts from other resource projects and existing land-uses, to downstream sedimentation, altered flow and sediment regimes and reduced alluvial and surface stream flow (see response to Question 2, paragraph 23). The Dawson River is described as 'essentially perennial' (PD, Water Resource Assessment, p. 31), and Santos (2012) reports that groundwater discharges from seeps along the stream bed and springs provide perennial flow in the Dawson River downstream of Dawson's Bend. Although Eurombah, Horse and Juandah Creeks are major tributaries of the Dawson River and flow through the project area, the proponent has not provided an assessment of potential cumulative impacts to the downstream environment, including any reduction in their flow arising from groundwater drawdown. The proponent's study of surface

water-groundwater interaction, limited to Horse Creek, found evidence for interactions which implied that groundwater drawdown will reduce flows.

33. The proponent should use existing hydrological data to describe baseline flow conditions and model baseline sediment regimes in the Dawson River downstream of the creeks flowing over the area of predicted cumulative groundwater drawdown, including from the project. From this baseline, they should then quantify the contribution of the proposed expansion's impacts on sedimentation and flow regimes in the Dawson River, especially any reduction in stream flow duration and base flow volume. Groundwater models may also be useful to predict changes to subsurface flows in the alluvial aquifer.
34. The infrastructure associated with the project, including river crossings, will result in large areas of surface disturbance being prone to erosion. This impact will be cumulative with that from two potential open cut coal mines within the project area, other resource projects in the region and with existing agricultural disturbance.

Ecology

35. The proponent should provide an assessment of the risk of cumulative impacts reducing flows to the Dawson River on in-stream and riparian ecosystems, especially where these may be supporting aquatic biota (e.g. native fish, turtles) as well as providing water and habitat for EPBC-listed species. This assessment should be based on the sedimentation and flow investigations described in paragraph 32.
36. The IESC notes that treated and untreated co-produced water of suitable quality may be used for project activities such as dust suppression and will therefore contribute to existing changes in soil and surface water quality chemistry caused by CSG operations onsite and in the surrounding regional area. The proponent should demonstrate that the quality of this water will not degrade the environmental values of nearby water resources or groundwater-dependent terrestrial vegetation.

Date of advice	07 February 2019
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Source documentation provided to the IESC for the formulation of this advice	Surat Basin Acreage Development Project – Water Resource Assessment (and attachments) 2018. QGC. MNES Impact Assessment Report (and attachments) (2018). Surat Basin Acreage Development EPBC 2018/8276 Preliminary Documentation.
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Conditions attached to this approval

1. For the protection of **EPBC Act listed threatened species and communities**, the approval holder must not take the proposed action outside the **project area**.

Terrestrial MNES

2. The approval holder must not clear more than:
 - a. 62 hectares (ha) of Koala (*Phascolarctos cinereus*) (combined populations of QLD, NSW and the ACT) habitat;
 - b. 62 ha of Greater Glider (*Petauroides volans*) habitat;
 - c. 80 ha of South-eastern Long-eared Bat (*Nyctophilis corbeni*) habitat; and
 - d. 8.8 ha of Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.
3. To manage impacts to **EPBC Act listed threatened species and communities**, the approval holder must implement the Significant Species Management Plans (SSMP) prepared for each of the **EPBC Act listed threatened species and communities** identified in Condition 2.
4. To manage impacts to **EPBC Act listed threatened species and communities** from pests and weed species, the approval holder must implement the **Biosecurity Manual**.
5. The approval holder must implement the **Constraints Planning and Field Development Protocol** (the **Protocol**).
6. The approval holder must implement the approved **Offset Strategy and Management Plan**.
7. The approval holder must implement the **Reinstatement and Rehabilitation Manual**.
8. The approval holder must register and **legally secure**, in accordance with Queensland legislation, offsets for **impacts** described in the Offsets Strategy and Management Plan within one (1) year of **commencement** of the action.
9. 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**.
10. 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 and the **Protocol** required by this approval, and make them available upon request to the **Department**. 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.

Water Resources – Monitoring and Management Plans

11. The approval holder must ensure there is no impact on the values of **Groundwater Dependent Ecosystems (GDEs)** resulting from the extraction of groundwater.
12. The approval holder must comply with the Queensland Government's Underground Water Impact Report (**UWIR**) under the Queensland *Water Act 2000* including implementation of

the technical requirements of the Surat Cumulative Management Area (CMA) UWIR, specifically:

- the Water Monitoring Strategy (WMS);
 - the Spring Impact Management Strategy (SIMS);
 - any Make Good requirements; and
 - management and mitigation plans for other environmental values including GDEs.
13. The approval holder must submit a Groundwater Dependent Ecosystem Management Plan (**GDEMP**) to the Minister at least 3 months before the commencement of groundwater extraction. The GDEMP must be prepared by a suitably qualified expert and be independently reviewed. The independent review must confirm in writing that the GDEMP will ensure Condition 11 is achieved and contains:
- a. details of escalating measures to be implemented to ensure compliance with Condition 11, including trigger values, impact thresholds and cease work limits based on a combination of modelled and monitored data; and
 - b. details of a modelling and monitoring regime that is capable of demonstrating compliance with Condition 11.
14. Notwithstanding Condition 13, the approval holder may commence the extraction of groundwater in the area shown in Attachment A as defined by “2019 Proposed Development Wells” prior to development of the GDEMP.
15. The GDEMP must be implemented by the approval holder.
16. If a cease work limit as defined in the GDEMP has been exceeded, groundwater extraction must cease as soon as reasonably practicable in the areas that have been identified to be contributing to the exceedance of the cease work limit.
17. If condition 16 is triggered, the approval holder may not recommence groundwater extraction within the potentially impacted area until it can be demonstrated, to the Minister’s satisfaction, that there has been no impact to the values of GDEs or that impacts can be mitigated and that early warning triggers, impact thresholds and cease work limits remain valid, ensuring no impact on the values of GDEs.
18. The approval holder must remediate any impacts to the values of GDEs.
19. If impacts cannot be remediated, offsets must be provided to compensate for any impacts to the values of GDEs.

Administrative Conditions

20. Within three (3) months of every 12 month anniversary of the **commencement** of the action, the approval holder must publish a report (the Annual Compliance Report) on its website describing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions (and the **Protocol** required under Condition 5) during the previous 12 months. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. The approval holder must continue to publish the Annual Compliance Report each year until such time as agreed to in writing by the **Minister**.

21. The approval holder must report any contravention of the conditions of this approval to the **Department** within five (5) business days of the approval holder becoming aware of a contravention.
22. 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 approval holder must not commence the audit until the **Minister** approves the independent auditor and audit criteria in writing. The audit report must address the criteria to the satisfaction of the **Minister**.
23. The approval holder may choose to revise a plan approved by the **Minister** under conditions 3 through 7 or condition 13 without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the revised plan would not be likely to have a **new or increased impact**. If the approval holder makes this choice, they must notify the **Department** in writing that the approved plan has been revised and provide the **Department**, at least four weeks before implementing the revised plan, with:
 - a. an electronic copy of the revised plan;
 - b. an explanation of the differences between the revised plan and the approved plan;
 - c. the reasons the approval holder considers the taking of the action in accordance with the revised plan would not be likely to have a **new or increased impact**.
24. The approval holder may revoke its choice under condition 22 at any time by notice to the **Department**. If the approval holder revokes the choice to implement a revised plan, without approval under section 143A of the **EPBC Act**, the plan approved by the **Minister** must be implemented.
25. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the revised plan would be likely to have a **new or increased impact**, then:
 - a. condition 22 does not apply, or ceases to apply, in relation to the revised plan; and
 - b. the approval holder must implement the plan approved by the **Minister**.

To avoid any doubt, this condition does not affect any operation of conditions 22 and 23 in the period before the day the notice is given. At the time of giving the notice, the **Minister** may also notify that for a specified period of time that condition 22 does not apply for one or more specified plans required under the approval.
26. Conditions 22, 23 and 24 are not limited to the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised plan to the **Minister** for approval.
27. If, at any time after five (5) 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**.
28. Unless otherwise agreed to in writing by the **Minister**, the approval holder must publish all management plans referred to in these conditions of approval (including the **Protocol** required under condition 5) on its website. These documents must be published on the website within one month of being approved by the **Minister** or being submitted under condition 22. All published reports must remain on the website for the lifetime of the approval unless otherwise agreed to in writing by the **Minister**.

Definitions

Biosecurity Manual: Either –

- the Biosecurity Manual referred to in the Final Preliminary Documentation for EPBC 2018/8276, Surat Basin Acreage Development September 2019; or
- a subsequent version of the Biosecurity Manual submitted in accordance with Condition 23 of this approval.

Commence / Commencement: The first instance of any specified activity associated with the proposed action, including clearance of vegetation or construction of any infrastructure. Commencement does not include –

- minor physical disturbance necessary to undertake preclearance surveys, geotechnical investigations or monitoring programs;
- activities that are critical to commencement that are associated with the 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**; or
- activities necessary to protect environmental and property assets from fire, weeds and pests.

Conservation advice: A conservation advice approved by the **Minister** under section 266B(2) of the **EPBC Act**.

Constraints Planning and Field Development Protocol (the Protocol): Either –

- the Protocol included in the QGC Preliminary Documentation Response for EPBC No. 2014/7047, Development of Surat Basin Acreage (Management Plans, Volume 4.0, June 2014); or
- the most recent version of the Protocol approved in writing by the **Minister**; or
- a subsequent version of the Protocol submitted in accordance with Condition 23 of this approval.

Department: The Australian Government Department or agency responsible for administering the **EPBC Act** from time to time.

EPBC Act: The *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

EPBC Act Environmental Offsets Policy (2012): The **EPBC Act** Environmental Offsets Policy. (October 2012), or subsequent revision, including the Offsets Assessment Guide. Available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

EPBC Act listed threatened species and communities: A threatened flora or fauna species listed under the **EPBC Act** and/or an endangered ecological community listed under the **EPBC Act** for which this approval has effect, including the:

- Koala (*Phascolarctos cinereus*) (combined populations of QLD, NSW and the ACT);
- Greater Glider (*Petauroides volans*);
- South-eastern Long-eared Bat (*Nyctophilis corbeni*); and
- Brigalow (*Acacia harpophylla* dominant and co-dominant).

Groundwater Dependent Ecosystem (GDE): Ecosystems that rely on groundwater for some or all of their water requirements.

Groundwater Dependent Ecosystem Management Plan: A plan that includes a series of actions to investigate causes of, monitor and mitigate a potential or actual reduction in groundwater availability to a Groundwater Dependent Ecosystem.

Impact/s: As defined in section 527E of the **EPBC Act**.

Koala habitat: As described in *EPBC Act referral guidelines for the vulnerable koala (combined populations of Qld, NSW and the ACT)*, Commonwealth of Australia, 2014.

Legally secure: Secure a covenant or similar legal agreement in relation to a site to provide enduring protection for the site against development incompatible with conservation.

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

New or increased impact: A new or increased **impact** on any matter protected by the controlling provisions for the action, when compared to the environmental impact or risk resulting from implementing the plan that has been approved by the **Minister** or submitted in accordance with condition 14 of this approval.

Offsets Strategy and Management Plan: Either:

- the Offsets Strategy and Management Plan provided in Appendix K of the Final Preliminary Documentation for EPBC 2018/8276, Surat Basin Acreage Development September 2019; or
- a subsequent version of the Offsets Strategy and Management Plan submitted in accordance with Condition 23 of this approval.

Potentially Impacted Area: An area that is predicted, from modelling or other technical assessment, to be impacted by the exercise of underground water abstraction.

Preliminary documentation: The document titled *Surat Basin Acreage Development, EPBC 2018/8276, Final Preliminary Documentation, Matters of National Environmental Significance, Impact Assessment Report, Revision 6 (September 2019)* prepared by QGC Pty Ltd. and as provided to the **Department**.

Project area: The area as described in the **preliminary documentation**, consisting of the following 16 graticular blocks and shown by the blue boundary at Attachment A.

QGC Field Name	Block ID
Botany	CHAR 1650
Charlotte	CHAR 1651
Friendship	CHAR 1652
Scarborough	CHAR 1653
Pleiades	CHAR 1654
Fishburn	CHAR 1722
Borrowdale	CHAR 1723
Golden Grove	CHAR 1724
Bloodworth	CHAR 1725
Thackery	CHAR 1794
Penrhyn	CHAR 1795

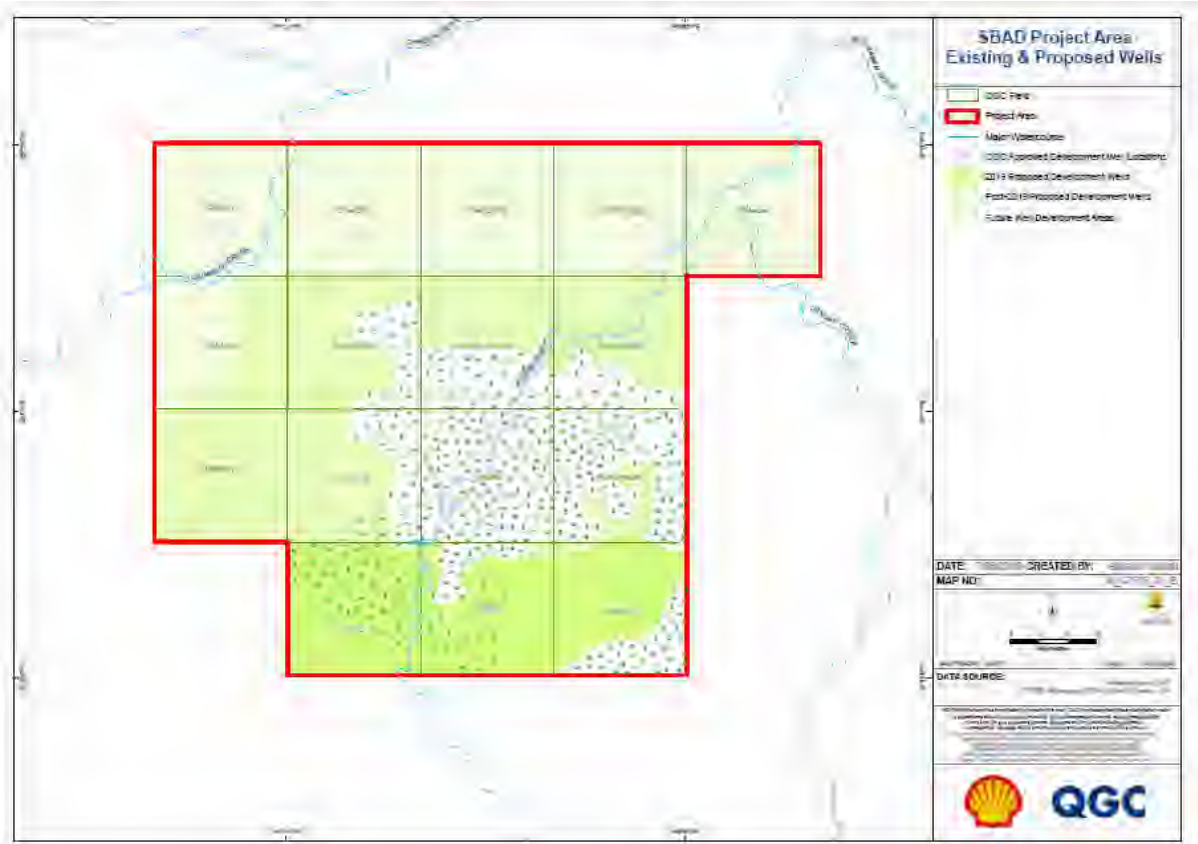
Charlie	CHAR 1796
Portsmouth	CHAR 1797
Arthur	CHAR 1867
Phillip	CHAR 1868
Cameron	CHAR 1869

Reinstatement and Rehabilitation Manual: Either:

- the Surat Basin Acreage Remediation, Rehabilitation, Recovery and Monitoring Plan as approved by the Minister on 17 December 2014, fulfilling the requirements of Condition 11 of EPBC Approval 2013/7047; or
- a subsequent version of the Reinstatement and Rehabilitation Manual submitted in accordance with Condition 23 of this approval.

Values: means ecosystem services, ecological function and environmental values (including habitat for EPBC listed threatened species and communities).

Attachment A



s. 22(1)(a)(ii)

From: Species Policy
Sent: Friday, 25 October 2019 2:57 PM
To: s. 22(1)(a)(ii)
Cc: Environment Protection; s. 22(1)(a)(ii) Species Policy
Subject: RE: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

On behalf of the Protected Species and Communities Branch, I confirm that we are not anticipating any changes to the documents relating to the threatened species and ecological communities identified by EAD in the email below in the coming six weeks.

Please note that PSCB has not re-checked whether the correct documents are present or that the citation information is correct.

Regards, s. 22(1)(a)(ii)

s. 22(1)(a)(ii) | Assistant Director | Species Information and Policy Section | Department of the Environment and Energy
PO Box 787 | CANBERRA ACT 2600
s. 22(1)(a)(ii)@environment.gov.au
Ph: s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Thursday, 24 October 2019 12:18 PM
To: Species Policy
Cc: Environment Protection ; s. 22(1)(a)(ii)
Subject: FW: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi Species Information and Policy Section,

The proposed decision for the Surat North CSG Project, approximately 20 km west of Wandoan, Queensland (EPBC 2018/8276), is likely to be signed by the delegate, Andrew McNee, on 4 November 2019.

I would be grateful if you could please advise on whether or not there are any new, revised or imminent conservation advices, recovery plans or threat abatement plans that may be relevant to this project.

I have reviewed the information below, and can confirm the relevant statutory documents have been correctly identified for the listed threatened species and ecological communities.

The last check of SPRAT for new or revised conservation advices, recovery plans or threat abatement plans was done 24 October 2019.

Thanks,

s. 22(1)(a)(ii)
Queensland Assessments North Section
Environment Approvals Division
Department of the Environment and Energy
t s. 22(1)(a)(ii) | e s. 22(1)(a)(ii) @environment.gov.au

From: s. 22(1)(a)(ii)
Sent: Thursday, 24 October 2019 11:23 AM
To: s. 22(1)(a)(ii) <@environment.gov.au>; s. 22(1)(a)(ii)
Cc: Environment Protection <Environment.Protection@environment.gov.au>; s. 22(1)(a)(ii)
Subject: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi QA Officer

The proposed decision for the Surat North CSG Project (EPBC 2018/8276) is likely to be signed by the delegate, Andrew McNee, on 4 November 2019.

The project is located in the QGC Surat Basin Acreage Development (SBAD), approximately 20 km west of Wandoan, Queensland. Could you please provide advice as to whether or not there are any new, revised or imminent conservation advices, recovery plans or threat abatement plans that may be relevant to this project?

I have listed the species and ecological communities which are likely to be significantly impacted by the project and the CAs, RPs and TAPs that have been considered in the decision below.

The last check of SPRAT for new or revised conservation advices, recovery plans or threat abatement plans was done on 23 October 2019.

Please let me know if you require any further information.

Are you able to provide this advice by **29 November 2019**?

Thanks.

s. 22(1)(a)(ii)
Environment Approvals Division
T s. 22(1)(a)(ii) | E s. 22(1)(a)(ii) <@environment.gov.au>

Relevant listed threatened species and communities:

- Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – Vulnerable
- Greater Glider (*Petauroides volans*) – Vulnerable
- South-eastern Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable

Conservation advices:

- Threatened Species Scientific Committee (2015). *Conservation Advice Nyctophilus corbeni south-eastern longeared bat*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83395-conservation_advice-01102015.pdf.
- Threatened Species Scientific Committee (2016). *Conservation Advice Petauroides volans greater glider*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-20160525.pdf>.
- Department of Sustainability, Environment, Water, Population and Communities (2012). *Approved Conservation Advice for Phascolarctos cinereus (combined populations in Queensland, New South Wales and the Australian Capital Territory)*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/197-conservation-advice.pdf>.

Recovery Plans:

Nil.

Threat abatement plans:

Nil.

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Thursday, 31 October 2019 11:51 AM
To: s. 22(1)(a)(ii)
Cc: Director Compliance
Subject: RE: Surat North CSG Project, Qld (EPBC 2018-8276): Environmental history check request [SEC=OFFICIAL]

Dear s. 22(1)(a)(ii)

Revised history check on QGC as requested below.

s. 22(1)(a)(ii) | **Director** |
Compliance Section

Office of Compliance

Department of the Environment and Energy

GPO Box 787 Canberra ACT 2601

T: s. 22(1)(a)(ii) | M: s. 22(1)(a)(ii)

s. 22(1)(a)(ii) | [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)

In relation to your request to inform pending approval of conditions, in particular section 136(4) *Person's environmental history* for **QGC Pty Ltd** the Compliance section provides the following advice:

Based solely on the information available, the Compliance Section of the Office of Compliance have conducted a history check on **QGC Pty Ltd** and the below history has been identified.

A Case was opened in CEMS on 4 April 2017 and closed 11 April 2017 with the following Case summary:

April 2014 Three infringement notices issued

The Queensland Gas Company Pty Limited (QGC) is a leading Australian coal seam gas explorer and producer. QGC hold an EPBC approval to develop and transporting gas through a 730km underground pipeline network from the Surat Basin to Curtis Island near Gladstone where it will be liquefied.

On or about 15 March 2011 plant and machinery cleared up to 6 kilometres of vegetation within the Gas Transmission Pipeline Right of Way of EPBC approval 2008/4399. The actions described are works associated with the pipeline construction.

The action or omission contravened conditions 4, 13 and 49 attached to EPBC approval 2008/4399, the action constituted an offence under s 142B EPBC

On 15 April 2011 QGC were served with three Infringement notices, each valued at \$6,600.

QGC received fines totalling \$19,800

June 2014 Three infringement notices issued

The Queensland Gas Company Pty Limited (QGC) is a leading Australian coal seam gas explorer and producer. QGC hold an EPBC approval to develop and transporting gas through a 730km underground pipeline network from the Surat Basin to Curtis Island near Gladstone where it will be liquefied.

Given the potential for any contraventions of state environmental approvals to impact on multiple matters of national environmental significance, in particular activities on Curtis Island impacting on the adjacent Great Barrier

Reef World Heritage Area (GBRWHA), the department has taken the view that any contravention of approval conditions must be reported within the five (5) day time limit imposed by condition

QGC failed to report three incidents within the designated timeframe. On 25 June 2012 QGC were served with three Infringement notices, each valued at \$6,600. QGC disputed the issue of the notices and following an internal review QGC were advised that the department remained of the opinions that a contravention had occurred. The notices were paid in full on 19 November 2012.

QGC received fines totalling \$19,800

September 2014 two infringement notices issued

Approvals Monitoring referred a potential contravention of approval conditions of QGC's approval EPBC 2008/4398, to EPBC Compliance. Compliance identified that QGC had contravened conditions 31 and 34 by failing to provide offsets within condition timeframes and recommended the issuing of infringement notices. On 18 July 2014, CMP endorsed the issuing of 2 infringement notices.

Infringement notices issued on QGC (EACD14/026 and EACD14025) were receipted in finance and were paid in full (\$20,400) on 17 September 2014 (Receipt # 14055321)

No further action required. Case was closed.

There are no other compliance incidents relating to this entity recorded.

Regards

Compliance Section
Office of Compliance

From: Compliance
Sent: Thursday, 17 October 2019 12:16 PM
To: Director Compliance <director.compliance@environment.gov.au>
Cc: Compliance <Compliance@environment.gov.au>
Subject: FW: Surat North CSG Project, Qld (EPBC 2018-8276): Environmental history check request [SEC=OFFICIAL]

Hi

Please see attached an environmental history check request.

Please note that a response by 25 October 2019 would be appreciated.

Triage and Wildlife Seizures
CITES Enforcement Authority of Australia
Legal and Compliance Division
Department of the Environment and Energy
Email: compliance@environment.gov.au
Phone: s. 22(1)(a)(ii) or free call 1800 110 395
GPO Box 787
Canberra ACT 2601

From: Intelligence Team
Sent: Thursday, 17 October 2019 11:51 AM
To: s. 22(1)(a)(ii) ; Compliance
Cc: s. 22(1)(a)(ii) ; Intelligence Team
Subject: RE: Surat North CSG Project, Qld (EPBC 2018-8276): Environmental history check request [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

Thank you for the request. All environmental history check requests are now handled by the Office of Compliance Triage team – compliance@environment.gov.au

Triage – could you please action the below environmental history check from the Post Approvals section. Thanks.

Kind regards,

s. 22(1)(a)(ii)

s. 22(1)(a)(ii)

Operational and Tactical Intelligence

Office of Compliance | Environment Protection Group

Department of the Environment and Energy

📱 s. 22(1)(a)(ii)

✉️ s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)

From: s. 22(1)(a)(ii)

Sent: Wednesday, 16 October 2019 4:19 PM

To: Intelligence Team <intelligence@environment.gov.au>

Cc: s. 22(1)(a)(ii)

Subject: Surat North CSG Project, Qld (EPBC 2018-8276): Environmental history check request [SEC=OFFICIAL]

Hi Intelligence

Please find a request for intelligence support attached for an environmental history check for QGC Pty Ltd, associated with the Surat North CSG Project, Qld (EPBC 2018/8276). A response by Friday 25 October would be appreciated to allow the briefing package to be prepared and provided to the delegate by 31 October .

Kind regards,

s. 22(1)(a)(ii)

Environment Approvals Division

T s. 22(1)(a)(ii) | E s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)

ss. 42(1), 47F(1), 22(1)(a)(ii)

ss. 42(1), 22(1)(a)(ii)

S. 42(1)

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

ERT

Report created: 29/10/19 08:50:19

[Summary](#)

[Details](#)

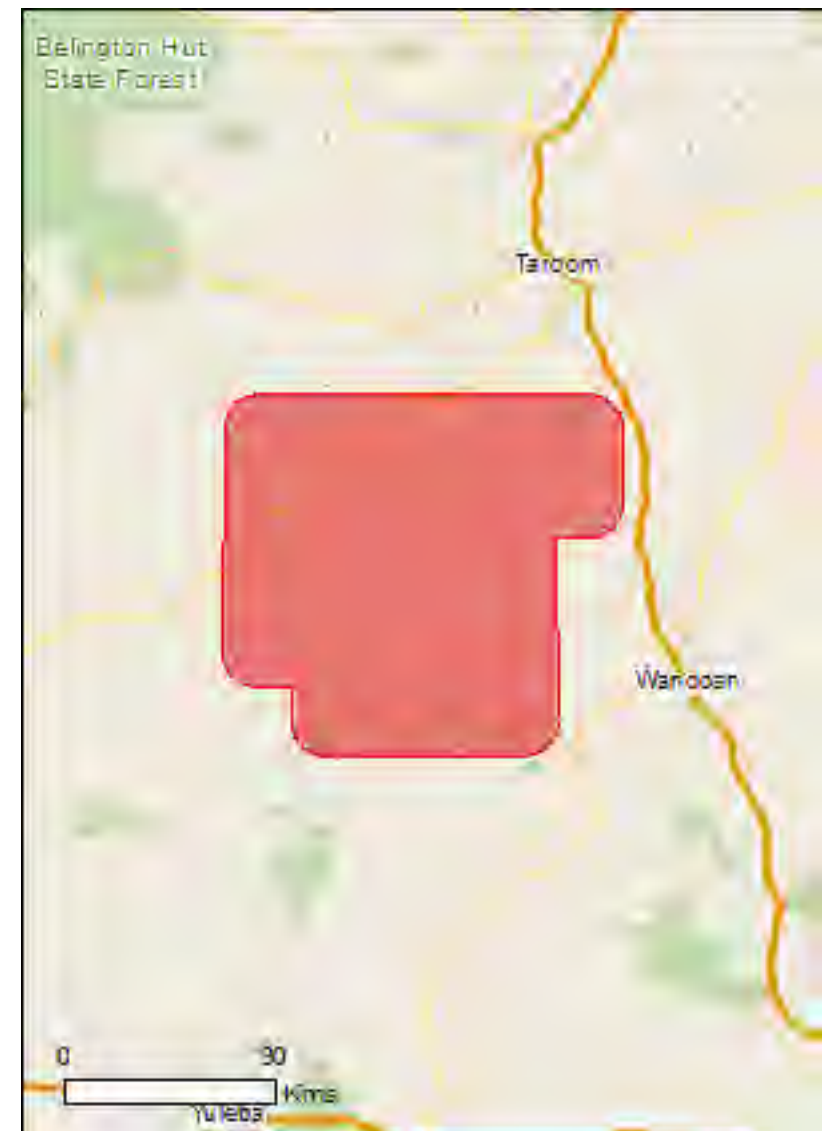
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA Australia Limited



Summary

Matters of National Environment Significance

World Heritage Properties:	None
National Heritage Places:	None
Ramsar Wetlands:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Threatened Ecological Communities:	5
Threatened Species:	21
Migratory Species:	11

Other Matters Protected by the EPBC Act

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	20
Nationally Important Wetlands:	None
EPBC Act Referrals:	18
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
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BIRDS

Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

MAMMALS

Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area

OTHER

Name	Status	Type of Presence
Adclarkia dawsonensis Boggomoss Snail, Dawson River Snail, Dawson Valley Snail [67458]	Critically Endangered	Species or species habitat may occur within area
Adclarkia dulacca Dulacca Woodland Snail [83885]	Endangered	Species or species habitat likely to occur within area

PLANTS

Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat may occur within area
Tylophora linearis [55231]	Endangered	Species or species habitat may occur within area

REPTILES

Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat likely to occur within area

Migratory Species

[Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
------	------------	------------------

Migratory Marine Birds

Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
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Migratory Terrestrial Species

Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area

Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		habitat may occur within area Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		habitat may occur within area Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit,

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur

Name	Status	Type of Presence
Sus scrofa Pig [6]		within area Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Plants

Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area

Reptiles

Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
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EPBC Act Referrals [\[Resource Information \]](#)

Further details about the referral or advice - including its current status if still active - are available in its PINK report; click on the title.

Referral

Title	Reference	Referral Outcome	Assessment Status
High Voltage Transmission line Development	2007/3230	NCA	Referral Decision Made
Coal Seam Gas Field Development for Natural Gas Liquefaction Park, Curtis Island	2008/4059	CA	Approval Decision Made
Elimatta Open Cut Coal Mine and Coal Processing Plant	2008/4130	NCA	Referral Decision Made
Wandoan Coal Project Coal Seam Methane Water Supply West	2008/4283		Withdrawn
Wandoan Coal Mine and Infrastructure Project	2008/4284	CA	Approval Decision Made
Development of Existing Coal Seam Gas Fields	2008/4398	CA	Approval Decision Made
Queensland Curtis LNG Project - Pipeline Network	2008/4399	CA	Approval Decision Made
Expansion of Coal Seam Gas Fields	2009/4974	CA	Approval Decision Made
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	CA	Approval Decision Made
Development of an underground longwall coal mine	2011/6129		Withdrawn
Development of the Norwood underground longwall coal mine project	2011/6130		Withdrawn
Future Gas Supply Area Project	2012/6357		Withdrawn
Santos GLNG Gas Field Development Project, QLD	2012/6615	CA	Approval Decision Made
Roma to Taroom Road Repair and Reconstruction	2012/6628	NCA	Referral Decision Made
Development of new natural gas acreage in Surat Basin	2013/7047	CA	Approval Decision Made
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	NCA	Referral Decision Made
Surat North CSG Project, Qld	2018/8276	CA	Preliminary Documentation Published
Project Atlas CSG Project, between	2018/8329	NCA	Referral Decision Made

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environment and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-Forestry Corporation of NSW](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.



Constraints Planning and Field Development Protocol
Surat Basin Acreage
Rev 2
November 2017

ACRONYMS / ABBREVIATIONS

In this document, the following acronyms and abbreviations apply:

Acronyms /Abbreviations	Meaning
ATP	Authority to Prospect
CG	Coordinator General
DEHP	Department of Environment and Heritage Protection (formerly DERM)
DEE	Department of the Environment and Energy (formerly DSEWPaC/DoE)
EA	Environmental Authority
EIS	Environmental Impact Statement
GES	General Ecological Significance (in regard to Referable Wetlands)
GIS	Geographic information system
HES	High Ecological Significance (in regard to Referable Wetlands)
PL	Petroleum Licence
QCLNG	Queensland Curtis Liquefied Natural Gas
RFL	Release from Land
RFS	Release from Survey
SIA	Social Impact Assessment
RTS	Release to Survey
TEC	Threatened Ecological Community
UDP	Upstream Delivery Process

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1 INTRODUCTION

1.0 Scope of Document

The purpose of this document is to describe the objectives, purpose and application of the Surat Basin Acreage Constraints Planning and Field Development Protocol (the Protocol).

The Protocol details how QGC will assess locations for infrastructure within the Surat Basin Acreage development area. It outlines various constraints and informs the planning and approval process for determining final infrastructure locations, thereby minimising the environmental impacts of the Project. The Protocol includes the principles of:

- Avoiding or reducing adverse impacts on identified constraints;
- Mitigating and managing impacts to minimise cumulative adverse impacts on identified constraints.

1.1 Document Revisions and Approval

This document bears a revision status identifier which will change with each revision. The protocol will be reviewed at least once every five years.

QGC will review the Protocol considering all relevant studies, policies, standards, guidelines and advice relating to relevant activities published or provided to QGC by the Commonwealth or Queensland governments, or published or provided by other proponents undertaking similar activities, or published or provided by other parties, including any findings of an audit against conditions, or plans or other documentation required under the conditions of approval.

If the protocol requires updating to reflect new information, then the updated protocol will be submitted to the Minister within two months of the revision.

The approved Protocol will be incorporated into the QGC's management procedures, operational plans and other relevant documentation and kept current for the life of the development.

1.2 Distribution and Intended Audience

This document is intended for all QGC personnel and contractors involved in selecting locations for QGC's gas field infrastructure

2 CONSTRAINTS PLANNING AND FIELD DEVELOPMENT PROTOCOL

2.0 Scope

The Protocol applies to the development of all infrastructure associated with the Surat Basin Acreage development (the development).

The gas field tenements included in the development are shown in Figure 1. This figure also illustrates other QGC tenements that are not part of, but are adjacent to the development tenures.

The development area includes the following gas field tenures:

- Petroleum Lease (PL): 299, 397, 400, 401, 402, 463, 464, 467, 498, 505, 506, 507, 1008.

Natural gas produced as part of the development will be processed at the Woleebee Creek Central Processing Plant (CPP), approved under EPBC 2008/4398, and from there supplied into QGC's portfolio, which includes sales of gas to the domestic market, power generation and supply to the Queensland Curtis LNG facility on Curtis Island. Water produced will enter the Woleebee Creek Water Treatment Plant (WTP), approved under EPBC 2008/4398, for treatment and future beneficial use.

The Development will include the construction, operation and decommissioning of the gas field and associated infrastructure. The Woleebee Creek facilities including CPP, WTP and subsequent transportation of natural gas and beneficial use associated water management are covered by existing relevant project approvals and are not covered by this specific protocol document.

Development of tenements for gas production may involve the following activities, although not all activities listed may be undertaken:




- Seismic and geotechnical investigations;
- Drilling of coal seam gas (CS) well and other conventional gas wells, core wells, water monitoring wells and water supply wells, including establishment of a well pad and construction of incidental activities (e.g. sumps and camps) and the construction of well access tracks where required;
- Installation and operation of well-pad infrastructure, including (but not limited to) wellhead, gas and water separator, flare, well lift pump, well lift pump engine and wellhead compressors;
- Installation and operation of stimulation ponds or tanks and associated well stimulation and proppant treatments and processes to enhance gas recovery;
- Installation and operation of gas gathering lines including low point drains and high point vents to connect wells to field compressor stations (FCSs);
- Construction and operation of FCSs to compress gas, including screw compressors, electric or natural gas drive motors, coolers, flare or vents, substation, pipework, separated water tank or ponds (where required) generators and fuel storage and telecommunications facilities including towers;
- Installation and operation of gas trunklines to pipe gas from FCSs to central processing plants (CPPs) authorised under existing project approvals;
- Installation (where required) of underground or above-ground power lines authorised under existing project approvals;
- Installation of water gathering lines and pump stations to transfer associated water from the wellhead separator to infield storages and regional storage ponds;
- Construction of in-field storages (tanks or ponds) and regional storage ponds;

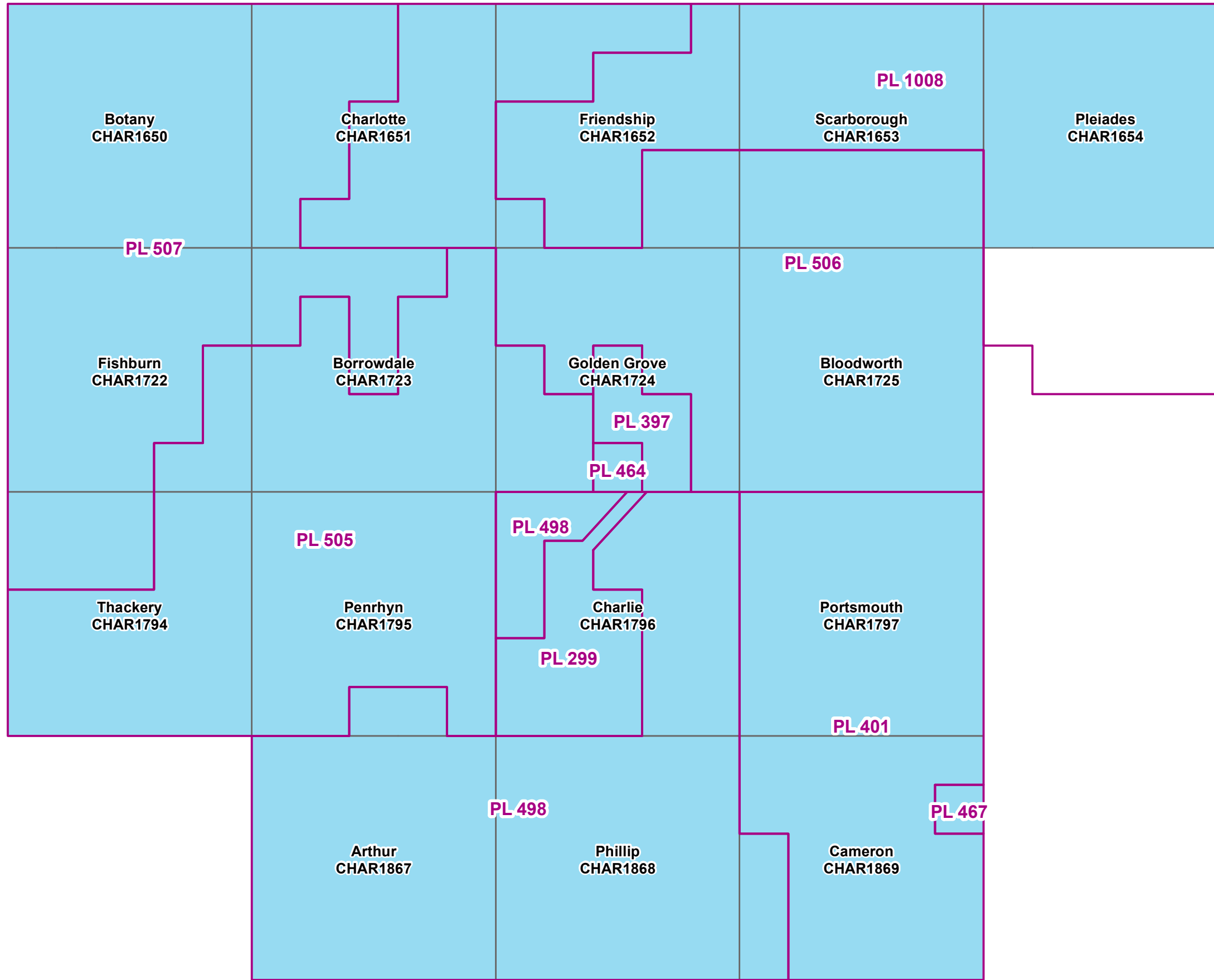
-
- Installation and operation of associated water trunklines and pump stations to transfer water from regional storage ponds to the WTP authorised under existing project approvals;
 - Development and construction of development-related access tracks and roads, fibre optic cable connections, telecommunication towers;
 - Development of, and extraction of quarry material from, borrow pits;
 - Accommodation camps for construction personnel (including sewage irrigation areas); and
 - Construction and operation of laydown areas, warehouses, core sheds, offices, vehicle wash downs and storage facilities.

Figure 1 indicates the proposed blocks to be developed and the tenements on which development will occur. Blocks to be developed will contain wells at an approximate spacing of between 600-1,100m (excluding exploration and appraisal wells which may implement tighter well spacing) and an associated network of access tracks, water and gas gathering pipelines. The location of all infrastructure will remain proposed until final locations are approved in accordance with this Protocol and the QGC Land Access Framework.

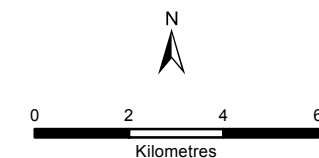
FIGURE 1 SURAT NORTH ACREAGE TENEMENTS

Development of Surat Basin Acreage

-  Development Area
-  QGC PL
-  QGC Field



DATE: 11/10/2016 CREATED BY: Rollmanc
 MAP NO: M_43940_01



Map Projection: GDA 94 SCALE: 1:160,000(A3)

DATA SOURCE: Infrastructure - QGC
 DCDB, Railways - DERM | Roads, Towns - GA

NOTE: Whilst care has been taken to prepare this map, QGC (and associated data custodians) make no guarantees about its accuracy, reliability or completeness and cannot accept responsibility of any kind for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are incurred by any party as a result of this product.
 Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2016. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.



2.1 Objective of the Protocol and Constraints Mapping

When confirming locations for gas-field infrastructure or petroleum activities, QGC will have regard to the environmental and social constraints at any proposed site. These constraints will be balanced against other drivers (including local geological characteristics, engineering requirements or landholder requirements for example).

QGC's priorities regarding constraints are (in order):

- Avoid
- Minimise
- Mitigate & rehabilitate
- Offset (In the case of ecological constraints)

To ensure infrastructure locations are chosen recognising local constraints, QGC will map environmental and social constraints on a site- and activity-specific basis to identify areas that are subject to varying levels of environmental and social limitation. This mapping will be used to identify areas of land that may be suitable or unsuitable for the development of gas-field infrastructure.

Areas with significant constraints are considered higher risk for gas field development because of their environmental and social sensitivity. The refinement of constraints mapping is an on-going process. All proposed infrastructure locations will be surveyed to confirm mapped constraints are accurate and to identify any additional constraints not previously identified in constraints mapping.

Examples of the environmental and social factors considered in constraints mapping include:

- Commonwealth matters of national environmental significance (MNES);
- Environmentally Sensitive Areas (ESAs);
- Watercourses and wetlands;
- Topography, slope and soil composition and erosion potential;
- Land Use and Infrastructure; and
- Social & Sensitive receptors (e.g. dwellings).

Environmental and social data gathered for the development will be collated in a geographic information system (GIS) for use in site selection of gas field infrastructure. Mapping will be built and maintained from internal and external data sources, including government and non-government data bases. It will be updated for relevant results of field-survey and public consultation. QGC will use the most up-to-date data to inform site selection decisions that will be confirmed through its internal planning and delivery process. A ranking will be assigned to each constraint consistent with this Protocol.

Where adverse impacts on constraints are unavoidable (typically arising from project engineering or land access issues), impacts will be minimised or mitigated for ecological constraints such as MNES and ESAs. Site remediation and rehabilitation of impacted areas will take place as per the relevant project environmental authority (EA) conditions to promote and maintain the long-term recovery of disturbed areas.

3 CONSTRAINTS SYSTEM

QGC has developed a custom GIS model to map constraints. The system overlays multiple constraint layers (datasets) for each proposed development-related infrastructure types (new layers are developed as an infrastructure type is proposed, designed and engineered).

3.0 Infrastructure Types

The constraints system includes constraint mapping specific to the following infrastructure or activity types:

- Utility Network, including power lines, communication lines;
- Pond – Other, including all ponds involved in the storage and transfer of associated water;
- Building, including administration buildings, camps, offices and storage facilities;
- Earth Work, including facility construction areas, laydowns and borrow pits;
- Plant, including FCSs;
- Well – All types;
- Pipeline, including all water and gas gathering lines and trunklines to transfer gas and water, on plot access tracks and roads; and
- Geology, including seismic surveys.

3.1 Identifying and Ranking Constraints

All constraints are assigned rankings as detailed below in Table 1:

TABLE 1: CONSTRAINT RANKINGS

Constraint Ranking	Description
Low	Development permitted with application of standard environmental management measures.
Medium	Development permitted with application of additional non-standard environmental management measures as required.
High	Environmental and/or social feasibility must be assessed prior to development and/or landholder agreement and compensation or offsets may be required.
Very High / no-go ¹	Development may not be environmentally and/or socially feasible for the proposed infrastructure. Other location options must be considered and assessed for viability.
¹ Infrastructure will not be located within very high / no-go constraint areas unless: <ul style="list-style-type: none"> • ecological field surveys demonstrate that siting infrastructure in that location will cause minimal adverse impact or can be managed through additional non-standard environmental management measures • other constraints preclude the selection of an alternative location 	

In relation to MNES specifically, proposed infrastructure locations will be determined in accordance with the following:

1. Preferentially avoid native vegetation that constitutes a listed threatened ecological community (TEC) and/or may provide habitat for listed threatened and migratory fauna species and utilise (where possible) previously cleared or previously utilised areas;
2. Exploration and production wells proposed within areas identified as very high / no-go constraint zone require justification for siting including site based (survey) assessment that the potential impact on any MNES will be minimal, short term and recoverable;
3. Where the location of other non-linear infrastructure in the very high constraint zone is justified given other constraints and cannot be avoided, only authorise the siting of that infrastructure in that zone where field ecological surveys demonstrate that there will be minimal, short term and recoverable, or no adverse impact on any MNES, including habitat for any listed species;
4. Linear infrastructure (e.g. pipelines), constraints are not generally assigned a no-go constraint ranking as it is not always possible to avoid constraint areas, especially where they are also linear in nature (e.g. watercourses). However, disturbance of any MNES will only be authorised, where necessary and preference will be given to collocation of linear infrastructure and siting within existing disturbed areas. Appropriate and proven QGC management methods to mitigate impacts will be implemented where practicable.

3.2 Constraints Classification

The following classification has been applied to constraints.

TABLE 2: CONSTRAINTS CLASSIFICATION

Zone	Ranking	Value
1	Low – Minimal Ecological Constraints	Altered landscapes, grazing, agricultural land,
2	Medium	Remnant vegetation – Not of Concern Cat C ESA – comprised of State Forests and Of Concern Regional Ecosystem (RE)
3	High	BPA corridors Cat C ESA – Essential Habitat, Nature refuges, Koala Habitat Areas and resource reserves Watercourses (excluding linear infrastructure) Cat B ESAs GES Referable wetlands
4a / 4b	Very high / no go	EPBC Listed Threatened Ecological Communities EPBC Listed Flora Listed threatened and migratory fauna species habitats as identified in the SSMP HES Referable Wetlands

Zone 4 areas are those with the highest ecological values. These values could potentially be significantly impacted by the petroleum activities and QGC will seek to avoid impacts to these areas wherever practicable.

Zone 4a areas are considered to have higher conservation values than Zone 4b. They are distinguished from each other only for enabling planning of linear infrastructure to avoid Zone 4a areas in preference to Zone 4b areas in locations where such areas are unavoidable.

Appropriate buffer zones adjacent to wetlands will be applied as required (in accordance with the relevant development EA conditions) based on confirmation of the location of the watercourse and wetland by site survey.

3.3 Ecological Constraints

QGC has considered a comprehensive list of potential ecological constraints including ESAs, MNES and other areas which are considered to have ecological constraints.

Ecological constraint mapping layers have been built using information from numerous databases from government, non-government, third party and QGC sources, including all available information and maps of MNES. Table 3 shows the zone allocations for the range of ecological values identified within the development area:

TABLE 3: ZONE ALLOCATIONS FOR IDENTIFIED ECOLOGICAL VALUES IN THE DEVELOPMENT AREA

Ecological Value	ESA Category	Zone	Comment
TEC	-	4	Three recognised within Development area; one other outside and to the west
Endangered Remnant Regional Ecosystems (EREs)	B	3	Eight EREs within Development area
Wetland (HES)	-	4	Includes HES Referable Wetlands that are also areas defined under the QLD Wetlands Program
Wetland (GES)	-	3	Includes GES Referable Wetlands that are also areas defined under the QLD Wetlands Program
Watercourse	-	3	As defined by the <i>Environmental Protection Act 1994</i>
State significant Biodiversity Planning Assessment (BPA) corridors	-	3	Unless already mapped under a higher category. Includes Juandah Creek corridor
Essential habitat for Endangered, Vulnerable or Near Threatened (EVNT) species	C	3	As defined by the <i>Vegetation Management Act 1999</i> and shown on the Regulated Vegetation Management Map
State Forest	C	2	Mount Organ State Forest
Of Concern Remnant RE	C	2	Six OC REs within study area
Regionally significant BPA	-	2	Unless already mapped under a higher

corridors			category
Not concern at present/Least Concern Remnant RE	-	2	Not including vegetation within state forest; 10 Least Concern REs identified within Development area
Non-remnant vegetation	-	1	Includes High-Value Regrowth that has not been recognised as a TEC

3.3.1 MNES

As described in Section 3.2, QGC has classified “zone 4a and 4b” as “very high or no go” constraints. MNES constraints include TECs, flora species and threatened and migratory fauna species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and associated regulations, which, where relevant, may be described in terms of specific niche habitat types.

MNES identified as potentially occurring in the Development area include:

- TECs:
 - Brigalow;
 - Coolibah – Black Box Woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions;
 - Semi-Evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar bioregions.
- Threatened flora and fauna species – a number identified as known or likely to occur (refer Table 4).

TABLE 4: EPBC LISTED FLORA AND FAUNA SPECIES KNOWN OR LIKELY TO OCCUR IN THE DEVELOPMENT AREA

Threatened Species	EPBC Act Status	Likelihood of Occurrence
Belson’s Panic Grass	Vulnerable	Known
Ooline	Vulnerable	Likely
Koala	Vulnerable	Likely
South-eastern Long-eared bat	Vulnerable	Likely
Yakka Skink	Vulnerable	Likely

3.3.2 APPROACH TO ACTIVITIES WITHIN MNES

Where QGC plans to undertake activities within or in proximity to areas identified as MNES, the standard approach is to identify, confirm, assess and minimise any potential or proposed impact to the known species or ecological community.

Identified MNES species, habitat and ecological communities will trigger further investigations that may include:

- Conducting further detailed surveys to confirm the presence of the species or ecological community concerned;
- Detail habitat features that are critical to the species;
- Locate the extent of the sensitive area (e.g. spatial extent of TEC); and
- Identify the preferred location of infrastructure following detailed environmental assessments.

During the construction of infrastructure within proximity of a MNES QGC will implement various strategies to minimise impacts to the MNES, including but not limited to:

- Restricting the scale of disturbance to as small an area as reasonably practicable;
- Locating non-critical infrastructure outside the identified sensitive area;
- Conducting pre-clearance ecological surveys to identify and flag sensitive areas;
- Engaging a licensed fauna spotter to spot throughout all clearing activities;
- Constructing infrastructure in consideration of the mitigation guidelines detailed in an appropriate significant species management plan; and
- Regular monitoring through the construction program (e.g. daily open trench walks for removal of entrapped and injured fauna).

3.3.3 ENVIRONMENTALLY SENSITIVE AREAS (ESAS)

ESAs are categorised into three types – Category A, B and C. Category A and B ESAs are prescribed in sections 25 and 26 of the *Environmental Protection Regulation 2008*.

Category A ESAs include areas such as National Parks, Conservation Parks and Wet Tropics Areas. Currently there are no category A ESAs located within the Development area.

There are a limited number of mapped Category B ESAs located within the Development area. Category B ESAs are most commonly identified through the mapping or presence of endangered regional ecosystems (EREs).

'Category C ESA' is not a term that is defined in legislation. Category C ESAs are currently taken to include any of the following areas:

- Nature Refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992*;
- Koala Habitat Areas as defined under the *Nature Conservation (Koala) Conservation Plan 2006*;
- State Forests or Timber Reserves as defined under the *Forestry Act 1959*;
- Regional parks (previously known as resource reserves) under the *Nature Conservation Act 1992*;
- An area validated as 'essential habitat' or 'essential regrowth habitat' from ground-truthing surveys in accordance with the *Vegetation Management Act 1999* for a species of wildlife listed as endangered or vulnerable under the *Nature Conservation Act 1992*; and
- 'Of Concern Regional Ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.

Approach to Activity Within ESAs

Where QGC plans to undertake activities within or close to areas identified as ESAs, the standard approach is to identify, confirm, assess and minimise any potential or proposed impact area through field validation surveys, observations and mapping of any Category A, B or C Environmentally Sensitive Areas and the presence of species classed as endangered, vulnerable or near threatened under the *Nature Conservation Act 1992*.

For all Category B or C ESAs proposed to be impacted or disturbed by infrastructure, field validation surveys will confirm the presence and status of the mapped ESA. Where the current spatial mapping is inaccurate, QGC will record the results of the field validation survey and subsequently undertake works using field-validated constraints mapping.

Siting of infrastructure and proposed disturbance to ESA areas will also be regulated and prescribed by the relevant EA authorising the activity. In addition to EA conditions QGC will also follow existing protocols (where appropriate) for minimising impacts during the construction phase as identified in Section 5.

3.3.4 TOPOGRAPHY AND SOILS CONSTRAINTS

Topography and soil constraints include topography, erosion potential and subsoil salinity.

Topography and soils are generally a constraint for construction activities and impacts will be managed or mitigated per the identified constraint ranking during the construction process and through appropriate engineering, detail design and reinforced on-site through the implementation of Construction Environmental Management Plans for specific activities.

3.3.5 WATERCOURSES & WETLANDS

Watercourses and wetlands throughout the development area are mapped in the GIS system and confirmed through field validation. Where mapped features are confirmed through survey as being present, QGC will apply buffers consistent with EA conditions to minimise the potential for impact from operational infrastructure. QGC consider the standard 100 m buffer to watercourses and 200m to wetlands of high ecological significance a guide for placement of static infrastructure (not associated with the construction or operation of linear infrastructure). Assessment of watercourses will be governed by the definition provided in Schedule 4 of the *Environmental Protection Act 1994*. Assessment of wetlands will be governed by the definition of the relevant EA.

HES Referable Wetlands are classified as a Zone 4 owing to their higher ecological value. EA conditions differ for development in and within a buffer zone to HES Referable Wetlands and GES Referable Wetlands.

Watercourse and wetland buffer zones have traditionally been applied to protect sensitive riverine environments from potential impacts of planned infrastructure and construction activities. On occasion QGC may require static development within these buffers areas. QGC, in assessing the likelihood of proposed infrastructure and activities within these buffers will engage a suitably qualified person to undertake an impact assessment of the planned works.

Static infrastructure within the prescribed buffer zones will only be constructed following receipt of detailed advice and provisions from a suitably qualified person and with the development and implementation of an appropriate Construction Environmental Management Plan.

Linear activities may not be able to avoid being located near or crossing through watercourse and wetland areas. Linear infrastructure activities may be undertaken within the bed and banks of a watercourse or within a wetland where there is no reasonable and practicable alternative, for the period as is permitted by any relevant statutory Code or Guideline for undertaking works in a watercourse, provided the relevant statutory Code and/or Guideline is complied with.

3.3.6 SENSITIVE RECEPTORS CONSTRAINTS

Sensitive receptors principally comprise residential dwellings in the Development area, but may also include community facilities and social uses as described in Section 3.4.8. Certain activities are constrained by their proximity to sensitive receptors, given the impact of the activity at the sensitive receptor (e.g. noise levels, visual amenity and localised air emissions).

Noise

QGC will undertake noise modelling to determine required separation distances between sensitive receptors and proposed sources of noise emissions (from well development, construction activities and the operation of fixed field infrastructure). Standard separation distances will be in constraints mapping. The requirement for ambient noise measurement will be assessed on a case by case basis and undertaken where appropriate prior to commencement of works to provide baseline levels.

Due to the large land parcel size within the Development area (average of approximately 1100 ha), FCS locations are unlikely to be within 1 km of a sensitive receptor, and noise emissions from operational FCSs are anticipated to be compliant with the noise criteria at these distances. Noise modelling of final FCS locations will determine potential engineering treatments or identify if alternative arrangements may be required.

Visual Amenity

Visual amenity of FCSs is considered a low constraint at distances greater than 1 km from a sensitive receptor.

Visual amenity of pipeline rights of ways is considered a low constraint, considering operational rehabilitation including land stabilisation including seeding will be established post construction. Visual amenity of pipeline rights of way and wells are considered a low constraint at distances greater than 500 m.

The assessment of proposed pond locations will consider land form, slope, proximity to sensitive receptors and public access around the site. Visual amenity has not been incorporated into the constraints model as separation distances for noise purposes are expected to effectively reduce the visual amenity constraint to low.

Air Quality

Modelling conducted for the Development demonstrated that localised exceedances of air quality objectives as defined in the *Environmental Protection Policy (Air)* will not occur therefore constraints on the separation distance to sensitive receptors are not expected.

3.3.7 AGRICULTURAL CONSTRAINTS

Agricultural constraints consider existing and potential land use for agricultural purposes, including Strategic Cropping Land (SCL).

The *Regional Planning Interests Act 2014 (RPI Act)* and *Regional Planning Interests Regulation 2014 (RPI Regulation)* commenced on 13 June 2014. The RPI Act identifies and protects areas of Queensland that are of regional interest through management of impacts to land and support of coexistence of activities associated with resource activities and other regulated activities in areas of regional interest. There are four areas of regional interest under the RPI Act:

- A priority agricultural area (PAA)
- A priority living area (PLA)
- The strategic cropping area (SCA)

- A strategic environmental area (SEA)

Land under cropping may be situated on SCL.

3.3.8 FLOOD-LEVEL CONSTRAINTS

Flood modelling of all watercourses in the Development area has not been conducted. QGC will, on a case-by-case basis, conduct flood modelling for FCSs and ponds.

Depending on type, infrastructure locations may be constrained by 50-year annual recurrence interval (ARI) or 100-year ARI flood levels.

QGC intends to construct FCSs at least one metre above the 100-year ARI flood levels. This may require the raising of the foundation levels of FCS. Ponds will be designed so that embankments are above the 100-year ARI flood level where practicable to do so.

There may be instances where wells are below the 50- or 100-year ARI flood levels. QGC will assess whether the risk of locating wells in a flood-prone area is as low as reasonably practicable. Where it is decided to construct wells in a flood zone, these wells may, depending on flood heights, be shut down in a flood event.

Pipelines will be installed across watercourses and in areas subject to flooding at depths prescribed by AS2885 or other relevant codes

Temporary worker's accommodation and associated on-site sewage treatment plants will be located above the 50-year ARI flood level where practicable to do so.

3.3.9 SOCIAL CONSTRAINTS

Social constraints considered include:

- Townships and localities;
- Dwellings;
- Community facilities;
- Emergency service facilities (with access/egress constraints also relevant);
- Non-Indigenous cultural heritage places (NICHs), with Indigenous cultural heritage places addressed in detail in the respective Cultural Heritage Management Plans;
- Social infrastructure:
 - community centres;
 - schools;
 - churches and community halls; and
 - recreational facilities.
- Land use and infrastructure constraints (e.g. stock routes).

3.4 Other Constraints

This Protocol considers environmental and social constraints. In addition, there may be constraints on the location of infrastructure due to:

- Engineering factors (identified through site survey) overlapping mining or other tenures;
- Tenure requirements;
- Existing or proposed third-party infrastructure;
- Commercial arrangements; or
- Health, safety and security.

QGC considers these and other non-environmental and non-social constraints through its business processes as it plans and locates gas-field infrastructure.

4 INCORPORATION OF THE PROTOCOL INTO MANAGEMENT PROCEDURES

All proposed Development infrastructure must be internally approved by relevant business groups prior to commencement of construction. Internal approvals can only be granted if proposed activities are approved under relevant State and Federal legislation and comply with any relevant conditions of approval.

4.0 Upstream Delivery Process

The QGC upstream delivery process (UDP) specifies the internal workflow and decisions followed to progress upstream scope through planning to execution and operations. All development infrastructure must be approved through this process and receive a series of functional endorsements culminating in a key approval authorising final planning and construction. The way in which the constraints protocol is applied through this process is shown in Figure 2.

The first stage of the internal planning and delivery process delivers integrated approvals of work scope. This is a strict internal process to select and approve location of wells, infrastructure and field activities. Proposed infrastructure locations are reviewed against the relevant constraints mapping held in the QGC GIS.

Specific instructions to the survey team to further investigate identified or potential constraints may be included at this stage. It may also include requirements that there be on-site investigation by an appropriately qualified specialist with skills relevant to a potential constraint (e.g. an ecologist with hydrogeological training).

Once conceptual locations are approved, a multidisciplinary survey is undertaken to verify mapped constraints and identify any un-mapped constraints.

Typically, a survey will include at least a surveyor, a relevant construction representative, appropriately approved / qualified ecologists, cultural heritage representative and a land access representative. Surveys may also be attended by landholders.

All site assessments and field ecological surveys will:

- Consider and reference previous ecological surveys undertaken in the area and relevant new information on likely presence or absence of constraints;
- Document the survey methodology, results and significant findings in relation to constraints; and

- Apply best practice site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities.

Objectives of the survey include confirmation of constraints to infrastructure locations.

Field surveys will record any potential disturbances to any level 3 or 4 constraints. Where a confirmed constraint is very high (e.g. 4), QGC will not conduct activities in the area, unless:

- Ground truthing and field ecological surveys demonstrate that siting infrastructure in that location will cause minimal adverse impact; and
- Other constraints preclude any alternative location.

In addition, QGC may seek alternative locations for proposed infrastructure in that location.

Alternative locations may be recommended by an appropriately qualified ecologist conducting pre-clearance surveys and by the QGC's environmental officers based on desktop analysis of environmental and other constraints.

If no viable alternative location is available (recognising that locations are subject to multiple and overlapping constraints), it may be necessary to locate infrastructure within a very high/no-go constraint. This must be approved through the UDP as described below in subsequent steps.

Where a potential impact to a very high/no-go constraint is expected prior to the disturbance occurring, QGC will record the expected disturbance by reference to:

- The proposed location, specific site and type of infrastructure or activity;
- Each very high constraint subject to disturbance;
- The related site assessment or field ecological survey documentation and recommendations, or the decision that the very high constraint was presumed to be present;
- The total area of predicted disturbance;
- The remaining disturbance limit for each affected very high constraint (if applicable);
- The reasons for the decision including justification for the action taken, description of the efforts taken to avoid impact, and explanation why other constraints might justify the impact on very high constraints; and
- Actions and commitments by QGC to avoid, prevent, remediate, rehabilitate, or make good any unauthorised disturbance.

Following the disturbance activities, QGC will confirm actual disturbances of very high/no go constraints (note this would occur after the final stage of the UDP, in the execution phase).

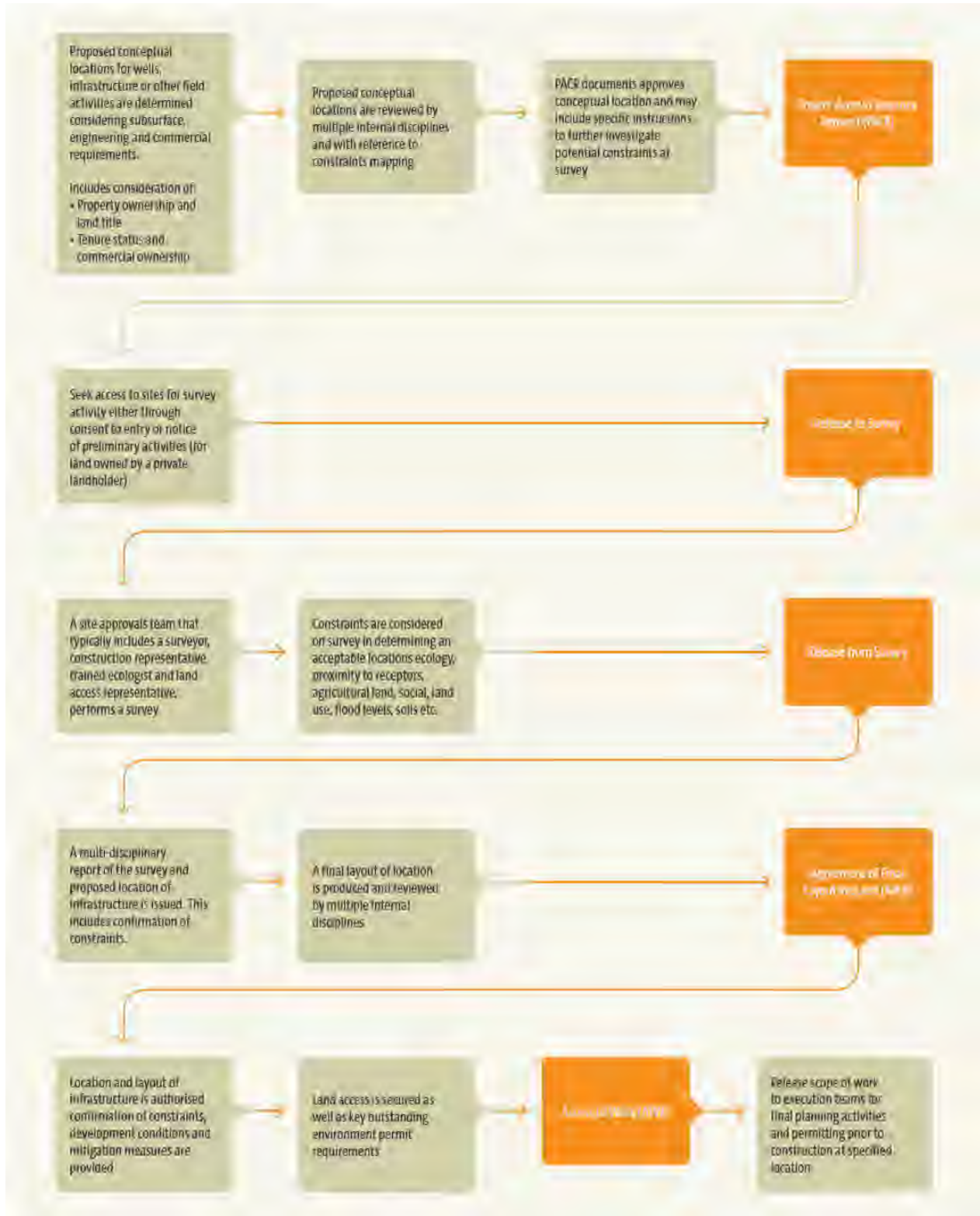
All information recorded during surveys will be recorded to a standard that can be independently audited.

On completion of the field surveys the site data and reporting the packages of information is collated and loaded into a second phase approvals packages. This phase of the approval seeks to gain acceptance of the proposed alignment/siting from each of the internal disciplines prior to approaching the landholder for negotiations and agreements. This stage confirms relevant constraints and includes any mitigation measures required.

Following the selection of infrastructure locations, QGC will seek to secure land access and any outstanding permit requirements, prior to authorising final planning activities and construction. This final stage confirms

that land access has been secured and that key outstanding environment permitting requirements are satisfied so that infrastructure can pass into execution phase for final planning and construction.

FIGURE 2 - UPSTREAM DELIVERY PROCESS FLOW DIAGRAM



5 MITIGATION MEASURES

Conditions of approval for the Development, from both DEE and DEHP will prescribe mitigation measures to be implemented where infrastructure is proposed to be in certain constraint zones. QGC will implement these mitigation measures where relevant.

6 UPDATING CONSTRAINTS

Information on constraints is held within QGC's GIS system. Constraints information will be updated where:

- Additional relevant information becomes available; or
- QGC assigns an alternative constraint ranking to an existing constraint.

Examples of additional relevant information include:

- Changes to government databases that form the basis of constraint mapping layers (where consistency with approved development conditions is not altered); and
- Survey data collected in the field which may indicate the presence of constraints not previously identified or the absence of constraints identified through desktop mapping.

QGC will not assign an alternative constraint ranking to a constraint that will result in a conflict with any conditions of approval from State or Federal governments. Before a constraint ranking is reassigned, QGC will follow a rigorous process to ensure all relevant business groups authorise the change before the change is approved by a senior manager with responsibility for environmental compliance or their delegate.

7 CONCLUSION

The Surat Basin Acreage Constraints Planning and Field Development Protocol provides a framework for the identification and ranking of known ecological and social constraints to inform selection of proposed infrastructure locations.

QGC's management procedures for infrastructure design and site selection incorporate a thorough review of all constraints. Proposed infrastructure locations will be overlaid on maps of known constraints to rapidly shortlist potential locations. Once potential locations have been selected, pre-clearance surveys will be undertaken to verify known constraints and identify previously unidentified constraints prior to construction.

The constraints protocol is viewed in GIS format that interprets high risk areas for planning and placement of infrastructure. The methodology of the constraints weighting is reviewed throughout each stage of review in the internal planning and delivery process.

Where a site is rejected the process starts again and other options are assessed.



Remediation, Rehabilitation, Recovery and Monitoring Plan QCLNG Gas Field

Rev 2

October 2011

Prepared by Unidel Group Pty Ltd

QCLNG-BX00-ENV-PLN-000026

Uncontrolled when printed

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QUEENSLAND CURTIS LNG PROJECT

DOCUMENT INFORMATION SHEET

TITLE: Environmental Guideline – Remediation, Rehabilitation, Recovery and Monitoring Plan

PURPOSE AND SCOPE:

This Remediation, Rehabilitation, Recovery and Monitoring Plan (RRRMP) has been prepared to address Commonwealth and State government approval requirements for the Queensland Curtis LNG Project (QCLNG) relating to Gas Field infrastructure construction activities.

The RRRMP specifically addresses conditions 14 and 15 of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) approval for the QCLNG Gas Fields (EPBC 2008/4398) dated 22 October 2010 (DSEWPaC 2010).

The purpose of this RRRMP is to outline the standards and methods of re-instatement, rehabilitation and monitoring required for the QCLNG Gas Fields. The scope of this document is the Gas Field Component only.

Revision Record

Issue	Date	Reason for Issue	Responsible	Accountable
2	18/10/2011	Revised to address DESEWPaC comments	FM	TW
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0	11/04/2011	Review by QGC and finalised	RO	TW

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Definitions and Abbreviations

In this document, the following definitions and abbreviations apply:

Term	Meaning
High Value Regrowth	Regrowth defined by DERM's <i>Regrowth Vegetation Code Version 1</i> (DERM 2009) or defined by DSEWPaC as mature native vegetation that has not been cleared since December 1989.
Progressive rehabilitation	The process by which disturbed areas are rehabilitated to their pre-disturbance land use with the same species and density of cover to that of surrounding undisturbed areas, as soon as practicable following the completion of any construction or operational works. (Based on DERM EA conditions)
Rehabilitation	Means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land. (DERM EA definition)
Recovery	The process of protecting, conserving and managing a listed threatened species or a listed threatened ecological community . (EPBC Act definition)
Reinstatement	The process of bringing the construction earthen landscape back to the original profile of the surrounding environment. Also referred to as re-profiling.
Regeneration	Vegetation that regenerates naturally (i.e. without the assistance of human intervention) from existing seed banks, suckering or coppice growth.
Regrowth	Native vegetation that has regenerated after clearing.
Remediation	To take action to repair or mitigate damage that may or will be, or that has been, caused to a MNES or an EVNT listed species. (EPBC Act definition) Remediation in reference to contaminated land, means: (a) rehabilitate the land; or (b) restore the land; or (c) take other action to prevent or minimise serious environmental harm being caused by the hazardous contaminant contaminating the land. (EP Act definition (Qld))
Restoration	Ecological restoration is defined by the Society for Ecological Restoration International as an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability. The term 'restoration' implies that the ecosystem will recover to its pre-disturbance health, integrity and sustainability. This may not be possible to be achieved after gas extraction, and as such the term 'rehabilitation' is used throughout this Plan as opposed to 'restoration'.
Revegetation	Means the use of direct seeding or tubestock to support an area

Term	Meaning
	achieving the pre-clearance native vegetation or regional ecosystem.
Decommissioning	To withdraw something from active service. This typically involves the removal of project infrastructure on the completion of a project.
Suitably Qualified Person	Means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature.
Watercourse	Has the meaning provided in section 5 of the Water Act 2000 and includes the bed and banks and any other element of a river, creek or stream confining or containing water.

Abbreviation	Meaning
CG	Queensland Coordinator-General
COE	Clean On Entry
CSG	Coal seam gas
DERM	Department of Environment and Resource Management
DIP	Department of Infrastructure and Planning
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EA	Environmental Authority
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ESA(s)	Environmentally Sensitive Areas include riparian areas, areas containing Threatened Ecological Communities listed under the EPBC Act, Regional Ecosystems listed as Endangered or Of Concern under the Vegetation Management Act, areas containing listed EVNT flora species, and areas providing habitat for EVNT listed fauna and MNES. Includes areas considered to be Zone 3 High Ecological Constraint or 4a and 4b Very High Ecological Constraint as defined in the Gas Fields EIS and QCG Constraints Planning and Field Development Protocol (QCLNG-BX00-ENV-PLN-000023).
EVNT	A species listed as endangered, vulnerable or near threatened under the NC Act
EP Act	Environmental Protection Act 1994 (Queensland)
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)

Abbreviation	Meaning
FEC	Field Environmental Coordinator
FEO	Field Environmental Officer
Ha	Hectare
LP Act	Land Protection (Pest and Stock Route Management) Act 2002
MNES	Matters of National Environmental Significance listed under the EPBC Act
NC Act	<i>Nature Conservation Act 1992</i> (Queensland)
P&WMP	Pest and Weed Management Plan (QCLNG-BX00-ENV-PLN-000027)
RARC	Rapid Appraisal of Riparian Condition
RE	Regional Ecosystem
RoW(s)	Right of Way(s)
SSMP	Significant Species Management Plan (QCLNG-BX00-ENV-PLN-000025)
TEC	Threatened Ecological Community listed under the EPBC Act
VM Act	<i>Vegetation Management Act 1999</i> (Queensland)
WMMP	CSG Water Monitoring and Management Plan (QCLNG-BX00-WAT-RPT-000005)

1 Introduction

1.1 Background

This Remediation, Rehabilitation, Recovery and Monitoring Plan (RRRMP) has been prepared to address Commonwealth and State government approval requirements for the Queensland Curtis LNG Project (QCLNG) (Queensland Government, 2010) relating to Gas Field infrastructure construction activities.

The RRRMP specifically addresses conditions 14 and 15 of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) approval for the QCLNG Gas Fields (EPBC 2008/4398) dated 22 October 2010 (DSEWPaC 2010).

DSEWPaC approval conditions that the RRRMP specifically addresses are provided in **Appendix 1**.

1.1.1 Project Summary

QCLNG is proposing to develop a Liquid Natural Gas (LNG) export facility at Gladstone in Central Queensland, Australia. The facility will allow QCLNG to commercialise QGC's Surat Basin Coal Seam Gas (CSG) resources. The project will source gas from CSG fields and transport it to the Curtis Island LNG facility via a 380km subsurface gas transmission pipeline.

The Gas Field component of the QCLNG project encompasses an area of 468,000ha, within the Walloon Fairway of the Surat Basin. The Gas Field development area is located between the towns of Moonie in the south, Wandoan and Miles in the north, Condamine and Tara in the west, and Chinchilla and Kogan in the east (**Figure 1**). The Project is anticipated to have a design life of between 20 and 30 years.

Over this timeframe development of the Gas Field component will comprise:

- approximately 6,000 gas production wells with approximately 1,500 wells across the gas field by mid-2014. The remaining wells will be phased in over the life of the project to replace declining wells;
- drilling of wells and installation of associated well pad surface equipment, such as wellhead separators, wellhead pumps, wellhead flares, telemetry devices and metering stations;
- gas gathering systems (High Density Polyethylene (HDPE) pipe and steel pipes);
- gas processing and compression infrastructure, referred to as Field Compressor Stations (FCSs) and Central Processing Plants (CPPs), which include flares, substations and power lines;
- field infrastructure such as access tracks, borrow pits, warehouses, camps (both construction and operations), offices and telecommunications;
- water gathering and water management infrastructure, such as water gathering lines, water trunklines, ponds, water treatment facilities, brine evaporation ponds and possible salt disposal landfill; and
- use of treated associated water.

The nature of these activities necessitates entry onto occupied land by the proponent, with a range of vehicles, equipment and materials required to undertake a variety of tasks including drilling, well establishment, earthworks, pond construction, access road construction, laying of pipelines, compressor and water treatment plant construction and building.

Re-instatement and rehabilitation of disturbance areas is a regulatory requirement at the Commonwealth and State levels as part of environmental impact mitigation measures for the QCLNG project. Due to the different types of activities, disturbances and land uses across the Gas Fields there is a need for a diversified approach to rehabilitation. Each site and each location will require site specific rehabilitation measures to ensure the land is returned to the pre-clearance quality in which it was prior to construction, unless otherwise agreed with the landholder.

1.2 Scope

The purpose of this RRRMP is to outline the expected standards and methods of re-instatement, rehabilitation and monitoring required for the QCLNG Gas Fields. This document specifically deals with the re-instatement and rehabilitation of disturbances from Gas Field activities.

The main development activities include:

- seismic and geotechnical investigations;
- drilling of wells, including establishment of a well pad and access tracks where required;
- installation and operation of well pad infrastructure, including wellhead, gas and water separator, flare, well lift pump engine and potentially wellhead compressor;
- installation and operation of gas gathering lines to connect wells to field compressor stations (FCSs);
- construction and operation of FCSs to compress gas, including screw compressors, electric drive motors, coolers, flare, substation and pipework;
- installation and operation of gas trunklines to pipe gas from FCSs to central processing plants (CPPs);
- construction and operation of CPPs to compress gas, including centrifugal compressors, electric drive motors, coolers, flares, triethylene glycol (TEG) dehydration units, substation and transformers and pipework;
- installation of above ground 132 kV power lines to connect third party substations to CPPs;
- installation of underground and above ground 33 kV power lines to connect CPP substations to FCS and Water Treatment Plant (WTP) substations;
- installation of water gathering lines and pumps to transfer water from the wellhead separator to infield storages and regional storage ponds;
- installation and operation of water trunklines and pumps to transfer water from regional storage ponds to collection header ponds and raw water ponds located adjacent to WTPs;
- construction and collection header ponds and raw water ponds;
- construction and operation of WTPs, including desalination facilities, water pumps, brine concentrators, treated water storages and gas or electric drive engines;
- construction of water pipelines for transfer and supply of treated water, coal seam gas concentrate or brine;
- construction and operation of brine storages and brine crystallisation basins;
- potentially, the construction and operation of a salt disposal landfill;

- development of access tracks where required;
- extraction of quarry material from borrow pits, if and where required;
- accommodation camps for construction and operations personnel;
- construction and operation of warehouses and laydown areas; and
- communication towers and fibre optic cables.

Not every tenement will need all of the above infrastructure.

Well life is typically 15 to 20 years and may be longer. Each well field will be depleted and rehabilitated typically 20 to 25 years after initial construction. There is also infrastructure such as water management facilities, compression facilities, power lines and roads that cannot be rehabilitated until the project is at the end of its life. The rehabilitation of these long term activities will be at the Decommissioning Phase and detailed in a separate report being the 'Decommissioning Plan', as required by Condition 81 of the DSEWPaC approval for the QCLNG Gas Fields (EPBC 2008/4398) dated 22 October 2010. However there are certain disturbances that can be progressively rehabilitated through the life of the Project.

This RRRMP focuses on those activities that can be progressively rehabilitated during the life of the Project but does discuss rehabilitation plans at the Decommissioning Phase.

1.3 Rehabilitation Requirements

The QCLNG Project was approved by the DSEWPaC and Coordinator General (CG) in 2010 and a number of conditions have been set relating to re-statement and rehabilitation of the Gas Fields, including Matters of National Environmental Significance (MNES) (**Appendix 1**).

At the State level QGC is required to obtain further approvals, being Environmental Authorities (EAs), from the Department of Environment and Resource Management (DERM). EAs regulate gas field development and associated activities under the *Environmental Protection Act 1994* and include statutory requirements relating to rehabilitation.

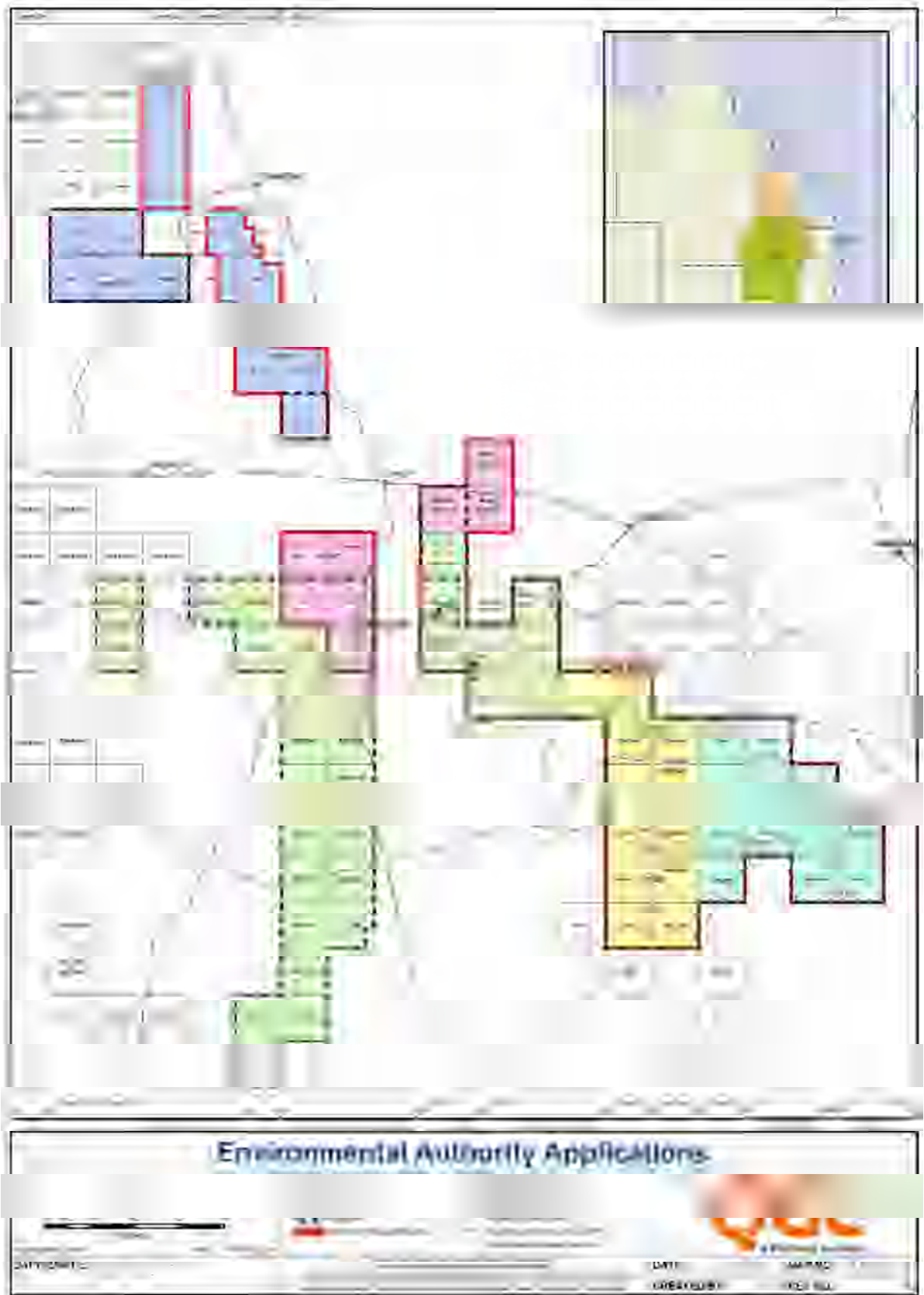
QGC have been issued with five Project Area EAs for the QCLNG Gas Fields. The EAs and their respective effective dates are:

- | | |
|------------------|----------------|
| • Woleebee Creek | 8 July 2011 |
| • Bellevue | 11 July 2011 |
| • Jordan | 26 July 2011 |
| • Ruby | 26 July 2011 |
| • Central area | 16 August 2011 |

The Woleebee Creek Project Area EA (PEN101741410) was the first to be issued on 8 July 2011 and all EAs issued subsequently contain similar conditions. This RRRMP references the Woleebee Creek EA conditions pertaining to restoration and rehabilitation as an example, but they equally apply across the remaining four Project Areas and therefore reflect the State's requirements across the Gas Fields. In particular Schedule H - Rehabilitation of the EAs sets conditions for rehabilitation of significantly disturbed land and an example is provided addressed in this RRRMP (**Appendix 2**).

In summary, the overall statutory requirement is for QGC to ensure that all significantly disturbed land as a result of Gas Field activities is rehabilitated to the pre-disturbed land use and condition. This includes that each native vegetation community is re-established to show distinct and progressive re-establishment of the various strata; 80% species diversity and richness; 80% foliage cover when compared to the pre-disturbed vegetation community. Each vegetation community must also be managed until it can be demonstrated it is self-sustaining.

Figure 1: Gas Field Component



2 Rehabilitation Objectives

2.1 Overall Rehabilitation Goals

QGC's operational policy is to rehabilitate disturbed land as a result of its activities, as far as reasonably practicable, to its pre-clearance land use and condition. There are five overall rehabilitation goals to be met by all Project disturbances. QGC will work to ensure that all rehabilitation areas ultimately must be:

- safe to humans and wildlife;
- non-polluting;
- stable;
- able to sustain an agreed post-disturbance land use; and
- equal in maintenance requirements to that required for the land prior to its disturbance by petroleum activities.

2.2 Progressive Rehabilitation vs. Decommissioning

Progressive rehabilitation provides a range of benefits including:

- enabling stripped topsoil to be directly reused in rehabilitation works and effectively minimising the amount of topsoil required to be stored or transported, and reduces double handling of material;
- the native seed bank is able to be used in rehabilitation and due to shorter timeframe of stockpiling is likely to contain more viable propagules. This will increase the chances of rehabilitating the same pre-clearance vegetation and species composition;
- likely to establish ground cover and therefore stabilise the area in a much quicker timeframe;
- reducing impacts on visual amenity, available fauna habitat and erosion;
- making efficient use of plant and machinery that are already being used onsite, rather than requiring machinery to be specifically transported back to site;
- enabling site specific rehabilitation techniques to be refined over the life of the Project, improving the overall success of rehabilitation; and
- minimising the final area for decommissioning.

Progressive rehabilitation will be carried out for a number of Gas Field activities as soon as practicable after the activity has been completed.

The main activities where progressive rehabilitation can be undertaken include:

- from the initial well hardstand area of approximately 100m x 100m for drilling pads at well sites, progressive rehabilitation can occur to reduce the area to approximately 80m x 60m after the well becomes operational;
- borrow pits (partial rehabilitation of the borrow pit may be able to occur);
- pipeline RoWs (the area outside that required for access tracks to allow pipe maintenance and well site access and the area directly above pipelines for deep-rooted vegetation); and

- temporary infrastructure and disturbance areas such as some access roads, lay down areas etc.

Considerable infrastructure such as compression stations, ponds, water treatment plants, offices, some camps and access tracks will need to be maintained and accessible for the life of project and will not be available for rehabilitation until project completion. The total area of Gas Field tenements is approximately 468,000 ha. Following progressive rehabilitation, the total area directly impacted will represent approximately 3.6 per cent of the total tenement area or 16,809 ha.

Refer to **Section 6** for further detail as to how progressive rehabilitation will be undertaken. The total land area that can be progressively rehabilitated is shown in **Table 1** below.

Table 1: Areas disturbed before and after progressive rehabilitation

Activity	Disturbance area before progressive rehabilitation (ha)	Progressive rehabilitation area (ha)	Area for final decommissioning (after progressive rehabilitation) (ha)
Gas wells	6,000	3000	3,000
Fracking ponds	3,516	1758	1,758
Gathering line / access tracks	10,398	2749	7,649
Trunklines	2,930	1318	1,612
Access - (not collocated with RoWs)	1,600	160	1,440
CPP, FCS, water treatment plants	575	0	575
Ponds and landfill	715	0	715
Borrow pits	420	420	0
Construction camps	250	190	60
Total	26,404	9,595	16,809

Progressive rehabilitation of disturbed areas will commence as soon as practicable following the completion of any construction or operational works associated with the petroleum activities. There are a number of specifications for the timing of progressive rehabilitation outlined in the Project EAs. As an example, the Woleebee Creek EA (PEN101741410) conditions are outlined below in **Table 2**.

Table 2: Required timeframes for progressive rehabilitation of areas not required for the ongoing conduct of petroleum activities

Woleebee Creek EA, PEN101741410 condition no.	Activity	Time frame for commencement of progressive rehabilitation
H1	Buried pipelines.	Backfilled immediately after pipe laying. Rehabilitation to commence within three months of pipeline completion, unless required for the ongoing conduct of petroleum activities.

Woleebee Creek EA, PEN101741410 condition no.	Activity	Time frame for commencement of progressive rehabilitation
H4	Any other disturbed area following the completion of any construction or operational works.	As soon as practicable, but within nine months following the completion of construction, decommissioning or operational works associated with petroleum activity(ies).

2.3 Revegetation Techniques

QGC propose to utilise three main revegetation techniques for progressive rehabilitation depending on the pre-clearance land use and final rehabilitation objectives (refer to **Table 43**):

1. Natural regeneration. This will be applied to:
 - a. MNES including TECs and habitat for listed fauna species;
 - b. EVNT flora and fauna habitat;
 - c. ESAs; and
 - d. all other remnant vegetation.
2. Direct seeding with grasses for the purpose of stabilisation. This will be applied to areas required to remain treeless during project operations and will include:
 - a. cropping/grazing land;
 - b. steep slopes;
 - c. waterways;
 - d. other erosion prone areas;
 - e. areas where land form stability is not achieved after six months;
 - f. topsoil and subsoil stockpiles that are to be stored for a period longer than 24 months; and
 - g. areas where topsoil stored longer than 24 months are spread for use in rehabilitation.
3. Revegetation (direct seeding and/or planting with native species tube-stock) where native vegetation communities is the desired final land use objective. This will be only be applied to areas not required to remain treeless during project operations and final decommissioning, including:
 - a. waterways;
 - b. individual EVNT and MNES flora species (may include translocation and propagation of specimens);
 - c. MNES and ESAs and all other areas of remnant vegetation where natural regeneration is not a stable land form after 12 months;
 - d. MNES and ESAs and all other areas of remnant vegetation where topsoil has been stored for longer than 24 months; and
 - e. areas with high visual impact.

A summary of rehabilitation techniques (both progressive rehabilitation and final decommissioning) is provided for each major infrastructure type in **Table 3**, including a summary of the revegetation techniques to be used. These techniques are separated according to land use type, with a technique provided for agricultural land (cropping and grazing land) and a method provided for areas of remnant native vegetation). These techniques are outlined in further detail in **Sections 6** and **8**.

Table 3: Summary of techniques for progressive rehabilitation and final decommissioning for each major infrastructure type

Infrastructure type	Native Vegetation (remnant vegetation and high value regrowth)			Agriculture (pasture and cropping)		
	Progressive Rehabilitation	Revegetation Techniques	Decommissioning	Progressive Rehabilitation	Revegetation Techniques	Decommissioning
<p>Buried infrastructure (gas and water gathering lines, trunk lines, collection headers, gas export lines)</p>	<p>Surplus cleared areas not required to be kept tree-free for operation and maintenance of infrastructure will be allowed to naturally regenerate.</p> <p>Backfill subsoil and topsoil.</p> <p>Replace soil horizons consistent with soil horizons of immediate surrounding area.</p>	<p>Natural regeneration encouraged; direct seeding carried out in areas at risk of erosion or in densely vegetated watercourses to enhance natural regeneration; seed areas that are required to remain open with native grasses and groundcover species; seed areas not required to remain open with native species as determined from analogue site surveys if natural regeneration is not successful after 12 months.</p>	<p>On project completion, supplementary tree planting may be required in areas that remained open to close the operational access.</p>	<p>Surplus cleared areas not required for operation and maintenance of infrastructure will be returned to pasture or cropping uses after subsoil and topsoil is backfilled into trenches.</p>	<p>Reinstatement of subsoil and topsoil and direct seeding of pasture grasses.</p>	<p>On project completion, supplementary seeding of pasture species may be required in areas that remained open to close operational access.</p>
<p>Temporary access tracks</p>	<p>Temporary access tracks not required for operations or to be retained by the landholder will be</p>	<p>Re-seed topsoil with a seed mix as determined from analogue surveys where tracks are to</p>	<p>Once access tracks are no longer required they will be rehabilitated by ripping to remove compaction,</p>	<p>Temporary access tracks not required for operations or to be retained by the landholder will be rehabilitated by</p>	<p>Undertake re-seeding of topsoil with a seed mix appropriate for the final land use as agreed to by the</p>	<p>Once access tracks are no longer required they will be rehabilitated by ripping to remove compaction,</p>

Infrastructure type	Native Vegetation (remnant vegetation and high value regrowth)			Agriculture (pasture and cropping)		
	Progressive Rehabilitation	Revegetation Techniques	Decommissioning	Progressive Rehabilitation	Revegetation Techniques	Decommissioning
	rehabilitated by ripping to remove compaction before respreading stockpiled topsoil.	be closed.	respreading topsoil stockpile and re-seeding with a seed mix as determined from analogue surveys.	ripping to remove compaction before respreading stockpile topsoil.	landholder.	respreading topsoil stockpile and re-seeding with a seed mix appropriate for the final land use as agreed to by the landholder.
Hardstand surrounds (Well pads, central processing plants, field compression stations, long and short term camps)	Progressive rehabilitation will include reducing the disturbance footprint to the minimum necessary.	Ripping of compacted areas followed by topsoil replacement; site stabilisation through seeding with native grasses and groundcover species.	Undertake decommissioning and final rehabilitation, including re-profiling of cut and fill batters; compacted hardstand areas will be ripped and stockpiled topsoil will be re-spread before seeding with native species determined from analogue surveys.	Progressive rehabilitation will include reducing the disturbance footprint to the minimum necessary.	Ripping of compacted areas followed by topsoil replacement; site stabilisation through seeding with a seed mix appropriate for the final land use as agreed to by the landholder.	Undertake decommissioning and final rehabilitation, including re-profiling of cut and fill batters; compacted hardstand areas will be ripped and stockpiled topsoil will be respread before seeding with pasture species.

Infrastructure type	Native Vegetation (remnant vegetation and high value regrowth)			Agriculture (pasture and cropping)		
	Progressive Rehabilitation	Revegetation Techniques	Decommissioning	Progressive Rehabilitation	Revegetation Techniques	Decommissioning
Associated Water Storage Ponds/Pond Walls/Surrounds (Regional storage ponds, raw water storage ponds, in field storage ponds, Brine evaporation ponds, fracking well ponds)	Limited scope for progressive rehabilitation apart from pond surrounds, which should be allowed to naturally regenerate where this does not interfere with pond operations. Pond walls and batters will be stabilised.	Pond walls/batters will be stabilised but there will be no reseeded until decommissioning	Pond embankments will be pushed in and depressions filled to return landforms; landforms to match surrounding topography; any retained subsoil would be used to infill ponds; topsoil will be placed to a minimum depth of 250mm; undertake re-seeding of topsoil with a native seed mix as determined from analogue surveys	Limited scope for progressive rehabilitation apart from pond surrounds, which should be seeded with grasses. Batters will be stabilised.	Pond walls/batters will be stabilised but there will be no reseeded until decommissioning.	Pond embankments will be pushed in and depressions filled to return landforms; landforms to match surrounding topography; any retained subsoil would be used to infill ponds; topsoil will be placed to a minimum depth of 250mm; undertake re-seeding of topsoil with a species mix as agreed to by the landowner.

Infrastructure type	Native Vegetation (remnant vegetation and high value regrowth)			Agriculture (pasture and cropping)		
	Progressive Rehabilitation	Revegetation Techniques	Decommissioning	Progressive Rehabilitation	Revegetation Techniques	Decommissioning
Borrow Pits	Progressive rehabilitation will commence once quarry material has been exhausted; backfilling should be completed to ensure surface subsidence is avoided; undertake ripping before re-spreading topsoil to reduce compaction.	Undertake re-seeding of topsoil with a seed mix as determined from analogue surveys.	No additional requirements	Progressive rehabilitation will commence once quarry material has been exhausted; backfilling should be completed to ensure surface subsidence is avoided; undertake ripping before re-spreading topsoil to reduce compaction.	Undertake re-seeding of topsoil with a seed mix as agreed to by the landowner.	No additional requirements

2.4 Management Principles

Prior to commencing any revegetation works it is important to understand the primary aim for the rehabilitation, and determine the most appropriate set of management principles that will direct the outcome for rehabilitation. These rehabilitation principles are obtained from the Rehabilitation and Construction Work Specification (BX00-ENV-SPE-000001), and rehabilitation under this plan will encompass these principles.

1. **Investigate** The first step in developing a suitable, successful and cost effective management strategy is to determine the local topographical landform and local processes (including drainage lines, erosion processes etc). The site and surrounding area needs to be investigated to identify any site specific characteristics that could impact the long term successful rehabilitation. Successful rehabilitation depends on understanding the specific factors at each site.
2. **Water** is the agent for salt movement and in most cases on QGC sites, erosion and salinity. Long term rehabilitation management will depend on understanding where the water moves to (e.g. deep drainage, uptake by vegetation, run off, etc.).
3. **Integrate** The key to long term successful rehabilitation is an integration of vegetation, land and water and infrastructure management.
4. **Time** There is no quick fix for any rehabilitation effort. Long-term commitment is required following any rehabilitation effort and often on-going monitoring and management is required. Depending on the final land use being rehabilitated, the size of the area and the sensitive receptors which may be nearby, a monitoring plan may be required.
5. **Unique** There is no single, viable rehabilitation option that will work at every site. Each site needs options to address climate, soils, and hydrological conditions of the area, removal of buried infrastructure, access tracks and the like. Just as there is no single landscape and groundwater process, there can be no single management remedy. Every site is unique.
6. **Choice** Selecting an appropriate management strategy will depend on:
 - the extent and nature of the issue;
 - the characteristics of the area, climate, soils, topography, water quality, infrastructure;
 - economic and budgetary constraints; and
 - on-going land use and production in that area.
7. **Holistic** Options should be evaluated not only for their contribution to rehabilitation management, but also for their contribution to other QGC land management objectives – do not consider rehabilitation in isolation. The implementation of one management option can have effects on other aspects of the business or neighbouring properties, therefore it is imperative to consider an integrated and holistic approach to rehabilitation and make balanced decisions.

The above seven principles outline the steps that QGC make when assessing each location for rehabilitation. This document recognises these principles and gives details of the expected standards and steps to take to achieve a successful rehabilitation project.

2.5 Landholder Agreement

QGC is committed to working with landholders to ensure project impacts to landholders are minimised and that rehabilitation will meet landholder objectives. As such rehabilitation will be

undertaken in consultation with the relevant landholder and final land use objectives for agricultural land will be negotiated with landholders (refer also to **Table 4**).

To mitigate impacts on property owners and land use during construction and post construction, the following measures are required as outlined in the Gas Fields EIS (QCLNG 2009);

- QGC will negotiate and finalise repairs, corrective actions, and rehabilitation work with the minimum of delay, and will invite the landowner to inspect the work area when the program of works is finished, so that any problems can be discussed;
- QGC will implement measures to minimise impacts on livestock during construction, including provision of stock crossing points at key locations and trench breakers and ramps;
- QGC will restore on-farm infrastructure disturbed during construction, including irrigation systems, fencing and gates, access tracks and stock watering facilities;
- permanent disruption to land use will be avoided and appropriate compensation negotiations undertaken where this is not possible; and
- temporary loss of access to land will be restored after construction activities.

2.6 Specific Rehabilitation Objectives

Within the EIS for the QCLNG Project (QCLNG 2009), rehabilitation objectives based on the zoning of the ecological constraints of a particular area were developed for the Gas Fields. These constraints are revised in QGC's Constraints Planning and Field Development Protocol (QCLNG-BX00-ENV-PLN-000023) (the Protocol) to provide consistency with EA conditions and DSEWPac's EPBC conditions (EPBC 2008/4398). These constraints are used to set rehabilitation objectives according to the constraint and existing land uses (**Table 4**).

Table 4: Rehabilitation objectives according to existing land use and ecological constraints

Existing land use and ecological constraints (as per QGC Protocol)	Rehabilitation objective	Rehabilitation techniques
Strategic Cropping land Good Quality Agricultural Land (Class A & B) Moderate to Very High Constraint	Return of areas to productive cropping land, or as otherwise negotiated with land holder.	Re-seeding with grasses to protect soils from erosion.
Good Quality Agricultural Land (Class C, D and W) Low to Moderate Constraint	Return of areas to productive grazing land, or as otherwise negotiated with land holder.	Re-seeding with grasses to protect soils from erosion.
Least Concern Remnant Vegetation under the VM Act. Moderate to High Constraint	Re-establish a self-sustaining regional ecosystem that reflects a similar species composition and density of cover to the pre-clearance regional ecosystem and surrounding undisturbed areas. Refer to Table 10 .	Natural regeneration will be used to rehabilitate least concern remnant vegetation. Direct seeding with native tree and shrub species representative of the regional ecosystem will be undertaken if land form is not stable after 12 months.
State forests ¹ and Of	Re-establish a self-sustaining	Natural regeneration will be used

Existing land use and ecological constraints (as per QGC Protocol)	Rehabilitation objective	Rehabilitation techniques
<p>Concern Remnant Vegetation under the VM Act High to Very High Constraint</p>	<p>regional ecosystem that reflects a similar species composition and density of cover to the pre-clearance regional ecosystem and surrounding undisturbed areas. Aim to restore or maintain biological processes and natural systems.</p>	<p>to rehabilitate Of Concern remnant vegetation. Direct seeding with native tree and shrub species representative of the regional ecosystem will be undertaken if land form is not stable after 12 months.</p>
<p>Areas containing MNES and EVNT flora or fauna species Very High to No Go Constraint</p>	<p>The primary Project objective will be to avoid MNES and EVNT flora and fauna habitat. Where clearing is unavoidable the objective will be to implement mitigation measures to reduce impacts, provide offsets in accordance with the QCLNG Offset Plan and undertake rehabilitation of their habitat that represents the pre-disturbed vegetation community (as determined by analogue sites). Refer to 'QCLNG Gas Field Significant Species Management Plan' (QCLNG-BX00-ENV-PLN-000025) for further detail on species presence, management procedures and proposed mitigation measures.</p>	<p>Natural regeneration will be used to rehabilitate MNES and EVNT species habitat. Direct seeding with native tree and shrub species representative of the regional ecosystem and habitat will be undertaken if land form is not stable after 12 months. Re-spreading of timber and leaf litter into the area to assist with restoring the micro-habitat. Other habitat features may also be put into the rehabilitation area including nest boxes and hollows. Translocation, propagation and replanting of MNES and EVNT flora species will be undertaken where established to be effective for that particular species, and identified in the relevant Significant Species Management Plan.</p>
<p>Threatened Ecological Communities and Endangered remnant vegetation under the VM Act. Includes high value regrowth of the above communities. Very High to No Go Constraint</p>	<p>The primary Project objective will be to avoid TECs and Endangered remnant vegetation. Where clearing is unavoidable the objective will be to ensure a net gain of the TECs and Endangered REs.² Refer to 'QCLNG Gas Field Significant Species Management Plan' for further detail on presence of the TEC, management procedures and proposed mitigation measures.</p>	<p>Natural regeneration will be used to rehabilitate TECs. In particular this is the most effective way to rehabilitate the Brigalow TEC. Direct seeding or replanting of tubestock with native tree and shrub species consistent with the TEC, will be required where natural regeneration is not successful after twelve months or at the end of five years it performance measures have not been met. This may be required particularly for Semi-evergreen Vine Thicket, should unavoidable impacts occur to this TEC. For Brigalow, planting of</p>

Existing land use and ecological constraints (as per QGC Protocol)	Rehabilitation objective	Rehabilitation techniques
		tubestock will be considered where there is limited regrowth due to soil disturbance.
<p>Watercourses and riparian areas (watercourse crossings) including wetlands lakes or springs and buffer zones adjacent to watercourses.</p> <p>High to Very High Constraint</p>	<p>The primary Project objective is to avoid impacts to watercourses where possible. Where it is unavoidable then mitigation measures will be adopted including minimising the area of disturbance and impacts on riparian vegetation and water quality.</p> <p>Where clearing riparian vegetation is unavoidable the objective will be to rehabilitate the creek banks and riparian vegetation immediately post construction.</p> <p>Objective is to minimise erosion and destabilisation of the creek bank, restore vegetation and habitat values and improve water quality.</p>	<p>Direct seeding with grasses and native riparian species. Where required additional planting of tubestock consistent with the pre-clearing vegetation and surrounding areas will be undertaken.</p>

¹ Refer to QGC Constraints Planning and Field Development Protocol (QCLNG-BX00-ENV-PLN-000023) for specific conditions regarding the Gurulmundi and Cherwondah State Forests.

²These objectives may also be achieved through the establishment of environmental offsets.

3 Disturbance Summary

This section contains a summary of disturbance as a result of planned Project operations that will require rehabilitation.

3.1 Land Tenure

The Gas Field Component encompasses an area of approximately 468,700ha and contains predominantly freehold lots. Several leasehold areas and reserves are located within the Gas Field. The number of lots and the approximate extent of the tenure type are summarised in **Table 5** below.

Table 5: Land tenure of areas to be disturbed as outlined in the Gas Fields EIS

Type of tenure	Number of lots	Extent (ha)
Freehold	3,189	359,449
State leasehold	123	124
Lands lease	141	64,941
Crown reserves	111	2,108
State forest	46	53,289
Profit <i>a prendre</i>	1	144
Unallocated state land	0	0
Railway corridors n/a	n/a	2,349
Stock routes	n/a	5,703
Road reserves	n/a	11,970
Total		500,077*

***Note:** The total area of Gas Field (468,700 ha) does not reconcile to the above as some tenures overlap, especially lands lease and state forest; and road reserves and stock routes.

3.2 Land Use

A summary of the pre-clearance land use is provided in **Table 6** below. Areas will be returned to their pre-clearance land use. Where it is cleared land previously under agricultural production, the final land use will be determined in consultation with the landholder.

Remnant native vegetation occurs within a range of land uses, including state forest and grazing areas containing natural vegetation. A worst case estimate of 9,577ha of remnant vegetation may be cleared within a total Gas Field footprint (direct disturbance) of approximately 26,760ha.

Table 6: Land use of areas to be disturbed as outlined in the Gas Fields EIS

Land use	Area within the Gas Field (ha)	Percentage of Gas Field by land use
Cropping	51,388	11%
Grazing natural vegetation	332,362	71%
Intensive animal production ¹	31	<1%
Irrigated cropping	5,097	1%
Horticulture	309	<1%
Rural residential	21,679	5%

Land use	Area within the Gas Field (ha)	Percentage of Gas Field by land use
State forest	53,289	11%
Other (rivers, wetlands, dams, (urban)	4,545	1%
Total ₃	468,700	100%

Note 1: Intensive animal activities (i.e. feedlots) occur within the Gas Field area for piggeries and cattle.

Note 2: The only large-scale forestry conducted within the Gas Field is in state forest.

Note 3: This total includes areas subject to other resource tenures under the Mineral Resources Act 1989 not differentiated in the land use type.

3.3 Soil Types

A range of soil types occur in the area to be rehabilitated (**Table 7**). Many of these are dispersive and therefore prone to erosion. These areas will require the application of erosion and sediment control measures as outlined in the following sections.

Table 7: Soil types of areas to be disturbed as outlined in the Gas Fields EIS

Soil Management Group 1	Major Terrain Unit	Area within the Gas Field (ha)
Shallow sands and sandy loams	Little weathered sedimentary rocks	5205
Shallow sands and sandy loams	Deeply weathered material	87,035
Deep sands and clay loams	Recent alluvium	17 040
Sandy or loamy gradational soils	Deeply weathered material	6000
Loamy texture contrast soils (dispersive)	Little weathered sedimentary rocks	34,830
Loamy texture contrast soils (dispersive)	Deeply weathered material and unconsolidated sediments	32,615
Loamy texture contrast soils (dispersive)	Recent alluvium	3810
Sandy texture contrast soils (dispersive)	Little weathered sedimentary rocks	52,705
Sandy texture contrast soils (dispersive)	Deeply weathered material and unconsolidated sediments	84,880
Sandy texture contrast soils (dispersive)	Recent alluvium	4830
Brown cracking clays	Little weathered sedimentary rocks	460
Grey-brown cracking clays	Little weathered sedimentary rocks	32,905
Grey-brown cracking clays	Unconsolidated sediments	80
Dark cracking clays	Little weathered sedimentary rocks	16,650
Dark cracking clays	Deeply weathered material and unconsolidated sediments	50,000
Dark cracking clays	Recent alluvium	19,895
Melonhole clays	Unconsolidated sediments	13,895
Total		468,680

1. A soil management group represents several soils that have similar profile features, chemical properties and physical properties and thus require similar management inputs to ensure sustainable use and to minimize environmental impact.

4 Interaction of RRRMP and other EMPs

All environmental impacts are regulated by the Queensland's DERM and Commonwealth's DSEWPaC. QGC is permitted to operate in Queensland under these laws which cover, among other aspects of environmental regulations, land, water, air, noise, and general waste management for all QGC operations and facilities.

All of QGC's design, construction, operation, decommissioning and rehabilitation must comply with all the QGC EIS commitments and regulatory approvals and conditions imposed. The following sections show the environmental conditions hierarchy that QGC must comply with as part of the QCLNG's project State and Federal approvals.

The RRRMP is one of QGC's environmental management plans (EMPs) for the gas fields.

Figure 2 provides a flowchart detailing the specific environment management plans prepared or being prepared by QGC and shows the relationship between the various plans, including the RRRMP.

4.1 Environmental Protection and Biodiversity Conservation Act 1999

The design of field facilities and infrastructure, pipelines and plants will be carried out in accordance with the DSEWPaC conditions. Moreover, the Basis of Design must be developed in accordance with but not limited to, the commitment QGC made in the EIS application and the following plans, strategies or programs:

1. Protocol for Constraints Planning and Field Development;
2. Species Management Plans for listed species and ecological communities;
3. Disturbance limits and Plan to secure offsets;
4. Coal Seam Gas Water Monitoring and Management Plans;
5. Regional Groundwater Model;
6. Groundwater & Springs Assessment, Mitigation and Monitoring Program;
7. Rehabilitation Area Offset & Rehabilitation Area Plan;
8. Site Remediation, Rehabilitation, Recovery and Monitoring Plan; and
9. Decommissioning Plan.

4.1.1 Constraint Planning and Field Development Protocol (Protocol)

The Constraints Planning and Field Development Protocol (the Protocol) (QCLNG- BX00-ENV-PLN-000023) applies across the gas field and to all gas field activities. The Protocol is used to guide the selection of location for all infrastructure. The primary aim of the Protocol is to avoid placing infrastructure within areas that will require disturbance to significant environmental values, including MNES, waterways and wetlands. This is achieved through the use of constraint mapping and pre-clearance surveys to identify the presence of environmental values and determine if there are suitable alternatives that will avoid impacts. The Protocol includes:

- the integrated approval process within QGC for signing off on the placement of infrastructure;
- constraints system and what is included in the constraint mapping;
- updating constraints;

- pre-clearance surveys and recording impacts to MNES; and
- approval and review of the Protocol.

4.1.2 Species Management Plans

QGC have prepared a Gas Field Significant Species Management Plan (SSMP) to address Condition 7 of the EPBC approval (EPBC 2008/4398) which requires that management plans are prepared addressing each listed species and ecological community that may be potentially impacted by gas field development before commencement of each major stage of gas field development.

The purpose of the SSMP is to ensure QGC in its construction and operation of the QCLNG Gas Fields identifies and implements all reasonable measures to avoid and mitigate impacts to Threatened Ecological Communities (TECs) and Threatened and Near Threatened flora and fauna species under the EPBC Act and Queensland *Nature Conservation Act 1992* (NC Act).

The key objectives of the SSMP are to document:

- Federal and State significant TECs and Threatened and Near Threatened flora and fauna species that are likely to occur in the QCLNG Gas Fields;
- Relevant details about each TEC and individual species to assist in understanding its potential distribution, biology and specific management requirements;
- Threats to each value as a result of Project activities;
- Supporting information and a process for identifying presence in the field;
- Standard management procedures and mitigation measures that will be implemented by QGC and its contractors to avoid and minimise impacts to these environmental values;
- Specific mitigation measures for particular TECs and species; and
- Recording and reporting of the above activities.

4.1.3 Offset Plan

The construction of the Project will include the unavoidable clearing of protected native remnant vegetation, TECs and EVNT flora and fauna species habitat listed under Federal and/or State legislation. While, some impacts can be mitigated through rehabilitation, DSEWPaC and the CG have confirmed that vegetation and biodiversity offsets will be required to compensate for these unavoidable impacts.

QGC are preparing an Offset Plan that aims to meet the requirements of both the CG approval (Condition 7) and DSEWPaC EPBC approval 2008/4398 (Condition 26). QGC is investigating strategic ways of meeting offset obligations at all levels of government to deliver the best environmental outcomes. This Offset Plan will be consistent with the Queensland Government Environmental Offsets Policy 2008 and the Draft Policy Statement: Use of environmental offsets under the Environment Protection and Biodiversity Conservation Act 1999 (August 2007). A summary of MNES offsets required include: 730ha of Brigalow TEC, 80ha of *Philothea sporadica* habitat, 343ha of Yakka Skink and 235ha of Brigalow Scaly-foot habitat.

4.1.4 Coal Seam Gas Water Monitoring and Management Plans

Coal Seam Gas Water Monitoring and Management Plans will be prepared by QGC to address potential direct and indirect impacts. The CSG WMMPs covers the following key components:

- Groundwater Monitoring and Management (including the assessment of groundwater impacts);
- Hydraulic Fracturing Matters;

- Surface Water Monitoring and Management;
- Response Actions; and
- Reporting.

To support identification and monitoring of potential impacts to the Communities dependent on natural discharge of groundwater from the Great Artesian Basin TEC QGC have prepared the “*Stage 1 Coal Seam Gas Water Monitoring and Management Plan*” (Stage 1 CSG WMMP) QCLNG-BXOO-WAT-RPT-000005 which fulfils requirements of Condition 49 of referral EPBC 2008/4398 in relation to the QCLNG Project.

4.2 Environmental Protection Act 1994

In addition to the CG and DSEWPaC approval recommendations and conditions, QGC is required to obtain environmental authority under the *Environmental Protection Act 1994* (EP Act) before commencing gas production. As such, the QCLNG project is divided into five (5) project areas conditioned by different EAs. **Table 8** below provides the tenure information currently relating to each EA project area.

Table 8: QCLNG project area environmental authorities

Project Area	Tenure	QGC Block
Ruby PEN101252910	PL273, PL275, PL279, PL274, PL466, PL474	David, Sean, Poppy, Ruby Jo, Isabella, Jen, Broadwater, Harry, Glendower, Bamey, Clunie, Cougals
Jordon PEN101252410	PL262, PL261, PL442, PL278, PL443, PL257, ATP648	Kenya East, Owen, Jammatt, Margaret, Jordon, Michelle, Celeste, Will, Ridgewood, Myrtle, Aberdeen, Teviot, Maire Rae
Kenya/Central PEN100020207 PEN100068707	PL229, PL228, PL179, PL180, PL263, PL212, PL201, PL211, ATP632	Argyle, Kenya, Kate, Codie, Lauren, Matilda-John, Berwyndale South, Berwyndale
Bellevue PEN101253210	PL461, PL472, PL459, PL458, PL247, ATP647, ATP632	Avon Downs, McNulty, Bellevue, Justin, Andrew, Lila, Arvin, Grace
Woleebee Creek PEN1071741410	PL276, PL277, PL171, PL399, PL398, ATP768, PL393, PL392, ATP574, ATP632	Cassio, Acrux, Polaris, Cam, Kathleen, Ross, Woleebee Creek, Mamdal, Paradise Downs, Alex, Lawton, Carla, Peebs, Marcus, Pinelands, Connor

The conditions imposed by each EA are almost identical. However, in carrying out authorised petroleum activities QGC must not exceed the number and size for each of the specified petroleum activities listed in each EA. QGC must install all measures, plant and equipment necessary to ensure compliance with the conditions of the each EA. All activities must be undertaken in accordance with the Operational Plan and Environmental Management Plan (EMP) for each Project Area EA.

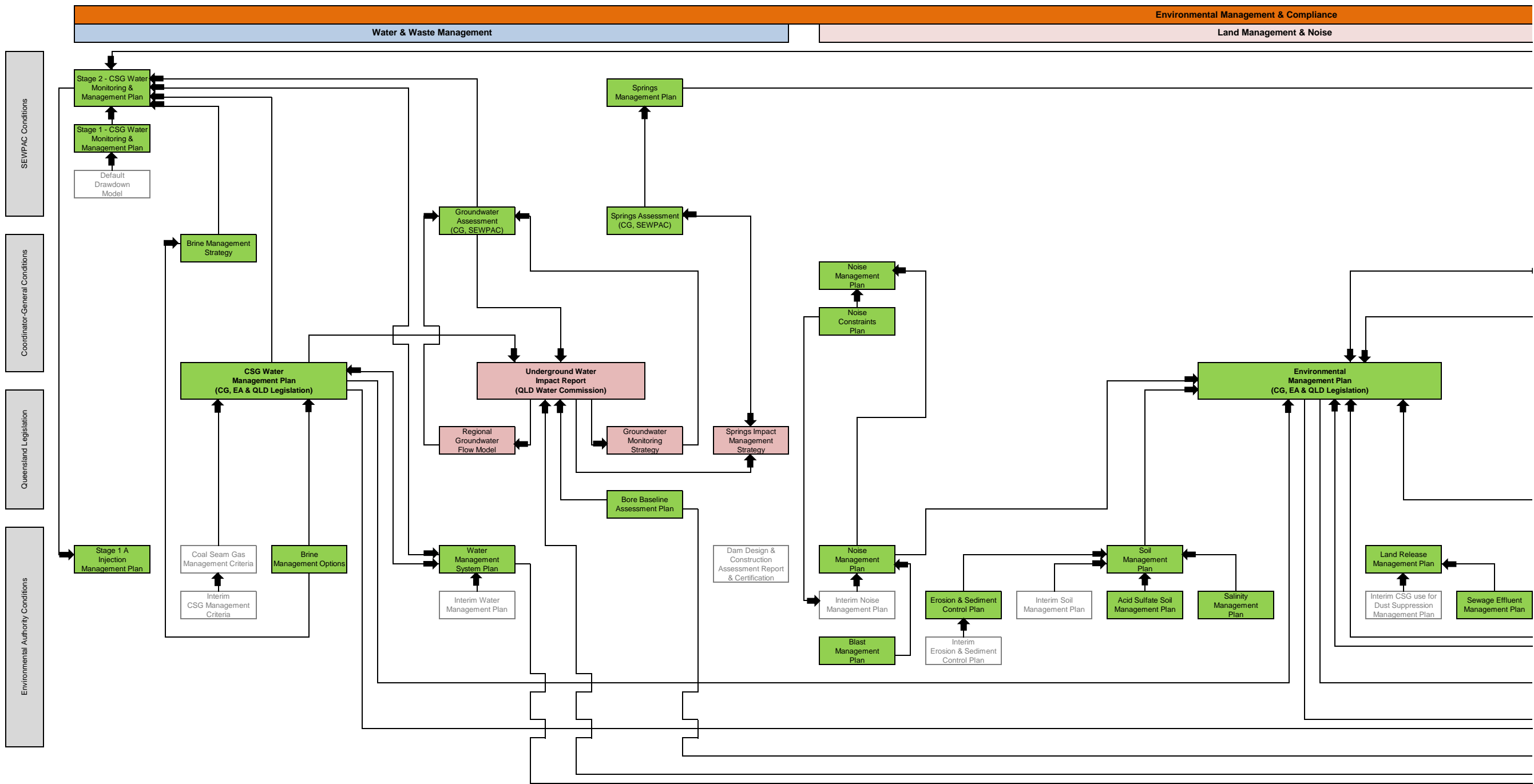
The Basis of Design must have consideration to the following management plans developed under the EA conditions for each Project Area.

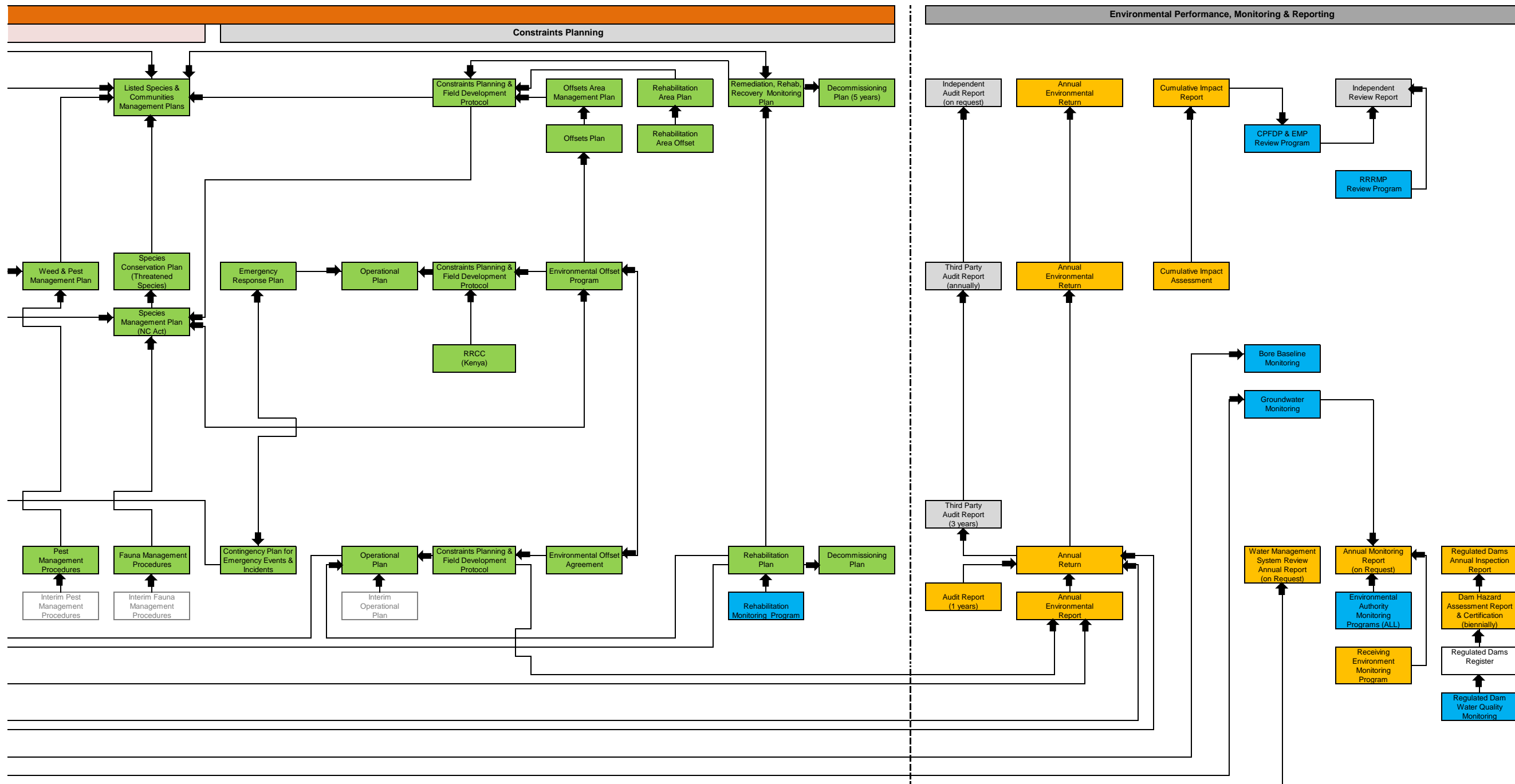
1. Constraints Planning and Field Development Protocol;
2. Contingency Plan for Emergency Events and Environmental Incidents;
3. Erosion and Sediment Control Plan;
4. Injection Management Plan;

5. Environmental Offset Agreement;
6. Soil Management Plan;
7. Salinity Management Plan;
8. Land Release Management Plan;
9. Fauna Management Procedures;
10. Rehabilitation Plan;
11. Pest Management Procedures;
12. Noise Management Plan & Imposed Limits;
13. Blast Management Plan;
14. Coal Seam Gas Water Management Plan;
15. Water Management Plan; and
16. Simulation Risk Assessment & Simulation Impact Monitoring Program.

An additional requirement of an EA is the submission of an Annual Environmental Report to the DERM with each annual return, which:

- (a) provides details of the status of disturbance, progressive rehabilitation and final rehabilitation associated with the project activities authorised by environmental authorities;
- (b) identifies all non-compliances with the conditions contained in the following documents:
 - i. the conditions of environmental authorities; and
 - ii. any current Operational Plan for the project;
- (c) identifies any amendments made, or required to be made to the following documents that relate to the conditions of the environmental authority, including:
 - i. any current environmental management plan for the project; and
 - ii. the Constraints Planning and Field Development Protocol.
- (d) provides details regarding any complaints received during the current work period relating to environmental harm and environmental nuisance.
- (e) QGC will produce an Annual Environmental Return which:
 - a. addresses compliance with the Federal conditions of approval for the gas field component of the QCLNG Project;
 - b. records any unavoidable adverse impacts on MNES, mitigation measures applied to avoid adverse impacts on MNES; and any rehabilitation work undertaken in connection with any unavoidable adverse impact on MNES;
 - c. identifies all non-compliances with the conditions of approval; and
 - d. identifies any amendments needed to plans to achieve compliance with the conditions of approval.





4.3 Command Structures

Each Project Area EMP and subordinate management plans will provide auditable commitments for aspects of environmental management. Overall responsibility for development, implementation and review of the EMPs and this RRRMP is with the QGC General Manager, Environment.

The QGC Environment Manager – QCLNG Field Operations will take responsibility for the implementation of the rehabilitation and monitoring activities contained in this RRRMP.

Project access and clearance requests (PACRs) are prepared for all proposed infrastructure layout for upstream delivery in the gas fields. The constraints protocol is applied by environmental officers in the environment team to identify any Federal MNES or State listed environmentally sensitive areas (ESAs) to be verified by field survey. Work packages are released to survey for proposed infrastructure locations in the field. The survey is undertaken by a pegging party of suitably qualified persons, including an ecologist, and follow up surveys may be required and undertaken if MNES or ESAs are present. The final layout plan of infrastructure is prepared taking into account what was found in the field and avoiding MNES and ESAs where possible. Final decisions on locations of infrastructure will be made by recommendation of suitably qualified persons.

Environment managers make the final decision about location of infrastructure if it is going to impact MNES and ESAs under the responsibility of the General Manager, Environment. Amendments or additional approvals for proposed infrastructure or activities where MNES or ESAs will be impacted will be prepared for submission and approval prior to any petroleum activities occurring in the field.

Field Environment Officers (FEOs) will be responsible for ensuring that all EMP commitments are implemented. The FEO will conduct regular audits of each project site and produce a report of non-compliances with commitments. This report will be circulated to the Field Environmental Coordinator (FEC) and Project Manager.

FEOs will report instances of non-compliance with commitments to the FEC. The FEC will conduct random audits of project sites to assess the performance of the FEO in identifying non-compliance with commitments and review instances of non-compliance reported by the FEO. The FEC will have authority to require project managers and project personnel to take corrective action to ensure commitments are implemented. Failure to implement commitments required by the FEC will be reported to the General Manager, Environment. The General Manager, Environment will have authority to require the Project Director to ensure the project personnel implement commitments.

Qualifications and responsibilities of FECs and FEOs are as follows:

Position Title	Field Environmental Coordinator
Position Summary	<p>The Field Environmental Coordinator focuses on the delivery of environmental services and regulatory compliance.</p> <p>These services are to be delivered in a meaningful and practical way, so all field staff are aware of their environment protection obligations.</p>
Key Accountabilities	<p>Core Accountabilities</p> <p>Position Specific</p> <ul style="list-style-type: none"> • Provide support in compiling data with and/or for Commonwealth and State Environmental Regulators • Ensure timely implementation of QGC's compliance, research and monitoring programs • Coordinate document environmental clearances for new work sites • Coordinate water quality monitoring and disturbed area records and monitoring as required • Develop and supervise environmental field surveys that may be

	<ul style="list-style-type: none"> required during construction or operations • Ensure appropriate documentation and records management processes are in place and maintained for effective tracking of environmental performance and compliance • Develop and implement procedures to guide the organisation, staff and contractors to meet environmental compliance requirements • Deliver operational based training on internal environmental systems of work, processes and related legislated requirements as required • Ensure contractor compliance with environmental legislation, licensing, permit conditions, and company policy •
<p>Qualifications and Experience Needed</p>	<p>Qualifications and Technical Experience</p> <ul style="list-style-type: none"> • Tertiary science or engineering qualification including environment discipline • A working knowledge and understanding of environmental legislation, policies and practices (both federal and state legislation) and how this is implemented within the local business environment • Familiarisation with both Commonwealth (DSEWPaC) and State (DERM, Coordinator General, DEEDI) Legislation, regulations, permitting, licensing and approvals and how they are applied in the workplace • Understanding of relevant Australian environmental standards, codes of practice and best practices and how they are applied in the workplace • User of established environmental systems, techniques, tools and software. Experience actively supervising and promoting environmental systems of work on a day-to-day basis •

<p>Position Title</p>	<p>Field Environment Officer</p>
<p>Key Accountabilities</p>	<p>Core Accountabilities</p> <p>Position Specific</p> <ul style="list-style-type: none"> • Provide recommendations and advice to field based operations on environmental solutions • Conduct and document environmental clearances for new work sites • Monitor water quality and amount of disturbance and monitor any other sites as required • Supervise and conduct environmental surveys • Ensure appropriate documentation and records management processes are maintained for effective tracking of environmental performance • Assist in the implementation of procedures to guide the organisation, staff and contractors to use environmental systems of work which meet environmental compliance requirements • Assist and provide advice to contractors to ensure compliance to legislation, licensing conditions and company policy • Provide support in compiling data to monitor environmental performance and compliance

Qualifications and Experience Needed	<ul style="list-style-type: none">•Qualifications and Technical Experience• Tertiary science or engineering qualification including the environmental discipline• A working knowledge and understanding of project approvals, environmental legislation, policies and practices (both federal and state legislation) and how this is implemented within the local business environment• Familiarisation with the Queensland Petroleum and Gas Act and Regulation (the legislation) and the Environmental Protection Act and how they are applied in the workplace• Understanding of the relevant Australian environmental standards and how they are applied in the workplace••
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5 General Management

The following section outlines the requirements for the management of vegetation, soil, seed, weeds and fire. These management requirements are applicable to all Project areas and rehabilitation irrespective of infrastructure type. A number of these requirements are based on conditions from the EAs.

5.1 Vegetation Clearing and Mulching

5.1.1 Vegetation Clearing

The SSMP provides Standard Management Procedures and mitigation measures that QGC will implement prior to, during and after clearing across the Gas Field to minimise environmental impacts. The SSMP also provides specific mitigation measures in relation to avoiding and minimising impacts to MNES. The Project EAs also provide conditions for the management of land and requirements to be implemented relating to vegetation clearing and fauna under Schedule D - Land.

A summary of measures regarding vegetation clearing that QGC will implement to avoid and minimise environmental impacts are provided below:

- As part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including TECs and any other likely significant flora and fauna species and populations they may encounter (based on constraint mapping including the results of pre-clearance surveys);
- Prior to clearing, the extent of clearing areas will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site FEO;
- Clearing is to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas of their own volition. Sequential clearing coupled with the slow nature of the clearing activities will take into account any variation in landscape features such as rocky escarpments, riparian habitats and steep sloping areas and provide fauna with sufficient time to exit the disturbance area;
- A fauna spotter catcher will be present during clearing (in areas where pre-clearance survey assessments have identified fauna are likely to be present, and spotter catchers are required). The roles and responsibilities of spotter catchers are to minimise impacts to fauna from clearing and are detailed in the Gas Field SSMP.
- All clearing activities will be carried out in a manner that will not result in the isolation of habitat, habitat features or any noted fauna persisting within the clearing area. Sequential clearing activities will provide safe escape routes for fauna and allow sufficient time for fauna spotter catchers to identify any potential fauna habitat, habitat features or fauna for relocation prior to clearing and identify this for consideration by the clearing team;
- Mature trees will be identified, and clearing will be avoided or minimised;
- Prior to commencing vegetation clearing, trees with hollows or potential nesting sites will be checked for the presence of arboreal fauna by a suitably qualified spotter catcher;
- Where trees with hollows are felled and suitable equipment is present on site, excise the section of the tree containing the hollow and relocate the hollow to suitable adjacent habitat;
- If non-mobile fauna are found prior to or during clearing activities, it shall be relocated from the clearing area to a safe and suitable location containing the microhabitat features, preferably within 200 metres of the capture location, by a spotter catcher. Appropriate

permits for fauna relocation shall be held by the spotter catcher. Any injured fauna shall be transported to a veterinarian or recognised wildlife carer immediately for treatment;

- In areas where significant species have been identified or their microhabitat is present, fauna spotter catchers must inspect and remove any fauna from pipeline trenches twice daily (early morning and late afternoon) every day while the trenches are open and have access to the site in all weather;
- All piping left overnight will be capped to avoid fauna from entering the pipes during nocturnal periods;
- Prior to backfilling of the trench site personnel will check the open trench for trapped fauna and where required a fauna spotter catcher will be called to move any fauna to a safe location away from the trench;
- Retain some felled timber within adjacent habitat to increase sheltering opportunities for displaced animals;
- Cleared vegetation will not be pushed into adjacent TEC areas, other vegetated areas or environmentally sensitive areas such as waterways and gullies. Vehicle activities will be restricted to roads, access tracks and hardened surfaces wherever possible to reduce the possibility of wildfire, spread of weeds and any potential impact on significant or other species;
- Compliance with industry standards and operational EMPs for the Project will ensure that receiving environments are not adversely impacted by the release of CSG water from operational activities;
- Dust suppression measures including road watering and reduced vehicle speeds will be implemented to minimise dust deposition on foliage;
- Re-spread timber and leaf litter into the area to assist in the restoration of micro-habitat and artificially increase ground debris if frequent fire has reduced fallen timber; and
- Fencing off from stock may be required, depending on adjacent land use, to prevent degradation of habitat of listed fauna species.

The Gas Field SSMP (QCLNG-BX00-ENV-PLN-000025) provides further detail on the proposed management procedures and mitigation measures relating to vegetation clearing and minimising impacts to fauna. In addition, measures within the Species Management Program – Tampering with the Breeding Place of a Protected Animal Species (Appendix 2 of the SSMP) will be put in place where the breeding place of a protected animal is to be disturbed.

5.1.2 Mulching

During clearing in heavily timbered areas, mulching of vegetation may be required. Mulching is the preferred option in the case when the quantity of cleared vegetation is a safety concern. Other vegetation will be retained without mulching for re-spreading and habitat re-creation and erosion control. Any large logs or hollows will be left as habitat for local species. Felled vegetation will not be burnt unless directed by regulatory authorities in response to heavy infestation of weed species. Cleared vegetation must be stockpiled in a manner that facilitates re-spreading or salvaging and does not impede vehicle, stock or wildlife movements.

The general procedure for mulching and stockpiling of vegetation is as follows:

- larger logs, hollows and rocks, in particular, may be retained for habitat recreation;
- a suitable mulcher will be used to mulch vegetation after clearing;
- mulched and cleared vegetation will be stockpiled to facilitate re-spreading or salvaging;

- within well pad leases, the mulch will be stored at the edge of the lease for later spreading; along pipeline routes it will be stored in windrows along the edge of the RoW, with gaps left to facilitate fauna movement;
- mulch stockpiles will not be wider than 10m, higher than 2m or longer than 200m, where practical; and
- stockpiles shall be monitored routinely with a temperature gun for the first two months. If the stockpile exceeds 60°C the stockpile shall be turned.

5.2 Management of Topsoil Seed Reserves

It is preferable from an environmental perspective to allow natural regeneration of vegetation. However, natural regeneration is only likely to occur in areas where the topsoil, which contains roots, the soil seed bank and other vegetative propagules, is not removed, or if removed and stockpiled, it is placed back before the soil seed bank declines. Topsoil contains the majority of nutrients and water required by plants and supports seed growth and germination. The chemical and physical properties of topsoil can be easily altered by handling and storage methods. It is therefore vital that topsoil is stripped and stored appropriately, irrespective of the type of Project disturbance.

Direct seeding is required where topsoil is stockpiled for long periods, as the soil seed bank declines during storage (Rokich 2000). After 3 years the size of the viable seed bank is greatly reduced. The stockpiling of soil for long periods will be required for final decommissioning, hence all decommissioned areas for rehabilitation will utilise direct seeding. Progressive rehabilitation may however rely on natural regeneration as it will occur within expected timeframes of less than nine months after disturbance.

QGC will maintain records and mapping of topsoil stockpiles and monitor the length of time they are stored for.

5.3 Soil Stripping and Stockpiling

5.3.1 Topsoil Stripping and Stockpiling

The chemical and physical properties of topsoil can be easily altered by management initiatives and storage methods. It is vital that topsoil is stripped and stored appropriately, irrespective of the type of Project disturbance, because it contains the majority of nutrients required by plants and supports seed growth and germination. Prior to any topsoil stripping the Soils Management Plan (Soils MP) must be consulted and a soil assessment undertaken to characterise the soil types and appropriate topsoil stripping depth.

Site Specific Rehabilitation Plans (SSRP) will record the type and locations of soil stockpiles to enable future identification and management by on-ground personnel.

Topsoil that is to be stored for decommissioning for longer than 24 months shall be stabilised using an appropriately designed seed mix, for example grasses such as sterile Japanese millet in summer and sterile rye grass in winter. This seed will be distributed heavily (as a guide, 50kg per hectare).

The equipment used for topsoil removal may be a scraper, excavator or dozer. To ensure the quality of stockpiled topsoil is maximised for use in rehabilitation, the following measures will be considered taking into account soil type and implemented:

- the quantity of topsoil will be quantified prior to stripping;
- soil stockpiles, both topsoil and subsoil will be recorded and identifiable in QGC's GIS system;

- stockpiles will be as low as possible with a maximum height of 3 to 4 metres, a maximum batter slope of 1 in 1.5 and shaped to minimise soil erosion (soil dependent);
- topsoil will be stockpiled close to where it is stripped but away from the diversion or natural drainage flow paths, however long-term topsoil stockpiles will be located above historic flood levels (Q50);
- stockpiles will be located where they will not be disturbed by future activities;
- weeds on the stockpiles will be monitored and controlled to prevent establishment and spread;
- erosion and sediment control measures will be implemented where stockpiles are to be located within 200m of watercourses to prevent contamination of waterways; and
- diversion drains will be constructed up-slope of stockpiles to divert surface water runoff away from stockpiles to limit erosion.

5.3.2 Subsoil Stockpiling

In cases where the subsoil must be disturbed, it is essential that subsoil and topsoil be stockpiled separately, with a separation distance to ensure they are not mixed during construction or rehabilitation works. This is because subsoil across QGC tenements can be high in salinity sodicity and be highly dispersive. Any backfill/subsoil material not utilised may be stockpiled in locations approved by landholders or removed from the gas pipeline rights of way prior to topsoil placement.

A designated subsoil location will be determined prior to construction works but generally it will be stored within the property from which it is extracted. Subsoil will require seeding with an appropriate seed mix if it is to be stored longer than 24 months before backfilling. Grasses such as sterile Japanese millet in summer, and sterile rye grass in winter will be used and seed distributed heavily (as a guide, 50kg per hectare) Millet is a quick growing summer annual forage crop that is also relatively salt-tolerant (Evans 2006). A soil salinity of up to 6 dS/m is tolerated by the variety 'Jap' millet, however no information could be found on the salt tolerance of the sterile variety. Annual rye grass is also moderately salt tolerant pasture species and will grow between autumn and spring (Evans 2006). If the sterile varieties of these two forage crops prove unsuccessful in colonising subsoil stockpiles, testing for sodicity will be conducted. The subsoil stockpile will be covered with at least 10cm of topsoil material and resown.

The equipment used for subsoil removal may be a scraper, excavator or dozer. To minimise environmental issues associated with subsoil stockpiles the following measures will be adopted:

- the quantity of subsoil will be quantified prior to stripping;
- stockpiles will be as low as possible with a maximum height of 4 to 5 metres, a maximum batter slope of 1 in 1.5 and shaped to minimise soil erosion;
- subsoil will be stockpiled close to where it is stripped but away from the diversion or natural drainage flow paths, however long-term topsoil stockpiles will, be located above historic flood levels (Q50);
- stockpiles will be located where they will not be disturbed by other activities;
- adequate erosion and sediment control provisions will be implemented to prevent contamination of adjacent surface water sources; and
- diversion drains will be constructed up-slope of stockpiles to divert surface water.

5.4 Erosion and Sediment Control Plan

A whole of Project Erosion and Sediment Control Plan (ESCP) will be prepared and certified by a professional in sediment and erosion control. The ESCP will consider and comply with; the Soils MP, International Erosion Control Association's (2008), Best Practice Erosion and Sediment Control Guidelines (2008), and the Institution of Engineers (1996) Soil Erosion and Sediment Control, Engineering Guidelines for Queensland Construction Sites. The ESCP will be updated to comply with any revisions of the aforementioned documents.

A suitably qualified person will interpret the Project wide ESCP and apply it at the site level relevant to the proposed disturbance and the soil type. The ESCP will be completed by 1 November 2011. Until then, site specific soil management plans, including erosion and sediment control, are being implemented. An example is attached in Appendix 3 – Interim Soil Management Plan Woleebee Creek Block PL276 (QCLNG-BB-24-ENV-PLN-000001).

The overarching ESCP will be a major constituent of the Soil Management Plan for the QCLNG project and will be made available to all relevant project personnel at the site through inclusion in the SSRP. Recommended erosion and sediment control measures will vary depending on the type of soil being disturbed. Erosion levels are expected to be more significant in the coarser textured soils, where there is little structure and organic matter to assist in binding the soil. Deep clay soils have a low to moderate erosion rating where undisturbed. However, as these subsoils can be sodic, these soils will erode due to clay dispersion where soil is exposed through vegetation removal.

The ESCP will include the following control measures which will be adapted to each soil and type of disturbance by a suitably qualified person:

- Diverting uncontaminated stormwater run-off around areas disturbed by the petroleum activities or where contaminants or wastes are stored or handled that may contribute to contamination of waters (where diversion of runoff water around a construction site is required, design will be mindful of possible erosion effects, including the instigation or exacerbation of gully and tunnel erosion);
-
- Sediment basins constructed on the downhill side of major facility sites, such as temporary accommodation facilities, when they are near sensitive water courses;
- Drainage lines and areas of concentrated water flow near major facilities inspected regularly for erosion to determine whether remedial action is required;
- Sediment and erosion control measures and areas receiving concentrated flows inspected on a regular basis, replaced where damaged and emptied following rainfall events, if required;
- Erosion and sediment control measures, such as contour banks, placed at frequent intervals along flow paths, where appropriate, and multiple discharge locations to ensure discharges have low velocities and volumes, rather than channelling discharges to a central point, which can exacerbate erosion;
- Point source discharges of runoff directed into stable waterways and/or drainage lines with engineering controls, such as scour protection and flow velocity limits where required;
- Vegetation progressively cleared to minimise the area of soil exposed;
- Slopes revegetated as soon as possible after disturbance;
- Stockpiles and/or exposed soil areas, such as unsealed access tracks, which are exposed for prolonged periods or have been identified as problem soils (erosive/dispersive) will be

stabilised as required. This will be done using chemical surface stabilisers, physical alternatives such as crushed rock, or direct seeding with grasses;

- Roads and tracks aligned across slopes, but where this is not possible, contour banks used at intervals appropriate to the slope and soil type to control the flow of surface water;
- Where pipelines are located along slopes, trench breakers installed in the backfill at intervals appropriate to the steepness of the slope to prevent water tunnelling along the buried pipe and install contour banks on the surface to divert water away from the disturbed areas.
-

Diversions and erosion and sediment control devices and measures will be fully implemented to provide effective erosion control prior to land disturbance activities, and will be kept in place and maintained fully functional until the area has been effectively rehabilitated. An inspection and maintenance program will be undertaken by the FECs.

The Project Manager and FEC are responsible for overseeing the implementation of the ESCP including the construction, commissioning and monitoring effectiveness of ESC devices. The responsibility for determining the requirements for erosion and sediment controls for each site will rest with appointed suitably qualified persons in ESC, in particular the design of ESC devices.

Ongoing environmental impact monitoring of the work activities including ESC effectiveness will be assigned to a FEO. The FEO will report any potential issues to the Environmental Manager (Operations) and Project Manager so that corrective actions can be taken if required. The FEC and Project Manager are responsible for the design of remediation, rehabilitation and recovery methodology including the management plan for the prevention of adverse impacts to water quality.

QGC are required (Schedule B – EAs) to minimise impacts to wetlands, lakes, springs and watercourses through adhering to minimum buffer distances to these areas such as: when carrying out petroleum activities not to clear vegetation or place fill, in or within:

- 200m from any wetland, lake or spring; or
- 100m of the high bank of any other watercourse.

Where QGC may be required to cross watercourses for pipeline construction appropriate mitigation measures must be in place including sediment control measures must be implemented to minimise any increase in water turbidity due to carrying out petroleum activities in the bed or banks of a watercourse, wetland or spring.

5.5 Seed Requirements

5.5.1 Direct Seeding

Seeding requirements will depend on the final land use objective as outlined in **Table 3**. The selection of species that will be used in the rehabilitation process will be guided by the pre-clearance vegetation as determined from analogue site surveys, soil conditions, micro-climate and aspect of the new land form, and will be determined in consultation with the land holder. Preference will be given to native species, although in many circumstances the site constraints or final land use objective will dictate that non-native species are required (such as using pasture grass for grazing land). For areas where native vegetation is the final land use objective and where areas are required to remain open during project operations the seed mix will include native ground cover and grass species that will provide good protection from erosion in the short term but allow shrubs and tree seedlings to establish successfully. Where areas are not required to remain open during project operations and during final decommissioning, the seed mix will also include native tree and shrub species determined from analogue site surveys.

Direct seeding will be required on all topsoil and subsoil that is to be stored for long periods (i.e. longer than 24 months) for decommissioning. It will also be used in other areas where the rapid re-establishment of vegetation cover is required (e.g. watercourse crossings, steep slopes and other potential high erosion areas). In these situations seeding will be undertaken with grasses such as sterile Japanese millet in summer and sterile rye grass in winter. This seed will be distributed heavily (as a guide, 50kg per hectare). In other situations, application rates will depend on the species mix used.

Areas where natural regeneration has not been successful and native vegetation is the final land use objective (i.e. where land form is not stable after 12 months) should also be seeded with native tree and shrub species, or ground cover species where areas are required to remain clear of trees for the duration of Project operations. Direct seeding will also be required on all ESAs and other areas with remnant vegetation, where topsoil that has been stored for longer than 24 months is to be used for rehabilitation.

Seeding is to be undertaken as soon as practicable after the topsoil has been reinstated and natural profile restored, but before spreading mulch.

5.5.2 Planting of Seedlings

Planting of seedlings will only be conducted in ESAs where specified by the FEO and detailed in a SSRP. In addition this may include areas with sensitive views to reduce the visual impact of the gas field infrastructure in some areas.

Planting of vegetation, particularly on banks of rivers and streams, may also be required to assist in the stabilisation of stream banks. Plants would be selected to match the pre-clearance native species and surrounding vegetation. The density and spacing would be determined to match the local surrounds, pre-disturbance vegetation and analogue sites.

5.5.3 Seed Collection

To meet the requirements for direct seeding and tubestock, QGC will purchase seed of pasture and native species from suppliers which follow seed collection methodology such as the Florabank Guidelines for Seed Collection (Mortlock and The Australian Tree Seed Centre 1999). Where collection of species listed under the NC Act is required, seed collectors will be required to show that they have the necessary licences under the *Nature Conservation (Protected Plants) Conservation Plan 2000*. Seed purchases will be made with a preference for local provenance seed of species adapted to local conditions. Seed purchasing will be guided by the list of key species developed for the relevant Regional Ecosystems from analogue site surveys, and for pasture species, in consultation with land holders (**Section 10.2**). Where there is reason to doubt seed viability (eg age, storage conditions), seed will be tested for viability before sowing to ensure there will be adequate germination rates.

Where tubestock is required it will be purchased or contract grown through local nurseries who source propagation material locally.

To ensure seed is purchased in advance to meet requirements, QGC will prepare a Seed Collection Strategy that will identify the following:

- priority species for purchase based on analogue site surveys;
- any specific EVNT species that may require seed collection and/or propagation;
- likely seed volumes required;
- seasonal availability;
- potential suppliers of seed for the Project and resourcing;

- seed viability, germination and storage requirements (i.e. storage in a cool room kept below 18°C); and
- tubestock requirements for planting, including identification of sources for tubestock.

5.6 Weed Management

QGC's overall approach to weed and pest management is detailed in the QCLNG Gas Field Pest and Weed Management Plan (P&WMP) (QCLNG-BX00-ENV-PLN-000027).

Declared weeds under the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) will be controlled in accordance with the P&WMP throughout the development and operational phases of the Project. Weeds will be identified through pre-clearance surveys and will be controlled, particularly prior to, and during the development phase. Weed management will also be undertaken during Project operations and rehabilitation works as outlined in the P&WMP.

Declared weeds under the *LP Act* likely to be encountered in the Gas Field are: African Boxthorn (*Lycium ferocissimum*), Hymenachne (*Hymenachne amplexicaulis*) Parthenium (*Parthenium hysterophorus*), Parkinsonia (*Parkinsonia aculeata*), Mother of Millions (*Bryophyllum* species) and Prickly Pear (*Opuntia* sp.). Some of these weed species are a potential threat to rehabilitation, and to MNES, given the nature of the proposed activities (particularly clearing and soil disturbance during construction). As such, measures to control these and other declared weeds will be put in place as per the P&WMP.

A summary of the measures QGC will implement to prevent the spread of weeds include:

- Weed Hygiene Notices as required under the *LP Act*;
- Frequency of monitoring before, during and following construction and a review of monitoring frequency based on the success of control measures and weed infestation levels;
- A key preventative measure to reduce the spread of weeds is that vehicles and machinery remain on designated roads and access tracks, and if they come into contact with a weed infested area they will require a wash-down prior to leaving the area;
- All vehicles and plant will require certification that they are weed-free prior to their initial commencement of works and when moving from weed-infested to weed-free areas across the Gas Fields;
- Access tracks and disturbance areas will be regularly inspected for weeds and control measures employed where declared weeds are identified, as per the monitoring guidelines provided in the P&WMP;
- Advice shall be provided by qualified field staff to assist in the prevention of weed spread and the treatment of declared weeds in rehabilitation areas; and
- Weed training and identification by all QGC field staff, reporting and control will also be a key management measure throughout the life of the Project.

Rehabilitation of disturbed areas may benefit from control of other exotic grasses; however, landholders may request that these species are retained for grazing purposes. Monitoring of weed infestations within disturbed areas will occur at least monthly during construction and then quarterly for a period of two years following construction. Following the two year period, the frequency of monitoring will be reconsidered dependent on the success of control measures and the level of infestations.

During rehabilitation, measures will be put in place to ensure that rehabilitation activities do not also spread weeds. This will include:

- rehabilitation equipment will be cleaned down upon entry of right of way and upon completion of work;
- FEOs will ensure from suppliers in writing, that materials imported for rehabilitation including; topsoil and seed stock are weed free. i.e. weed hygiene declaration form as outlined in the P&WMP; and
- machinery and equipment must be cleaned down before movements between gas fields as per the P&WMP through designated clean on entry (COE) points.

5.7 Pest Management

Pest animals have potential to cause severe land degradation by promoting soil erosion, stream turbidity and the spread of weeds and can impact on MNES and rehabilitation success. Under the LP Act, it is a legal requirement of all landowners or landowning state agencies to control declared pests. Procedures for the monitoring and management of pests are outlined in the P&WMP. In addition to the P&WMP, QGC is required under conditions D66-D72 of the Woleebee Creek EA (PEN101741410), to prepare Interim Pest Management Procedures. This will include procedures to:

- identify pest species and infestation areas;
- prevent and/or minimise the introduction and/or spread of pests;
- control and manage pest outbreaks as a result of petroleum activity(ies); and
- undertake community consultation in developing pest management procedures.

The overall abundance and diversity of pest species across QGC tenements and adjacent lands will be identified during field surveys. High risk pests or areas will be noted and may be used to generate special conditions of control during Gas Field activities. All QGC contractors and staff are encouraged to immediately report the location of pest sightings and provide a photo where possible of the species to a FEO. The FEOs will then liaise with the relevant local government pest officer and decide the most appropriate control method or program. Only certified operators can be used to control pest infestations and they are most effective when undertaken across properties (rather than one property at a time). Landowners will be notified prior to any pest animal control being undertaken.

The risk of increased pest species populations due to accommodation camps in the Gas Fields is significant. To control the associated risks with large accommodation camps, waste management procedures will be produced and monitoring of camp environs for pest species will be conducted. Procedures will predominately focus on reducing the amount and access to food waste by pest species. Wild dog, feral pig, fox and vermin pest species populations will be monitored near the camps and results collated to allow development of control programs for these species. Control of pest species will be in accordance with waste management guidelines and where possible integrated with other programs in the region.

Where pest species are observed to have an impact on an area of conservation significance (i.e. an ESA or area containing MNES) or threaten rehabilitation success, such as wallowing or severe browsing, QGC will arrange pest control or fencing to ensure that impacts on MNES and ESAs are reduced. Fencing will also be required to protect rehabilitated areas and MNES from the impacts of livestock grazing until rehabilitation meets acceptance criteria

QGC owns and operates, or will operate on, a number of working pastoral properties within the Gas Fields that are Class C1 and C2 pastoral land as defined by State Planning Guidelines: The

Identification of Good Quality Agricultural Land. It also operates, or will operate on, working pastoral properties owned by third parties.

On QGC'S own land, additional measures will be taken to avoid or minimise threats to MNES arising from livestock grazing:

Prior to agistment, QGC will use pre-clearance ecological surveys to identify MNES species, habitat, and threatened communities. Significant habitats and communities will be fenced to prevent livestock grazing. QGC will implement land management practices on its own land to protect habitat, and in accordance with sustainable agriculture and good land care practices

QGC will inspect its properties for the presence of feral animals and weeds, and the potential that these factors may have on MNES species, habitats, and threatened communities. Feral animals will be controlled following codes of practice, standard operating procedures and humaneness to ensure the best and most appropriate application of techniques (i.e. fencing, water source, biological and fertility control). Where possible, management and control strategies between feral species shall be considered to increase the environmental benefit to an area and minimize control costs. Similarly, weed control will form part of QGC's land management practices. The control of weed species on private property is the landowner's responsibility. QGC will inspect its properties for the presence of weeds, and the potential negative impact that they may have on MNES species, habitats, and threatened communities. QGC will control declared pest plants consistent with the Australian Weeds Strategy, National Weeds Strategy, guidelines and local government area pest management plans and the Queensland Weeds Strategy 2002-06.

5.8 Fire Management

A Bushfire Risk Management Plan (currently draft QCQGC-BX00-HSS-PLN-000003) has been prepared for Project areas that outline aspects of bushfire risk, preparedness, how bushfires will be managed around QGC infrastructure and what will happen in the event of a bushfire. Two site-specific Bushfire Management Plans have been completed for Windibri and Kenya. Additional bushfire management plans will be prepared for all QGC managed properties as infrastructure is developed. The primary objective of the Bushfire Management Plans is the protection of life, property and the environment.

Each infrastructure site will be surrounded by an appropriate fire safety zone and all activities will consider the risk of causing a fire and measures to prevent QGC's activities causing fires. Bushfire risk and prevention will be managed by the Land Management Group, utilising a variety of measures as follows:

- Monitoring of a bushfire weather forecasting and forewarning system;
- Observation of fire bans for high risk days/seasons where practical;
- Implementation of fire prevention measures during construction;
- Staff and contractor bushfire education and training;
- Preparation and implementation of emergency response plans tailored to individual project component situation;
- Implementation of fire prevention, fire watch, and fire response procedures during construction and operation;
- Where QGC is the property owner, QGC will establish and maintain firebreaks on the property in consultation with local fire authorities. Where QGC is not the property owner,

QGC will liaise with landholders about fire management and establish and maintain firebreaks around infrastructure;

- Cooperate with the Rural Fire Service in respect to any control burning;
- Regular consultation with the Rural Fire Service and landowners on matters of mutual interest;
- Installation of emergency shut down systems; and
- Design, siting and construction of facilities using fire resistant material and in accordance with the Australian Standard 3959-2009 Construction of Buildings in Bushfire-prone Areas Third Edition.

FEOs attend and complete surveys of planned firebreaks to identify any MNES or EVNT's to ensure plans are not impacting on any significant species. These are undertaken on an as needs basis and in conjunction with the Rural fire Service.

Fuel reduction may be undertaken to protect significant environmental areas within QGC's leases from fire. This may include habitat of EVNT listed flora and fauna species, and other MNES such as TECs including Brigalow and semi-evergreen vine thicket (SEVT), which are fire sensitive plant communities. Fuel reduction measures will include stick raking, herbicide control maintenance lines, mechanical management strategies involving grading, dozing, slashing or ploughing and/or prescribed burns to establish fire breaks or a combination of any of these methods.

Fuel load assessments will be undertaken by suitably qualified personal or external providers. Fire management will be undertaken on properties owned by QGC and planned, implemented and managed by the Land Management Group.

Fire sensitive plant communities are those that can be killed or severely damaged by fire. These communities contain species that are not adapted to fire and are therefore fire intolerant. Fire is not required as an ecological process to promote regeneration of species in such communities. Examples of fire sensitive vegetation types in the Project area include EPBC listed TECs such as Brigalow woodlands and SEVT. In addition to plant communities, individual flora and fauna species and their habitats, including Commonwealth and State listed EVNT species may be prone to fire. As such, fire may need to be excluded from populations and habitats. Individual Significant Species Management Plans (QCLNG-BX00-ENV-PLN-000025), both for TECs and listed EVNT species will be referred to for specific ecological fire requirements where they are known.

Fire sensitive vegetation types can be naturally protected from fire by growing in sheltered or rocky areas. However, in the current altered landscape many examples of fire-sensitive vegetation are now highly prone to fire due to clearing up to their margins and replacement of the ground layer with improved pastures, such as Buffel Grass and Green Panic, which further promote flammability. Given the reduction of the Brigalow woodland and SEVT TECs in the region by clearing, the exclusion of fire from within these communities is of high priority. On site fire management practices shall be in accordance with Contractor HSSE requirements, relevant construction permits and method statements and appropriate dedicated fire fighting equipment will be available at high risk construction sites to manage any fires that may start up and to avoid wildfires breaking out.

6 Progressive Rehabilitation Methods

6.1 Site Specific Rehabilitation Plans

In line with EA conditions for each of the five Project Areas, QGC will prepare a Site Specific Rehabilitation Plan (SSRP). The SSRP will be in addition to the RRRMP and will be informed by the overarching framework and criteria contained in the RRRMP.

The SSRP will form part of the Operational Plan (for that particular Project area) and address rehabilitation of disturbed land resulting from the existing and programmed infrastructure during the period of the Operational Plan.

The SSRP will include but not be limited to:

- areas to be rehabilitated;
- land uses of each area to be rehabilitated prior to disturbance;
- vegetation communities present, including a map of suitable scale displaying the distribution of vegetation communities;
- benchmark information including flora species richness, diversity, percent foliage cover;
- proposed revegetation methods;
- proposed stockpile locations will be shown on these plans and actual stockpile locations will be recorded on QGC's GIS systems;
- forecasted total area to be rehabilitated during the period of the Operational Plan;
- timeframes for rehabilitation; and
- monitoring and reporting.

A separate Vegetation Rehabilitation Monitoring Program will also be prepared which identifies:

- suitable analogue¹ site(s) to be used for measuring rehabilitation success that represent the land use(s), topographic and soil characteristics and vegetation community(ies) of each area to be rehabilitated prior to disturbance;
- the parameters to be measured in analogue and rehabilitated sites for determining rehabilitation (revegetation) success include as a minimum:
 - i. flora species richness and diversity;
 - ii. a description of the structural strata present;
 - iii. dominant species within each strata;
 - iv. associated stem count densities; and

¹ The latest version of the Queensland Government's *BioCondition, a Condition Assessment Framework for Terrestrial Biodiversity in Queensland, Assessment Manual* (Eyre et al 2011) and accompanying document, *Methodology for the Establishment and Survey of Reference Sites for BioCondition* (Eyre et al 2006) may be used to establish suitable analogue sites for like native vegetation communities. Please note, that the pre-disturbance site should be used as the analogue/reference site to establish benchmark parameters.

- v. percent foliage cover;
- the frequency of monitoring within the sites to be rehabilitated (monitoring must be undertaken at a minimum yearly frequency); and
- the experimental design for analysing analogue and rehabilitated site data including statistical methods of analysis.

Timing for preparation of the SSRP and Monitoring Program will be determined by the EA conditions and submission of the Operational Plan. The SSRP and Monitoring Program will be submitted to DERM and approved prior to any rehabilitation commencing.

6.2 Buried Infrastructure

Buried infrastructure represents all underground infrastructure including pipelines (water and gas), electrical cabling and other services. This includes gas and water gathering lines, trunk lines, collection headers and gas export lines. Buried infrastructure will generally be required for the life of the project, and will not be able to be progressively rehabilitated. However, after construction progressive rehabilitation can occur on surplus cleared areas not required to be kept tree-free for the purpose of operation and maintenance, with approximately 4,000 ha to be progressively rehabilitated. Progressive rehabilitation will be undertaken in watercourse crossing areas to rehabilitate creek banks and riparian vegetation.

Specific rehabilitation requirements for where buried infrastructure crosses creeks or other waterways are outlined in **Section 7.2**.

6.2.1 Natural Regeneration

Trees and shrubs will be allowed to regenerate naturally on cleared areas not required to be kept free of vegetation for the purpose of operation and maintenance of buried infrastructure, where the re-establishment of native vegetation is the final land use objective.

6.2.2 Backfill /Compaction

In the process of burying infrastructure, topsoil and subsoil will be removed and stockpiled separately as per **Section 5.3**, before being backfilled. Pipeline trenches must be backfilled as soon as practicable after pipe laying.

The objective of backfill is to ensure the protection of coating, minimise subsidence, and elimination of rocks of unacceptable size that can cause damage to the integrity of the buried infrastructure. The subsoil will be placed into the trench first and compacted to ensure surface subsidence does not occur over time. Surface subsidence occurs through poor compaction rates, voids in the backfill, and excessive moisture in the trench. The subsoil is to be reinstated to the same subsoil level as surrounding soils. Subsoils will be reinstated in the same order as excavation where practicable, particularly where salinity and/or sodicity increase at depth. It may require the separation of different subsoil horizons in separate stockpiles and the use of gypsum or dolomite prior to reinstatement of topsoil to decrease the risk of erosion and rehabilitation failure. During backfilling, topsoil must be kept separate from subsoil, and the original profile reinstated. Subsoil will not be used as a final surface layer. Any excessive subsoil material will be disposed of appropriately or stockpiled for future rehabilitation undertaken as part of the Project.

6.2.3 Surface Drainage and Reinstatement

Surface drainage lines will be reinstated to match the existing formations (ephemeral creeks) and contours as soon as practicable (i.e. the period following removal of surface facilities / infrastructure and backfilling or compaction) to ensure any works completed will not be affected by a rainfall event or over a longer summer rainfall period. Most surface drainage lines occur with areas of greater slope so extra measures are required for erosion control and soil establishment. Rock armouring may be required at drainage outlets and along drainage lines with significant flow, to avoid scour

and erosion issues. The need for rock armouring, or other engineered sediment and erosion controls, will be determined by a suitably qualified person, such as a certified practising engineer.

Surface contouring reinstates the pre-construction land formation to the natural contours of the existing environment. This ensures water flow over the surface is in cohesion with the surrounding landscape and minimises the risk of potential erosion. Surface contouring will be completed prior to re-spreading of topsoil. Contouring will pay particular attention to drainage lines for surface water flows to ensure erosion potential is minimised.

6.2.4 Permanent Erosion and Sediment Controls

Erosion and sediment controls will be installed in erosion prone areas, such as steep slopes or to divert water flow and ponding away from infrastructure. These controls will be maintained during and post construction until practical completion is achieved, or longer if required. In some instances permanent controls will be installed. Prior to construction temporary controls will be in place to minimise the risk of sediment loss throughout the construction phase.

In areas along the buried infrastructure that contain an increased gradient, the RoW is to be reinstated with contour berms to minimise erosion. Contour berms can be made of soil or mulch, and will be placed with the guidance of an FEO. As a guide, there will be at least one contour berm per 3m fall in topography, throughout the alignment. Contour berms will not be required in areas with no change in topography.

6.2.5 Scarification of the Surface

Prior to the re-spreading of the topsoil, the ground surface will be ripped to assist with binding of the soil layers, water penetration and plant establishment. Ripping and scarification can assist with binding of the soil layers, increases retention time of water on the slope, aids water infiltration into the soil increasing the opportunity of seed germination success and reduces the volume and velocity of runoff generated from the slope. However where there is a shallow sodic subsoil, ripping has the potential to cause blending of topsoil and subsoil, so should be avoided for shallow texture contrast soils. Requirements for ripping will therefore be determined from the findings of soil surveys undertaken in the Soils MP.

Surface roughening will be completed prior to seeding (after topsoil is spread) and should ensure no subsoil is ripped to the surface. The scarification will be completed using the teeth of a grader or in some cases the tracks of the grader. Scarification can also be achieved by ploughing of the sub-surface material prior to topsoil reinstatement. A figure eight or zigzag rip lines may prevent rill erosion in flat low gradient areas. Ripping will be undertaken along contours, and will only be undertaken on heavily trafficked areas such as temporary access tracks, camps and hardstands and other areas compacted by construction activities.

In accordance with approval conditions and as incorporated into the Protocol, buffer zones around TECs and MNES will, in most circumstances, be avoided. Where impacts on TECs or MNES are unavoidable and can be justified, any ripping undertaken during the rehabilitation process will avoid the root zones of adjacent vegetation by confining soil works to areas outside of the vegetation's drip line.

6.2.6 Topsoil Re-spreading

Following re-profiling, the topsoil is to be spread back over and left 'rough' (rather than smooth and compacted) to minimise potential erosion and increase water infiltration. Depth of topsoil to be spread will be determined on a site by site basis, by reference to the Site-Specific Rehabilitation Plans.

Topsoil application will only take place after subsoil re-spreading and will be evenly spread and left with a slightly rough surface. Topsoil must cover the entire width of the right of way/disturbed area so that there is no exposed sub-surface material. This will ensure seeding and germination has the best opportunity to 'take', enabling establishment of groundcover. A low crown or soil mound over

the trench location is necessary to compensate for potential subsidence of trench soil. Regular breaks will be required if mounding occurs in areas of drainage and erosion control. Topsoil is to be spread will be re-spread over the entire gas pipeline rights of way.

However, it is recognised conditions vary greatly depending on the soil type and structure. A greater amount of topsoil may be available for re-spreading over exposed areas if conditions permit.

QGC will utilise stockpiled topsoil in rehabilitation works, however on some occasions where insufficient topsoil exists, additional materials may be sourced from other locations. Confirmation of the source and quality of any imported topsoil, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of topsoil between sites and information about its certification as weed free. Weed free certification will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

Once topsoil has been spread driving over the area is by general vehicle traffic will be prohibited, except during seed spreading and on temporary access tracks that may remain open to provide access to gas pipeline infrastructure and for ongoing maintenance and monitoring of rehabilitated areas.

6.2.7 Direct Seeding

Requirements for the application of seed are outlined in **Section 5.5**.

Areas required to remain open for access may be seeded with native grasses and groundcover species where native vegetation is the final land use. Areas not required to remain open will be seeded with native species determined from analogue site surveys (native vegetation) or re-seed with pasture grasses as agreed to by land holders (agricultural land).

Seeding is to be undertaken after topsoil has been spread but before mulch reinstatement. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a spreader which involves the delivery of seed into the soil via a spreader on the rear of a tractor. Seeding is to take place after ploughing, but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process.

Using machinery such as tractors on steep slopes will be avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

6.2.8 Planting of Seedlings

Planting of seedlings will be undertaken in particular situations, as specified by the environmental team. It is proposed to be used in waterway rehabilitation, ESAs and MNES where natural regeneration is not successful after 12 months, and areas with high visual impact.

6.2.9 Vegetation Re-spreading

Vegetation cleared as part of the original disturbance for development of gas field infrastructure will be used for the progressive rehabilitation of disturbed areas. The distribution of this vegetation will be monitored by the FEO to ensure that any erosion or subsidence that may occur will not be concealed during subsequent monitoring inspections.

Mulch created from cleared vegetation from the gas pipeline RoW will be reinstated evenly across the gas pipeline RoW once seeding and planting has been completed. Mulching increases the regeneration capability of the soils increasing nutrients, habitat value, conservation of water,

reduces erosion potential and acts as a weed control, all beneficial outcomes for the successful rehabilitation of the gas pipeline RoW. It is important mulch is spread in a thin layer over the right of way (50mm or less). This will allow seeds to germinate and will not inhibit seed growth and therefore groundcover establishment.

If the mulch is spread too thick, the seeds will take longer to germinate slowing the rehabilitation process. If excess mulch needs to be utilised, contour berms and erosion control structures can be constructed using mulch instead of soil.

In addition to mulch, native vegetation and other fauna habitat features (surface rocks, logs and felled tree trunks) will be respread after seeding as follows:

- material will be evenly spread over the area to assist in the distribution of seed stock and provide shelter for fauna;
- to prevent weed and soil pathogen spread and assist with appropriate revegetation and soil micro-organism recovery, topsoil, mulch and habitat elements will be sourced from salvage specific to that site; and
- any large logs or hollows will be returned to provide habitat for fauna species. On steep slopes these will be re-laid along the contour.

Any stockpiled vegetation will be redistributed relatively quickly (within 2 years) as this section of the RRRMP refers to areas to be progressively rehabilitated. Areas to be rehabilitated after decommissioning are referred to in **Section 8**.

6.2.10 Maintenance

Following rehabilitation works, limited access to infrastructure will be allowed to perform essential maintenance requirements. All other traffic is prohibited on topsoil areas and will remain off the rehabilitation areas to enable successful establishment of groundcover.

It is not always practical to water entire disturbed areas; however creek banks and steep slopes are to be selected for watering. Areas where tubestock is planted will also be watered. This will ensure groundcover is established and erosion is minimised. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water quality suitable for the purpose that meets Environmental Authority standards.

6.3 Temporary Access Tracks

Temporary access roads not required for operations or to be retained by the landowner will be closed and reinstated to a condition compatible with the surrounding land use. Prior to re-spreading topsoil and undertaking seeding, compacted road surfaces will be deep ripped to reduce compaction. Tracks will be seeded with native species determined from analogue site surveys (remnant vegetation) or reseed with pasture grasses as agreed to by land holders (agricultural land).

Where access routes are to be retained, but are not for public access, the entry will be disguised (e.g. by dog-legging, brush spreading). Any wheel ruts will be graded and erosion-control measures installed before tracks are returned to land holders.

Access tracks in existence prior to construction will not to be blocked in anyway.

6.4 Hardstand Surrounds – Wells and Facilities

Hardstand surrounds represents well pads and facilities (central processing plants, field compression stations, long and short-term camps, site offices etc.) and tracks to access these facilities. The base of these areas is typically constructed out of blue metal or earthen materials forming a level base. Topsoil will require removal and stockpiling as outlined in **Section 5.3** before

this base is constructed. These areas will typically not be available for rehabilitation until Project completion. However the area of some well pads will be able to be reduced from an area of 100 x 100m to 80 x 60m after construction, and as such part of the area will be available for progressive rehabilitation. Across the Gas Field this is estimated to be an area of 3,000ha that will be progressively rehabilitated as well pad construction is rolled out.

6.4.1 Natural Regeneration

Trees and shrubs will be allowed to regenerate naturally on cleared areas not required to be kept tree free for the purpose of operation and maintenance, where the re-establishment of native vegetation is the final land use objective.

6.4.2 Surface Drainage and Reinstatement

Surface contouring reinstates the pre-construction land formation to the natural contours of the existing environment. This ensures water flow over the surface is in cohesion with the surrounding landscape and minimises the risk of potential erosion. Surface contouring will be completed prior to re-spreading of stockpiled topsoil. However, where cut and fill batters have been created to create a level hardstand, reinstatement of the final landform will not be able to take place until final decommissioning of the hardstand.

Surface drainage lines will be reinstated to match the existing contours as soon as practicable to ensure any works completed will not be affected by a rainfall event or over a longer summer rainfall period. Rock armouring may be required at drainage outlets and along drainage lines with significant flow, to avoid scour and erosion issues. The requirement for rock armouring or other engineered sediment and erosion controls will be determined by the project civil engineer and be designed to ensure compliance with the requirements of the Soils MP.

6.4.3 Permanent Erosion and Sediment Controls

Erosion and sedimentation controls are to be installed in erosion prone areas. These controls will be maintained during and post construction until practical completion is achieved, or longer if required. In some instances permanent controls will be installed. Prior to construction temporary controls will be in place to minimise the risk of sediment loss throughout the construction phase.

6.4.4 Scarification of the Surface

Prior to the re-spreading of the topsoil, the ground surface will be ripped to assist with binding of the soil layers, water penetration and plant establishment. Ripping and scarification can assist with binding of the soil layers, increases retention time of water on the slope, aids water infiltration into the soil increasing the opportunity of seed germination success and reduces the volume and velocity of runoff generated from the slope. However where there is a shallow sodic subsoil, ripping has the potential to cause blending of topsoil and subsoil, so should be avoided for shallow texture contrast soils. Requirements for ripping will therefore be determined from the findings of soil surveys undertaken in the Soils MP.

Surface roughening will be completed prior to seeding (after topsoil is spread) and should ensure no subsoil is ripped to the surface. The scarification will be completed using the teeth of a grader or in some cases the tracks of the grader. Scarification can also be achieved by ploughing of the compacted sub-surface material prior to topsoil reinstatement. A figure eight or zigzag rip lines may prevent rill erosion in flat low gradient areas.

Ripping will be undertaken along contours, and will only be undertaken on heavily trafficked areas such as temporary access tracks, camps and hardstands and other areas compacted by construction activities.

In accordance with approval conditions and as incorporated into the Protocol, buffer zones around TECs and MNES will, in most circumstances, be avoided. Where impacts on TECs or MNES are unavoidable and can be justified, any ripping undertaken during the rehabilitation process will avoid

the root zones of adjacent vegetation by confining soil works to areas outside of the vegetation's drip line.

6.4.5 Topsoil Re-spreading

Following scarification, the topsoil is to be spread back over the hardstand and left 'rough' (rather than smooth and compacted) to minimise potential erosion and increase water infiltration.

Depth of topsoil to be spread will be determined on a site by site basis, by reference to the Site-Specific Rehabilitation Plans. Topsoil must cover the entire width of the disturbed area so that there is no exposed compacted material. This will ensure seeding and germination has the best opportunity to 'take', enabling establishment of groundcover. Topsoil is to be spread over the entire hardstand. However, it is recognised conditions vary greatly depending on the soil type and structure. A greater amount of topsoil may be available for re-spreading over exposed areas if conditions permit.

If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of its source and quality, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of topsoil between sites and information about its certification as weed free. Weed free certification will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

Once topsoil has been spread, driving over the area, other than for the purpose of seed spreading, is prohibited.

6.4.6 Direct Seeding

Requirements for the application of seed are outlined in **Section 5.5**. Areas required to remain open for access may be seeded with native grasses and groundcover species where native vegetation is the final land use. Areas not required to remain open will be seeded with native species determined from analogue site surveys (native vegetation) or reseed with pasture grasses as agreed to by land holders (agricultural land).

Seeding is to be undertaken after topsoil has been spread but before mulch reinstatement. Any rehabilitation works on private land will be carried out in consultation with the landholder to ensure QGC meet landholder requirements. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a spreader which involves the delivery of seed into the soil via a spreader on the rear of a tractor. Seeding is to take place after ploughing, but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process.

Using machinery such as tractors on steep slopes will be avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

6.4.7 Planting of Seedlings

Planting of seedlings will only be specified in ESAs where specified by the environmental team as outlined in **Section 5.5.2**.

6.4.8 Mulching and Vegetation Management

Re-spreading brush over the area will assist in the distribution of seed stock and provide shelter for fauna. Distribution of vegetation will be controlled to ensure that any erosion or subsidence that may occur will not be concealed during subsequent monitoring inspections. Any large logs or

hollows will be returned as habitat for fauna species. Mulching is the preferred option in the case when the quantity of cleared vegetation is a safety concern. Mulching of cleared vegetation will be reinstated evenly across the area once seeding and planting has been completed. Mulching increases the regeneration capability of the soils increasing nutrients, habitat value, conservation of water, reduces erosion potential and acts as a weed control, all beneficial outcomes for successful rehabilitation. It is important mulch is spread in a thin layer (50mm or less). This will allow seeds to germinate and will not inhibit seed growth and therefore groundcover establishment. If the mulch is spread too thick, the seeds will take longer to germinate slowing the rehabilitation process.

If excess mulch needs to be utilised, contour berms and erosion control structures can be constructed using mulch instead of soil.

6.4.9 Maintenance

Following rehabilitation work, limited access to the rehabilitation areas is allowed to perform essential maintenance requirements only. All other traffic will remain off the rehabilitation area to enable successful establishment of groundcover/vegetation.

Watering will be restricted to erosion prone areas where the establishment of vegetation cover is a high priority, or to areas where tubestock has been planted. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water quality suitable for the purpose that meets Environmental Authority standards.

6.5 Associated Water Management

The disposal and use of associated water, including measures to mitigate impacts is described in the CWMP, Stage 1 and 2 CWMMP.

The potential for contamination of land and waters from the storage of associated water and from the hydraulic fracturing is described in **Section 8.3.1**.

6.6 Associated Water Storage Ponds/Pond Walls/Surrounds

Water associated with the gas field activities will be stored in; regional storage ponds, raw water storage ponds, in field storage ponds (if not tanks); brine ponds and fracking well ponds.

The current pond batter rehabilitation technique is undergoing assessment. The current hydro mulch technique requires high levels of maintenance and in some cases structural integrity issues exist causing erosion. QGC will further investigate batter stabilisation methods.

Pond walls and surrounds represent the areas required for pond infrastructure including spillways, extra workspaces, stockpile areas and pond batters. These facilities will typically not be available for rehabilitation until the completion of Project operations. However some stabilisation of pond batters is required to ensure the ongoing integrity of these facilities.

6.6.1 Pond Design, Construction and Operation

Ponds will be designed and constructed in accordance with Environmental Authority requirements, including the guidelines set out in the DERM publication "*The Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*".

At the start of the wet season (1 November) all pond water levels will be below the maximum operating level (MOL). This level provides sufficient pond capacity to contain the Design Storage Allowance (DSA) which is the volume of rainfall calculated in accordance with the applicable Environmental Authority (EA) from historical rainfall sequences representative of the site sourced from either the Bureau of Meteorology daily rainfall stations or the Silo Data Drill, using a continuous water balance simulation covering at least 100 years.

Ponds will have a mandatory reporting level (MRL) being the level below the pond overflow spillway sill level which, when reached, will require that the responsible authorities are advised.

The MRL is calculated as the lower of:

- the level on the pond wall above which the runoff volume from the 100-year annual exceedance probability (AEP) 72-hour storm cannot be contained below the spillway sill level; and
- the level on the pond wall that allows sufficient freeboard below the spillway sill level to prevent discharge due to wave action under the influence of the 100-year AEP storm.

Ponds will be located above the 1:100 year flood level as far as practicable.

CSG water will be collected at wells, transferred in a water gathering line to infield storages (ISs) and regional storage ponds (RSPs) and then transferred in a water trunkline from the regional storage pond to a raw water pond (RWP) located adjacent to a water treatment plant (WTP), where the water is treated. Treated water will be sent to a treated water pond. Treated water is then provided for beneficial use, such as for irrigation, stock watering, use in industrial processes and dust suppression. All water is treated to a standard that is appropriate for its authorised use.

QGC is installing brine concentrators as part of the major WTPs, in order to reduce the brine stream to 2-4 % of the raw CSG water inflow volume. This will also increase the overall water recovery rate to 96-98 %, to minimise the waste brine stream and maximise the amount of treated water that can be directed to beneficial re-use. At both of the major WTP's proposed for the project there will be dedicated brine storage ponds. The brine process will be managed by directing concentrated brine from the BCs to the concentrated brine ponds for the purpose of holding peak flows (which occur in the initial years) and then feeding this concentrated brine into the downstream brine management plant at a lower feed rate. This lower feed rate allows the size of the downstream plant to be minimised. The concentrated brine ponds will also be used to "hold" the brine in the event of a downstream plant shutdown.

QGC is currently investigating a brine commercialisation project which offers the prospect of one of the best environmental outcomes in the management of CSG water. This project is the preferred outcome and primary focus of the QGC brine management strategy. The concentrated brine stream will typically contain > 210,000 mg/L of TDS. These dissolved solids are primarily made up of sodium bicarbonate, sodium carbonate, and sodium chloride (salt). The aim of the commercialisation project is to separate the salts and produce quantities of commercial grade sodium chloride (salt), sodium carbonate (soda ash) and/or sodium bicarbonate (bicarbonate of soda) from the waste concentrated brine stream. It is envisioned that this can be achieved by means of fractional crystallisation.

Infield storages, regional storage ponds and raw water ponds will balance water flows between wells and the WTP. Under QGC's existing environmental authorities for tenements covered by ATPs, ponds have been constructed or are planned for storing water from gas exploration and appraisal (E&A) activities. Where it is considered feasible to do so, E&A ponds will be utilised as regional storage ponds rather than construct new ponds.

Monitoring and inspection of ponds will take place in accordance with QGC's Standard Ponds Operating Procedures, Ponds Operational Plan Guide and individual pond operating plans and monitoring procedures. These detail routine pond inspections and monitoring. For clay-lined ponds, geophysical surveys (e.g. electromagnetics or resistivity) and installation and monitoring of piezometers in the pond walls and in bores around the ponds, will act as early warning systems for potential seepage and for safety purposes. Annual pond inspections will be conducted by a suitably qualified person and reported to DERM in accordance with the environmental authority requirements.

Geosynthetic-lined ponds will have appropriate leak-detection and monitoring systems, which may include under-liner drainage systems. They will be constructed to quality assurance and control

standards, including hole-detection surveys at the completion of liner placement. QGC will install site-specific groundwater monitoring systems in each pond. Monitoring and control systems will be constructed for each pond to provide information about water levels and volumes and any seepage. Monitoring systems will be automated, except for infield buffer storages, regional storage and exploration ponds.

Each pond will be subject to a risk analysis and hydrogeological evaluation to determine the potential for seepage. Aquifer monitoring wells (indicatively, up to 100 m deep depending on geological conditions at a particular site) and shallow monitoring wells, nominally 2 m to 12 m deep, may be installed.

Monitoring wells will be located in aquifers that may receive seepage from ponds and will provide an early indication of potential seepage by measuring water quality over time. Shallow wells will be located adjacent to ponds and will provide information about any potential seepage from beneath pond lining or from embankments.

Subsoils in the gas field are often sodic or saline and natural salt accumulation and movement has occurred over time. Natural salinity or sodicity levels may be used as a guide to establishing acceptable levels of salt migration and concentration from the basal area of QGC's ponds. An appropriate trigger value for change in salinity or sodicity will be established. Where these values are exceeded, QGC will initiate measures to prevent further salt migration or accumulation. This may include decommissioning ponds and installation of seepage-collection drains (where not already installed).

Where there is potential for contamination of surface waters from pond seepage, water monitoring sites will be located downstream and upstream of the pond. The parameters to be monitored include electrical conductivity, suspended solids, bicarbonate, sulphate, chloride and sodium.

QGC does not intend to empty water storages as they balance water flows between wells and the WTP. Some storages will no longer be required once the WTPs are working and water is being treated and used.

Frac ponds will be designed and constructed in accordance with environmental authority requirements. Management of frac chemicals and management and decommissioning of ponds is described in the HFRAMP.

Pond Decommissioning is described in **Section** Error! Reference source not found..

6.6.2 Scarification of the Surface

The potential for erosion on the external batter of the pond wall is extreme. Scarifying of the surface is pivotal in reducing the velocity of the water runoff and flow. Scarifying the surface increases the detention time of water on the surface improving the infiltration rate and the ability of seedlings to establish. Scarifying should be completed by running the tracks of an excavator or the teeth of the bucket from the excavator horizontally across the batter surface ensuring the subsoil is not disturbed.

6.6.3 Topsoil Re-spreading

Due to the nature of the clayey soil types used for pond construction it is imperative that topsoil is spread evenly across the site, once the profiles are complete to ensure vegetation is given the best base to establish and develop. Topsoil must be spread at a minimum depth of 25 cm. Embankment material will form a cover over the pond base, and stored topsoil will then be utilised to support the growth of a grass species mix.

If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of its source and quality, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of topsoil between sites and information about its certification as weed free. Weed free certification

will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

6.6.4 Seeding/Hydro-mulching

Requirements for the application of seed are outlined in **Section 5.5**.

Seeding is to be undertaken after topsoil has been spread but before mulch reinstatement. Any rehabilitation works on private land will be carried out in consultation with the landholder to ensure QGC meet landholder requirements. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a tractor with a spreader, which involves the delivery of seed into the soil via seeders. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

Pond walls/batters that require reseeding will require hydro-mulching as the preferred method. Hydro-mulching is a combination of spraying a mix of seed, fertiliser, organic mulch, a binder and water onto the soil surface. This is completed using a spray on method for application at a rate of 50kg per hectare.

6.6.5 Maintenance

Following rehabilitation work, limited access to the rehabilitation areas is allowed to perform essential maintenance requirements only. All other traffic will remain off the rehabilitation area to enable successful establishment of groundcover. Fencing of rehabilitation areas may be required to prevent grazing, with fences to be removed once sufficient vegetation cover has established

It is not always practical to water entire disturbed areas however pond walls/batters are to be selected for watering. This will ensure groundcover is established and erosion is minimised. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water of a quality suitable for the purpose that meets Environmental Authority standards.

6.7 Borrow Pits

QGC considers that borrow pits are an incidental activity under the *Petroleum and Gas (Production and Safety) Act 2004* necessary for the construction of infrastructure and will seek approval to locate borrow pits on its tenements. Specific rehabilitation requirements for borrow-pits are outlined in the Borrow Pits Environmental Impact Assessment and are outlined below. Prior to the excavation of borrow pits, topsoil and subsoil will be excavated and stockpiled separately as per the requirements in **Section 5.3**. Borrow pits will be rehabilitated as extraction is completed, however some areas may remain open for ongoing gravel extraction for re-surfacing.

Site rehabilitation works include:

- removal of all fixed and mobile plant;
- removal of all temporary and permanent structures unless required for an agreed future use;
- levelling off any noise-control bunds and subsoil stockpiles, and shaping to an appropriate form: for final land-use requirements, drainage and to minimise erosion;
- stabilising and re-profiling landform as appropriate using stockpiled subsoil and topsoil for final land-use requirements;

- identification and disposal of all waste materials including hazardous and contaminated materials to appropriately licensed landfills;
- breaking up and removal of concrete slabs, unless required for future use;
- removal of surplus roads, office sites and hard standing areas; and
- disposal of all materials to appropriately licensed landfills.

6.7.1 Permanent Erosion and Sediment Controls

Prior to the final shaping and land preparation works, appropriate erosion and drainage control measures must be considered to prevent sheet erosion, gullying and rilling prior to vegetation cover being established. Peak flows from storm events will be factored into the landform design and erosion controls through hydrological modelling.

6.7.2 Backfill/Compaction

Backfilling of the site with subsoil is required to ensure the surface is in close alignment with the natural contours of the existing landscape while allowing for a lower surface due to material that has been extracted. Backfilling will be completed to ensure surface subsidence is avoided. It is important to use all subsoil at this stage as once topsoil is spread over the subsoil any remaining subsoil will be removed from site. Any remaining subsoil will be managed in accordance with requirements of the Soils MP.

6.7.3 Surface Drainage and Reinstatement

Once a borrow pit site has been fully decommissioned and suitable drainage and erosion control measures implemented, the remaining landform must be shaped and re-profiled and topsoil respread to be suitable for the establishing vegetation and support the final land use. Land preparation is often the key to the success of rehabilitation of a site and will include the following:

- final landform shaping using backfilled overburden material to reduce all slopes to be no greater than 1:3; or if this is unachievable, installing artificial slope stabilisation such as geotextiles, mulch mats or benching to break up the slope; and
- batters that have a slope that is greater than 1:2.5 (i.e. 40%) and longer than 40m will be subject to a specialist geotechnical assessment.

6.7.4 Topsoil Re-spreading

Topsoil will be spread in thickness between 100-300mm (where available at this depth) where vegetative cover is to be established, but may be as thin as <50mm should grass cover be required. The topsoil will be ripped at a depth of 400mm, parallel to the ground contours to aid water infiltration and minimise the potential for erosion.

If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of its source and quality, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of topsoil between sites and information about its certification as weed free. Weed free certification will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

6.7.5 Direct Seeding

Requirements for the application of seed are outlined in **Section 5.5**. Due to the nature of disturbance involving the removal and stockpiling of topsoil, natural regeneration will not be relied upon and direct seeding will be required on all borrow pit areas.

Seeding is to be undertaken after topsoil has been spread but before mulch reinstatement. Any rehabilitation works on private land will be carried out in consultation with the landholder to ensure QGC meet landholder requirements. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a spreader which involves the delivery of seed into the soil via a spreader on the rear of a tractor. Seeding is to take place after ploughing, but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process.

Using machinery such as tractors on steep slopes will be avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

6.7.6 Mulching and Vegetation Management

After seeding any timber will be brush spread across the scarified surface. Re-spreading brush over the area will assist in the distribution of seed stock and provide shelter for fauna. Any large logs or hollows will be spread as habitat for local species. Mulching is the preferred option in the case when the quantity of cleared vegetation is a safety concern. Mulching of cleared vegetation will be reinstated evenly across the area once seeding and planting has been completed. Mulching increases the regeneration capability of the soils increasing nutrients, habitat value, conservation of water, reduces erosion potential and acts as a weed control, all beneficial outcomes for successful rehabilitation. It is important mulch is spread in a thin layer (50mm or less). This will allow seeds to germinate and will not inhibit seed growth and therefore groundcover establishment.

If the mulch is spread too thick, the seeds will take longer to germinate slowing the rehabilitation process. If excess mulch needs to be utilised, contour berms and erosion control structures can be constructed using mulch instead of soil.

6.7.7 Maintenance

Maintenance and monitoring of the rehabilitation sites will be required to minimise the potential risks from weather conditions, flooding, fire, predation, disease, erosion and weed infestations, and ensure that prompt action is taken to remedy any identified problems. Rehabilitation success criteria and monitoring is detailed in **Sections 9 and 10**.

Watering will be restricted to erosion prone areas where the establishment of vegetation cover is a high priority. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water quality suitable for the purpose that meets Environmental Authority standards.

7 Rehabilitation of Environmentally Sensitive Areas and MNES

There are additional requirements and considerations for the rehabilitation of ESAs including MNES. MNES include TECs and listed flora and fauna species habitat under the EPBC Act. ESAs include Regional Ecosystems listed as Endangered or Of Concern under the VM Act or listed EVNT flora and fauna species and their habitat under the NC Act. Creek and watercourse crossings are included here as although the vegetation communities may not be EPBC Act or VM Act listed, these areas are especially sensitive to erosion and sedimentation and have specific rehabilitation requirements.

TECs that are known to occur in the Gas Field include Brigalow and SEVT.

The MNES and EVNT flora and fauna species that may occur in the Gas Field are detailed in the SSMP. Potential impacts, measures to avoid, mitigate and / or offset impacts and monitoring the effectiveness of measures to mitigate the impacts to MNES listed species and ecosystems are described in the SSMP. The SSMP describes applicable recovery plans for impacted species and ecosystems. Avoidance and mitigation measures are also outlined in the Protocol.

Approximately 37% of the Gas Fields is remnant vegetation, equating to 171,255ha with a maximum of 9,577 ha estimated to be cleared.

Table 9 below provides a breakdown of the remnant vegetation to be cleared as outlined in the Supplementary EIS (QCLNG 2010).

Table 9: Remnant vegetation to be cleared in Gas Fields as outlined in the Supplementary EIS

Vegetation Community	Area (ha)
EPBC Listed*	73
Endangered REs	108
Of Concern REs	308
Least Concern REs	9,088
Total	9,577

*EPBC-listed communities are overlapping (and not additional to) VM Act REs

There are slight differences in the techniques for revegetation of the dominant species within each RE or TEC, based on these species natural regeneration processes in response to fire and other natural disturbances. Each ecosystem contains a range of species with different germination and seedling establishment requirements. Some plants germinate from the topsoil without any action required. Some species only require seed to be collected and sown across the site, while others require some seed treatment (e.g. exposure to smoke, prior to sowing). Determining the germination and seedling establishment requirements of a range of appropriate plant species will be required.

7.1 Offsets

The construction of the Project will include the unavoidable clearing of protected native remnant vegetation, TECs and EVNT flora and fauna species habitat listed under Federal and/or State legislation. While, some impacts can be mitigated through rehabilitation, DSEWPac and the CG have confirmed that vegetation and biodiversity offsets will be required to compensate for these unavoidable impacts.

QGC are preparing an Offset Plan that aims to meet the requirements of both the CG approval (Condition 7) and DSEWPac EPBC approval 2008/4398 (Condition 26). QGC is investigating

strategic ways of meeting offset obligations at all levels of government to deliver the best environmental outcomes.

This Offset Plan will be consistent with the Queensland Government Environmental Offsets Policy 2008 and the Draft Policy Statement: Use of environmental offsets under the Environment Protection and Biodiversity Conservation Act 1999 (August 2007). A summary of MNES offsets required include: 730ha of Brigalow TEC, 80ha of *Philothea sporadica* habitat, 343ha of Yakka Skink and 235ha of Brigalow Scaly-foot habitat.

7.2 Creek and Watercourse Crossings

QGC will avoid creek and watercourse crossings where possible. All QGC EAs have conditions which restrict activities in and near watercourses. However there may be circumstances where project infrastructure will be required to cross creeks and other watercourses, such as gas, water and electrical pipelines and access roads.

7.2.1 Habitat Avoidance

As an example the Woleebee Creek Project Area EA (PEN101741410) sets out requirements to avoid and mitigate impacts to watercourses, wetlands and springs in conditions B10 – B19 as follows:

(B10) In the carrying out of the petroleum activities the holder of the environmental authority must not clear vegetation or place fill, in or within:

- (a) 200 m from any wetland, lake or spring; or
- (b) 100 m of the high bank of any other watercourse.

(B11) The holder of the environmental authority must not excavate or place fill in a way that adversely interferes with the flow of water in a watercourse, wetland or spring, including works that divert the course of flow of the water or works that impound the water.

(B12) Despite conditions (B10) and (B11), linear infrastructure activities such as those relating to the construction of pipelines, access tracks, powerlines, communication cables and roads may be undertaken within 200 m of and in a wetland, lake or spring, or within 100 m of and in a watercourse where there is no reasonable and practicable alternative (e.g. trenchless methods) for:

- (a) a maximum period of 10 business days; or
- (b) such other time as is permitted by any relevant statutory Code or Guideline for undertaking works in a watercourse, provided:
 - i. the relevant statutory Code and/or Guideline is complied with; and
 - ii. the administering authority is notified and provided details of the relevant statutory Code and/or Guideline under which the works may extend beyond 10 business days; and
 - iii. the administering authority is notified prior to the commencement of the works beyond the ten day period; or
- (c) such other time as the agreed to in writing by the administering authority.

(B13) If activities are to be undertaken in a watercourse in accordance with (B12) (b) or (c), the holder of the environmental authority must notify the administering authority in writing prior to the commencement of the period beyond the 10 business days.

(B14) The holder of the environmental authority must ensure that all activities undertaken in watercourses in accordance with (B12) (a), (b) and (c) are conducted in accordance with the following order of preference:

- (a) conducting work in times of no flow; and
- (b) conducting work in times of flow but in a way that does not:
 - i. cause a permanent adverse impact to the flow of water within the watercourse; or
 - ii. permanently impound water; or
 - iii. permanently divert the course of flow of water.

(B15) The linear infrastructure activities such as those relating to the construction of pipelines, access tracks, powerlines, communication cables and roads resulting in significant disturbance to the bed and banks of a watercourse, lake, wetland or spring must:

- (a) only be undertaken where necessary for the construction and/or maintenance of the linear infrastructure types included in condition (B12), that are essential for carrying out the authorised petroleum activities and no reasonable or practicable alternative location exists;
- (b) be no greater than the minimum area necessary for the purpose of the significant disturbance;
- (c) be designed and undertaken by a suitably qualified person taking into account the matters listed in the 'Planning Activities' and 'Impact Management' sections of the Department of Environment and Resource Management's "Guideline – Activities in a watercourse, lake or spring associated with mining operation" December 2010, as amended from time to time; and
- (d) upon cessation of the petroleum activities or works, commence rehabilitation immediately.

(B16) Sediment control measures must be implemented to minimise any increase in water turbidity due to carrying out petroleum activities in the bed or banks of a watercourse or wetland, or a spring.

(B17) Routine, regular and frequent visual monitoring must be undertaken while carrying out construction work and/or any maintenance of completed works in a watercourse, wetland or spring.

(B18) If, due to the linear infrastructure activities such as those relating to the construction of pipelines, access tracks, powerlines, communication cables and roads, water turbidity increases in the watercourse, wetland or spring outside contained areas, works must cease and the sediment control measures must be rectified to limit turbidity before activities recommence.

(B19) All measures must be taken to minimise adverse impacts to or reversal of any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.

7.2.2 Surface Drainage and Reinstatement

The banks and bed of a watercourse crossing are to be reinstated to the original contours and bank profiles as soon as practicable (i.e. the period following removal of surface facilities / infrastructure and backfilling or compaction) to minimise disturbance to the stream hydrology and ecology and minimise soil loss through erosive forces. The banks are to be reinstated no steeper than existing site conditions and at a grade compatible with the strength of the sites soil type. For buried

pipelines, re-spread and compact subsoil over the trench and use subsoil for the construction of contour banks on steep slopes and above banks at water crossings.

7.2.3 Permanent Erosion and Sediment Control

The whole of project Erosion and Sediment Control Plan will identify in what instances permanent ESC measures will be installed.

These may include that diversion banks and drains will be required; diverting water away from the disturbed areas ensuring excess minimal runoff enters the gas pipeline rights of way.

Contour banks will be placed in accordance with direction from a FEO (as a guide, 1 per 3m fall in land topography), always installing a perimeter bank at the top of the disturbed bank to divert water runoff away from the batter.

Jute matting or placement of rock, or timber may be installed along the banks of the disturbed gas pipeline rights of way in creeks and drainage lines as required and instructed by the Environmental Manager – Constructor and/or suitably qualified person in ESC. Jute matting acts as a surface stabiliser minimising sedimentation and planting into the mat will be required to ensure vegetation establishment and reinforcing of the banks. The matting requires anchoring with pins (2 per square metre) as per manufacturer's specifications. The specifications for jute matting will be determined by the civil engineer and documented in the Site-Specific Rehabilitation Plans. The FEO will check the jute matting and require the engineering contractor to rectify if and as required. Sediment fencing is required along the banks of the watercourse to ensure sediments do not enter the water course.

The watercourse base/bed is to be rock lined using rip rap to minimise scour ensuring not to raise the level of the creek base to increase flow rates and interfere with aquatic fish passage. Rip rap rock is preferable to river stone as rounded river stone is less resistant to flow. The base of the channel will be lined with a filter layer of smaller rocks (a minimum of 150mm) and then the larger rip rap rocks placed over using smaller rocks to infill voids to form a relatively smooth surface for water flow.

Any barriers (silt fences etc.) constructed throughout construction across a waterway will be removed after construction leaving no permanent flow inhibition.

7.2.4 Topsoil Re-spreading

A cap of up to 250mm topsoil must be spread over the area of disturbance. The depth of the topsoil will depend on the depth of the surrounding landform's soil profile. Soil will be respread at a depth which represents that of the surrounding landform. The use of fertilisers will be restricted adjacent to watercourses.

If insufficient topsoil exists to establish vegetation, additional materials may be sourced from other locations but confirmation of its source and quality, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of topsoil between sites and information about its certification as weed free. Weed free certification will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

7.2.5 Direct Seeding

Seeding must be undertaken as soon as practicable to stabilise and minimise soil erosion. Seeding will be undertaken using grass species at a rate of 20kg/ha minimum (by portable spreader if machine access is restricted). Direct seeding of native species consistent with the pre-clearing regional ecosystem as determined from analogue site surveys will also be undertaken as rapid re-establishment of riparian vegetation cover is required.

7.2.6 Planting of Seedlings

Revegetation through planting of seedlings may also be undertaken to assist in the rehabilitation of the riparian vegetation, particularly if the creek banks are steep and susceptible to further erosion. Species will be selected to be consistent with the pre-clearing Regional Ecosystem and surrounding vegetation. The density and spacing will be determined by the surrounding vegetated banks and local provenance plant species.

7.2.7 Mulching and Vegetation Management

Litter or mulch and timber debris will be spread across as much of the cleared footprint as possible. While works are occurring, the litter or mulch and timber debris will be stored as indicated in preceding sections (refer to **Section 5.1**).

Creek banks may be stabilised by placement of suitable contour banks along with an application of mulch. The combination of mulch and sufficient contour banks is enough to prevent erosion in many cases, provided the contour banks are frequent enough and are structured on a suitable angle (1 degree slope from left to right, to prevent scour).

7.2.8 Maintenance

Banks of creeks are to be watered regularly. It is not practical to water entire rights of way; however creek banks and steep slopes are to be selected for watering. This will ensure groundcover is established and erosion is minimised. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water quality suitable for the purpose that meets Environmental Authority standards.

7.3 Vegetation Communities of Conservation Significance

There may be circumstances where competing constraints result in infrastructure being located within areas containing TECs or REs listed as Endangered or Of Concern, including high value regrowth of these communities. In these situations avoidance measures listed in the Protocol will be implemented. Specific management procedures and mitigation measures for TECs are detailed in the SSMP.

Disturbance and rehabilitation within areas containing TECs or REs listed as Endangered or Of Concern, including high value regrowth of these communities, will require additional controls which are outlined below.

7.3.1 Avoidance

The Protocol details the measures to be undertaken to avoid impacts to environmental constraints including TECs and Endangered and Of Concern REs. In addition the following measures will be undertaken to avoid and mitigate impacts to these vegetation communities:

- pre-clearance surveys, as set out in **Section 10.1**, will be undertaken as part of early planning and detection of these vegetation communities;
- the confirmed location of these vegetation communities will be built into the the Protocol to ensure these communities are avoided where possible;
- as part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including the presence of TECs, Endangered and Of Concern REs, and any other likely significant flora and fauna species and populations they may encounter;
- prior to clearing of the RoWs, well pads or other disturbance sites, limits of clearing areas will be clearly marked out and significant vegetation communities identified as “no go”

zones. "No go" zones will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;

- where clearing is unavoidable, the clearing boundaries will be marked on design drawings and flagged in the field prior to any works commencing and will be restricted to the minimal area required. Clearing details will be recorded for future reporting requirements;
- cleared vegetation will not be pushed into adjacent vegetated areas or environmentally sensitive areas such as waterways and gullies. Vehicle activities will be restricted to roads, access tracks and hardened surfaces wherever possible to reduce the possibility of wildfire, spread of weeds and any potential impact on significant or other species; and
- dust suppression measures will be implemented to minimise dust deposition on foliage.

7.3.2 Mulching and Vegetation Management

No burning of felled vegetation is permitted. Rather, the felled vegetation will be stick raked into piles and left to provide fauna habitat, and to assist in regeneration and erosion control. This will further encourage habitat regeneration within these communities, as well as minimise weed infestations. Felled native vegetation and timber will be re-spread over the disturbance areas not required for ongoing maintenance or access.

7.3.3 Natural Regeneration

Natural regeneration of vegetation in areas of MNES and remnant vegetation will be encouraged. This will occur through:

- re-profiling natural contours and drainage lines to their original profile with topsoil spread across disturbed areas to minimise erosion and promote vegetation regeneration;
- re-spreading mulch or felled vegetation across disturbed areas;
- installation of permanent erosion and sediment controls to shed runoff from the altered surface; and
- weed, pest and fire management.

7.3.4 Revegetation

Areas where natural regeneration has not been successful (i.e. land form is not stable within twelve months) will be seeded with native tree and shrub species. Direct seeding will also be required where the topsoil used has been stockpiled for longer than 24 months.

A re-seeding plan will be implemented based on soil type and native species consistent with the pre-clearing regional ecosystem and vegetation characteristics. Densities and species diversity will be based on the assessment of reference sites established prior to clearing.

7.3.5 Specific Rehabilitation Measures for TECs

This section contains specific rehabilitation techniques for vegetation communities listed as TECs under the EPBC Act.

***Acacia harpophylla* dominant and co-dominant (Brigalow)**

The Brigalow TEC represents forests and woodlands dominated or co-dominated by *Acacia harpophylla* (Brigalow) and/or *Casuarina cristata* (Belah). The REs that comprise this community within the Project area are REs 11.3.1, 11.4.3, 11.4.7, 11.4.10, 11.9.5 and 11.9.6. Promoting existing regrowth of Brigalow is the most efficient way to rehabilitate these communities. Natural germination events of Brigalow are extremely rare (e.g. once every few decades). Brigalow is soft-

seeded, so germination is not promoted by fire. Propagation of Brigalow from root suckers could be trialled and planting of tubestock will be considered where there is limited regrowth due to soil disturbance. Belah seeds develop within capsules that remain unopened on the tree for a few years. Store capsules in a paper bag, where the capsules will open and drop seed within days of collection from the tree. No seed treatment is necessary. Sow fresh seed of Belah directly onto the site, where required. Typically associated eucalypts include *Eucalyptus coolabah*, *E. cambageana* and *E. populnea*. The seed of these eucalypts falls from the capsules when mature, although seed is not always produced annually. Collect mature capsules before or as seed is released. Seed should be sown fresh with no pre-treatment necessary.

Fires will be kept out of Brigalow woodlands by maintaining low fuel loads in adjacent eucalypt woodlands. Where invaded by exotic grasses, especially Buffel Grass, reduce the fuel loads through herbicide control of grasses on the margins. For existing Brigalow communities adjacent to infrastructure, on-ground management activities likely to assist in recovery as outlined in the Brigalow (*Acacia harpophylla* dominant and co-dominant) Recovery Plan (DSEWPac 2011) include:

- limiting disturbance (e.g. clearing for roads) in or adjacent to remnants to minimise weed incursion;
- carrying out appropriate treatment to avoid weed invasion (especially by exotic grasses); and
- managing grass fuel loads and maintaining fire breaks to avoid hot fires in remnants.

Semi-evergreen vine thicket

The semi-evergreen vine thicket (SEVT) TEC represents vine thickets dominated by species such as *Ehretia membranifolia*, *Apophyllum anomalum*, *Geijera parviflora*, *Capparis* spp., *Croton phebaloides*, *Erythroxylum australe*, *Alectryon diversifolius*, *Cadellia pentastylis* and *Carissa ovata*. SEVTs may also have Brigalow trees. *Brachychiton* species (Bottle Trees) may form an emergent layer above the vine thicket. Within the Project area, SEVT is represented by two Regional Ecosystems. These are RE 11.8.3 and RE 11.9.4. Semi-evergreen vine thickets have a high diversity of tree and shrub species compared to other ecosystems in the region. Their rehabilitation will best be achieved by enhancing the regrowth of existing remnant patches. SEVTs can be damaged by cattle, with seedling establishment often inhibited, so fencing off rehabilitation areas will be required. Seeds of SEVT species are produced within capsules that open to release seeds (e.g. *Brachychiton* species, *Denhamia oleaster*, and *Geijera parviflora*) or are surrounded by a fleshy pulp (e.g. *Ehretia membranifolia*, and *Erythroxylum australe*). Seeds produced within capsules can be collected by tying bags over near-mature fruits to collect seed as they mature and fall, or by collecting nearly mature capsules and storing within bags. No seed treatment is required. For some SEVT species planting of tubestock will be required. Vine thicket plantings will require supplementary watering during establishment as they are mostly very slow growing. Plantings are prone to invasion by weeds, especially grasses, and will require several maintenance treatments over the first 3-5 years. Semi-evergreen vine thicket plants are damaged by fires, even of a low intensity. While some scrub plants may re-shoot following a fire, their canopy height is lost and they are slow to recover. Fires allow grasses to invade the SEVTs, which promote subsequent fires. Keeping fire out of rehabilitation areas is important for all rehabilitating ecosystems, but especially so for SEVTs. Low fuel loads will be maintained in woodlands adjacent to vine thickets, through fuel reduction as outlined in **Section 5.8**. Further Management Practices for SEVTs are outlined in the National Recovery Plan for SEVTs (McDonald 2010).

Weeping Myall Woodlands

Certain woodland communities (including RE 11.3.2 and 11.3.28) in which Weeping Myall (*Acacia pendula*) occurs as the dominant canopy species are considered endangered ecological communities under the EPBC Act. Weeping Myall commonly occurs within other communities on alluvial soils and may occur in densities consistent with the nationally endangered community. As REs 11.3.2 and 11.3.28 have been mapped as present in the Project area, the key management

strategy is to verify the presence of Weeping Myall TEC prior to clearing, and protect them from clearing and disturbance to the greatest extent possible. Should disturbance of Weeping Myall woodland be required, habitat rehabilitation will occur through the management of natural regeneration. Should direct seeding be required, seed of *Acacia pendula* should be soaked in hot water before sowing to promote germination, before sowing, Minimisation of ground disturbance is recommended.

Coolibah-Black Box Woodlands

The Coolibah–Black Box Woodlands of the Darling Riverine Plains and Brigalow South Bioregions were listed as Endangered under the EPBC Act on 1 March 2011 (Beeton 2011). This listing includes RE 11.3.3, 11.3.15, 11.3.16, 11.3.28 and 11.3.37 within the Project area.

Where Coolibah-Black Box Woodland analogous to this TEC is detected, the key management strategy is to protect them from clearing and disturbance to the greatest extent possible. Since these communities occur in riparian areas, the general measures for creek and waterways (**Section 7.2** will be put in place during the installation of Project infrastructure).

Habitat rehabilitation will occur through the management of natural regeneration. Revegetation through planting of seedlings may also be undertaken to assist in the rehabilitation of riparian vegetation, particularly on creek banks that are susceptible to erosion. Species will be selected to be consistent with the pre-clearing Regional Ecosystem as determined from analogue site surveys. Since this community has only recently been listed, no recovery plan has been developed. Once a recovery plan has been developed, this will be referred to for any relevant recovery methods for this TEC.

Natural Grasslands

Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin have the potential to occur in the Project area. These ecosystems have not been detected with the footprint of the Project Area. Nonetheless, the key management strategy is to identify these areas, if any, prior to clearing and avoid clearing and disturbance to the greatest extent possible. In the unlikely event that disturbance is required; habitat rehabilitation through natural regeneration of grasslands is the most appropriate recovery method. Minimisation of ground disturbance is recommended.

Communities dependent on natural discharge of groundwater from the Great Artesian Basin

The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin (mound springs) is not known to occur within the footprint of the Gas Field, including the potential area of influence of CSG depressurisation activities or pipeline route.

Nonetheless, the key management strategy is to identify these areas, if any, prior to clearing and avoid clearing and disturbance to the greatest extent possible. In the unlikely event that disturbance of mound spring communities is required; a site specific Species Management Plan, including details for rehabilitation will be developed.

To support identification and monitoring of potential direct and indirect impacts to this TEC QGC have prepared the “*Stage 1 Coal Seam Gas Water Monitoring and Management Plan*” (Stage 1 CSG WMMP) QCLNG-BXOO-WAT-RPT-000005 which fulfils requirements of Condition 49 of referral EPBC 2008/4398 in relation to the QCLNG Project.

The CSG WMMP covers the following key components:

- Groundwater Monitoring and Management (including the assessment of groundwater impacts)
- Hydraulic Fracturing Matters
- Surface Water Monitoring and Management

- Response Actions
- Reporting.

In addition, several parallel programs have been done to satisfy Queensland Government requirements. These include the development and submission of a:

- CSG Water Management Plan;
- Groundwater Monitoring Plan, 2011 (annually updated);
- Receiving Environment Management Plan; and
- Local Incident Management Plan.

In committing to the CSG WMMP, QGC will invest more than A\$60 million during the next 12 months in modelling, drilling bores for groundwater monitoring, groundwater repressurisation studies (including initial deep well injection investigations) and in financial support to the Queensland Water Commission programs for regional groundwater modelling and springs programs.

The latest modelling for this report, done through GEN 2, the second generation model, indicates that the extraction of groundwater through QGC's coal seam gas operations will have no significant impact on matters of national environmental significance. Improved data and refinements to the model over the past year indicate that the potential impact of QGC activity on groundwater will be most likely less than previously thought.

Notwithstanding, data gathered from QGC's monitoring program will be incorporated into yet a further refined in the next generation of groundwater impact modelling, the GEN 3 model. This will improve confidence in future modelling of groundwater levels and aquifer changes.

Results of the ongoing monitoring will assist in identifying the presence of this ecological community and any potential adverse impacts on the vegetation. The SMP will be updated where required based on implementation of the CSG WMMP and survey results.

7.4 EVNT and MNES Listed Fauna

7.4.1 Avoidance

The primary Project aim will be to avoid populations and habitat of EVNT and MNES fauna species following the measures outlined in the Protocol and SSMP. In cases where impacts are unavoidable a more detailed Species Management Plan will be developed to assess the degree of impact upon the species and provide detailed management strategies to ensure appropriate conservation prior to the impact occurring.

This may include strategies for:

- on-site protection and mitigation;
- relocation of fauna and their breeding places;
- rehabilitation of their habitat; and
- offsets where appropriate (refer to **Section 7.1**).

QGC's Fauna Management Procedures will be also be implemented by appropriately qualified and licenced spotter catchers to minimise injury and death to fauna during clearing.

The following activities will be implemented at proposed disturbance areas identified as containing potential habitat for EVNT and MNES fauna species:

- Pre-clearance fauna surveys will be undertaken in accordance with DSEWPaC fauna survey guidelines where MNES fauna species and their habitats are identified as occurring, or have the potential to occur, as documented during the first pre-clearance survey (as part of the pegging party);
- The location of these fauna species and their habitats will be recorded and built into the Protocol to ensure these species and their preferred potential habitat communities are avoided where possible;
- As part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including any likely significant flora and fauna species populations they may encounter. The Protocol will be used to assist in identifying these environmental values to ensure they are avoided where possible and managed appropriately;
- Wherever practicable signage will be erected to increase the general awareness amongst work crews of the presence of EVNT and MNES fauna, particularly any nesting or other breeding sites in the area;
- Clearing is to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas of their own volition. Sequential clearing coupled with the slow nature of the clearing activities will take into account any variation in landscape features such as rocky escarpments, riparian habitats and steep sloping areas and provide fauna with sufficient time to exit the disturbance area;
- All clearing activities will be carried out in a manner that will not result in the isolation of habitat, habitat features or any noted fauna persisting within the clearing area. Sequential clearing activities will provide safe escape routes for fauna and allow sufficient time for fauna spotter catchers to identify any potential fauna habitat, habitat features or fauna for relocation prior to clearing and identify this for consideration by the clearing team;

- Mature trees will be identified, and clearing will be avoided or minimised;
- Prior to commencing vegetation clearing, trees with hollows or potential nesting sites will be checked for the presence of arboreal fauna by a suitably qualified spotter catcher;
- Where trees with hollows are felled and suitable equipment is present on site, excise the section of the tree containing the hollow and relocate the hollow to suitable adjacent habitat;
- If non-mobile fauna are found prior to or during clearing activities, it shall be relocated from the clearing area to a safe and suitable location containing the microhabitat features, preferably within 200 metres of the capture location, by a spotter catcher. Appropriate permits for fauna relocation shall be held by the spotter catcher. Any injured fauna shall be transported to a veterinarian or recognised wildlife carer immediately for treatment;
- In areas where significant species have been identified or their microhabitat is present, fauna spotter catchers must inspect and remove any fauna from pipeline trenches twice daily (early morning and late afternoon) every day while the trenches are open and have access to the site in all weather;
- All piping left overnight will be capped to avoid fauna from entering the pipes during nocturnal periods;
- Prior to backfilling of the trench site personnel will check the open trench for trapped fauna and where required a fauna spotter catcher will be called to move any fauna to a safe location away from the trench;
- Retain some felled timber within adjacent habitat to increase sheltering opportunities for displaced animals; and
- Cleared vegetation will not be pushed into adjacent TEC areas, other vegetated areas or environmentally sensitive areas such as waterways and gullies. Vehicle activities will be restricted to roads, access tracks and hardened surfaces wherever possible to reduce the possibility of wildfire, spread of weeds and any potential impact on significant or other species.

7.4.2 Mulching and Vegetation Management

No burning of felled vegetation is permitted. Rather, the felled vegetation will be stick raked into piles and left to provide fauna habitat, and to assist in regeneration and erosion control. This will further encourage regeneration of fauna habitat, as well as minimise weed infestations. To further assist in habitat recovery felled native vegetation, rocks and timber will be re-spread over the disturbance areas not required for ongoing maintenance or access.

7.4.3 Natural Regeneration

Natural regeneration of clearing areas in EVNT and MNES fauna habitat will be encouraged. This will occur through:

- re-profiling natural contours and drainage lines to their original profile with topsoil spread across disturbed areas to minimise erosion and promote natural regeneration;
- re-spreading mulch or felled vegetation across disturbed areas;
- installation of permanent erosion and sediment controls to shed runoff from the altered surface; and
- weed, pest and fire management.

7.4.4 Revegetation

Areas where natural regeneration has not been successful (i.e. land form is not stable after twelve months) will be seeded with native tree and shrub species. Direct seeding will also be required where the topsoil used has been stockpiled for longer than 24 months.

A re-seeding plan will be implemented based on soil type and native species consistent with the pre-clearing regional ecosystem and vegetation characteristics. Densities and species diversity will be based on the assessment of reference sites established prior to clearing.

Refer to the SSMP for more detail on EVNT fauna species likely to be present and appropriate mitigation and performance measures.

7.5 EVNT and MNES Listed Flora

The primary Project aim will be the identification and avoidance of any individuals or populations which may be detected prior to clearing. Avoidance and mitigation measures should species be detected are listed in the Protocol. In cases where clearing is unavoidable a comprehensive species specific Species Management Plan will be developed to assess the degree of impact upon populations and provide detailed strategies to ensure appropriate conservation. This may include strategies for:

- on-site protection and mitigation;
- offsite propagation and re-seeding, replanting and/or translocation; and
- environmental offsets where appropriate (refer to **Section 7.1**).

In these cases, the collection of seed, other propagation material or whole plants and the growing on of tubestock for replanting may be required. This material may be direct seeded, planted, or translocated into sites being progressively rehabilitated, or into offset sites. This will be determined for specific sites where populations are detected on an individual species basis on the advice of an approved ecologist and outlined in individual.

In addition to the avoidance measures listed in the Protocol the following measures will be undertaken to avoid and mitigate impacts to threatened communities and flora species:

- pre-clearance surveys, as described in **Section 10.1**, will be undertaken as part of early planning and detection of these flora species;
- the location of these flora species will be built into the Protocol to ensure these plants or their communities are avoided where possible;
- as part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including the presence of TECs, Endangered and Of Concern REs, and any other likely significant flora and fauna species and populations they may encounter;
- prior to clearing well pads, access roads, pipelines or other disturbance sites, limits of clearing areas will be clearly marked out and significant vegetation communities identified as “no go” zones. “No go” zones will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;
- where clearing is unavoidable, the clearing boundaries will be marked on design drawings and flagged in the field prior to any works commencing and will be restricted to the minimal area required. Clearing details will be recorded for future reporting requirements;

- cleared vegetation will not be pushed into adjacent vegetated areas or environmentally sensitive areas such as waterways and gullies. Vehicle activities will be restricted to roads, access tracks and hardened surfaces wherever possible to reduce the possibility of wildfire, spread of weeds and any potential impact on significant or other species; and
- dust suppression measures will be implemented to minimise dust deposition on foliage.

Habitat recovery for EVNT and MNES listed flora species will also consist of natural regeneration, revegetation, erosion and sediment control and control of weeds at all Project disturbance sites as outlined in the above sections. With respect to weeds and their control, reference should be made to the QGC Pest and Weed Management Plan which indicates that:

- rehabilitation equipment to be cleaned down upon entry of right of way and upon completion of work (refer to the QGC Environmental Guideline Weed Hygiene for Vehicles and Machinery (OPS-T-GDL-002); and
- FEOs to ensure from suppliers in writing, via the Queensland Government Weed Hygiene Declaration Form, that any materials imported for rehabilitation including topsoil and seed stock are weed free.

Refer to the SSMP for more detail on EVNT and MNES flora likely to be present and appropriate mitigation and performance measures.

8 Decommissioning

When infrastructure is no longer in use (operating as part of the CSG production process), QGC will decommission any part of the gas field in accordance with the regulatory requirements and accepted Best Management Environmental Practice of the day. Such infrastructure would include well heads, compression stations, ponds, water treatment facilities and any above ground pipeline infrastructure. Prior to final decommissioning of gas field facilities, QGC will investigate potential environmental issues and impacts associated with the decommissioning in accordance with relevant guidelines, standards and licences.

QGC will prepare a Decommissioning and Rehabilitation Plan within five years of commencement of the Project in accordance with the EPBC Act approval Condition 81. It is required to include details such as:

- Management practices and safeguards to minimise environmental disturbance during decommissioning;
- Ensure MNES are not impacted by progressive decommissioning or final decommissioning of gas field infrastructure; and
- Define rehabilitation actions for the infrastructure sites following decommissioning.

The Decommissioning Plan must be approved by the Minister for Sustainability, Environment, Water, Population and Communities.

In many situations, final decommissioning will rely on soil stockpiled during Project construction, and as such the stockpiling of soil during construction needs to be managed to ensure there is sufficient soil available for decommissioning.

Decommissioning of the Gas Field facilities is expected to be completed in three phases:

- dismantling and removal of the above-ground facilities;
- destruction and removal of hardstand areas; and
- rehabilitation of land in accordance with DERM requirements or as agreed with landholders.

This section outlines the process of removing Project infrastructure and undertaking rehabilitation on the completion of the Project operation.

Rehabilitation in the decommissioning phase will be detailed in a separate report and submitted to appropriate regulators prior to the final phase of the Project.

8.1 Below Ground Infrastructure

Inactive, buried gas, water and electricity pipelines will be decommissioned *in situ* consistent with the requirements of the **Australian Standard 2885**. This includes:

- review of stakeholder requirements;
- identify different requirements for different sections of the pipeline;
- development of an abandonment plan, including a rehabilitation plan;
- disconnection and purging of the pipeline;
- abandonment of underground pipelines either in-situ or by removal;

- where abandoned in-situ, minimisation of risk of subsidence and maintenance of any cathodic protection;
- removal of all above ground pipeline components, fences, equipment, etc;
- obtaining releases from relevant landowners;
- relinquishment of RoWs, where no future use is required; and
- making publically available records of pipelines.

8.1.1 Pipeline Removal

The removal of below-ground structures (e.g. pipes) may cause unnecessary environmental disturbance. It is therefore expected that the pipes will be left in the ground. The abandoned pipe shall be purged of gas, filled with an inert substance and cathodic protection devices and associated utility structures left intact. This will prevent ground subsidence associated with the corrosion of the pipe, which may result in surface-water diversion, ponding and erosion. Below-ground facilities will be cut off and banded below ground level.

8.1.2 Removal of Waste/Rubbish/Water

The gas pipeline rights of way require the removal of any other waste/liquid/rubbish prior to rehabilitation works proceeding. A FEO will conduct analysis of the waste product and direct waste removal and management.

All waste will be managed in accordance with a Waste Management Plan.

8.1.3 Scarification of the Surface

Following decommissioning buried pipelines must be rehabilitated to a native vegetation community, where this is the final land use. This will involve the establishment of tree and shrubs where only ground cover species were established during progressive rehabilitation. Since soil was replaced during backfilling, no further soil replacement or surface re-instatement will be required, except where erosion or subsidence occurred.

Surface roughening will be completed prior to seeding to reduce compaction and create a suitable seed bed; however no deep ripping will occur due to the buried infrastructure. The scarification be completed using the teeth of a grader or in some cases the tracks of the grader. Scarification can also be achieved by ploughing of the sub-surface material prior to topsoil reinstatement. A figure eight or zigzag rip lines may prevent rill erosion in flat low gradient areas. In areas compacted by traffic deep ripping of the surface is required to relieve the compaction to encourage aeration and water seepage.

In accordance with approval conditions and as incorporated into QGC's Constraints Planning and Field Development Protocol, buffer zones around TECs and MNES will, in most circumstances, be avoided. Where impacts on TECs or MNES are unavoidable and can be justified, any ripping undertaken during the rehabilitation process will avoid the root zones of adjacent vegetation by confining soil works to areas outside of the vegetation's drip line.

Once topsoil has been spread driving over the area is prohibited, except for the sowing of seed.

8.1.4 Direct Seeding

Requirements for the application of seed are outlined in **Section 5.5**. Any rehabilitation works on private land will be carried out in consultation with the landholder to ensure QGC meet landholder requirements. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a spreader which involves the delivery of seed into the soil via a spreader on the rear of a tractor. Seeding is to take place after surface scarification but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process.

Using machinery such as tractors on steep slopes will be avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

8.1.5 Planting of Seedlings

Planting of seedlings (tubestock) may be required to revegetate rehabilitation areas, where vegetation has established through regrowth, but not all the component species are present to meet success criteria. This decision will be made by the Land Access Consultant on behalf of the land holder as to the plant selection and plant spacing. Seedlings will be selected from the native species prominent in the area as determined from analogue site surveys.

8.1.6 Maintenance

Following rehabilitation works, limited access to the gas pipeline rights of way is allowed only to perform essential maintenance requirements. All other traffic is prohibited on topsoil areas and will remain off the right of way to enable successful establishment of groundcover.

Banks of creeks are to be watered regularly. It is not practical to water entire rights of way; however creek banks and steep slopes, and areas where seedlings have been planted, are to be selected for watering. This will ensure groundcover is established and erosion is minimised. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water quality suitable for the purpose that meets Environmental Authority standards.

Where practical and possible native shrubs will be allowed to regenerate and reduce the barrier to fauna movement, especially for ground dwelling fauna.

8.2 Hardstand Surrounds – Wells and Facilities

8.2.1 Removal of Waste/Rubbish/Water

The site requires removal of waste/liquid/rubbish from the flare/sump pits and any sedimentation ponds prior to any rehabilitation. Accommodation camps, administration buildings and warehouses will be removed from the site, unless a landholder requests to retain aspects of this infrastructure. All camps, waste and other material will be removed from site and re-used, recycled or disposed of appropriately. Field compression stations, central processing plants and associated infrastructure, such as interceptor pits, and triethylene glycol units, will be removed from the site. Items such as compressors and driver engines will be recycled or salvaged for potential reuse by a third party where possible. Hardstand areas will be removed where not required by the landholder, with footings buried in a suitable location, preferably a decommissioned pond footprint. Compacted material will be deep ripped or removed from the site depending on the final land use requirements. Flares will be removed from the site. Water treatment facilities will be wholly removed from the site. Treatment units, or components thereof, will be recycled or salvaged for potential reuse by a third party where possible. Waste transfer facilities will be decommissioned by the removal of all waste materials off site to an appropriate disposal location.

A FEO will conduct analysis of the waste product and direct waste removal and management.

8.2.2 Backfill/Compaction

Backfilling of the site with stockpiled subsoil is required to ensure the surface is in alignment with the natural contours of the existing landscape. Backfilling will be completed to ensure surface subsidence is avoided.

It is important to use all subsoil at this stage as once topsoil is spread any remaining subsoil will be removed from site. In the case of a drill pit, they will be backfilled and any remaining cuttings covered with at least one metre of soil. Back filled pits will be compacted into mounds to provide for future subsidence. Any cut and fill batters created to establish a level hardstand surface will be removed and re-contoured to the original land surface.

8.2.3 Surface Drainage and Reinstatement

Surface drainage lines will be reinstated to match the existing formations (streams, ephemeral creeks) and contours following removal of surface facilities/infrastructure and backfilling or compaction to ensure any works completed will not be affected by a rainfall event or over a longer summer rainfall period. Surface contouring reinstates the construction land formation back to the natural contours of the existing environment. This ensures water flow over the surface is in cohesion with the surrounding land and minimises the risk of potential erosion. Surface contouring will be completed prior to re-spreading of topsoil. Rock armouring may be required at drainage outlets to avoid scour and erosion issues.

8.2.4 Permanent Erosion and Sediment Controls

Permanent sediment and erosion controls will be completed prior to rehabilitation. This will ensure the sediment and erosion structures are vegetated with the entirety of the site. These structures will include diversion drains and contour berms across the elevated side of the site if a slope is evident.

The area between the edge of the drill pad and the edge of the disturbance area will be deep-ripped and seeded. If the disturbance area is on a slope, a diversionary drain will be formed on the uphill side of the drill pad.

8.2.5 Scarification of Surface

Ripping and scarification assists with binding of the soil layers, increases retention time of water on the slope, aids water infiltration into the soil increasing the opportunity of seed germination success and reduces the volume and velocity of runoff generated from the slope. Surface roughening will be completed prior to seeding and will ensure no subsoil is ripped to the surface. The scarification will be completed using the teeth of a grader or in some cases the tracks of the grader. Scarification can also be achieved by ploughing of the sub-surface material prior to topsoil reinstatement. In areas compacted by traffic deep ripping of the surface is required to relieve the compaction to encourage aeration and water seepage.

In accordance with approval conditions and as incorporated into QGC's Constraints Planning and Field Development Protocol, buffer zones around TECs and MNES will, in most circumstances, be avoided. Where impacts on TECs or MNES are unavoidable and can be justified, any ripping undertaken during the rehabilitation process will avoid the root zones of adjacent vegetation by confining soil works to areas outside of the vegetation's drip line.

8.2.6 Topsoil Re-spreading

Following re-profiling, the topsoil is to be spread back over and left 'rough' (rather than smooth and compacted) to minimise potential erosion and increase water infiltration. Depth of topsoil to be spread will be determined on a site by site basis, by reference to the Site-Specific Rehabilitation Plans. Topsoil must cover the entire width of the hardstand so that there is no exposed sub-surface material. This will ensure seeding and germination has the best opportunity to 'take', enabling establishment of groundcover. However, it is recognised conditions vary greatly depending on the soil type and structure. A greater amount of topsoil may be available for re-spreading over exposed

areas if conditions permit. A greater amount of topsoil may be available for re-spreading over exposed areas if conditions permit. If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of the source and quality must be verified by a FEO. If topsoil is imported from elsewhere this must be of an appropriate quality and must be certified weed free, and must only be used with landholder approval. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of its source and quality, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of topsoil between sites and information about its certification as weed free. Weed free certification will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report.

Once topsoil has been spread driving over the area is prohibited except for the sowing of seed.

8.2.7 Direct Seeding

Requirements for the application of seed are outlined in **Section 5.5**. In the case of decommissioning, since topsoil will have been stockpiled for long periods, natural regeneration will not be relied upon, as topsoil seed reserves are likely to have declined. Therefore all areas will require seeding.

Seeding is to be undertaken after topsoil has been spread but before mulch reinstatement. Any rehabilitation works on private land will be carried out in consultation with the landholder to ensure QGC meet landholder requirements. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a spreader which involves the delivery of seed into the soil via a spreader on the rear of a tractor. Seeding is to take place after ploughing, but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process.

Using machinery such as tractors on steep slopes will be avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

8.2.8 Planting of Seedlings

Planting of seedlings may be required to revegetate rehabilitation areas. This decision will be made an FEO on behalf of the land holder as to the plant selection and plant spacing. Seedlings will be selected from the native species prominent in the area.

8.2.9 Fence Removal

Fences and other areas may be installed around Project areas where appropriate and where approved by the landholder, to minimise unauthorised access. Where no longer required on decommissioning, and where not required by the landholder, fences will be removed and all fencing material disposed of appropriately.

Fence removal will be undertaken in accordance with the requirements of the Waste Management Plan. If fences are a regulated waste they will be handled and disposed of accordingly.

8.2.10 Maintenance

Following rehabilitation work, limited access to the rehabilitation areas is allowed to perform essential maintenance requirements only. All other traffic will remain off the rehabilitation area to enable successful establishment of groundcover/vegetation.

It is not always practical to water entire disturbed areas; however creek banks and steep slopes, and areas where seedlings have been planted are to be selected for watering. This will ensure groundcover is established and erosion is minimised. Watering is to be conducted on a twice weekly basis until sufficient groundcover (>50%) is achieved. Watering is to be undertaken with water quality suitable for the purpose that meets EA standards.

8.3 Associated Water Storage Ponds/Pond Walls/Surrounds

8.3.1 Management of Potentially Contaminated Land

In accordance with Condition 81 of the DSEWPaC Gas Field Approval, QGC will prepare Decommissioning Plans for gas field infrastructure within five years of commencement of activities. Decommissioning plans will be prepared for all sites where activities have potentially resulted in contamination of soils. This includes CSG water aggregation dams and brine storage and / or evaporation dams. Decommissioning plans will include an assessment of the potential contamination at the site and the methods to mitigate impacts where contamination is identified. Where leakage of the liner system has occurred a full contaminated land assessment will be undertaken in accordance with National Environment Protection (Site Assessment) Measure 1999.

Soils will be remediated following the *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*. As outlined in the *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*, the preferred order or options for site clean-up and management are:

- on-site treatment of the soil so that the contaminant is destroyed or the associated hazard is reduced to an acceptable level; and
- off-site treatment of excavated soil so that the contaminant is destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.

Purpose built soil remediation areas may be established for the remediation of contaminated soil from various locations. These locations are yet to be confirmed and current remediation of soils involves transportation to licensed waste disposal facilities. Contaminated soils are to be transported by a regulated waste removal provider to the proposed purpose built soil remediation areas for remediation or a current licensed waste disposal facility. Following the removal of contaminated soils visual inspections and contamination testing will be undertaken to confirm that all contaminated soil has been removed. Documentation for the transport, disposal (permits and disposal docket) and reports for contaminated soil analyses will be retained by QGC and data stored as identified in **Section 10.3**.

Soil remediation strategies may include:

- excavating contaminated soil and burying it at one location on site (this reduces the area containing contaminated soil);
- installing horizontal, vertical or reactive barriers;
- constructing an engineered landfill cell on site (for situations with shallow groundwater, permeable soils, leachable contaminants or very high results);
- solidifying (locking contaminants in solidified matrix) or stabilising (converting contaminants to a less mobile and/or less toxic form, typically by chemical reaction) when contaminants are highly leachable, then incorporating with one of the above options land farming volatile contaminants and reusing soil on-site (if no sensitive receptors are nearby);
- land farming volatile contaminants at an offsite location then returning the soil to site;
- on-site or off-site treatment, for example thermal desorption; and

- in-situ biological (e.g. air stripping, sparging or venting) or chemical treatments.

These shall be considered for permeable soils but are usually slow processes.

The appropriate soil remediation strategy will be determined by a suitably qualified person in consultation with the Environment Manager and Project Manager in compliance with *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* with the preferred order for site clean-up and management applied. The selected soil remediation strategy will be documented and strategy chosen will be a reflection of the level of contamination, the type of contaminant and the surrounding environment where contamination has occurred.

8.3.2 Notifiable Activities

Activities that have been identified as likely to cause land contamination are listed in Schedule 3 of the *Environmental Protection Act 1994*. Under the Act, landowners or occupiers and local government must inform the department (DERM) that land has been or is being used for a notifiable activity. Land that has been or is being used for a notifiable activity is recorded on the Environmental Management Register (EMR), which is maintained by DERM.

Pursuant to Schedule 3 of the *Environmental Protection Act 1994*, the following notifiable activities are likely to be carried out under this Environmental Authority:

- 1. Abrasive blasting - carrying out abrasive blast cleaning (other than cleaning carried out in fully enclosed booths) or disposing of abrasive blasting material.
- 7. Chemical storage (other than petroleum products or oil under item 29) - storing more than 10t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.
- 20. Landfill—disposing of waste (excluding inert construction and demolition waste).
- 23. Metal treatment or coating - treating or coating metal including, for example, anodising, galvanising, pickling, electroplating, heat treatment using cyanide compounds and spray painting using more than 5L of paint per week (other than spray painting within a fully enclosed booth).
- 29. Petroleum product or oil storage - storing petroleum products or oil-
 - (a) in underground tanks with more than 200L capacity; or
 - (b) in above ground tanks with -
 - (i) for petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code-more than 2500L capacity; or
 - (ii) for petroleum products or oil in class 3 in packaging groups 3 of the dangerous goods code-more than 5000L capacity; or
 - (iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS 1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia-more than 25 000L capacity.
- 37. Waste storage, treatment or disposal - storing, treating, reprocessing or disposing of regulated waste (other than at the place it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50 000 persons having sludge drying beds or on-site disposal facilities.

Should activities result in contaminated land or land being used for a notifiable activity, DERM will be informed under the provisions of the EP Act.

Any contaminated land will be remediated in accordance with the relevant decommissioning plan.

8.3.3 Decommissioning of Ponds

Ponds which are no longer required will be decommissioned in a manner which eliminates any ongoing environmental hazard. Once saline liquor and waste products are removed the facilities will require rehabilitation to remove any source of potential contaminants and return the land to a useable form. The landform will be re-instated such that it will no longer function as a dam and will be stable.

QGC will develop a Decommissioning Plan for all ponds (refer **Section 8.3.3**), including the development and application of the following practices:

- the pond will be dewatered by pumping water to another water storage pond or to the WTP. After the pond has been dewatered for decommissioning, there will be no more driving head so the potential for spread of any saline seepage in the horizontal plane will rapidly cease;
- removal of saline wastes and liquors for further treatment or disposal;
- clay liners, geo-synthetic liners and any contaminated soils will be gathered at a high point in the pond footprint or transferred to another pond scheduled for decommissioning. This will reduce the footprint of contaminated materials within each pond;
- pond embankments will be levelled and material used to cover the pond floor. This will ensure that the pond no longer impounds any water;
- diversion drains surrounding the pond may be retained to divert any clean water runoff from the decommissioned pond area;
- a capillary break layer will be installed over the pond footprint to prevent capillary rise of salts into any soil cover;
- a clay layer will be installed over the capillary break layer to minimise seepage from rainfall and runoff. It is expected that this would have a minimum thickness of 300mm;
- a growth medium/topsoil will be installed over the clay layer in a convex shape to prevent pooling of rainfall and runoff. It is expected that this would have a minimum topsoil depth of 250mm; and
- the growth medium will be planted with species suited to the climate and with roots that will not penetrate the clay or capillary break layers. These species will take up water from the growth medium and minimise the volume of water seeping into the clay or capillary break layers.

QGC has undertaken modelling for the decommissioning of an existing brine pond, which indicates that, after the pond is dewatered, the driving head for seepage will be removed and the migration rate of any seepage bulb will slow and stop in underlying and adjacent unsaturated, extremely weathered rock strata. This and the retained very-low hydraulic conductivity of the underlying unsaturated strata will limit the possibility of saline water flowing downwards to deeper aquifers after decommissioning. The final process will be determined in the Decommissioning Plan.

Where monitoring during the life of the pond indicates the potential for soils and aquifer contamination post decommissioning, an ongoing monitoring plan will be implemented. It is possible any shallow monitoring wells that existed prior to decommissioning will be removed. However, these will be replaced by a network of shallow monitoring wells in surficial soils around

the site of the decommissioned pond. Deep monitoring bores will not be removed and will continue to provide data on aquifer water quality after decommissioning.

All decommissioned ponds will be subject to routine monitoring (refer **Section 10**) of surrounding erosion and vegetation, including vegetation established during the decommissioning process, for any evidence of scalding or die-off due to migration of salts.

QGC will continue to monitor shallow bores, deep bores, soils and vegetation surrounding ponds for a period agreed with regulatory authorities or until there is no evidence of seepage of saline materials.

Ponds will be designed to minimise the potential for any contamination in accordance with *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as issued by DERM. During operations, potential contamination from aggregation dams and brine storages / dams will be monitored through a network of groundwater monitoring bores in accordance with the GMP.

As part of the Coal Seam Gas Water Management Plan (CWMP), QGC will prepare a Brine Management Plan, including management of residual salts from the brine crystallization process.

An assessment of the eco-toxicological risk to human health and the environment and management of hydraulic fracturing (fracking) and chemicals used during fracking is provided in the HFRAMP. With the proposed management measures in place at all frac wells, it is not expected that the use of chemicals during the fracking process will result in contamination to land. Disturbances created by fracking, such as the frac pond will be decommissioned and rehabilitated in accordance with the relevant plan to be developed for that activity.

8.3.4 Pond Retention

Ponds may be decommissioned for a beneficial use provided that it is approved or authorised by the administering authority and the landowner. For example ponds and water storage facilities may remain at the request of a landholder only if they do not contain hazardous substances; have been subject to a contaminated land assessment and possess structural integrity suitable for the future purpose.

8.3.5 Engineering and Decommissioning Plans

The rehabilitation and decommissioning of each pond will be subject to a detailed engineering and decommissioning plan. An engineering and decommissioning plan will include alternatives to minimise the footprint of former storage ponds. All surface drainage around the pond site will also be completed in compliance with the engineering and decommissioning plan. Significant drainage structures will be required around the perimeter of the pond and contouring of the cleared area. Decommissioning associated with the disposal of saline residues and storage ponds is likely to require physical and chemical investigation to determine the area extent of saline contamination, undisturbed landform characteristics and landholder requirements (e.g. preferred vegetation type). Individual engineering and decommissioning plans will depend on many factors that are site-specific including: landform features, slope, water-flow restrictions in the landscape and soil type and quality.

8.3.6 Topsoil Re-spreading

Due to the nature of the clayey soil types used for pond construction it is imperative that topsoil is spread evenly across the site, once the profiles are complete to ensure vegetation is given the best base to establish. Topsoil must be spread at a minimum depth of 25cm. Embankment material will form a cover over the pond base, and stockpiled topsoil will then be utilised to support the growth of a grass species mix.

If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of its source and quality, including certification as weed free, must be verified by a FEO. A database maintained by QGC and accessible to all FEOs will record any such transfer of

topsoil between sites and information about its certification as weed free. Weed free certification will be documented through the use of the Weed Hygiene Declaration Form, issued by the Queensland Government and the QGC Internal Weed Hygiene Inspection Report. Fertilisers and soil ameliorants will be used where required to assist with successful rehabilitation.

8.3.7 Direct Seeding

Requirements for the application of seed are outlined in **Section 5.5**. In the case of decommissioning, since topsoil will have been stockpiled for long periods, natural regeneration will not be relied upon, as topsoil seed reserves are likely to have declined. Therefore all areas will require seeding.

Seeding is to be undertaken after topsoil has been spread but before mulch reinstatement. Any rehabilitation works on private land will be carried out in consultation with the landholder to ensure QGC meet landholder requirements. Areas to be seeded will be identified with flagging tape.

A direct seeding method will be undertaken using a spreader which involves the delivery of seed into the soil via a spreader on the rear of a tractor. Seeding is to take place after ploughing, but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process.

Using machinery such as tractors on steep slopes will be avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews will assess each site on a case by case basis, according to the topography and level of risk involved if machinery is utilised.

8.3.8 Maintenance

Following rehabilitation work, limited access to the rehabilitation areas is allowed to perform essential maintenance requirements only. All other traffic will remain off the rehabilitation area to enable successful establishment of groundcover.

All decommissioned ponds will be subject to routine inspections of surrounding erosion and vegetation, including vegetation established during the decommissioning process, for any evidence of scalding or die-off due to migration of salts.

8.4 Borrow Pits

While borrow pits will be rehabilitated as extraction is completed, some areas may remain open for ongoing gravel extraction for re-surfacing. These areas will be decommissioned following the method outlined for progressive rehabilitation, outlined in **Section 6.7**.

All sites will be subject to erosion and sediment controls as described above.

8.5 Above Ground Power Lines and Access Roads

Access roads not required to be retained by the landowner will be closed and reinstated to a condition compatible with the surrounding land use. All sites will be subject to erosion and sediment controls as described above. Ripping will be required to reduce compaction before topsoil is spread and areas are seeded. Rehabilitation success indicators shall be monitored for progress purposes after the completion of rehabilitation activities (**Section 9** and **10**).

Energy infrastructure, such as power lines, may remain if a further appropriate use can be foreseen. Otherwise it will be dismantled for recycling, scrap metals or transported to a waste disposal facility. Rehabilitation activities will and will reflect the surrounding land use and comply with **Section 6** and **7**. Rehabilitation monitoring will follow **Section 9** and **10**.

9 Rehabilitation Success Criteria

Rehabilitation success criteria are conditioned in EA's for each Project area. The Woleebee Creek Project Area EA (PEN101741410), Schedule H6 Final Acceptance Criteria for Significantly Disturbed Land has been summarised below as an example. Measurable success criteria have been developed based on these conditions for application to rehabilitated areas within the Gas Fields (**Table 10**). Success criteria in relation to MNES to address EPBC 2009/4974 Condition 14e are provided in **Table 10** also.

Table 10: Rehabilitation success criteria

Application	Success Criteria as per Schedule H, H6	Indicators	Measurable success criteria	Corrective Actions
All significantly disturbed land	H6 a) Land is reinstated to the pre-disturbed land use unless otherwise agreed to by QGC, the landholder and the administering authority	Land suitability	Land holder and administering authority agree in writing that land supports the pre-disturbance land use	Assess soil and land suitability and rework site if assessment and landholder approval prove unsatisfactory as per requirements outlined in the Soils Management Plan
All significantly disturbed land	b) Land is reinstated to the pre-disturbed soil suitability class	Soil suitability	Soil suitability is equivalent to pre-disturbed soil suitability class as determined by a soil suitability study	
All significantly disturbed land	c) Land is reinstated so that the distribution of vegetation communities represent that of the pre-disturbed distribution	Vegetation distribution	Vegetation distribution is equivalent to pre-disturbed distribution as determined by vegetation mapping	Revegetate using direct seeding and/ or tubestock if monitoring indicates vegetation distribution is not equivalent to pre-disturbed distribution
Disturbed vegetation communities (including TECs, if disturbed)	d i) Each vegetation community must be re-established so that the rehabilitated site shows distinct and progressive re-establishment of the various strata which characterise the pre-disturbed vegetation communities	Vegetation structure	Development of distinct vegetation strata as determined through BioCondition monitoring	If monitoring indicates vegetation strata are not progressing towards strata in analogue sites revegetate using direct seeding and/ or tubestock
Disturbed vegetation communities (including TECs, if disturbed)	d ii) Each vegetation community must be re-established so that all dominant species within each strata are re-established at	Species composition and community structure	Stem densities of dominant species as determined through BioCondition monitoring	Revegetate using direct seeding and/ or tubestock if monitoring indicates vegetation composition within each strata is not

Application	Success Criteria as per Schedule H, H6	Indicators	Measurable success criteria	Corrective Actions
	densities and frequencies equivalent to that of the pre-disturbed site			equivalent to pre-disturbed vegetation
Disturbed vegetation communities (including TECs, if disturbed)	d iii) Each vegetation community must be re-established so that a minimum of 80% species diversity and richness observed in the original site is achieved	Flora species diversity	Maintain 80% of the floral diversity in analogue sites as determined through BioCondition monitoring	Revegetate using direct seeding and/or tubestock if monitoring indicates flora species richness and diversity is not equivalent to pre-disturbed vegetation
Disturbed vegetation communities (including TECs, if disturbed)	d iv) Each vegetation community must be re-established so that a minimum of 80% foliage cover is achieved when compared to the pre-disturbed vegetation community	Foliage cover	Maintain 80% of foliage cover in analogue sites as determined through BioCondition monitoring	Revegetate using direct seeding and/or tubestock if monitoring indicates foliage cover is not equivalent to pre-disturbed vegetation
Disturbed vegetation communities (including TECs, if disturbed)	e) Each vegetation community must be rehabilitated and maintained until it can be demonstrated that is a self-sustaining vegetation community	Vegetation cover, richness, diversity	Recruitment of canopy species	Revegetate via direct seeding or tubestock planting if monitoring indicates that recruitment is not occurring
Disturbed vegetation communities (including TECs, if disturbed)	f) Each vegetation community must be established and maintained for a period of not less than 5 years	Vegetation established and maintained	BioCondition monitoring values maintained for five years	Revegetate via direct seeding or tubestock planting if BioCondition monitoring indicates that vegetation communities are not maintained for at least five years
Disturbed vegetation communities including habitat of EVNT and MNES listed fauna	g) Habitat structures including but not limited to litter cover, fallen woody material, hollow logs, etc. will be re-established to reflect the pre-disturbed values observed to the greatest extent	Fauna habitat	Maintain a minimum equal density of habitat structures in analogue sites as determined through BioCondition monitoring for three years	If progress to success criteria is not evident rework site to meet the measurable success criteria

Application	Success Criteria as per Schedule H, H6	Indicators	Measurable success criteria	Corrective Actions
	possible			
MNES and EVNT listed flora	Not applicable	Offset establishment	Should impacts to a listed species be required, any adjacent populations will not be disturbed and an Offset will be provided for the impacted plants, as applicable.	Replanting of species in offsets, rehabilitated areas, translocation sites or adjacent areas.
All significantly disturbed land	h. Landform is safe for humans and fauna	Subsidence and erosion	No subsidence or erosion observed for at least five years	Rework site to remediate land to a stable landform and reinstate erosion and sediment control devices
All significantly disturbed land	i) The landform is stable with no subsidence or erosion gullies for at least 5 years	Subsidence and erosion	No subsidence or erosion observed for at least five years	Rework site to remediate land to a stable landform and reinstate erosion and sediment control devices
Erosion prone areas	j) Erosion is minimised with appropriate sediment traps and erosion control measures installed as determined by a suitably qualified person	Erosion control measures installed	Erosion control measures installed	Reinstate erosion and sediment control measures
Residual voids or water bodies	k) Water quality meets criteria for subsequent uses and does not have the potential to cause environmental harm	Water quality	Water quality monitoring parameters to be defined from monitoring of regulated dams	If water quality parameters are not met, the source of contamination must be identified and the problem rectified
Waterways	l) There is no ongoing contamination of waters	Water quality	Water quality monitoring parameters to be defined	If water quality parameters are not met, the source of contamination must be identified and the problem rectified
Dams or monocells	m) There is no ongoing contamination to groundwater from dams or monocells	Groundwater quality and leak detection	Monitoring shows no adverse impacts on groundwater quality No leakage detected	If water quality parameters are not met, the source of contamination must be identified and the problem rectified
Agricultural areas	n) The maintenance requirements for	Maintenance requirements	Maintenance is no greater than that	Rework site if measurable success

Application	Success Criteria as per Schedule H, H6	Indicators	Measurable success criteria	Corrective Actions
	rehabilitated land is no greater than that required for the land prior to its disturbance caused by carrying out the petroleum activity(ies)		required for the land prior to its disturbance as determined by a landholder survey	criteria and landholder satisfaction cannot be reached
All significantly disturbed land	The ongoing risk of bushfires is minimised through removal of high fuel loads	Vegetation established and maintained	Monitoring shows no adverse impacts from bushfires.	If progress to success criteria is not evident rework site to meet the measurable success criteria.

10 Monitoring

10.1 Preclearance Surveys

To ensure that site specific rehabilitation success criteria can be developed, background pre-clearance data must be collected. The process and requirements for these pre-clearance surveys is specified in the Protocol and SSMP.

10.1.1 Photo Monitoring

Pre-clearance photos will be taken of sites where MNES or ESAs are to be disturbed, at permanent photo monitoring points to be established. These photos will provide a record of what the pre-clearance land form and vegetation was prior to clearing, and set minimum visual standards against which land form stability and vegetation regeneration can be assessed.

10.1.2 Riparian Condition

A survey of the condition of riparian areas to be impacted by major waterway crossings (third order or greater) will be undertaken before disturbance commences, using the Rapid Appraisal of Riparian Condition (RARC) methodology (Janson *et al.* 2005).

This rapid appraisal method measures the health of riparian vegetation to provide a score for the condition of riparian areas. This will then be used to measure the success of rehabilitation in riparian areas.

Photo monitoring points will be set up at each RARC site.

10.1.3 Ecological Survey

QGC will, prior to conducting petroleum activities and any clearing of vegetation, undertake a pre-clearance survey to assess and document the regional ecosystems, condition of vegetation and ecological values of the area where the activity is proposed to take place. This information will be used to determine measures and benchmarks for the success of rehabilitation.

The pre-clearance survey will be undertaken by suitably qualified ecologists approved by DSEWPaC, and include the carrying out of field validation surveys, observations and mapping of any ESA's and MNES and the presence of species classed as endangered, vulnerable, rare or near threatened under the NC Act.

As outlined in the Protocol and SSMP, all pre-clearance surveys will:

- Apply the constraint mapping including constraints class Zone 4a (very high or no go); the infrastructure location requirements; minimum no impact zones; impact risk zones; and the width requirements for linear infrastructure corridors;
- Document the vegetation communities, species composition and regional ecosystem types present in the area;
- Identify the likely presence or absence of MNES;
- Be undertaken by a suitably qualified ecologist approved by the DSEWPaC;
- Document the survey methodology, results and significant findings in relation to MNES;
- Fauna surveys will be undertaken in accordance with DSEWPaC's survey guidelines in effect at the time of the survey;

- Apply best practice site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities (Note: Best practice includes applying the optimum timing and frequency of site assessments and surveys to determine presence or absence of listed threatened species or migratory species or their habitat, or a listed threatened ecological community);
- Publish reports on the internet 20 business days before clearance of native vegetation in an infrastructure impact area and provide reports to DSEWPaC on request. Consistent with EPBC condition 5g (vii).

10.1.4 Vegetation Communities of Conservation Significance

Initial planning has used RE mapping to identify and avoid vegetation communities of conservation significance (as part of the Protocol). Where site clearances identify the presence of vegetation communities of conservation significance, alternative infrastructure sites shall be adopted where possible.

All well placements and pipeline routes will be surveyed for species that comprise these communities, during site inspections that will be conducted at the time of final site determination.

10.1.5 EVNT and MNES Listed Flora

Pre-clearance surveys will identify the presence of Threatened flora species under the NC Act and EPBC Act.

As detailed in the SSMP if a species is found, the ecologist will record its location (GPS) and the number of individual plants in the vicinity of the Project.

10.1.6 EVNT Listed Fauna

The pre-clearance survey will include a targeted fauna habitat assessment where values are considered high. Where a threatened fauna species and/or its habitat is noted as occurring, or likely to occur, and QGC cannot avoid disturbing the area, the ecologist will advise QGC to commission a more detailed survey in accordance with DSEWPaC Guidelines.

The second round of pre-clearance surveys will be carried out to validate the presence of EVNT fauna species and their habitats. These surveys will be undertaken in accordance with the DSEWPaC Survey Guidelines (relevant to the likely MNES fauna species present) in place at the time of survey. Guidelines currently include:

- Survey guidelines for Australia's threatened Mammals 2011;
- Survey guidelines for Australia's threatened Bird Species 2010;
- Survey guidelines for Australia's threatened Bats 2010; and
- Survey guidelines for Australia's threatened Reptile Species 2011.

While some species may be found during pre-clearing surveys the likelihood of successfully locating all individuals of all species is very low for cryptic species².

In the case of listed fauna, the location of the fauna will be recorded as accurately as possible and habitats of listed fauna that can be described in terms of specific niche habitats will be recorded. All listed species will be managed in accordance with the requirements of the SSMPs.

² Cryptic species may include bird species if they are rare and or have habits that make it difficult to find.

10.1.7 Weeds

A weed survey will identify the overall abundance and diversity of weed species across QGC tenements and adjacent lands prior to the commencement of Project disturbances. High risk weeds or areas will be noted and may be used to generate special conditions of access for Gas Field activities. 5.7

10.1.8 Soil and Land Suitability Survey

All surveys will be undertaken in accordance with the requirements of the Soils MP.

QGC will undertake representative soil surveys for areas to be disturbed by petroleum activities prior to commencement of petroleum activities in these areas to prevent or minimise the impacts of soil disturbance. All soil surveys will be undertaken in accordance with the requirements of the Soils MP specified under EA conditions. These surveys will set the baseline land suitability against which post Project land suitability can be assessed. These surveys will include but not be limited to:

- establishing baseline soils information for areas to be disturbed including soil depth, pH, electrical conductivity (EC), chloride, cations (aluminium, calcium, magnesium, potassium and sodium), exchangeable sodium percentage (ESP), particle size and soil fertility (including nitrogen, phosphorous, potassium, sulphur and micronutrients);
- identify soil units within areas to be disturbed by petroleum activities at a suitable scale, in accordance with the *“Guidelines for Surveying Soil and Land Resources, 2nd Edition”* (McKenzie *et al.* 2008), *“Australian Soil and Land Survey Handbook, 3rd Edition”* (National Committee on Soil and Terrain 2009) and *“The Australian Soil Classification”* (Isbell 2002) or subsequent versions thereof; and
- develop soil descriptions that are relevant to assessment for agricultural suitability, topsoil assessment, erodibility and rehabilitation, for example:
 - i. shallow cracking clay soils;
 - ii. deep cracking clay soils;
 - iii. deep saline and/or sodic cracking clay soils with melonholes;
 - iv. thin surface, sodic duplex soils;
 - v. medium to thick surface (say >15cm), sodic duplex soils; and
 - vi. non-sodic duplex soils.

In addition to identifying soil types, any actual and potential acid sulfate soils will be identified.

10.2 Reference Site Survey

10.2.1 Site Selection

Information on the vegetation structure and species composition, including abundance, and fauna habitat features, will be collected at analogue (reference) sites (to be established) to compare and monitor the effectiveness of rehabilitation efforts during the life of the Project, and to set rehabilitation goals for each Regional Ecosystem, as required by EA conditions. For example A12 (i) (ii) (A) within the Woleebee Creek EA (PEN101741410).

Reference sites will be established and surveyed using the BioCondition reference site methodology (Eyre *et al.* 2006).

Reference sites will be selected to be representative of each of the Endangered, Of Concern, and Least Concern REs to be disturbed. Reference sites will also be located in TECs where they are to be disturbed. The Queensland Herbarium's Methodology for the Establishment and Survey of Reference Sites for BioCondition (Eyre *et al.* 2006) will be used to select survey sites. This methodology requires that a minimum of three reference sites be set up and surveyed for each RE. Additional reference sites may be established where there is a risk of inadvertent disturbance to sites. Areas to be rehabilitated will be compared with a reference site that occurs as close as possible to the area to be assessed and has similar environmental conditions, i.e. the same regional ecosystem, vegetation community, similar climate (same subregion), similar landscape conditions (soil, slope, position in the landscape, geology etc.) and similar natural disturbance (such as fire history).

Reference sites will be selected in RE's with no extensive chemical or mechanical disturbance to the predominant canopy evident on the aerial photograph archive (from 1960s to recent) or on the ground. As per Eyre *et al.* (2006) when selecting a reference site, QGC will take into account that it must:

- be homogenous with regard to RE and condition status;
- represent an undisturbed, late mature or Best on Offer example of the required RE. That is, the site must have minimal modification through timber harvesting, grazing, fire, erosion, dieback, flood, high recruitment of native species, and/or weed infestation;
- ideally, be located within a reasonably large (> 5ha) intact patch of remnant vegetation (to avoid issues of edge effects);
- be located at least 50 m from a roadside; and
- not be located proximally, and are established at least 3km apart to account for potential geographic variation.

Reference sites will ideally be located in areas to be disturbed (assuming) the sites to be disturbed meet the criteria above. Where suitable remnant vegetation is not available within areas to be disturbed, reference sites may be located within adjacent areas of remnant vegetation such as State Forests that provide Best on Offer examples of the Regional Ecosystem.

Photo monitoring points will be set up at the centre of each BioCondition monitoring site as specified in the BioCondition reference site methodology (Eyre *et al.* 2006).

Reference sites will be established and details included in the SSRPs that relate to that particular Project area.

10.3 Rehabilitation Monitoring

Monitoring will be required at various intervals for a range of parameters to ensure that success criteria are being met. While some success criteria require maintenance of an indicator at a particular level for at least three years, land form stability must be demonstrated for at least five years as required by EA conditions.

It may however take several years for a particular level to be reached before maintenance can then be demonstrated. Further, monitoring must be undertaken for a minimum of five years after rehabilitation is completed as required by conditions of the EA.

Monitoring to demonstrate that rehabilitation meets success criteria, will take place at a minimum annual frequency as required by conditions of the EA. Details of indicators to be monitored and the frequency of monitoring are provided in **Table 11**.

10.3.1 Land-form Monitoring

Monitoring to ensure visual consistency and stability of monitoring will take place both through monitoring of erosion and subsidence and through photo monitoring.

Monitoring of erosion and subsidence will occur at areas considered to be prone to subsidence or erosion including:

- rehabilitated buried transmission pipeline corridors;
- decommissioned ponds or dams;
- waterway crossings; and
- areas with texture contrast soils and sodic subsoils (as identified in the Soils MP)

QGC will monitor the above areas for subsidence and erosion after rehabilitation is completed as required by EA conditions. After this time, monitoring of erosion and subsidence will be restricted to observations at other monitoring sites (i.e. BioCondition and RARC monitoring sites). Since criteria H6(i) of the Woleebee Creek EA (PEN101741410) requires that the land form is stable (no erosion or subsidence gullies) for at least five years, monitoring may need to continue beyond five years if stability is not initially demonstrated in the first few years.

Erosion and subsidence monitoring will involve a walk-through of the pipeline corridor and recording the GPS co-ordinates of any erosion and subsidence areas. Photographs of erosion or subsidence areas will also be taken.

10.3.2 Riparian Condition

A survey of the condition of riparian areas impacted by major waterway crossings (third order or greater) will be undertaken annually for at least five years after rehabilitation using the Rapid Appraisal of Riparian Condition (RARC) methodology (Janson *et al.* 2005). Success will be measured by RARC scores being equivalent or better than pre-disturbance scores.

Photographs will be taken at the photo monitoring points that were set up at each RARC site, and any erosion will be noted.

10.3.3 EVNT and MNES Listed Flora

An appropriate monitoring program, incorporating the monitoring of any rehabilitation, translocation or offset site if applicable, will be established in conjunction with the relevant authority once it is determined that a EVNT or MNES listed species will be impacted. Monitoring details will be included in the revised Species Management Plan for the particular flora species. This monitoring program may include counts of individual plants, monitoring the distribution and health of the species in the vicinity of the disturbance and monitoring any translocation or propagation of the species.

Offset management plans will include specific monitoring and reporting requirements in relation to the performance of the offset.

10.3.4 Monitoring of the Rehabilitation of Native Vegetation Communities

Monitoring of vegetation structure and species composition, including abundance, and fauna habitat features of areas being rehabilitated back to remnant native vegetation will be undertaken using the BioCondition survey methodology (Eyre *et al.* 2011). This will include all remnant vegetation, irrespective of VM Act status, and include TECs. The BioCondition survey methodology will enable measurement of the following rehabilitation indicators:

- flora diversity (for each major life-form group or strata);
- stem density (number of large trees);
- tree canopy height;
- weed cover;
- recruitment of canopy species;
- vegetation cover in major strata (typically tree and shrub layers);
- percentage ground cover; and
- fauna habitat (number and length of fallen logs, and percentage litter cover).

Annual BioCondition surveys will be undertaken as outlined in **Table 11**. Flora diversity can vary during different seasons (i.e. reduced diversity of annuals and perennial herbs during dry periods). As such, where possible, BioCondition surveys will not be undertaken during dry periods (late winter-spring, except after a wet winter) and ideally will be undertaken between late summer and mid-winter.

The EA conditions require for example that vegetation communities be established and maintained for a period of not less than five years. As such, once criteria are met, monitoring will be required for a minimum of five years. Depending on how long it takes for rehabilitated areas to meet criteria, monitoring may therefore be required for more than five years.

BioCondition surveys will be undertaken by a suitably qualified ecologist.

As part of the annual BioCondition surveys, annual photo monitoring will be undertaken at the centre point of each BioCondition transect.

10.3.5 Fauna

The reestablishment of fauna habitat values (litter cover, fallen woody material, hollow logs and standing trees with hollows) (including habitat for MNES listed species) will be assessed through a BioCondition survey (above) with an additional count of the density of standing trees with hollow and hollow logs on the ground.

Any incidental observations of MNES or ENVT listed fauna species during BioCondition or other monitoring will be recorded.

10.3.6 Soil and Land Suitability

The Soils MP will describe the management of soils during all project stages and guide the determination of whether rehabilitated soils have the same pre-disturbance land suitability class.

A final soil and land suitability study will be undertaken after five years to ensure that all agricultural land can be used for its pre-disturbance land use. The results of this survey will be compared to results from the pre-disturbance soil survey outlined in **Section 10.1.8**, to ensure that soil suitability remains unchanged. For consistency the same sites will be used as for the initial soil and land suitability study outlined in **Section 10.3.6**.

Land capability assessment will include a land holder survey of all agricultural properties (grazing and cropping) after five years to determine that maintenance requirements are no greater than for surrounding areas, and obtain approval in writing that land can be used for its pre-disturbance land use.

All soil surveys will be undertaken in accordance with the requirements of the Soils MP.

10.3.7 Weeds

Monitoring of weed infestations of declared weed species within disturbed areas will occur at least monthly during construction and then quarterly for a period of two years following construction. Weed control measures will be applied. Following the two year period, the frequency of monitoring will be reconsidered dependent on the success of control measures and the level of infestations. Any infestation of declared weed species observed during other monitoring will be noted.

10.3.8 Surface water

Coal seam gas water is managed separately from stormwater and overland flow in the gas fields. All coal seam gas water will be gathered to regional storages and ultimately treated through water treatment plans for beneficial use or reinjection. Coal seam gas water is managed via a site water balance model which records the inflows and outflows of coal seam gas water through the water management system and ensures enough capacity is maintained in dams for coal seam gas water storage. Raw coal seam gas water is not used for any petroleum activities directly into the environment, for example dust suppression.

QGC maintains a Coal Seam Gas Water Management Plan, a Water Management Plan and a Surface Water Monitoring and Management Plan (part of the CSG Water Monitoring and Management Plan and Receiving Environment Management Plans) for any treated coal seam gas water that is proposed to be released to the environment. Currently treated water is planned for short term release into Wieambilla Creek and for the longer term into the Chinchilla Weir, on the Condamine River, for uptake by irrigators. These plans are reviewed on an annual basis and include monitoring and reporting requirements. QGC implement erosion and sediment control measures at each site to prevent sediment impacts on local waterways. In addition QGC maintain buffer distances where possible from any watercourse, wetland or spring to avoid any impacts of activities on these environments. Stormwater control measures are implemented and maintained to direct clean storm water from work sites and trap any contaminated stormwater at these sites to be appropriately treated.

All dams will be removed and rehabilitated unless the landholder requests that they remain. If this is the case, the dam will be remediated and water quality monitored by suitably qualified persons to ensure that it is suitable for the proposed use.

10.3.9 Ground water

A groundwater quality monitoring program will be developed to ensure that there is no ongoing contamination to groundwater from dams, as required for example by condition H6 (m) of the Woleebee Creek EA (PEN 101741410). The groundwater quality monitoring program will be provided in the Groundwater Management Plan (GWMP) and will be prepared to meet environmental authority conditions for a ground water monitoring program.

QGC is committed to undertaking an extensive groundwater monitoring program on our tenements, which include installing monitoring bores in multiple aquifers in the Surat Basin to determine hydraulic connectivity to the Walloon Coal Measures (the aquifer from which coal seam gas ground water is being dewatered). QGC will continue to monitor groundwater drawdown and landholders bores for the entire life of the project to determine any adverse impact on landholders and MNES including springs. QGC is also joining with other CSG industry members to develop a regional scale, multi-layered, transient groundwater flow model of the cumulative impacts of CSG developments. Modelling and monitoring will be used in conjunction with one another in an adaptive management regime to ensure any adverse impacts are minimised and rectified through measures such as reinjection.

10.3.10 Data Management

Monitoring data related to information collected at specific locations will be recorded in QGC's GIS systems. Monitoring data related to analysis of samples will be recorded in QGC's database system for record keeping.

10.3.11 Annual Environmental Return

Reporting on rehabilitation and monitoring will be undertaken within an Annual Environmental Return (AER) with QGC's overall reporting on the Project and reconciliation statements.

The AER will contain the following information:

- records of any unavoidable adverse impacts to MNES;
- outline mitigation measures applied to avoid adverse impacts on MNES;
- outline any rehabilitation work undertaken in connection with any unavoidable adverse impact on MNES; and
- identifies all non-compliances with DSEWPaC conditions, and identify any amendments to plans (including this RRRMP) to achieve compliance with the set conditions of the Environmental Approval

The Annual Environmental Return will be published on the internet each year.

10.3.12 Review and Rework

Corrective actions are outlined in **Table 10**, should monitoring indicate that rehabilitation success criteria are not met within the set timeframes, which for most criteria is five years. For areas to be rehabilitated back to their pre-disturbance condition, rework will typically involve revegetation through direct seeding or tubestock planting with species determined from analogue site surveys.

Should monitoring indicate that erosion and subsidence is still occurring within the first twelve months, or that the land form is not stable, the area will undergo additional rehabilitation using a method approved by the relevant authority or landholder. This is likely to include further land-form reinstatement and surface re-contouring and the installation of erosion and sediment control measures. Direct seeding with a seed mix appropriate to the final land use, as agreed to by landholders will be required. ESAs and MNES where natural regeneration has not been successful are also required to be seeded with native tree and shrub species, or ground cover species where areas are required to remain clear of trees for the duration of Project operations. Tubestock planting of species where establishment from seed is unsuccessful may be required. If rehabilitation is not successful within five years, rehabilitation methods will be reviewed and alternative methods developed.

Table 11: Monitoring interval and details of monitoring for rehabilitation indicators

Rehabilitation Indicator	Monitoring Interval					
	During construction	Every 20 business days for 120 business days	Quarterly for up to two years	Annual monitoring (1-4 years)	Five years	Annually after 5 years (only where criteria not yet met)
Land suitability (agricultural land)					Final soil and land suitability study	Final soil and land suitability study
Soil suitability (agricultural land)					Final soil and land suitability study	Final soil and land suitability study
Maintenance requirements (agricultural land)					Land holders to be surveyed for maintenance requirements	Land holders to be surveyed for maintenance requirements
Riparian Condition (waterway crossings)				RARC Monitoring	RARC Monitoring shows RARC scores equivalent to pre-disturbance scores	RARC Monitoring shows RARC scores equivalent to pre-disturbance scores
Vegetation distribution				BioCondition monitoring to show that vegetation is equivalent to the pre-disturbance RE	BioCondition monitoring to show that vegetation is equivalent to the pre-disturbance RE	BioCondition monitoring to show that vegetation is equivalent to the pre-disturbance RE

Rehabilitation Indicator	Monitoring Interval					
	During construction	Every 20 business days for 120 business days	Quarterly for up to two years	Annual monitoring (1-4 years)	Five years	Annually after 5 years (only where criteria not yet met)
Vegetation Structure				Vegetation strata developing as determined through BioCondition Surveys	Vegetation strata developing as determined through BioCondition Surveys	Vegetation strata developing as determined through BioCondition Surveys
Species composition and community structure				Stem density of dominant species as determined through BioCondition Surveys	Stem density of dominant species as determined through BioCondition Surveys	Stem density of dominant species as determined through BioCondition Surveys
Foliage cover				Foliage cover as determined through BioCondition surveys.	Foliage cover as determined through BioCondition surveys.	Foliage cover as determined through BioCondition surveys.
Flora species diversity and richness	Check no disturbance occurs within "no go" zones			Flora diversity as determined through BioCondition surveys.	Flora diversity as determined through BioCondition surveys.	Flora diversity as determined through BioCondition surveys.
Recruitment of canopy species				Recruitment of canopy species observed in BioCondition surveys	Recruitment of canopy species observed in BioCondition surveys	Recruitment of canopy species observed in BioCondition surveys

Rehabilitation Indicator	Monitoring Interval					
	During construction	Every 20 business days for 120 business days	Quarterly for up to two years	Annual monitoring (1-4 years)	Five years	Annually after 5 years (only where criteria not yet met)
Subsidence and erosion	Any erosion or subsidence to be recorded	Any erosion of subsidence to be noted through visual land form monitoring		Any erosion of subsidence to be noted at other monitoring sites	Any erosion of subsidence to be noted at other monitoring sites	Any erosion of subsidence to be noted at other monitoring sites
Vegetation communities of conservation significance. (TECs, Of Concern or Endangered REs, including high value regrowth of these communities).	Spatial mapping of clearing, vegetation re-establishing in rehabilitated areas, regrowth and vegetation offsets, to show no loss of area of these communities.					
	BioCondition surveys are also required in rehabilitated sites annually to compare with analogue sites (vegetation indicators above).					
EVNT and MNES listed flora				The location where the species was found will be surveyed, and the number of individuals counted (or distribution mapped)	The location where the species was found will be surveyed, and the number of individuals counted (or distribution mapped)	The location where the species was found will be surveyed, and the number of individuals counted (or distribution mapped)
EVNT and MNES listed fauna habitat	Records to be kept of any fauna observations including during pre-clearance surveys and incidental observations during construction and monitoring. Spatial mapping of clearing, vegetation re-establishing in rehabilitated areas and vegetation offsets, to show no loss of habitat for listed fauna species.					

Rehabilitation Indicator	Monitoring Interval					
	During construction	Every 20 business days for 120 business days	Quarterly for up to two years	Annual monitoring (1-4 years)	Five years	Annually after 5 years (only where criteria not yet met)
Fauna habitat				Habitat structures (litter cover, fallen woody material, hollow logs and hollow bearing trees) measured through BioCondition monitoring	Habitat structures (litter cover, fallen woody material, hollow logs and hollow bearing trees) measured through BioCondition monitoring	Habitat structures (litter cover, fallen woody material, hollow logs and hollow bearing trees) measured through BioCondition monitoring
Declared weed species (all areas)	Weed infestations in disturbed areas to be monitored		Weed infestations in disturbed areas to be monitored	New infestations to be recorded if observed in other monitoring sites. Effectiveness of weed control to be noted.	New infestations to be recorded if observed in other monitoring sites. Effectiveness of weed control to be noted.	New infestations to be recorded if observed in other monitoring sites. Effectiveness of weed control to be noted.
Acid sulfate soils	Acid sulphate soil monitoring program to be developed should ASS be found.					
Surface water	Refer to Receiving Environment Monitoring Program and Land Release Management Plan regarding monitoring required of surface water releases to land and CSG water releases.					
Groundwater	Refer to CSG Water Monitoring and Management Plan (WMMP) for monitoring requirements of groundwater.					

10.3.13 Review of the RRRMP

This RRRMP will be revised as required based on results of monitoring and learning's throughout the rehabilitation process. At a minimum the RRRMP will be reviewed every five years from the date of commencement.

This review program will be established by QGC and will be conducted by an independent expert and will involve:

- an audit of site specific rehabilitation plans against the RRRMP;
- an audit of a sample of rehabilitation sites against the performance criteria described in site specific rehabilitation plans to determine the success of rehabilitation, recovery, remediation and monitoring;
- a review of inspection reports of rehabilitation sites to establish whether any learnings from on-ground experience will be incorporated into the RRRMP and site specific rehabilitation plans;
- a report detailing the audit findings;
- recommendations to improve rehabilitation, recovery, remediation and monitoring; and
- recommendations to incorporate additional relevant information from QGC's findings and from government and industry sources on rehabilitation, recovery, remediation and monitoring into the RRRMP and site specific rehabilitation plans.

The independent expert will not involve any consultant or consultancy firm involved in the preparation of the RRRMP or site specific rehabilitation plans.

QGC will act on the findings of the review program within one month of the release of the findings and recommendations of the review program.

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Appendix 1 – DSEWPaC Approval Conditions (EPBC2008/4398 addressed by this RRRMP for the QCLNG Gas Fields Project

Requirement Source	Approval EPBC2008/4398 Requirement	Where addressed in RRRMP
DSEWPAC Approval Conditions EPBC 2008/4398 approved 22 October 2010	14. Where a direct or indirect impact has occurred to MNES (which may include a presumed impact where the species is presumed to be present) the proponent must under the Protocol apply remediation, rehabilitation and recovery measures appropriate for each MNES to restore connectivity or rehabilitate disturbed areas to pre-clearance quality or better, and to minimise cumulative impacts throughout the life of the project.	Remediation, rehabilitation and recovery measures provided in this RRRMP
DSEWPAC Approval Conditions EPBC 2008/4398 approved 22 October 2010 Remediation, Rehabilitation, Recovery and Monitoring Plan	<p>15. Before commencement of gas field development the proponent must develop a Remediation, Rehabilitation, Recovery and Monitoring Plan. The Plan must:</p> <ul style="list-style-type: none"> a. include site remediation measures including timeframes and standards for preventing erosion and stabilising disturbed soil in impact areas; b. include measures to support recovery of listed species' habitat and recovery of listed ecological communities affected by gas field development; c. include responses to threats to MNES from the proponent's operational activities and land management activities including the disposal and use of associated water, damage by livestock, and impacts from feral animals and weeds; d. provide for fire prevention and management regimes during construction, operation and decommission of protected MNES; e. include performance measures and related monitoring to assess site remediation, rehabilitation and recovery; f. provide for reporting on the implementation of the Remediation, Rehabilitation, Recovery and Monitoring Plan including monitoring and performance standard which can be independently audited; and g. reference relevant conservation advice, recovery plans, species management plans, or policies, practices, standards or guidelines endorsed or approved from time to time by the Department. <p>16. The Remediation, Rehabilitation, Recovery and Monitoring Plan must be submitted for the approval of the Minister.</p>	<p>15.</p> <ul style="list-style-type: none"> a. erosion control measures in Section 5.4 b. measures to support recovery of habitat and communities provided in Section 7 c. associated water addressed in Section 8.3 c. livestock and feral animal impacts addressed in Section 5.7 c. weed impacts addressed in Section 5.6 d. fire management addressed in Section 5.8 e. performance measures provided in Section 9 f. monitoring and reporting outlined in Section 10 g. recovery plans referenced in Section 7.3 <p>16. RRRMP to be implemented by QCLNG</p> <p>17. frequency and requirements for review stated in Section 10.3.13</p>

Requirement Source	Approval EPBC2008/4398 Requirement	Where addressed in RRRMP
	<p>Commencement of gas field development must not occur without approval of the Minister. The proponent may undertake 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 MNES, and only if the proponent has notified the Department in writing before an activity is undertaken. The approved Remediation, Rehabilitation, Recovery and Monitoring Plan must be implemented.</p> <p>17. The proponent must establish a program to routinely review the Remediation, Rehabilitation, Recovery and Monitoring Plan by an independent qualified ecologist, or other experts, approved by the Department to take into account any new information available to the proponent, including any information and advice provided by Commonwealth or Queensland Government agencies or available from other CSG proponents.</p> <p>18. The minister may require through a request in writing the periodic review of the Remediation, Rehabilitation, Recovery and Monitoring Plan by the Department or alternatively qualified ecologist, or other experts, approved by the Department. Plans must be approved by the Department in writing.</p>	
<p>DSEWPAC Approval Conditions EPBC 2008/4398 approved 22 October 2010 Decommissioning Plan</p>	<p>81. Within five years of the commencement of gas field development; the proponent must develop a Decommissioning Plan. The Plan must:</p> <ul style="list-style-type: none"> a. require the progressive removal or reuse of infrastructure where gas field operation cease during project life; b. establish management practices and safeguards to minimise environmental disturbance; c. ensure MNES are not impacted by progressive decommissioning, or final decommissioning of gas field infrastructure; d. define rehabilitation actions for the infrastructure sites following decommissioning including for: <ul style="list-style-type: none"> i. optimising habitat and habitat connectivity for MNES; ii. enhancing pre-construction environmental quality; and iii. ongoing management during 	<p>Some decommissioning procedures are provided in Section 8, however this requirement is to be addressed in a separate Decommissioning Plan</p>

Requirement Source	Approval EPBC2008/4398 Requirement	Where addressed in RRRMP
	<p>rehabilitation.</p> <p>82. The Decommissioning Plan must be submitted for the approval of the Minister. The approved Plan must be implemented.</p>	
<p>DSEWPAC Approval Conditions Annual Environmental Return</p>	<p>110. The proponent must produce an Annual Environmental Return which:</p> <ul style="list-style-type: none"> a. addresses compliance with these conditions; b. records any unavoidable adverse impacts on MNES, mitigation measures applied to avoid adverse impacts on MNES; and any rehabilitation work undertaken in connection with any unavoidable impact on MNES; c. identifies all non-compliances with these conditions; and d. identifies any amendments needed to plans to achieve compliance with these conditions. 	<p>Requirement for an Annual Environmental Return addressed in Section 10.3.11.</p>

Appendix 2 – Environmental Authority Conditions Relevant to Remediation and Rehabilitation

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
<p>Woleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Assessment of Hazard Category</p> <p>(C1) The hazard category of any dam must be assessed by a suitably qualified and experienced person in accordance with the “<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>”, as amended from time to time.</p> <p>(C2) The hazard assessment required under Condition (C1) must occur in any of the following situations:</p> <ul style="list-style-type: none"> (a) prior to the design and construction of the dam; (b) prior to any change in its purpose or its stored contents; (c) for a dam assessed and certified as a high or significant hazard dam, at least biennially after its construction; (d) for an existing low hazard dam, within 1 year of the date of grant of this environmental authority. <p>(C3) A hazard assessment report and certification must be prepared for any dam assessed and the report may include a hazard assessment for more than one dam.</p> <p>(C4) The holder must, on receipt of a hazard assessment report and certification, provide to the administering authority one paper copy and one electronic copy of the hazard assessment report and certification.</p> <p>(C5) All certifications must be in the form set out in the “<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>”, as amended from time to time.</p>
<p>Woleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Construction of Low Hazard Dam to Contain Wetting Front</p> <p>(C6) Where a dam is assessed as low hazard dam as per the definition of low hazard dam in this environmental authority, it must be:</p> <ul style="list-style-type: none"> (a) constructed, operated and maintained in accordance with accepted engineering standards currently appropriate for the purpose for which the dam is intended to be used; and (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation. <p>(C7) In the event of early indications of loss of structural or hydraulic integrity of the low hazard dam the holder must:</p> <ul style="list-style-type: none"> (a) take immediate action to prevent or minimise any actual or potential environmental harm; and (b) report in writing to the administering authority, any findings and actions taken within 20 business days of that event³. <p>(C8) Where the dam is for the first time assessed as being a regulated dam, the holder must ensure that within 12 months of that assessment, the dam meets the conditions required for</p>

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	regulated dams under this authority.
<p>Woolleebie Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Design and Construction of a regulated dam</p> <p>(C9) All regulated dams must be designed by, and constructed under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>";</p> <p>(C10) Construction of a regulated dam is prohibited unless the holder has:</p> <ul style="list-style-type: none"> (a) submitted a hazard category assessment report and certification to the administering authority; (b) commissioned a suitably qualified and experienced person to prepare a design plan for the dam; and (c) received the design plan for the dam, together with certification of that plan from the suitably qualified and experienced person, that: <ul style="list-style-type: none"> i. the design plan is in accordance with the requirements of the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>"; ii. the dam is capable of delivering the performance stated in the design plan; and iii. when constructed and operated in accordance with the design plan, the dam will be compliant with Condition (C9) to (C13). <p>(C11) Regulated dams must:</p> <ul style="list-style-type: none"> (a) be designed and constructed to prevent: <ul style="list-style-type: none"> i. floodwaters from entering the regulated dam from any watercourse or drainage line to the Annual Exceedance Probability (AEP) specified for determining spillway capacity in the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>"; and ii. wall failure due to erosion by floodwaters arising from the watercourse or drainage line to the AEP specified for determining spillway capacity in the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>"; iii. overtopping as a result of a flood event of the AEP specified for determining spillway capacity in the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>"; and (b) be designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation. <p>(C12) Notwithstanding Condition (C11), aggregation dams must have a system to detect any passage of the wetting front or entrained contaminants through either the floor or sides of the dam.</p> <p>(C13) Brine dams must:</p> <ul style="list-style-type: none"> (a) have the floor and sides of the dam designed with material that will contain the wetting front and any entrained contaminants during the operational life of the dam and for

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<p>any period of decommissioning and rehabilitation of the dam; and</p> <p>(b) have a system to detect any passage of the wetting front or entrained contaminants through either the floor or sides of the dam; and</p> <p>(c) have a system for the collection and proper disposal of any contaminants that move beyond the bounds of the containment system.</p> <p>(C14) Regulated dams receiving brine produced through the treatment and concentration of coal seam gas water must be constructed with the capacity to continuously remove any leachate from beneath the floor or beyond the sides of the dam.</p> <p>(C15) The design plan for a regulated dam must include, but is not limited to:</p> <p>(a) a design report which provides:</p> <ol style="list-style-type: none"> i. certification of the design plan in accordance with the <i>"Manual for Assessing Hazard Categories and Hydraulic Performance of Dams"</i>; ii. a description of all the documents which constitute the design plan; iii. a statement of: <ol style="list-style-type: none"> A. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory documents, relied upon in preparing the design plan; and B. all relevant facts and data used in preparing the design plan, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the design plan; C. the hazard category of the dam; and D. setting out the reasoning of the suitably qualified and experienced person who has certified the design plan, as to how the design plan provides the necessary required performance; iv. documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities; v. detailed criteria for the design, operation, maintenance and decommissioning of the dam, including any assumptions; vi. design, specification and operational rules for any related structures and systems used to prevent failure scenarios; vii. reasoning for how the design plan provides the required performance; viii. details of any other matter which may substantially affect, or is critical to, the design plan; and ix. evidence that the certifier is a suitably qualified and experienced person. <p>(b) drawings showing the lines and dimensions of built structures and land forms associated with the dam;</p> <p>(c) design, specification and operational rules for any related</p>

Source	Woolleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<p>structures and systems used to prevent failure scenarios;</p> <p>(d) a description of the containment system implemented;</p> <p>(e) an operational plan that includes;</p> <p>i. normal operating procedures and rules;</p> <p>ii. contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the dam;</p> <p>(f) a plan for the decommissioning and rehabilitation of the dam at the end of its operational life;</p> <p>(g) details of reports on investigations and studies done in support of the design plan; and</p> <p>(h) any other matter required by the suitably qualified and experienced person.</p> <p>(C16) A certification by the designer must be submitted to the administering authority on the completion of construction of the dam, which certifies that the 'as constructed' drawings and specifications meet the original intent of the design plan for that dam.</p>
<p>Woolleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Operation of a regulated dam</p> <p>(C17) Operation of a regulated dam is prohibited unless the holder has:</p> <p>(a) submitted to the administering authority one paper copy and one electronic copy of the design plan and certification, and a set of 'as constructed' drawings and specifications, together with certification that the dam:</p> <p>i. has been constructed in accordance with the design plan;</p> <p>ii. is capable of delivering the performance stated in the design plan; and</p> <p>iii. is compliant with the relevant conditions of this authority.</p> <p>(b) the conditions of this authority relating to the construction of the dam have been met; and</p> <p>(c) the holder has entered the details required under this authority, into a Register of Regulated Dams.</p> <p>(C18) Each regulated dam must be maintained and operated in a manner that is consistent with the current design plan and the associated certified 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.</p> <p>(C19) The holder must ensure reasonable and practicable control measures are in place to ensure that harm is not caused to persons, livestock or wildlife through the construction and operation of a regulated dam. Reasonable and practicable control measures may include, but are not limited to:</p> <p>(a) the secure use of fencing, bunding or screening; and</p> <p>(b) escape arrangements for trapped livestock and fauna.</p>
<p>Woolleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Mandatory Reporting Level</p> <p>(C20) The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.</p> <p>(C21) The holder must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority</p>

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<p>when the level of the contents of a regulated dam reaches the MRL⁴.</p> <p>(C22) The holder must, immediately on becoming aware that the MRL has been reached, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.</p>
<p>Wooleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Annual Inspection Report</p> <p>(C23) Each regulated dam must be inspected each calendar year by a suitably qualified and experienced person.</p> <p>(C24) At each annual inspection, the condition and adequacy of all components of the regulated dam must be assessed:</p> <ul style="list-style-type: none"> (a) against the most recent hazard assessment report and design plan; (b) against recommendations contained in previous annual inspections reports; (c) against recognised dam safety deficiency indicators; (d) for changes in circumstances potentially leading to a change in hazard category; (e) for conformance with the conditions of this authority; (f) for conformance with the 'as constructed' drawings of the certified design plan; and (g) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken no more than three months prior to 1 November of each year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam. <p>(C25) A suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the dam.</p> <p>(C26) The suitably qualified and experienced person who prepared the annual inspection report must certify that report in accordance with the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>".</p> <p>(C27) The holder must:</p> <ul style="list-style-type: none"> (a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the regulated dam will safely perform its intended function; and (b) within twenty (20) business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated dam. <p>(C28) A copy of the annual inspection report must be provided to the administering authority upon request and within ten (10) business days.</p>
<p>Wooleebee Creek Project Area EA,</p>	<p>Design Storage Allowance</p> <p>(C29) On 1 November of each year, storage must be available in</p>

⁴ Please note that for some model conditions, such as model conditions for dams that are associated with a Chapter 5A activity, the notification requirements may be located in a separate part of the conditions of an environmental authority (e.g. under notification requirement conditions).

Source	Woolleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
PEN 101741410, 8 July 2011 Schedule C Dams	<p>each regulated dam, to meet the Design Storage Allowance (the DSA) for the dam.</p> <p>(C30) The holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam will not have the available storage to meet the DSA on 1 November of any year, notify the administering authority.</p> <p>(C31) The holder must, immediately on becoming aware that the regulated dam will not have the available storage to meet the DSA on 1 November of any year, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.</p>
Woolleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams	<p>Performance Review</p> <p>(C32) The holder must assess the performance of each regulated dam over the preceding November to May period based on actual observations of the available storage in each regulated dam taken in May of each year.</p> <p>(C33) The holder must take action⁵ to modify its water management system so as to ensure that the regulated dam will perform in accordance with the requirements of this authority, for the subsequent November to May period.</p>
Woolleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams	<p>Transfer Arrangements</p> <p>(C34) The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Dams, hazard assessment, design plan and other supporting documentation, to a new holder and the administering authority on transfer of this authority.</p>
Woolleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams	<p>Repair requirements</p> <p>(C35) Where the holder detects any passage of the wetting front through the floor or sides of a regulated dam they must, as soon as practicable:</p> <p>(a) repair the dam to rectify the detected passage of the wetting front or entrained contaminants through the floor or sides of the dam; or</p> <p>(b) decommission and rehabilitate the dam.</p>
Woolleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams	<p>Transitional Arrangements</p> <p>(C36) All existing aggregation dams must meet the requirements of Condition (C11) and (C12) and the requirements of the “<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>”, as amended from time to time by 1 October 2011, or such other time as the administering authority may permit in an approved Transitional Environmental Program.</p> <p>(C37) All existing coal seam gas evaporation dams must meet the requirements of Conditions (C11) and C12) and the requirements of the “<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>”, as amended from time to time, by 1 October 2011, or such other time as the administering authority may permit in an approved Transitional Environmental Program.</p>
Woolleebee Creek Project Area EA,	<p>Decommissioning and Rehabilitation</p> <p>(C38) Prior to the cessation of the environmentally relevant activity,</p>

⁵ Action may include physical modification of a regulated dam.

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
<p>PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>each regulated dam must be decommissioned such that:</p> <ul style="list-style-type: none"> (a) ongoing environmental harm is minimised by the dam: <ul style="list-style-type: none"> i. becoming a safe site for humans and animals at the completion of rehabilitation; or ii. becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts; or iii. not allowing for acid mine drainage; or iv. being approved or authorised under relevant legislation for a beneficial use; or v. being a void authorised by the administering authority to remain after decommissioning; and (b) the dam is compliant with all other relevant rehabilitation requirements of this authority.
<p>Woolleebie Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Register of Regulated Dams</p> <p>(C39) A Register of Regulated Dams must be established and maintained by the holder and include, as a minimum, the following information for each regulated dam</p> <ul style="list-style-type: none"> (a) date of entry in the register; (b) name of the dam, its purpose and intended/actual contents; (c) location of the dam defined by coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area; (d) the hazard category of the dam as assessed using the "<i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i>"; (e) dates, names, and reference numbers of all document/s lodged as part of a design plan for the dam; (f) name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings; (g) for the regulated dam, other than in relation to any levees <ul style="list-style-type: none"> i. the dimensions (meters) and surface area (hectares) of the dam measured at the footprint of the dam; ii. dam crest volume (megalitres); iii. spillway crest level (metres AHD); iv. maximum operating level (metres AHD); v. storage rating table of stored volume versus level (metres AHD); vi. design storage allowance (megalitres) and associated level of the dam (meters AHD); and vii. mandatory reporting level (metres AHD). (h) the design plan title and reference relevant to the dam; (i) the date construction was certified as compliant with the design plan; (j) the name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan; (k) details of the composition and construction of any liner; (l) the system for the detection of any leakage through the

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<p>floor and sides of the dam;</p> <p>(m) dates when the dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;</p> <p>(n) dates when recommendations and actions arising from the annual inspection were provided to the administering authority; and</p> <p>(o) reference to documents and/or locations of dam water quality as obtained from monitoring required under Conditions (C45) to (C47).</p> <p>(C40) The holder must provisionally enter the required information in the Register of Regulated Dams when a design plan for a regulated dam is submitted to the administering authority.</p> <p>(C41) The holder must make a final entry of the required information in the Register of Regulated Dams once compliance with Condition (C16) has been achieved.</p> <p>(C42) The holder must ensure that the information contained in the Register of Regulated Dams is current and complete on any given day.</p> <p>(C43) All entries in the Register of Regulated Dams must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.</p> <p>(C44) The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Dams, in the electronic format required by the administering authority.</p>
<p>Wooleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule C Dams</p>	<p>Regulated Dam Water Quality Monitoring</p> <p>(C45) The holder of this environmental authority must monitor the quality of water in all regulated dams on the relevant resource authority(ies) in the month of October every year.</p> <p>(C46) The monitoring of regulated dam water must include sufficient analytes and physico-chemical parameters to characterise water quality in the dam and must include, but not necessarily be limited to:</p> <p>(a) pH;</p> <p>(b) electrical conductivity [$\mu\text{S}/\text{m}$];</p> <p>(c) turbidity [NTU];</p> <p>(d) total dissolved solids [mg/L];</p> <p>(e) dissolved oxygen [mg/L];</p> <p>(f) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [mg/L];</p> <p>(g) sodium adsorption ratio (SAR);</p> <p>(h) anions (bicarbonate, carbonate, hydroxide, chloride, fluoride, sulphate) [mg/L];</p> <p>(i) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];</p> <p>(j) silica [mg/L];</p> <p>(k) dissolved metals (including but not necessarily being limited to: aluminium, barium, borate (boron), cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc) [$\mu\text{g}/\text{L}$];</p> <p>(l) total arsenic [mg/L];</p>

Source	Woolleebie Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<p>(m) total phosphorus [mg/L];</p> <p>(n) ammonia, nitrate, nitrite as nitrogen [mg/L];</p> <p>(o) total petroleum hydrocarbons [μg/L];</p> <p>(p) BTEX (as benzene, toluene, ethylbenzene and total xylene) [μg/L];</p> <p>(q) polycyclic aromatic hydrocarbons (including but not necessarily being limited to naphthalene, phenanthrene, benzo[a]pyrene) [μg/L];</p> <p>(r) chlorophyll a [μg/L];</p> <p>(s) total cyanobacteria biovolume [cells/mg/L]; and</p> <p>(C47) If the results of a sample required by Conditions (C45) and (C46) indicate that background groundwater quality concentration levels have been exceeded for total xylene, then the holder of this environmental authority must undertake further speciation of that parameter.</p> <p>(C48) Water quality samples of regulated dams must be taken from at least three (3) different dam profile depths for each sampling event and be taken as far as practicable from the edge of the regulated dam.</p>
<p>Woolleebie Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule H Rehabilitation</p>	<p>Progressive Rehabilitation for Significantly Disturbed Land – Operational Pipelines</p> <p>(H1) Pipelines trenches must be backfilled as soon as practicable after pipe laying and rehabilitated as soon as practicable but not longer than three (3) months after completion.</p> <p>(H2) During backfilling of pipeline trenches, soils must be replaced so that the soil horizons are consistent with the soil horizons of the immediately surrounding area.</p> <p>(H3) Backfilled and rehabilitated pipeline trenches must:</p> <ul style="list-style-type: none"> (a) be a stable landform; (b) exhibit no subsidence or erosion gullies for the life of the operational pipeline; (c) be re-profiled to a level consistent with surrounding soils; (d) be re-profiled to original contours and established drainage lines; (e) be visually consistent with the surround land features; (f) for the term of the operational life of the pipeline, be vegetated with groundcover as a minimum to ensure that erosion is minimised; and (g) following decommissioning, be rehabilitated in accordance with the final acceptance criteria described in Conditions (H6) and (H7).
<p>Woolleebie Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule H Rehabilitation</p>	<p>Progressive Rehabilitation for Significantly Disturbed Land – Other Activities</p> <p>(H4) Progressive rehabilitation of significantly disturbed land caused by the carrying out of the petroleum activity(ies) which is not required for the ongoing conduct of the petroleum activity(ies) must commence as soon as practicable, but not longer than nine (9) months following the completion of any construction, decommissioning or operational works associated with the petroleum activity(ies).</p> <p>(H5) Progressive rehabilitation of significantly disturbed land caused by the carrying out of the petroleum activity(ies) must:</p>

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<ul style="list-style-type: none"> (a) remediate any contaminated land (e.g. contaminated soils, decommissioned dams containing salt); (b) reshape all significantly disturbed land to a stable landform; (c) reprofile all significantly disturbed land to representative contours of the surrounding landscape; (d) on all significantly disturbed land: <ul style="list-style-type: none"> i. re-establish surface drainage lines; ii. reinstate the top layer of the soil profile; iii. establish groundcover to ensure that erosion is minimised; iv. re-establish vegetation based upon the floristic species composition found in analogue sites (using stock of local provenance where possible and where active revegetation is required) and with the intent of re-achieving collated benchmark parameters noted in Condition (A10); (e) undertake rehabilitation in a manner such that any actual and potential acid sulfate soils in or on the site are either not disturbed, or submerged, or are treated to prevent and / or minimise environmental harm.
<p>Woleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule H Rehabilitation</p>	<p>Final Acceptance Criteria for Significantly Disturbed Land</p> <p>(H6) All significantly disturbed land caused by the carrying out of the petroleum activity(ies) must be rehabilitated to meet the following final acceptance criteria:</p> <ul style="list-style-type: none"> (a) all significantly disturbed land is reinstated to the pre-disturbed land use unless otherwise agreed to between the holder of this environmental authority, the landholder and the administering authority and is provided for in the Operational Plan; (b) all significantly disturbed land is reinstated to the pre-disturbed soil suitability class; (c) all significantly disturbed land is reinstated so that the distribution of vegetation communities represent that of the pre-disturbed distribution; (d) each vegetation community must be re-established so that the following rehabilitation parameters (noted in (A12)) are achieved: <ul style="list-style-type: none"> i. the rehabilitated site shows distinct and progressive re-establishment of the various strata which characterise the pre-disturbed vegetation communities; ii. all dominant species within each strata are re-established at densities and frequencies equivalent to that of the pre-disturbed site; iii. notwithstanding (i) and (ii) above, a minimum of 80% species diversity and richness observed in the original site is achieved; and iv. a minimum of 80% foliage cover is achieved when compared to the pre-disturbed vegetation community; (e) each vegetation community must be rehabilitated and maintained until it can be demonstrated that it is a self-

Source	Woleebee Creek Project Area EA, PEN101741410, 8 July 2010 Condition (as an example)
	<p>sustaining vegetation community;</p> <ul style="list-style-type: none"> (f) notwithstanding (H6)(e) each vegetation community must be established and maintained for a period of not less than 5 years; (g) habitat structures, including (but not limited to) litter cover, fallen woody material, hollow logs, etc. will be re-established to reflect the pre-disturbed values observed as per Condition (A12) to the greatest extent possible; (h) the landform is safe for humans and fauna; (i) the landform is stable with no subsidence or erosion gullies for at least five (5) years; (j) erosion is minimised with appropriate sediment traps and erosion control measures installed as determined by a suitably qualified person; (k) the water quality of any residual void or water bodies constructed by the petroleum activity(ies) meets criteria for subsequent uses and does not have potential to cause environmental harm; (l) there is no ongoing contamination to waters; (m) there is no ongoing contamination to groundwater from dams (demonstrated via groundwater monitoring; and (n) the maintenance requirements for rehabilitated land are no greater than that required for the land prior to its disturbance caused by carrying out the petroleum activity(ies). <p>(H7) Notwithstanding Condition (H6), all buried pipelines must be decommissioned in accordance with the requirements of Australian Standard 2885.</p> <p>(H8) Notwithstanding Condition (H6), any dam may be decommissioned for a beneficial use provided that it is approved or authorised by the administering authority and the landowner</p>
<p>Wooleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule H Rehabilitation</p>	<p>Progressive Rehabilitation Monitoring (H9) Regular maintenance and at least yearly monitoring of rehabilitated areas must take place to measure compliance with the requirements of Condition (H5).</p>
<p>Wooleebee Creek Project Area EA, PEN 101741410, 8 July 2011 Schedule H Rehabilitation</p>	<p>Monitoring of Rehabilitation Success (H10) At least yearly monitoring must be undertaken to demonstrate compliance with the requirements of Condition (H6) for a minimum of five (5) years after rehabilitation is completed.</p>

**Appendix 3 – Interim Soil Management Plan Woleebee Creek Block PL276
(QCLNG-BB-24-ENV-PLN-000001)**

INTERIM SOIL MANAGEMENT PLAN

Woleebee Creek Block PL276

QCLNG-BB24-ENV-PLN-000001

Uncontrolled when printed

DOCUMENT INFORMATION SHEET

TITLE: Interim Soil Management Plan

PURPOSE AND SCOPE:

The purpose of this document is to outline the environmental standards and requirements that must be followed when undertaking construction of tracks, well pads and camp locations as part of drilling activities.

Responsible:

Signature: 

Position: Principal Environmental Advisor


Name: Martin Crossley

Date: 07th October 2011

Accountable:

Signature: 

Position: Environmental Manager, Upstream

Name: Brad Kitchen 

Date: Oct. 7/2011

Consulted:

Enter name/position of those who have reviewed the document

Brad Kitchen/ Manager Environment,
Upstream

Informed:


Enter name/position of those who shall receive the completed document and any subsequent revisions

Brad Kitchen/ Manager Environment
Upstream

Endorsed:

Signature: 

Position: General Manager, Environment

Name: Tracy Winters 

Date: Oct. 7/2011

RACIE Terms

R	Responsible:	the person who actually produces the document
A	Accountable:	the person who has to answer for the success or failure of the quality and timeliness of the document
C	Consulted:	those who must be consulted before the document is published
I	Informed:	those who must be informed after the document is published
E	Endorsed:	the person who must approve the document before publication

Revision Record

Issue	Date	Reason for Issue	Responsible	Accountable
A	October 2011	Issued for review	M Crossley	B Kitchen
0	October 2011	Issued for use	M Crossley	B Kitchen

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1.0 INTRODUCTION

1.1 Scope of Document

The purpose of this document is to outline the environmental standards and requirements that must be followed when undertaking construction activities.

1.2 Document Revisions and Approval

This document has been prepared by the Principal Environmental Advisor – Upstream and shall be reviewed and endorsed in accordance with the Document Information on Pages 2 and 3 and the Document Approval Procedure.

This document bears a revision status identifier which will change with each revision. All revisions to this document (after approval and distribution) will be subject to review and endorsement by the same functions as the original.

1.3 Distribution and Intended Audience

This document is intended for Upstream Projects Team members. The document will be made available via the Document Management System. This document will be superseded by the QCLNG Soil Management Plan, and up to that point will be updated and changes communicated to the project team as applicable.

1.4 Acronyms and Abbreviations

In this document, the following acronyms and abbreviations apply:

Acronym/Abbreviation	Meaning
ASS	Acid Sulphate Soils
ATP	Authority to Prospect
CEC	Cation Exchange Capacity
DERM	Department of Environment Resource Management – Queensland
EA	Environmental Authority
ESA	Environmentally Sensitive Area
g	gram
GQAL	Good Quality Agricultural Land
iSMP	Interim Soil Management Plan
Kg	Kilogram
Km(s)	Kilometre(s)
LRAs	Land Resource Areas
m	Metre
mm	Millimetre
m ²	Square metre
PFL	Petroleum Facility License
PL	Petroleum Leases
QCLNG	Queensland Curtis Liquefied Natural Gas project
QGC	QGC Pty Ltd (a BG Group company)
RE	Regional Ecosystem
RoW	Right of Way

Acronym/Abbreviation	Meaning
SAR	Sodium Absorption Ratio
SCL	Strategic Cropping Land
TC	Texture contrast: <i>Soils in which the B horizon is dominated by a texture class one and a half (or more) finer than the A horizon. The clear to sharp change between the two horizons occurs within 0.1 m</i>

1.5 Referenced / Associated Documents

Ref.	Document Number	Title/Description
1.	QCLNG-BX00-ENV-PLN-000019	Woleebee Creek Area Environmental Authority Application
2.	DERM Permit Number: PEN101741410	QCLNG Project – Woleebee Creek Project Area: Authority to Prospect (ATP) 574, 632, 651, 768 Petroleum Lease (PL) 171, 276, 277, 392, 393, 398, 399 Petroleum Facility Licence (PFL) 14
3.	Land Resource Assessment and Management Pty Ltd (LRAM) – June 2009	QCLNG Project – CSG Field Soil Study
4.	IECA 2008	Best Practice Erosion and Sediment Control Manual

2.0 BACKGROUND

QGC Pty Limited (QGC), a BG Group business, is undertaking an appraisal drilling programme in the Woleebee Creek Environmental Authority (EA) Area.

Woleebee Creek EA reference#: DERM Permit Number: PEN101741410

EA conditions for these tenements will be reinforced throughout this Interim Soil Management Plan (iSMP) however the EA document must be referred to in conjunction with this iSMP, and it must be noted that where there is a discrepancy between the iSMP and EA, the conditions of the EA take precedence. A copy of the Environmental Authorities for these tenements **must** be retained on site. It should be noted that conditions of specific licences can vary across different tenements, so each EA should be referred to prior to undertaking exploration activities.

This iSMP will demonstrate industry practices and management techniques that will assist in achieving compliance with the EA. This document is a working manual, which identifies environmental factors that may impact upon the surrounding region's environmental values. It is the responsibility of all users to protect the area's environmental values, and instigate revisions to this management plans content in the light of experience.

2.1 Location of Activity

Refer to map **Figure 1** showing the location of the Woleebee Creek Project EA area and Woleebee Creek block within.

Refer to **Figure 2** showing the extent of development across Woleebee Creek block.

This iSMP specifically covers activities associated with development across **Woleebee Creek block only**.

2.2 Description of Activity

The development programme will require the drilling of well bores in the Surat Basin to reach target formations in the Walloon Coal Measures.

Transportation of drilling rigs, associated equipments and support facilities will be undertaken where possible on existing tracks. Any new tracks, or upgrades required to affect safe transportation will be undertaken in accordance with this iSMP.

Areas will be cleared for placing of drilling activities and temporary support facilities (well pad accommodation); Field Compressor Stations (FCS); Central Processing Plants (CPP); Water Treatment Plants (WTP); Sewage Treatment Plants (STP); and associated process ponds.

All facilities will be remediated at end of life in accordance with the QCLNG Rehabilitation and Reinstatement Management Plan (RRMP).

2.3 Incidental Activities

Access Track Construction

Access track construction will be minimised to the extent required for safety and subject to landowner requirements. Where new access tracks are required, a location that is in compliance with the EA will be agreed upon with the landowner to maximise the potential for future use.

Access tracks will, where possible, avoid the clearing of vegetation and any dissection of habitat corridors within the landscape. Access tracks may require vegetation to be cleared up to a width of 10m in non environmentally sensitive areas (ESAs), and 6m in “Endangered” or “Of Concern” Regional Ecosystems (REs). This distance will be restricted where possible and shall be in accordance with the limitations set out in the relevant EA conditions. Any track access to be constructed will be subject to an environmental clearance prior to any construction.

Temporary Camps

Design of temporary camps will be dependent upon individual site requirements but will avoid the clearing of vegetation and will minimise environmental impact where possible. The campsite area will be graded and levelled with gravel sourced from existing gravel pits in nearby areas.

The main camp associated with the drilling rig will be approximately 1ha in size and located in close proximity to the well site. This camp holds the majority of project personnel accommodating up to nominally 20 people and will include the following facilities:

- Accommodation blocks
- Dining and kitchen unit
- Recreation unit
- Laundry
- Generators
- Ablution facilities
- Parking facilities

Additionally there will be a small rig camp, located on the well site. This camp accommodates up to 10 staff and is primarily for the senior staff personnel and specific persons who may be required at short notice for operational reasons. This camp will include:

- 2 x accommodation units
- 2 x offices
- Dining Room
- Training room
- First aid room
- Toilet facilities

There will be two temporary wastewater storage systems required per drilling rig during the operation of the project. One storage system will be located at the well site and one system located at the main camp. As required, the waste water will be transferred by regulated waste transporter to an appropriate and licensed disposal facility.

3.0 AIMS OF THIS MANAGEMENT PLAN

The aim of this interim management plan is to minimise the impact upon the depth and quality of soil to provide a basis for future land use either by agriculture or for environmental conservation.

Potential impacts on environmental values include:

- Soil erosion and sedimentation
- Soil dispersion and run-off to water courses
- Loss of or degradation of topsoil leading to reduced rehabilitation success
- Exposure of saline subsoil and potential dispersive impacts

Through this interim soil management plan, QGC will minimise and manage its exploration activities upon soils to the objectives stated in the conditions of the relevant Environmental Authorities. These include, but are not limited to;

- Minimise access and disturbance to only essential areas;
- Minimise areas of exposed soil to avoid erosion, provide hard standing or soil stabilisation to reduce erosion;
- Stockpile soil in a manner that minimises erosion and preserves its biological and chemical integrity;
- Top soil only to be used for on-site processes
- Revegetate and rehabilitate disturbed areas as soon as possible.
- Design channels/drains and inlet and outlet works to convey intercepted water with minimal impact;
- Place sediment control structures such as diversion drains, rock-check dams and silt trapping measures at key locations (swales, stormwater pit inlets, around stockpiles) to capture suspended sediment;
- In areas where the risk of soil erosion is medium or high, the seeding of perennial grass may be required;
- Reinstate all drainage pits and clean out accumulated sediment or leaf litter in pits after storm/heavy rain events;
- Reinstate all existing erosion-control structures after storm/heavy rain events.

- Repair any damage caused directly or indirectly as a result of the proposed works (e.g. to roads, pipes, drains and gutters);
- Take reasonable measures to limit the amount of vehicle movements on site during wet weather where safe and practical;
- Remove temporary erosion-control structures when no longer required;

Suitable conditions for formation of iron sulphides are not known within the Coal Seam Gas field and it is extremely unlikely that acid sulphate soils are present. If acid sulphate soils are detected, these soils must be managed in accordance with the EA conditions.

4.0 MANAGEMENT OPTION IDENTIFIERS

4.1 Introduction

The following aspects have been identified as requiring due consideration under this interim soil management plan;

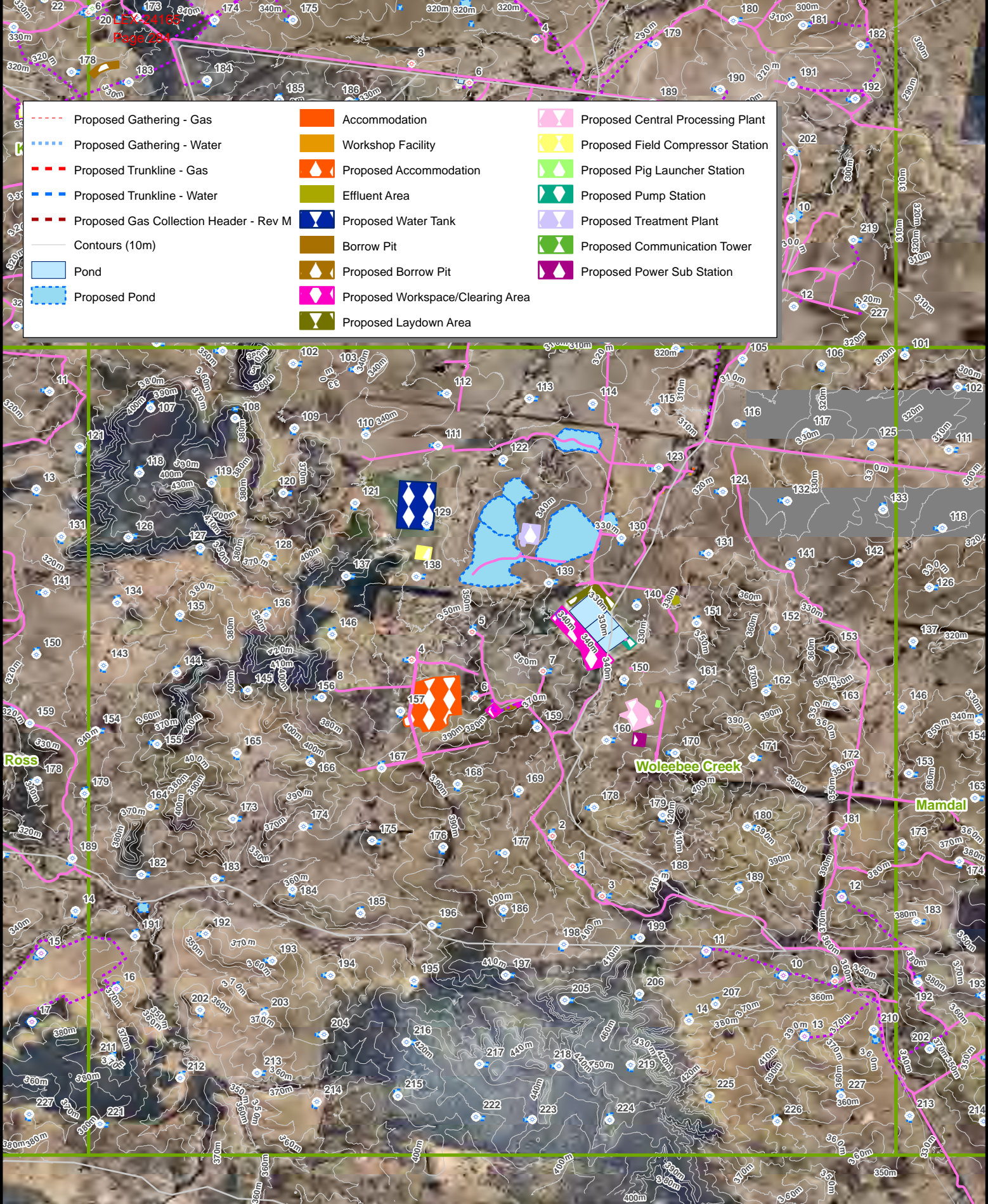
- Topography
- Good Quality Agricultural Land (GQAL)
- Strategic Cropping Land (SCL)
- Regional Ecosystems
- Slope
- Soil Status
- Subsoil Salinity
- Erosion Hazard

5.0 SITE SPECIFIC INTERIM SOIL MANAGEMENT PLANS

– GENERAL

5.1 Topography

An aerial view encompassing the work area is presented in **Figure 3** depicting the lie of the land with indicative contours. This is presented for information purposes and may be used in conjunction with the other maps presented to aid optimisation of best outcomes and positioning of works.



Woleebee Creek - 10 Metre Contours

<p>Map Projection: GDA 94 SCALE: 1:55,000 (A4)</p>	<ul style="list-style-type: none"> * Existing Well Location * Released Well Location * Pegged Well Location * Proposed Well Location — Principal Road — Secondary Road — Minor Road — Track Well Pad QGC Field 	
--	---	--

5.2 Good Quality Agricultural Land (GQAL) and Strategic Cropping Land (SCL)

Good Quality Agricultural Land (GQAL) aspects are identified in [Figure 4](#) map “Ross Field – Good Quality Agricultural Land” (source; DERM 2011).

Ross block contains all three classifications of agricultural land types;

- Crop Land
- Limited Crop Land
- Pasture Land

No specific management regime is required for these land classifications beyond those conditions stated in the EA. However, due consideration shall be given through consultation with the Landowner before encroaching on these areas. Activities shall limit the impact of activities, and reinstatement measures shall equal or augment conditions of the surrounding soils.

Strategic Cropping Land occurs across approximately 15% of Woleebee Creek Block through north centre to north east of the block and is presented in [Figure 5](#).

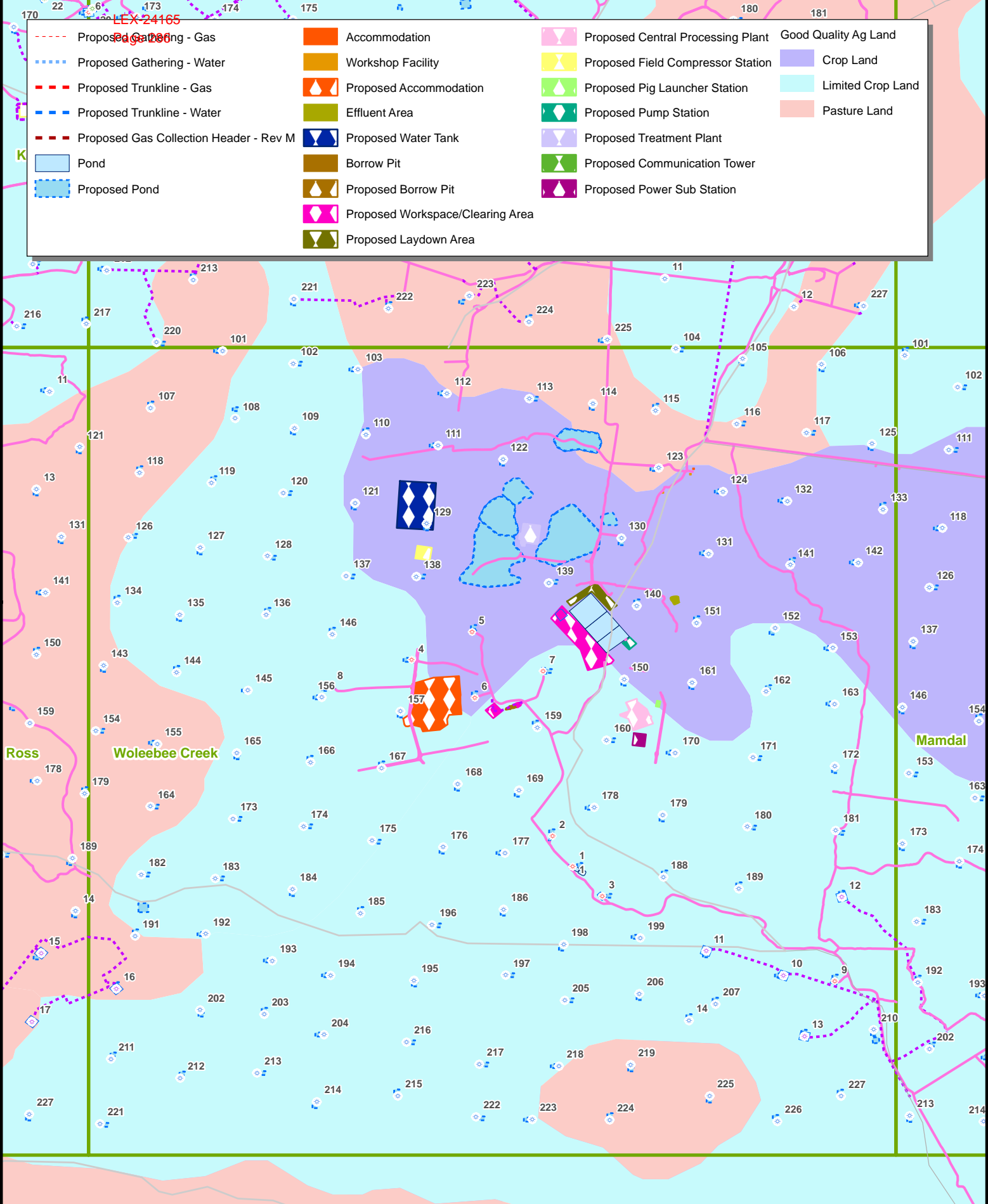
All avoidance practices shall be considered in undertaking EA approved activities on SCL, and due consideration shall be given to emerging legislation and guidelines.

5.3 Regional Ecosystems (REs)

Regional ecosystems are identified in [Figure 6](#) map “Ross Field – Regional Ecosystems” (source; DERM 2011) and are managed in accordance with the QCLNG Flora and Flora Management Plan.

- Endangered Dominant
- Endangered Sub-dominant
- Remnant Not of Concern
- Remnant Of Concern Sub-dominant

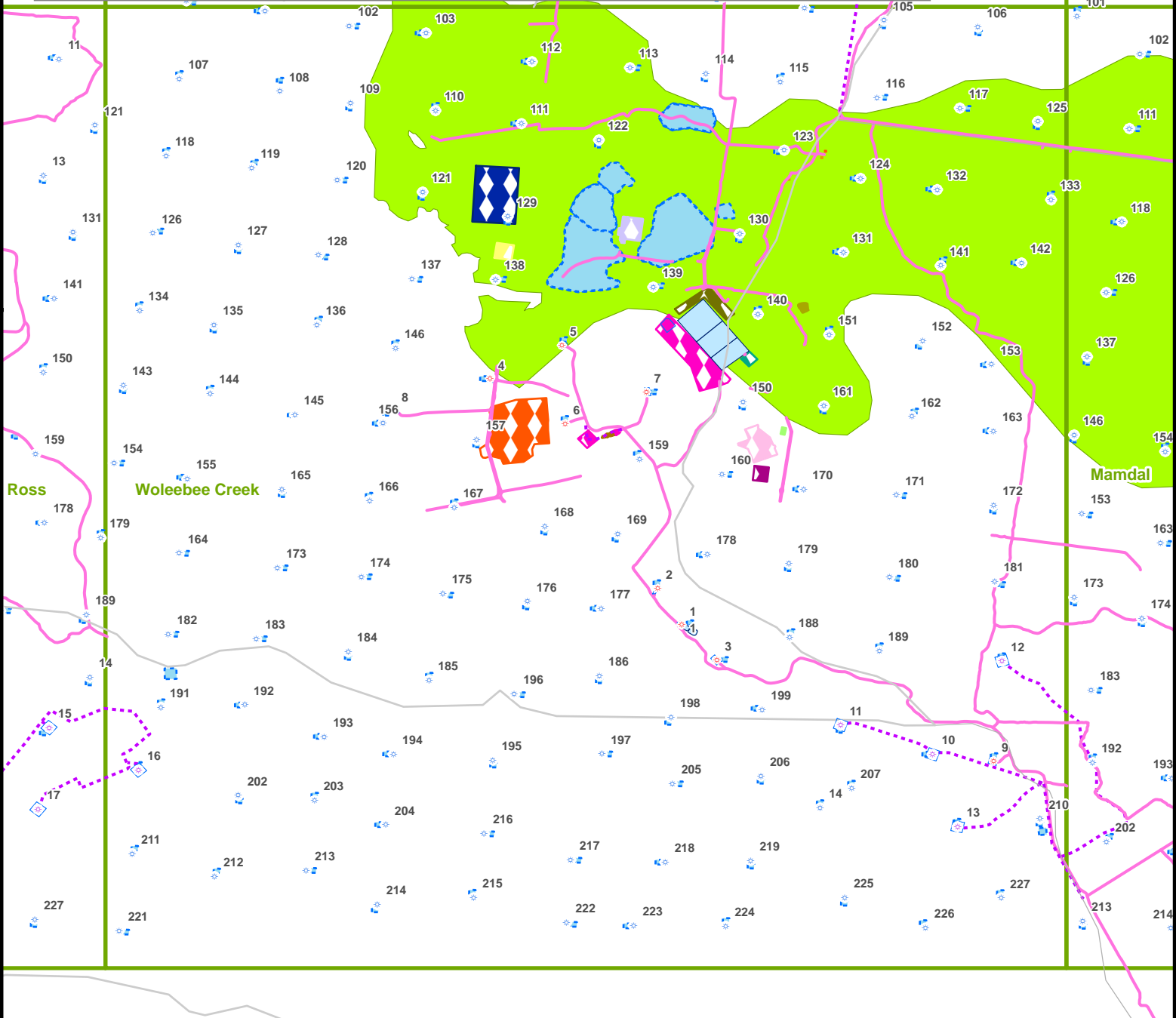
REs are managed in accordance with the QCLNG Flora and Flora Management Plan and Schedule D conditions of the EA.



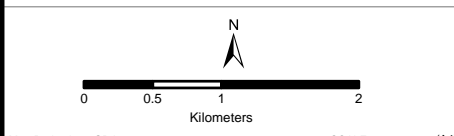
Woleebee Creek - Good Quality Agricultural Land

<p>Map Projection: GDA 94 SCALE: 1:55,000 (A4)</p>	<table border="0"> <tr> <td>• Existing Well Location</td> <td>— Principal Road</td> <td>□ Well Pad</td> </tr> <tr> <td>• Released Well Location</td> <td>— Secondary Road</td> <td>□ QGC Field</td> </tr> <tr> <td>• Pegged Well Location</td> <td>— Minor Road</td> <td></td> </tr> <tr> <td>• Proposed Well Location</td> <td>— Track</td> <td></td> </tr> </table>	• Existing Well Location	— Principal Road	□ Well Pad	• Released Well Location	— Secondary Road	□ QGC Field	• Pegged Well Location	— Minor Road		• Proposed Well Location	— Track		<div style="background-color: #cccccc; width: 100px; height: 50px; margin-bottom: 5px;"></div> <p>DATE: 6/10/2011 MAP NO: M_11130_01</p> <p>CREATED BY: TM MAP TYPE: v4Other REV NO: A</p>
• Existing Well Location	— Principal Road	□ Well Pad												
• Released Well Location	— Secondary Road	□ QGC Field												
• Pegged Well Location	— Minor Road													
• Proposed Well Location	— Track													
<p>DATA SOURCE: Tenements - DME</p> <p>PLAN REF: XXXX-XXXX-XXXX-XXXX Rev A</p> <p style="font-size: small; text-align: center;"> Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location. Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) resulting in any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws. </p>														

	Proposed Gathering - Gas		Accommodation		Proposed Central Processing Plant
	Proposed Gathering - Water		Workshop Facility		Proposed Field Compressor Station
	Proposed Trunkline - Gas		Proposed Accommodation		Proposed Pig Launcher Station
	Proposed Trunkline - Water		Effluent Area		Proposed Pump Station
	Proposed Gas Collection Header - Rev M		Proposed Water Tank		Proposed Treatment Plant
	Pond		Borrow Pit		Proposed Communication Tower
	Proposed Pond		Proposed Borrow Pit		Proposed Power Sub Station
			Proposed Workspace/Clearing Area		Strategic Cropping Land
			Proposed Laydown Area		



Woleebee Creek - Strategic Cropping Land



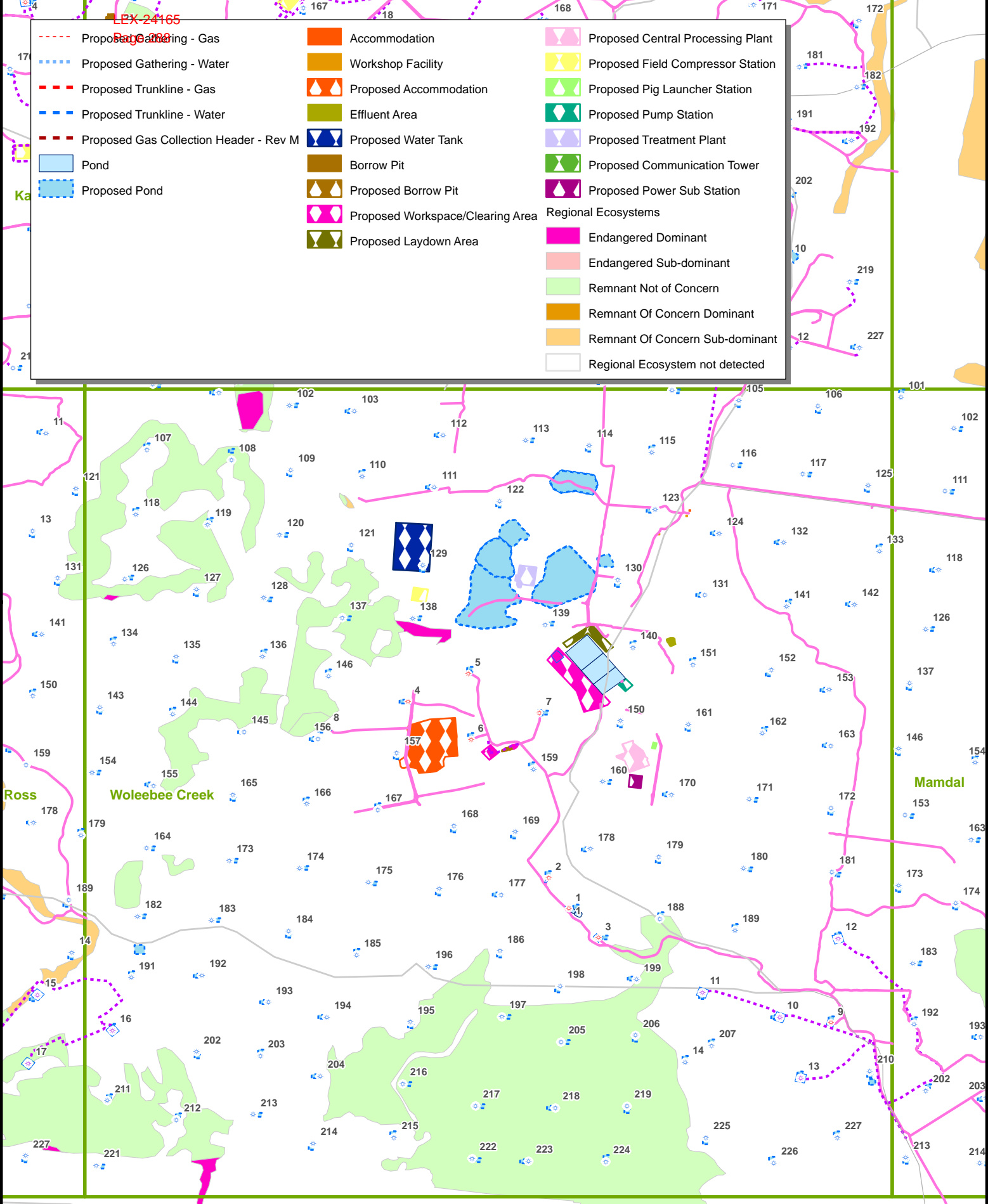
	Existing Well Location		Principal Road		Well Pad
	Released Well Location		Secondary Road		QGC Field
	Pegged Well Location		Minor Road		
	Proposed Well Location		Track		

Map Projection: GDA 94
SCALE: 1:55,000 (A4)
DATA SOURCE: Tenements - DME
PLAN REF: XXXX-XXXX-XXXX-XXXX Rev A

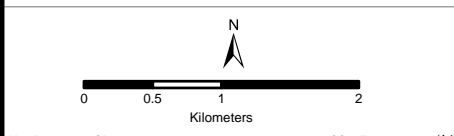
Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.
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DATE: 6/10/2011	MAP NO: M_11130_08
CREATED BY: TM	MAP TYPE: v4Other
	REV NO: A

- Proposed Gathering - Gas
- Proposed Gathering - Water
- Proposed Trunkline - Gas
- Proposed Trunkline - Water
- Proposed Gas Collection Header - Rev M
- Pond
- Proposed Pond
- Accommodation
- Workshop Facility
- Proposed Accommodation
- Effluent Area
- Proposed Water Tank
- Borrow Pit
- Proposed Borrow Pit
- Proposed Workspace/Clearing Area
- Proposed Laydown Area
- Proposed Central Processing Plant
- Proposed Field Compressor Station
- Proposed Pig Launcher Station
- Proposed Pump Station
- Proposed Treatment Plant
- Proposed Communication Tower
- Proposed Power Sub Station
- Regional Ecosystems
- Endangered Dominant
- Endangered Sub-dominant
- Remnant Not of Concern
- Remnant Of Concern Dominant
- Remnant Of Concern Sub-dominant
- Regional Ecosystem not detected



Woleebee Creek - Regional Ecosystems



- Existing Well Location
- Released Well Location
- Pegged Well Location
- Proposed Well Location
- Principal Road
- Secondary Road
- Minor Road
- Track
- Well Pad
- QGC Field

Map Projection: GDA 94 SCALE: 1:55,000 (A4)

DATA SOURCE: Tenements - DME

PLAN REF: XXXX-XXXX-XXXX-XXXX Rev A

Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.
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DATE: 6/10/2011 MAP NO: M_11130_05
 CREATED BY: TM MAP TYPE: v4Other REV NO: A

5.4 Slope

Slope percentages are presented in **Figure 7** map “Ross Field – Slope” (source; DERM 2011).

Whilst their precise nature requires verification in the field, the map reveals that the southern middle portion of the block poses notably undulating terrain. The siting and orientation of work sites may need to consider repositioning to minimise cut and fill activities.

Dispersive nature of sandy and loamy soils will necessitate track gradients being minimised where ever possible, and not exceeding a maximum gradient of 30% at any point. ESC guidelines (IECA) recommend water velocities do not exceed 0.7m/s on stable soils, 0.5 m/s on sandy/highly erodible soils and no more than 0.3m/s on extremely erodible soils. Velocities are reduced by flow stemming measures such as rock check dams.

5.5 Soil Status

For the purpose of this management plan, the wide range of soils within the Gas Field has been amalgamated into a series of soil management groups defined in QCLNG EIS Volume 3 Chapter 4. Each soil management group consists of soil types that have similar profile features as well as similar chemical and physical properties and thus require similar management inputs to ensure sustainable use and to minimise environmental impact.

All descriptions of soil management groups in this document use standard terminology of the Australian Soil and Land Survey Field Handbook (McDonald et al 1990).

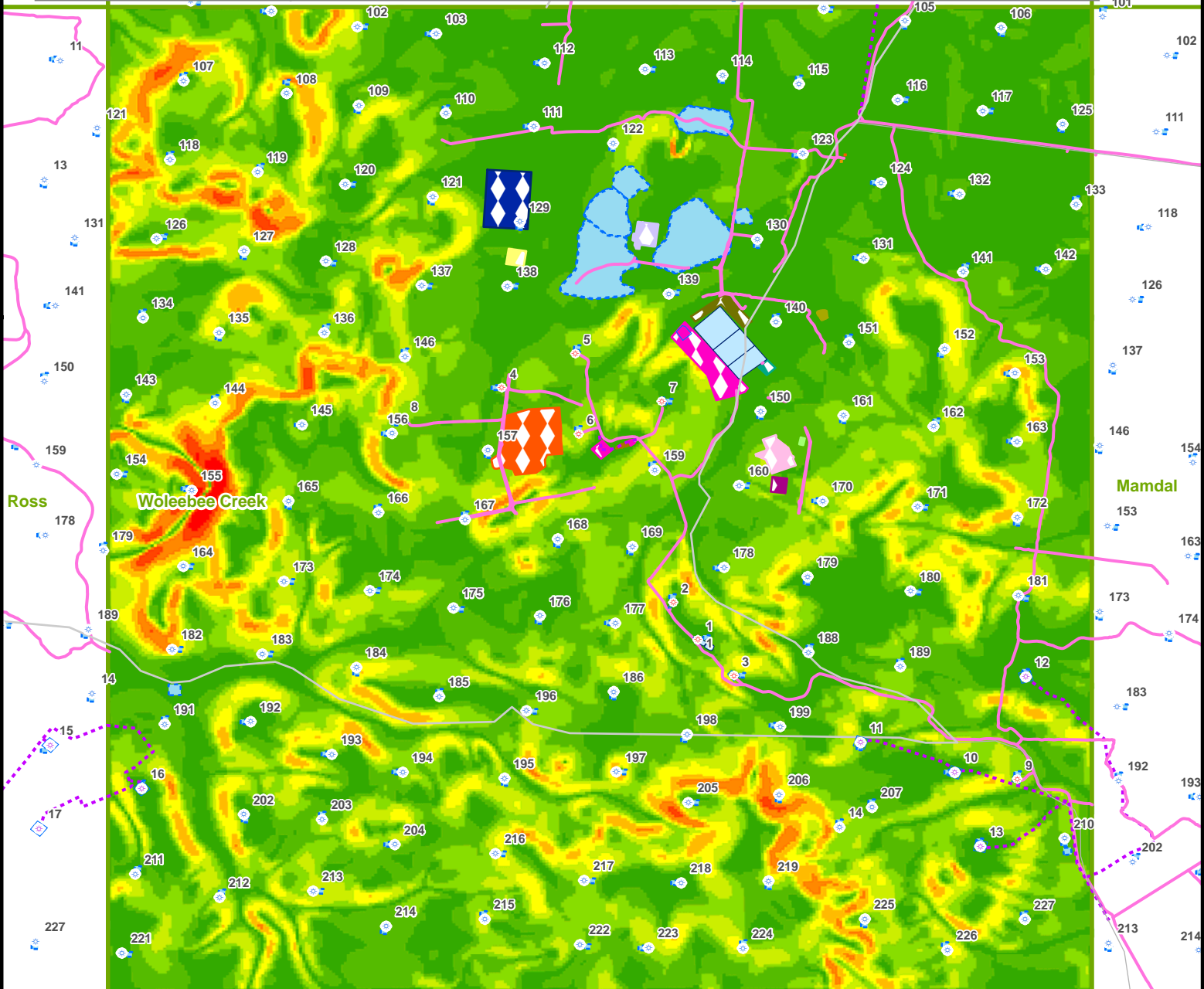
Soil status distribution is presented in **Figure 8** map “Woleebee Creek Block – Soil Status” (source; DERM 2011).

Information on the soil management group’s components are presented in **Table 1**.

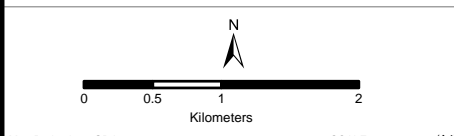
Table 1 : Soil Management Groups

Soil Management Group	Major terrain unit	Brief description	ASC sub order
Grey-brown cracking clays	Little-weathered sedimentary rocks ----- Unconsolidated sediments	Deep soils with thin, brown or dark grey, light clay to medium clay texture overlying brown, dark grey or reddish brown, medium clay to heavy clay subsoil becoming brown to yellowish brown with depth. Occupies rises and undulating plains developed on little-weathered sedimentary rocks, mainly southwest of Wandoan.	Brown Vertosols and Grey Vertosols

Proposed Gathering - Gas	Accommodation	Proposed Central Processing Plant	Slope (%)
Proposed Gathering - Water	Workshop Facility	Proposed Field Compressor Station	
Proposed Trunkline - Gas	Proposed Accommodation	Proposed Pig Launcher Station	
Proposed Trunkline - Water	Effluent Area	Proposed Pump Station	
Proposed Gas Collection Header - Rev M	Proposed Water Tank	Proposed Treatment Plant	
Pond	Borrow Pit	Proposed Communication Tower	
Proposed Pond	Proposed Borrow Pit	Proposed Power Sub Station	
	Proposed Workspace/Clearing Area		
	Proposed Laydown Area		



Woleebee Creek - Slope



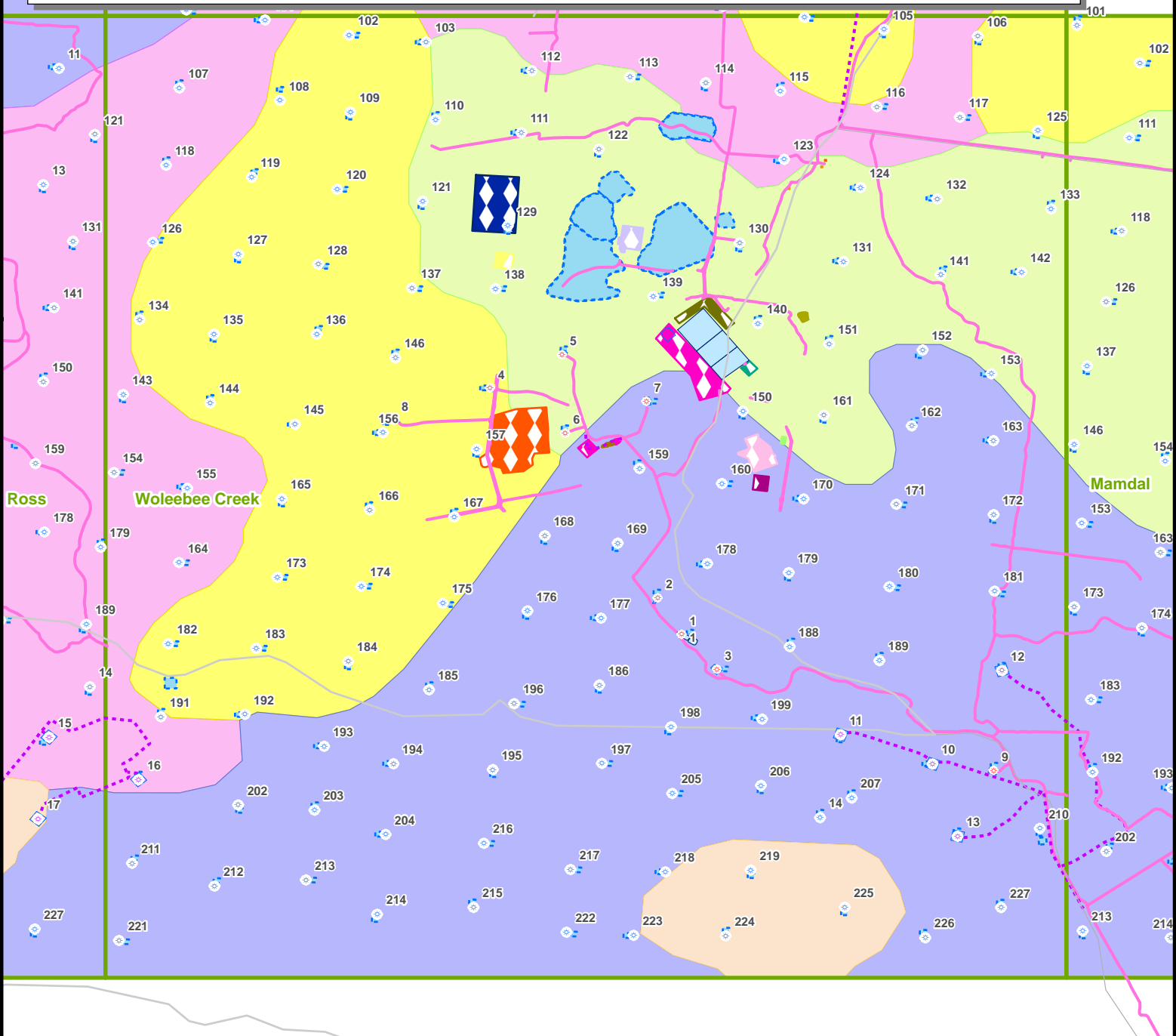
Existing Well Location	Principal Road	Well Pad
Released Well Location	Secondary Road	QGC Field
Pegged Well Location	Minor Road	
Proposed Well Location	Track	

Map Projection: GDA 94
SCALE: 1:55,000 (A4)
DATA SOURCE: Tenements - DME
PLAN REF: XXXX-XXXX-XXXX-XXXX Rev A

Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.
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DATE: 6/10/2011
MAP NO: M_11130_03
CREATED BY: TM
MAP TYPE: v4Other
REV NO: A

Proposed Gathering - Gas	Accommodation	Proposed Central Processing Plant
Proposed Gathering - Water	Workshop Facility	Proposed Field Compressor Station
Proposed Trunkline - Gas	Proposed Accommodation	Proposed Pig Launcher Station
Proposed Trunkline - Water	Effluent Area	Proposed Pump Station
Proposed Gas Collection Header - Rev M	Proposed Water Tank	Proposed Treatment Plant
Pond	Borrow Pit	Proposed Communication Tower
Proposed Pond	Proposed Borrow Pit	Proposed Power Sub Station
	Proposed Workspace/Clearing Area	Soil Status
	Proposed Laydown Area	Grey-brown cracking clays/Grey-brown non-cracking clays
		Sandy TC soils (dispersive)
		Sandy TC soils (dispersive)/Shallow loams and clay loams
		Sandy or loamy TC soils (dispersive)
		Sandy or loamy gradational soils/Sandy TC soils (dispersive)



Woleebee Creek - Soil Status

 Map Projection: GDA 94 SCALE: 1:55,000 (A4)	Existing Well Location Released Well Location Pegged Well Location Proposed Well Location	Principal Road Secondary Road Minor Road Track	Well Pad QGC Field
	<p><small>Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.</small></p> <p><small>*Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating in any way to the data. Data must not be used for direct marketing or be used in breach of the privacy laws.</small></p>		

		Topsoil depth: <=100 mm. Weathered rock below 1 m depth.	
Grey-brown non-cracking clays	Little-weathered sedimentary rocks	Shallow to deep soils with thick, brown or black, light clay to medium clay overlying greyish brown to reddish brown subsoil of similar texture; weathered rock below 300 mm depth	Grey Dermosols and Brown Dermosols
Shallow loams and clay loams	Deeply weathered material	Shallow and gravelly soils with thin, brown, grey or black, sandy clay loam, loam or clay loam that either directly overlies weathered rock or grades into a paler subsurface layer of similar texture which then overlies rock; weathered rock at <100 to 300 mm depth	Clastic Rudosols, Leptic Tenosols and Bleached-Leptic Tenosols
Sandy or loamy gradational soils	Deeply weathered material	Moderately deep to deep soils with very thick, brown, sandy loam to clay loam, sandy grading into red or yellow subsoil of sandy light clay to medium clay that may be strongly mottled at depth; weathered rock below 600 mm depth	Red Kandosols and Yellow Kandosols
Sandy texture contrast soils (dispersive)	Little-weathered sedimentary rocks ----- Deeply weathered material and unconsolidated sediments ----- Recent alluvium	Moderately deep to deep soils with thick, brown or dark grey, sand, loamy sand or sandy loam usually overlying a bleached subsurface of similar texture which abruptly overlies mottled brown, grey or yellow, sandy light clay to sandy medium clay subsoil. Most widespread soil management group throughout the study area, occurring on all types of terrain except dissected plateaus. Topsoil depth: 100 to 300 mm to >300 mm. Weathered rock below 600 mm depth.	Brown, Grey and Yellow Sodosols, Brown, Grey and Yellow Kurosols
Loamy texture contrast soils (dispersive)	Little-weathered Sedimentary rocks ----- Deeply weathered material and unconsolidated sediments ----- Recent alluvium	Moderately deep to deep soils with thin, brown or dark grey, loam, sandy clay loam or clay loam often overlying bleached subsurface of similar texture which abruptly overlies brown, grey or mottled, brown and grey, sandy light clay to medium clay subsoil. Widespread throughout the study area, mainly on rises and plains but may also occur on low hills. Topsoil depth: <100 to 300 mm. Weathered rock below 600 mm depth	Brown and Grey Sodosols, Brown and Grey Kurosols

5.6 Erosion Hazard

Erosion Hazard is described in three classifications: High, Medium and, Low (source: DERM 2011) and presented in **Figure 9** map “Woleebee Creek Block – Erosion Hazard”.

The potential for erosion (erosion hazard) is multifactorial and arises out of prevailing **slope, soil status and subsoil salinity**.

Essentially the product of physicochemical interactions, soil erosion in the context of the work area arises from;

- **disturbance**, e.g. abrasion from vehicle movements, excavation;
- **abrasion**, e.g. from; wind, water flows; and
- **dispersion**, e.g. from prolonged exposure of high clay content soil or sodic subsoils to surface run-off and rain water.

The erosion hazard classification across Woleebee Creek Block are; **High, Medium and Low**

High erosion hazard associated with: Sandy TC soils (dispersive); and Sandy TC soils (dispersive)/Shallow loams and clay loams.

Medium erosion hazard associated with: Grey-brown cracking clays/Grey-brown non-cracking clays; Sandy or Loamy TC soils (dispersive).

Low erosion hazard associated with: Sandy or loamy gradational soils, (dispersive).

Pasture Land: Whilst soils of the QGC gas fields range from low to high erosion hazard, current grazing practices on pasture land limit the occurrence of present erosion to minor sheet erosion. The very nature dispersive soils has limited past agricultural activity on those lands.

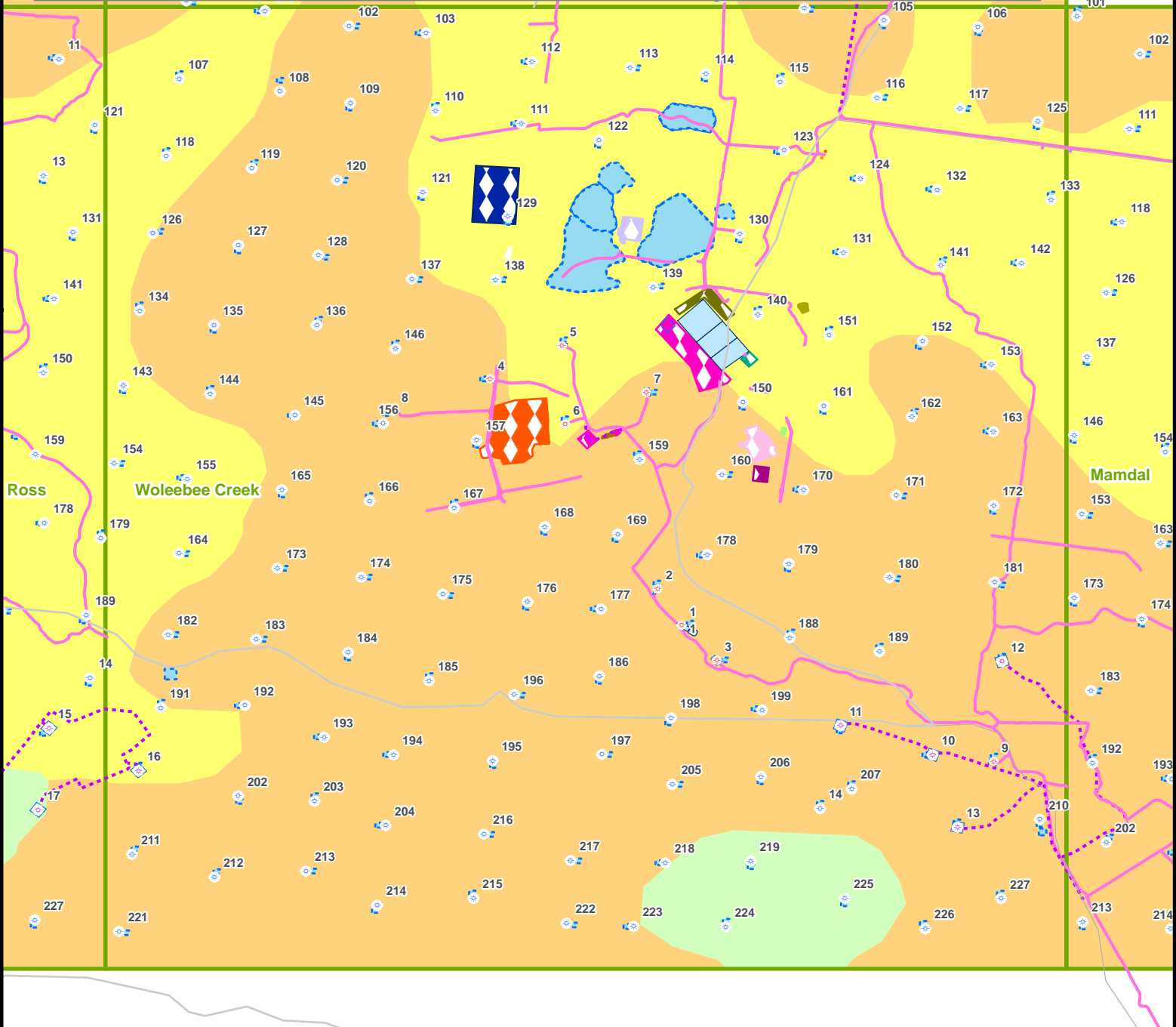
Cropping land: Run-off control structures and appropriate land management practices have generally been adopted across the region as a result of horticultural practices, and effectively minimise ongoing erosion. As a result, only minor soil movement due to sheet erosion can be expected, particularly in the worked clay soils of the region.

5.7 Sub soil salinity

Woleebee Creek block subsoil salinity is presented in **Figure 10** map “Woleebee Creek Block – Subsoil Salinity”.

Across Woleebee Creek block there is a mixture of **High and Medium** subsoil salinity, closely associated with soil status classifications;

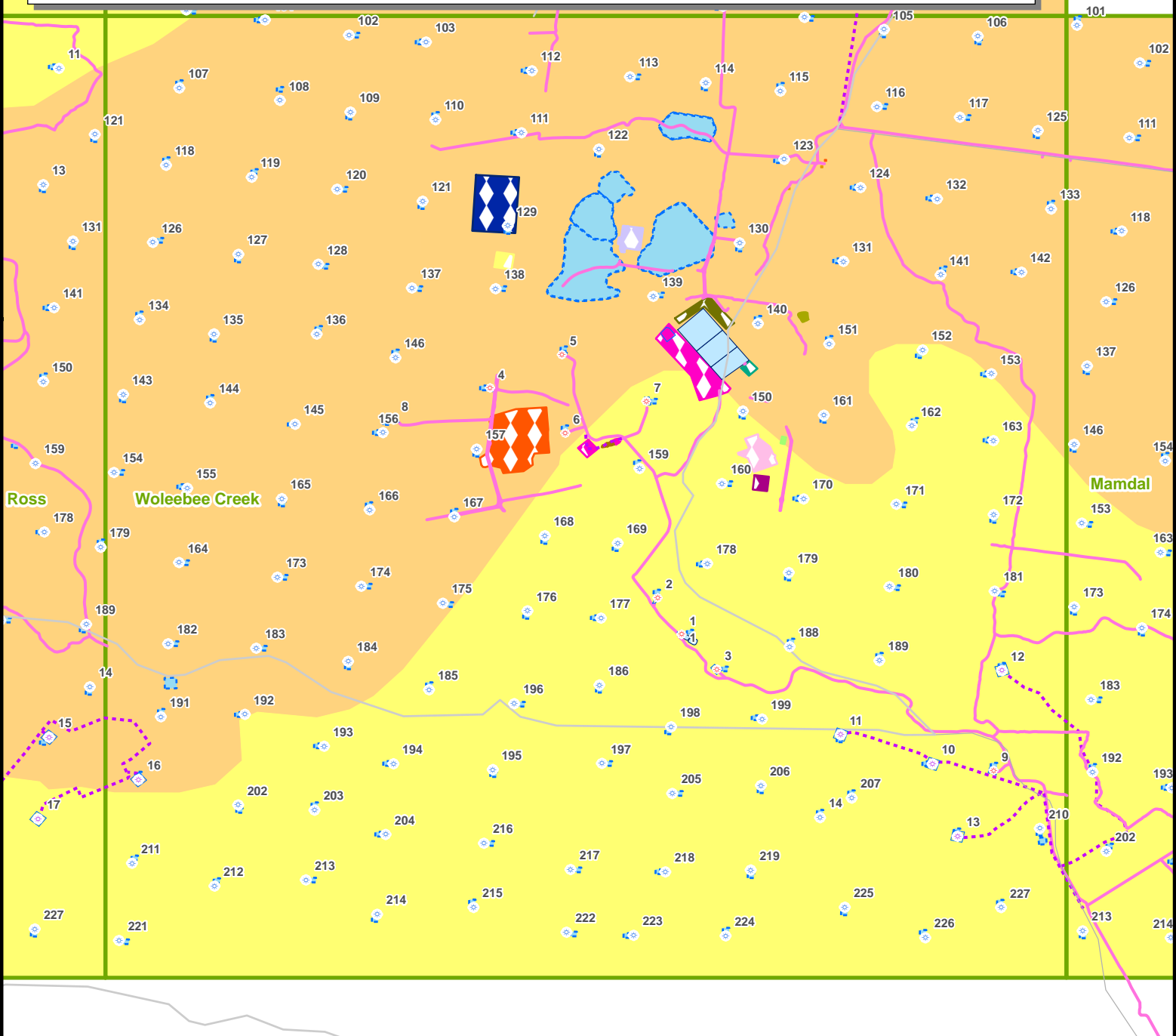
	Proposed Gathering - Gas		Accommodation		Proposed Central Processing Plant	Erosion Hazard
	Proposed Gathering - Water		Workshop Facility		Proposed Field Compressor Station	
	Proposed Trunkline - Gas		Proposed Accommodation		Proposed Pig Launcher Station	Medium
	Proposed Trunkline - Water		Effluent Area		Proposed Pump Station	Low
	Proposed Gas Collection Header - Rev M		Proposed Water Tank		Proposed Treatment Plant	
	Pond		Borrow Pit		Proposed Communication Tower	
	Proposed Pond		Proposed Borrow Pit		Proposed Power Sub Station	
			Proposed Workspace/Clearing Area			
			Proposed Laydown Area			



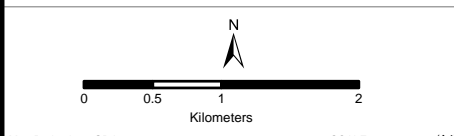
Woleebee Creek - Erosion Hazard

 Map Projection: GDA 94 SCALE: 1:55,000 (A4)	Existing Well Location Released Well Location Pegged Well Location Proposed Well Location	Principal Road Secondary Road Minor Road Track	Well Pad QGC Field
	<p><small>Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.</small></p> <p><small>*Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.</small></p>		

	Proposed Gathering - Gas		Accommodation		Proposed Central Processing Plant	Subsoil Salinity High Medium Low
	Proposed Gathering - Water		Workshop Facility		Proposed Field Compressor Station	
	Proposed Trunkline - Gas		Proposed Accommodation		Proposed Pig Launcher Station	
	Proposed Trunkline - Water		Effluent Area		Proposed Pump Station	
	Proposed Gas Collection Header - Rev M		Proposed Water Tank		Proposed Treatment Plant	
	Pond		Borrow Pit		Proposed Communication Tower	
	Proposed Pond		Proposed Borrow Pit		Proposed Power Sub Station	
			Proposed Workspace/Clearing Area			
			Proposed Laydown Area			



Woleebee Creek - Subsoil Salinity



- Existing Well Location
- Released Well Location
- Pegged Well Location
- Proposed Well Location
- Principal Road
- Secondary Road
- Minor Road
- Track
- Well Pad
- QGC Field

Map Projection: GDA 94
SCALE: 1:55,000 (A4)
DATA SOURCE: Tenements - DME
PLAN REF: XXXX-XXXX-XXXX-XXXX Rev A

Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.

*Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

DATE: 6/10/2011
MAP NO: M_11130_06
CREATED BY: TM
MAP TYPE: v4Other
REV NO: A

High subsoil salinity associated with: Sandy or loamy TC soils (dispersive); Sandy TC soils (dispersive); and Grey-brown cracking clays/Grey-brown non-cracking clays

Medium subsoil salinity associated with: Sandy or loamy gradational soils/Sandy TC soils (dispersive; Sandy TC soils (dispersive)/Shallow loams and clay loams;

Management of sub soil salinity principally requires prevention or minimisation of exposure to atmosphere and fresh water. Where unavoidable, mitigative measures shall be adopted to promote soil stabilisation including, but not limited to; the application of flocculants and; engineering of barriers to eliminate prolonged contact with water.

6.0 SITE SPECIFIC INTERIM SOIL MANAGEMENT PLANS

- WOLEEBEE CREEK BLOCK

6.1 Description

Construction activities will include, but not limited to;

- Clearance of tracks from access road to well pad site and camp sites
- Construction of Well pads
- Construction of Camps
- Construction of pipelines
- Construction of FCS
- Construction of CCP
- Construction of WTP
- Construction of Ponds

Whilst their precise nature requires verification in the field, relief across the block comprises frequent undulating terrain of $\pm 40\text{m}$ with slopes of up to 25% on ridges. More than 60% of the block comprises gradients greater than 4.5%.

Work activities on both clay and dispersive top soils will necessitate gradients being engineered to promote spill from tracks and effective drainage of hard stands to prevent pooling.

6.2 Topsoil Stripping and Soil Stockpiling

No vegetation shall be burned, and felled vegetation should be mixed with top soil to protect soil structure and increase the soil's seed stock.

Clay soils occur across approximately 15% of the block, in the north/northeast area. Due consideration shall be given to restricting activities on these soil types during wet periods.

Texture contrast soils dominate the remaining ~85% of the block. Being prone to erosion and dispersion, these soils are of limited practical use and are not suitable in constructing water diversionary structures. The dispersive nature of sandy or texture contrast soils also renders them prone to generating considerable **dust** during dry periods. Conversely during wet periods they easily disperse, and impair

traffic movements and safety on unmade roads. These characteristics tend to favour drier months for periods of heavier traffic and construction activity.

Care should be taken during removal of top soil in observing the expected versus actual depths to affect segregation of the horizons into different stock piles. Table 1 offers guidance only in this respect and TC soils require particular attention.

As stated in IECA Manual (2008), erosion and sediment control measures should be modified as site conditions change, or if the adopted measures fail to achieve the level of control required ('Principle 10').

The following management principals apply to management of **all soils** across all work areas:

- Appropriate camber and drainage shall be applied to prevent pooling on or surrounding constructed work surfaces.
- Stockpiling of soil should be conducted close to rehabilitation areas and away from drainage lines, and on appropriate contours.
- Top soil should be segregated and stock piled separate to any subsoil, paying close attention to changes in soil horizon throughout excavation.
- Topsoil stockpiles should be no greater than 2m in height to maintain viability of seed stock.
- Subsoil stock piles may require capping with suitable cover to prevent erosion and loss of material through rilling and tunnelling.
- Erosion and sediment controls shall be placed around all stockpiles.
- Stockpile and windrow batter gradients should be no greater than 30% (1V:3H.)
- Where soil pH is less than 5, gypsum may be substituted with agricultural lime to redress acidity and limit the soils dispersive potential.
- Short term topsoil stockpiles should be vegetated and where possible reused within 12 months.
- Riprap or geo-textiles are suitable alternatives for immediate / temporary stock pile cover.
- Where Medium erosion hazard topsoils are required to be retained for operational periods greater than 12 months, stockpiles should be dressed with stabilising flocculant such as gypsum or lime at a rate of approximately 2 kg / m² then sown with local native plant species (or sterile pasture species) and vegetative cover maintained to preserve the fertility of the topsoil and minimise erosion potential.
- Where High erosion hazard topsoils are required to be retained for operational periods greater than 12 months, mitigative measure against potential gully or tunnel erosion, should consider gypsum amendment (minimum 2kg/m²) being applied, and incorporated to a minimum depth of 20cm, then sown.
- Cross land flows shall be permanently diverted around pads until decommissioning.
- Down gradient pad run off should be channelled to vegetated / turfed areas in order to intercept and promote sediment drop out.

- Where necessary, means to promote more effective interception may include; ripping of surface, placement of gravel / rip-rap, mulching and revegetation / grassing.
- Construction of pads should promote even sheet flow across its extent.
- Gravel shall be applied across all work areas to minimise erosion from vehicular movements, and promote runoff / drainage of sheet flow.

6.3 Salinity Management

Diversionary structures shall be in place where needed any time top soil is removed to prevent entry of sheet flow into the work area.

The following management principals apply to management of subsoils in this area:

- Management of High subsoil salinity requires immediate and corrective measures when these subsoils are exposed. The area should be dressed with adequate flocculant (2-4 Kg/m²) and reinstated with a non dispersive cover (e.g. gravel) or suitably available top soil to a minimum depth of 200mm. Where this is not possible for operational reasons all due containment measures shall be applied.
- Medium subsoil salinity requires that soil should not be exposed, paying close attention to changes in soil horizon and segregation into separate stock piles throughout excavation. This may not be possible where top soil is shallow; however exposed subsoil areas should be dressed with an ameliorant such as gypsum or agricultural lime (~2 Kg/m²) to limit any dispersive potential, with earliest reinstatement of non dispersive cover or suitably available top soil to a depth of minimum 200mm.
- Where excavation of subsoil is unavoidable, mitigation against potential gully or tunnel erosion, particularly if stock piled, requires gypsum amendment (minimum 2kg/m²) and incorporation (minimum 200mm depth) to all excavated subsoils (B Horizon). If sodic soils are excavated and stockpiled, Gypsum should be added /mixed during this process.
- Mitigation of saline run-off would require application of gypsum to affected areas (until CEC is redressed) in order to reinstate soil stability.

6.4 Compaction Mitigation

- Topsoil should be stripped prior to the movement of heavy machinery to avoid unnecessary compaction.
- Stockpiled soils should be located outside trafficable areas such that no vehicle or machinery movement occurs over stockpiled soils.

- At the completion of bulk earthworks and prior to topsoil respreading, ripping or tilling of the subsoil to approx 30cm is recommended. Ripping will promote water infiltration and help bind the topsoil to the subsoil and mitigate against sheet erosion.

6.5 Decommissioning and Rehabilitation

Soils must be reinstated in the same order as the parent soil profile.

Stabilisation of subsoil may be improved through ripping to a depth of 30cm and a 1 – 2 kg/m² application of gypsum applied prior to covering with top soil. This will aid in adhesion of topsoil and drainage.

Where suitable topsoil is unavailable, gypsum should be applied at 2kg/m² and incorporate to a minimum depth of 20cm. Due to the inherently low nutrient and organic content of dispersive soil types, additional amendments such as feedlot manure (1kg/m²) or suitable NPK fertiliser may be applied (e.g. Nitrophoska™ at approx 10g/m²) to supply additional macronutrients and trace elements, prior to revegetation with endemic plant species.

The pH of sandy top soils typically lies below pH 5, and it is recommended that lime be applied (2 – 4 Kg/m²) during respreading of these top soils to raise the pH and improve rehabilitation.

PA Strategies

From: EPBC <EPBC@industry.gov.au>
Sent: Tuesday, 19 November 2019 4:57 PM
To: PA Strategies; EPBC; 'epbc@ga.gov.au'
Cc: s. 47F(1)
Subject: RE: PROPOSED DECISION: Surat North CSG Project, Qld (EPBC 2018/8276)
[DLM=For-Official-Use-Only]
Attachments: Geoscience Australia comments on proposed decision - Surat North CSG Pro....pdf

Good afternoon,

Thank you for the opportunity to comment on the proposed approval of the Surat North CSG Project in Queensland. The Department of Industry, Innovation and Science has no comment on this decision.

Geoscience Australia has reviewed the proposed decision and provided comments for your consideration. Please find them attached.

Warm regards,

s. 47F(1)
Policy Officer, Environment and Resources Stewardship
Resources Strategy| Resources Division
s. 47F(1) | s. 47F(1) @industry.gov.au

Department of Industry, Innovation and Science

For Official Use Only

From: PA Strategies [mailto:PA.Strategies@environment.gov.au]
Sent: Thursday, 7 November 2019 10:33 AM
To: EPBC <EPBC@industry.gov.au>; s. 47F(1) @industry.gov.au>; 'epbc@ga.gov.au'
<epbc@ga.gov.au>
Subject: PROPOSED DECISION: Surat North CSG Project, Qld (EPBC 2018/8276) [SEC=OFFICIAL]

Good morning

This email is to notify you that a delegate of the Minister for the Environment has made a proposed approval decision on the Surat North CSG Project, Qld (EPBC 2018/8276). Please find a letter of notification and a copy of the proposed conditions of approval attached. Please provide any comments on the proposed decision by COB Tuesday 19 November 2019.

Kind regards,

Post Approvals Strategies Section
Environment Approvals Division
Department of the Environment and Energy



Cnr Jerrabomberra Avenue
and Hindmarsh Drive,
Symonston ACT 2609
GPO Box 378,
Canberra, ACT 2601 Australia
Phone: +61 2 6249 9111
Facsimile: +61 2 6249 9999
Web: www.ga.gov.au
ABN 80 091 799 039

**Environment and Resources Stewardship
Resources Strategy
Resources Division
Department of Industry, Innovation and Science**

19 November 2019

Attn: s. 22(1)(a)(ii)

Re: Invitation to comment on EPBC Proposed Approval Decision and Conditions – Surat North CSG Project (EPBC 2018/8276), Queensland

I refer to the request for comments dated 7 November on the proposed approval decision for the Surat North CSG Project (the Project), west of Wandoan, Queensland, by QGC Pty Limited (the Proponent). Geoscience Australia (GA) has reviewed the proposed approval conditions, particularly as they relate to sections 24D and 24E (the water trigger) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Geoscience Australia has focused on the conditions addressing the potential for impacts to groundwater resources.

The Project has been identified as a controlled action under the EPBC Act, with the water trigger a controlling provision. The Project was assessed by preliminary documentation.

GA has undertaken a rapid review of the conditions to meet the statutory timeframe for provision of these comments. Based on this limited review, the following observations are made.

Background

The Project is the second phase of the Surat Basin Acreage Development Project, a coal seam gas (CSG) field located approximately 20 km west of Wandoan and 35 km south west of Taroom. The first phase included drilling and operating 400 CSG wells in the Surat Basin, approved under EPBC 2013/7047. The Project relates to the further development of up to 740 CSG wells.

The Project is located within the Surat and Surat North Groundwater Management Area of the Great Artesian Basin (GAB). The aquifers in these Groundwater Management Areas provide an important water resource for agricultural, stock and domestic purposes and some urban water supply in the Surat Basin area. The Project is located within the Surat Cumulative Management Area (CMA), declared under the Queensland Water Act (2000).

General Comments

Groundwater Dependent Ecosystems

The approval conditions relating to water resource management focus solely on impacts to Groundwater Dependent Ecosystems (GDEs). GA notes that impacts to groundwater resources may be significant however there are no explicit requirements in the conditions to monitor these potential impacts.

The approval conditions focus on monitoring and measuring the condition of the GDEs, and place triggers and limits on parameters representing the condition of the GDEs. This approach may prove difficult to enforce as there is no requirement for adequate baseline monitoring with which to compare a change in GDE condition with the impact on groundwater resources resulting from the CSG extraction. Without this evidence of correlation it will be very difficult to demonstrate the cause of any decline in the condition of the GDE. For example seasonal and climate variability may have a significant impact on the GDE, as will cumulative impacts from surrounding resource extraction and agriculture. It is not clear how the Proponent would differentiate the impacts of these factors from the impacts of the Project without adequate baseline data and without monitoring the groundwater system supporting the GDE.

The technical and statistical challenges in developing a 'GDE program' that provides measureable parameters that are able to show an enforceable link between groundwater condition and GDE condition, for each GDE in the area of interest, are non-trivial. The evidence to support such a program will be substantial and require a significant time to collect.

Timeframes

GA is concerned that some of the conditions reflect unrealistic timeframes that will mean that the proponent is not able to address the condition appropriately or that the condition is not enforceable. For example condition 21e) requires that the 'description and location of all identified GDEs, performance criteria, trigger values and limits' be submitted with a 'GDE program' that includes an analysis of impacts during Stage 1 of the Project. However Condition 23 requires that 'the description and location of all identified GDEs, performance criteria, trigger values and limits' be approved within 6 months of the commencement of Stage 1. This timeframe does not allow enough time to analyse the Stage 1 impacts, the required peer review, and Ministerial approval.

Condition 29 requires that exceedance of trigger values must be reported to the Minister within two business days of detection, and the definitions indicate that trigger values may be reached through modelling or monitoring. Both monitoring and modelling require considerable data analysis and review and it is not clear at what point the approval holder must consider an exceedance to be 'detected'. Similar concerns arise for Condition 30, which sets a one business day reporting timeframe on any exceedance of a limit.

GA notes that impacts may propagate very slowly through groundwater systems. For example it may take years for an impact to groundwater, resulting from CSG extraction, to propagate to a GDE. Triggers, limits and mitigation actions should be chosen with respect to these potential timeframes.

Comments Regarding Specific Conditions:

Condition 19. The approval holder must ensure that there is no adverse effect on the function of groundwater dependent ecosystems in, or within 30km of the project area as a result of the project.

While there is an implied meaning of the condition based on the plain English interpretation of the words, the following definitions are provided for terms used in the condition:

- **adverse effect/s** means an exceedance of a limit as a result of the project.
- **function** means the groundwater, surface water and ecosystem components ... processes and benefits/services that characterise and support the occurrence of the GDE...'

Given these definitions, the meaning of this condition becomes confusing, and it will be difficult for the proponent to ensure they are addressing it as intended, without further clarification.

Condition 20 then uses different terminology, stating:

*20. To ensure there is no **impact** on the function of GDEs, the approval holder must provide for the approval of the Minister:*

- a) description and location of all identified GDEs;*
- b) performance criteria;*
- c) trigger values; and*
- d) limits.*

Where '**Impact/s/ed** means to suffer any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action'.

Conditions 19 and 20 therefore impose two different requirements on the protection of GDEs: either a limit must not be exceeded (condition 19) or no measureable impact must occur (condition 20). GA recommends that the conditions are reviewed and clarified in this regard.

GA suggests using one of the earlier terms ('adverse effects' or 'limits') to minimise potential confusion between these definitions in the conditions.

Cumulative impacts are mentioned against both subsections a) and d) of Condition 21, and could be removed from d) to avoid unnecessary repetition and potential confusion.

Subsection 21e) requires '*evidence to confirm adverse effects [ie the exceedance of a limit] on the function of GDEs have not occurred or are not occurring as a result of Stage 1 and to demonstrate that the proposed trigger values and limits have not been influenced by the commencement of Stage 1*'.

GA notes that the proposed trigger values and limits will not be 'influenced' by the commencement of Stage 1 as they are static values, and the wording of the condition may require clarification. GA also notes that it is highly unlikely that the groundwater impacts from the Project will propagate to a GDE in the short timeframe between the commencement of Stage 1 and the submission of the 'GDE program'.

Condition 24 states *The approval holder must undertake the action in accordance with the approved performance criteria, trigger values and limits.*

This wording is confusing, as the performance criteria, trigger values and limits do not control how the action is undertaken, they only relate to the potential impacts the action may cause at GDEs. GA suggests the condition is reworded to clarify the intended meaning. If the intention is that the Project does not exceed the limits and triggers, this is already stated in other conditions.

Condition 25 relates to 'outcomes reports' which are to be prepared every 12 months, however the last line of Condition 25 refers to 'the 6 month period that is the subject of the outcomes report'. GA recommends the condition be reviewed to clarify if the outcomes reports are reporting on 6 months or 12 months.

Note 3 indicates that the proponent may be required by the Minister to update the GDE program at some point in the future. GA suggests that this requirement be formalised in a condition (rather than just a note), and that a regular review process be considered to ensure GDE impact management and monitoring is based on all the available data and best system understanding in an adaptive management framework.

Condition 29 imposes a 20 business day timeframe for approval holders to provide mitigation plans following any trigger exceedance. This is a tight timeframe, and may be unrealistic if trying to ensure best practice, evidence based actions. GA recommends mitigation options be presented in the GDE program, which can then be refined following an exceedance.

Condition 31 states *'... the approval holder must not recommence groundwater extraction until the impact has been reversed, or the Minister has agreed, in writing, that no adverse effect on the function of GDEs has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the Minister in writing.'* GA notes that this wording indicates that groundwater extraction cannot recommence if an impact has occurred. Additionally, it may take years for the impact to be 'reversed' as required by Condition 31. Impact reversal is unlikely to be possible.

Condition 32 requires revision of the 'description and location of all identified GDEs, performance criteria, trigger values and limits' within 2 years of the date of the approval. GA suggests the revision be linked with a revision of the 'GDE program' to ensure explanation of the scientific basis of the values is updated.

GA recommends that the conditions be checked for consistency of terminology throughout, for example the terms 'groundwater extraction' and 'groundwater production' (definition of 'Stage 1') appear to be synonymous, however only groundwater extraction is defined. The term 'adverse effect'

is defined, however the term 'adverse impact' is also used (in the definition of 'performance criteria') and appears to be synonymous.

If you have any queries on this, please contact [s. 47F\(1\)](#) on [s. 47F\(1\)](#) or [s. 47F\(1\)](#) @ga.gov.au.

Kind regards,

s. 47F(1)

A/g Director - Groundwater Advice, Groundwater Branch,
Environmental Geoscience Division
Geoscience Australia



PROPOSED APPROVAL

Surat North CSG Project, Queensland (EPBC 2018/8276)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). Note that section 134(1A) of the **EPBC Act** applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	QGC Pty Limited
ACN of approval holder	089 642 553
Action	To construct, operate and decommission up to 740 coal seam gas wells, and associated infrastructure, in the Surat Basin Acreage Development, approximately 20 km west of Wandoan in Queensland (see EPBC Act referral 2018/8276).

Proposed Approval decision

My decisions on whether or not to approve the taking of the action for the purposes of each controlling provision for the action are as follows.

Controlling Provisions

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve
Coal seam gas or large coal mining development impact on water resources	
Section 24D	Approve
Section 24E	Approve

Period for which the approval has effect

This approval has effect until 31 December 2082.

Decision-maker

Name and position	Andrew McNee Assistant Secretary of Assessments and Governance Branch Department of the Environment and Energy
Signature	PROPOSED DECISION DO NOT SIGN
Date of decision	PROPOSED DECISION - DO NOT DATE

Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

Project Area

1. For the purpose of the action, the approval holder must not undertake any activities outside the **project area**.

Disturbance Limits

2. The approval holder must not **clear** more than:
 - a) 80 ha of **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat**.
 - b) 62 ha of **Koala (*Phascolarctos cinerus*) (combined populations of Qld, NSW and the ACT) habitat**.
 - c) 62 ha of **Greater Glider (*Petauroides volans*) habitat**.
 - d) 9 ha of **Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community**.

Pre-clearance Surveys

3. The approval holder must undertake pre-clearance surveys of areas to be **cleared** prior to **clearing**.
4. Pre-clearance surveys must be undertaken by a **suitably qualified field ecologist** and undertaken in accordance with the **Department's Survey Guidelines** in effect at the time of the pre-clearance survey or other survey methodology endorsed by the **Department** in writing.
5. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report which demonstrates a potential **impact to listed threatened species and communities** as a result of **clearing** must be published on the **website** within 6 months of completion and remain published on the **website** for the period of approval. The approval holder must notify the **Department** within five **business days** of publishing each pre-clearance survey report.

Listed Threatened Species and Communities Management Plans

6. The approval holder must manage **impacts to listed threatened species and communities** that are known to occur within the **project area** in accordance with the **Significant Species Management Plan (SSMP)**.
7. If a **listed threatened species or community** which are not addressed in the **SSMP** are identified in the **project area**, the approval holder must revise the **SSMP** to include management measures to avoid and/or mitigate **impacts** to that **listed threatened species or community** and submit, within 3 months of identifying this **listed threatened species or community**, a copy of the revised **SSMP** to the **Minister** for written approval. The approved revised **SSMP** must be implemented.
8. The approval holder must manage to reduce/minimise **impacts to listed threatened species and communities** from pest and weed species in accordance with the **Biosecurity Control Manual**.
9. The approval holder must undertake the action in accordance with the **Reinstatement and Rehabilitation Manual**.
10. The approval holder must undertake the action in accordance with the **Constraints Planning and Field Development Protocol**.

Environmental Offsets

11. The approval holder must prepare an Offset Management Plan that details the provision of offsets in accordance with the **Offset Assessment Guide values**. If offsets in accordance with the **Offset**

Assessment Guide values cannot be provided, an alternative offset or offsets must be proposed. The Offset Management Plan must:

- a) be prepared by a **suitably qualified person**, and in accordance with the principles of the **EPBC Act Environmental Offsets Policy** and the **Department's Environmental Management Plan Guidelines**;
- b) demonstrate how the offsets compensate for the **impacts** of the action in accordance with the **Offset Assessment Guide values** and consistent with the **EPBC Act Environmental Offsets Policy**; and
- c) include, but not be limited to:
 - i. baseline data that validates the **habitat quality score** of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community cleared for the purpose of undertaking **Stage 1** in the **Offset Assessment Guide values**. The approval holder may also elect to provide baseline data that validates the **habitat quality score** of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community cleared for the purpose of undertaking **Stage 2** in the **Offset Assessment Guide values** in the Offset Management Plan;****
 - ii. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses;
 - iii. baseline data and other supporting evidence that documents the presence, suitability and baseline quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community within the offset area/s;**
 - iv. maps and **shapefiles** of the offset area/s;
 - v. specific objectives to demonstrate **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community quality improvement over the life of the approval;**
 - vi. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community within the offset area/s;**
 - vii. key performance indicators to demonstrate the improvement to the quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community within the offset area/s;**
 - viii. the nature, timing and frequency of monitoring to determine the success of management actions against key performance indicators;

- ix. the timing for the provision of an annual monitoring report to the **Department**. The monitoring report must include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period;
 - x. an assessment of risks that the key performance indicators, completion criteria and/or plan objectives will not be met and identification of the sources of those risks and strategies for managing them;
 - xi. indicative corrective actions that will be implemented in the event monitoring activities indicate key performance indicators are not or are unlikely to be achieved;
 - xii. the roles and responsibilities for implementing the management actions;
 - xiii. evidence of consistency with relevant conservation advices, recovery plans and/or threat abatement plans.
12. The approval holder must not **commence clearing of South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community** associated with **Stage 2** unless the **Minister** has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.
 13. The approval holder must **legally secure** the offset area/s proposed in the Offset Management Plan approved by the **Minister** within 9 months of the date of the **Minister's** approval of the Offset Management Plan.
 14. If the approval holder did not provide baseline data that validates the **habitat quality score** of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community cleared** for the purpose of undertaking **Stage 2** in the **Offset Assessment Guide values** under Condition 11(a)(i), the approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the **Minister** for written approval.
 15. The Revised Offset Management Plan must constitute a revision of the approved Offset Management Plan and include baseline data that validates the **habitat quality score** of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat, ~~and~~ Greater Glider (*Petauroides volans*) habitat and Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community cleared** for the purpose of undertaking **Stage 2**. If the residual **impact** of the action on **listed threatened species and communities** is greater than that predicted in the approved Offset Management Plan, as demonstrated through the **habitat quality score** of the areas cleared for the purpose of undertaking **Stage 2**, an offset or offsets to compensate for the additional residual **impact** must be provided. Any additional offset or offsets must be consistent with the **EPBC Act Environmental Offsets Policy**. The **Minister** may request specified changes to the revised Offsets Management Plan, and specify a timeframe to make the changes. If the **Minister** requests changes, the approval holder must make the specified changes to the revised Offsets Management Plan and resubmit it within the specified timeframe. The approval holder must implement that Revised Offset Management Plan.
 16. The approval holder must **legally secure** the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the **Minister's** approval of the Revised Offset Management Plan.

Note 1: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect to impacts to each individual **listed threatened species and communities** being offset.

Note 2: The **Minister** may determine that offsets approved by the Queensland Government satisfy the requirements for offsetting **listed threatened species and communities** as long as any required offsets comply with the principles of the **EPBC Act Environmental Offsets Policy** or an equivalent Queensland Government offsets policy that ensures the maintenance and protection of **listed threatened species and communities**.

Chemical Risk Assessment

17. Prior to the use of any **new drilling fluid compound/s**, the approval holder must undertake a **chemical risk assessment**. The **chemical risk assessment** must be undertaken in accordance with **best practice risk assessment methodology**.
18. The approval holder must not use any **new drilling fluid compound/s** determined by the **best practice risk assessment methodology** to be high risk until the **chemical risk assessment** for that **new drilling fluid compound** has been approved in writing by the **Minister**. For any **new drilling fluid compound** identified as medium or high hazard, the **chemical risk assessment** must be provided to the **Minister** prior to the use of the **new drilling fluid compound**.
19. The approval holder must implement the approved **chemical risk assessment**.

Groundwater Dependent Ecosystem Monitoring and Management

20. The approval holder must ensure that there is no **adverse effect** on the **function of groundwater dependent ecosystems (GDEs)** in, or within 30 km of, the **project area** as a result of groundwater extraction. The approval holder must minimise the surface disturbance of **GDEs** and ensure that there is no **adverse effect** on the **viability** of any **patch** of a **GDE**.
21. To ensure there is no **adverse effect** on the **function of GDEs** or **viability of patches of GDEs**, the approval holder must provide for the approval of the **Minister**:
 - a) description and location of all **patches of GDEs**;
 - b) **performance criteria**;
 - c) **trigger values**; and
 - d) **limits**.
22. The description and location of all **patches of GDEs**, **performance criteria**, **trigger values** and **limits** must be submitted to the **Minister** with an accompanying GDE Program prepared by a **suitably qualified water resources expert** and accompanied by a **GDE Program peer review** undertaken by an **independent suitably qualified water resources expert**, which explains the scientific basis on which the description and location of all **patches of GDEs**, **performance criteria**, **trigger values** and **limits** have been derived to ensure that Condition 20 will be met. The GDE Program must include, and provide justification of:
 - a) hydrogeological conceptual modelling, including an ecohydrological model incorporating the stressor-response relationships for all **GDEs**, local scale numerical modelling and consideration of cumulative impacts;
 - b) a site-specific risk assessment;
 - c) past and proposed ongoing monitoring;
 - d) the procedure/methodology used to detect whether a **trigger value** and/or **limit** has been reached or exceeded and to identify the area contributing to the exceedance;
 - e) proposed mitigation strategy, including corrective action(s) if **trigger values** and/or **limits** are reached or exceeded and consideration of cumulative impacts;
 - f) evidence to confirm **adverse effects** on the **function of GDEs** or the **viability of patches of GDEs** have not occurred or are not occurring as a result of **Stage 1** and to demonstrate that the proposed **trigger values** and **limits** have not been influenced by the **commencement of Stage 1**; and
 - g) proposed reporting.

23. The approval holder must not **commence groundwater extraction** associated with **Stage 2** unless the description and location of all **patches of GDEs, performance criteria, trigger values and limits** have been approved by the **Minister** in writing.
 24. The description and location of all **patches of GDEs, performance criteria, trigger values and limits** must be provided to the **Minister** for written approval within 6 months of the **commencement of groundwater extraction** associated with **Stage 1**. The approval holder must not **commence groundwater extraction** associated with **Stage 2** until the description and location of all **patches of GDEs, performance criteria, trigger values and limits** are approved by the **Minister** in writing.
 25. The approval holder must undertake the action in accordance with the approved **performance criteria, trigger values and limits**.
 26. For each 12 month period following the date of **commencement of groundwater extraction**, or in accordance with a date otherwise agreed in writing by the **Minister**, the approval holder must submit an outcomes report prepared by a **suitably qualified water resources expert** and accompanied by an **outcomes report peer review** undertaken by an **independent suitably qualified water resources expert**, for the written acceptance of the **Minister**. Each outcomes report, accompanied by the **peer review**, must be submitted to the **Minister** within 6 months of the end of the 12 month period that is the subject of the outcomes report.
 27. The outcomes report submitted under Condition 26 must include, but not be limited to:
 - a) Performance against the approved **trigger values and limits**, including analysis of trends that indicate that reaching or exceeding an approved **trigger value or limit** is likely during or before the next reporting period and demonstration of how **adverse effects** on the **viability of patches of GDEs** has been minimised.
 - b) Any changes to the existing regulatory arrangements in place to avoid **adverse effects** to the **function of GDEs or viability of patches of GDEs**, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.
 28. The **Minister** may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the **function of GDEs or viability of patches of GDEs**.
 29. If, on the basis of the information provided (or that has not been provided) under Condition 26 and/or Condition 28, and/or other information available to the **Minister**, the **Minister** determines that the action has had, or is likely to have, an **adverse effect** on the **function of GDEs or viability of patches of GDEs**, the **Minister** may notify the approval holder in writing in accordance with the provisions of Condition 31.
- Note 3:** The **Minister** may throughout the life of the approval seek advice from experts, or an expert panel. As a consequence, specific matters identified through such advice may need to be addressed in the GDE Program or any outcomes report. Where such advice is sought, the approval holder will be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure reports are based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the approval.
30. If the approval holder detects that a **trigger value** has been reached or exceeded, the approval holder must report this to the **Minister** within five **business days** of the detection. If a **trigger value** is reached or exceeded, the approval holder must submit within 3 months of the detection, any proposed corrective action(s) to the **Minister** in writing and demonstrate that the proposed corrective action(s) will not result in **impacts** beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the **Minister** agrees, in writing, that it will not result in **impacts** beyond the scope of the action.
 31. If the approval holder detects that a **limit** has been reached or exceeded, the approval holder must report this to the **Minister** within one **business day** of the detection. The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action in the area identified as contributing to the exceedance of the limit as determined using the procedure/methodology required under Condition 22(d) within 48 hours of detecting

that a **limit** has been reached or exceeded, or of receiving notification that the **Minister** has determined that an **adverse effect** on the **function** of **GDEs** or **viability** of **patches** of **GDEs** has occurred.

32. If the approval holder has been required to cease groundwater extraction pursuant to Condition 31, the approval holder must not recommence groundwater extraction until the **impact** has been **reversed**, or the **Minister** has agreed, in writing, that no **adverse effect** on the **function** of **GDEs** or **viability** of **patches** of **GDEs** has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the **Minister** in writing. Approval to recommence groundwater extraction may be subject to conditions that the **Minister** considers reasonable. The **Minister** may direct the approval holder to implement corrective action(s) at the approval holder's expense.
33. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all **patches** of **GDEs**, **performance criteria**, **trigger values** and **limits** for the written approval of the **Minister**. The revised **performance criteria**, **trigger values** and **limits** must be in accordance with **coal seam gas water management guidelines**.

Part B – Standard administrative conditions

Notification of date of commencement of Stage 1

34. The approval holder must notify the **Department** in writing of the date of **commencement of Stage 1** within 10 **business days** after the date of **commencement of Stage 1**.
35. If the **commencement of Stage 1** does not occur within 5 years from the date of this approval, then the approval holder must not **commence Stage 1** without the prior written agreement of the **Minister**.

Compliance records

36. The approval holder must maintain accurate and complete **compliance records**.
37. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note 4: Compliance records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department's** website or through the general media.

Preparation and publication of plans

38. The approval holder must:
 - a. submit **plans** electronically to the **Department**;
 - b. publish each **plan** on the **website** within 20 **business days** of the date the **plan** is approved by the **Minister** or of the date a revised action management plan is submitted to the **Minister** or the **Department**, unless otherwise agreed to in writing by the **Minister**;
 - c. exclude or redact **sensitive ecological data** from **plans** published on the **website** or provided to a member of the public; and
 - d. keep **plans** published on the **website** until the end date of this approval.
39. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a **plan** or conditions of this approval, is prepared in accordance with the **Department's Guidelines for biological survey and mapped data** (2018) and submitted electronically to the **Department** in accordance with the requirements of the **plan** or conditions of approval.

Annual compliance reporting

40. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:
- a. publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;
 - b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within five **business days** of the date of publication;
 - c. keep all **compliance reports** publicly available on the **website** until this approval expires;
 - d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and
 - e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within five **business days** of publication.

Note 5: Compliance reports may be published on the **Department's** website.

Reporting non-compliance

41. The approval holder must notify the **Department** in writing of any: **incident**; non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than two **business days** after becoming aware of the **incident** or non-compliance. The notification must specify:
- a. any condition which is or may be in breach;
 - b. a short description of the **incident** and/or non-compliance; and
 - c. the location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.
42. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying:
- a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;
 - b. the potential impacts of the **incident** or non-compliance; and
 - c. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

43. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted as requested in writing by the **Minister**.
44. For each **independent audit**, the approval holder must:
- a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;
 - b. only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and
 - c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.

45. The approval holder must publish the audit report on the **website** within 10 **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.

Revision of action management plans

46. The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister** under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the **EPBC Act**. If the **Minister** approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.
47. The approval holder may choose to revise an action management plan approved by the **Minister** under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the RAMP would not be likely to have a **new or increased impact**.
48. If the approval holder makes the choice under condition 47 to revise an action management plan without submitting it for approval, the approval holder must:
- a. notify the **Department** in writing that the approved action management plan has been revised and provide the **Department** with:
 - i. an electronic copy of the RAMP;
 - ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;
 - iii. an explanation of the differences between the approved action management plan and the RAMP;
 - iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a **new or increased impact**; and
 - v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 **business days** after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the **Department**.
 - b. subject to condition 47, implement the RAMP from the RAMP implementation date.
49. The approval holder may revoke their choice to implement a RAMP under condition 46 at any time by giving written notice to the **Department**. If the approval holder revokes the choice under condition 47, the approval holder must implement the action management plan in force immediately prior to the revision undertaken under condition 47.
50. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the RAMP would be likely to have a **new or increased impact**, then:
- a. condition 47 does not apply, or ceases to apply, in relation to the RAMP; and
 - b. the approval holder must implement the action management plan specified by the **Minister** in the notice.
51. At the time of giving the notice under condition 50 the **Minister** may also notify that for a specified period of time, condition 47 does not apply for one or more specified action management plans.

Note 6: conditions 47, 48, 49 and 50 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised action management plan, at any time, to the **Minister** for approval.

Completion of the action

52. Within 30 days after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

In these conditions, except where contrary intention is expressed, the following definitions are used:

Adverse effect/s means an exceedance of a **limit** as a result of the project.

Aquatic GDEs means ecosystems dependent on the surface expression of groundwater, including:

- river baseflow systems, aquatic and riparian ecosystems that exist in or adjacent to streams (including the hyporheic zone) which are fed by groundwater; and
- wetlands (aquatic communities and fringing vegetation dependent on groundwater-fed lakes and wetlands), including palustrine and lacustrine wetlands that receive groundwater discharge and spring and swamp ecosystems.

Best practice risk assessment methodology means a risk assessment in accordance with best practice national or international standards and guidelines including, but not limited to:

- a) US EPA (2014). EPA-Expo-Box (A Toolbox for Exposure Assessors), or subsequent revision.
- b) OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management, or subsequent revision.

Biosecurity Control Manual means the *HSSE Risk Control Manual: Biosecurity, QCQGC-BX00-ENV-MAN-000002, Revision 4*, May 2018, approved on 15 May 2018, or subsequent revision approved by the **Minister**.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community means the EPBC listed threatened ecological community as described in the *Approved Conservation Advice for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community* (2013), or subsequent revision.

Business day/s means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Cease work provisions means a protocol to promptly discontinue all aspects of the action which have the potential to cause any impact to the **function** of **GDEs** and to urgently implement corrective action to reduce **performance criteria** below **limits** and **trigger values**.

Chemical risk assessment means an assessment prepared by a **suitably qualified person** to assess the risk of chemicals used in drilling operations for coal seam gas extraction on **protected matters**.

Clear/ed/ing means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Coal seam gas water management guidelines means any **Departmental** policies, guidance or agreements that relate to coal seam gas water management and/or monitoring.

Commencement of clearing means the first instance of any cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Commence/ment of Stage 1 means the first instance of any specified activity associated with **Stage 1** including clearing of vegetation and **construction** of any infrastructure. **Commencement of Stage 1** does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs;

- ii. install signage and /or temporary fencing to prevent unapproved use of the project area;
- iii. protect environmental and property assets from fire, weeds and pests, including **construction** of fencing, and maintenance of existing surface access tracks; and
- iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters**.

Commence/ment of groundwater extraction means the first instance of groundwater extraction.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department's** preferred spatial data format is **shapefile**. **Completion data** includes information detailing the date, location, approved project area, and actual total **cleared area/s**, total area and type of **listed and threatened species and communities** habitat **cleared** within the project area, **listed threatened species and communities** **habitat quality** within **retention area/s**, actual total **retention area/s**, the type of **listed threatened species and communities** habitat within **retention area/s**, actual total area of **listed threatened species and communities** habitat and the **habitat quality** within the offset area/s required under Conditions 11 and 14.

Completion of the action means all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

- i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;
- ii. consistent with the **Department's Annual Compliance Report Guidelines (2014)**;
- iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and
- iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Constraints Planning and Field Development Protocol means the *Constraints Planning and Field Development Protocol – Surat Basin Acreage Revision 2*, November 2017, approved on 4 January 2018, or subsequent revision approved by the **Minister**.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Department/al means the Australian Government agency responsible for administering the **EPBC Act**.

DEHP Guide means the *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (Qld Department of Environment and Science, 2017).

Environmental Management Plan Guidelines means the *Environmental Management Plan Guidelines (2014)*, or subsequent revision.

Environmental Offsets Policy means the **EPBC Act Environmental Offsets Policy (2012)**, or any subsequent revision, including the Offset Assessment Guide.

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

Function means the groundwater, surface water and ecosystem components (including organisms), processes and benefits/services that characterise and support the occurrence of the **GDE**, including support for biological diversity or species composition.

GDE Program peer review means a review carried out by an **independent suitably qualified water resources expert** which will evaluate whether the GDE Program required under Condition 22 will ensure Condition 20 will be met. As a minimum, this must include, but not be limited to a review of the adequacy of the:

- a) hydrogeology and conceptualisation, including the review of all historical monitoring data to determine trends and its ability to set appropriate **trigger values** and **limits**;
- b) groundwater flow modelling;
- c) accuracy of **GDE** surveying and characterisation;
- d) scope of groundwater, surface water and ecological monitoring;
- e) applicability and scientific robustness of **performance criteria, trigger values and limits** in meeting Condition 20;
- f) methodology for confirming exceedance of a **trigger value** or **limit**, including the area of influence; and
- g) feasibility of mitigation measures.

Where inadequacies are identified, the **independent suitably qualified water resources expert** must state what the inadequacy is, why it has occurred and what work must be taken to rectify it.

Greater Glider (*Petauroides volans*) habitat means all areas of Eucalypt forests or woodlands that contain, or have the potential to contain, hollow-bearing trees. For the impact site, the relevant habitat is shaded in yellow and designated 'Greater Glider Habitat' at Attachment D.

Groundwater Dependent Ecosystem/s (GDE/s) means **Aquatic GDEs, subterranean GDEs and terrestrial GDEs**.

Habitat quality means the baseline condition of **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** determined by ecological surveys undertaken in accordance with the **DEHP Guide**.

Habitat quality score/s means the score out of 10 which is input into the **Offsets Assessment Guide** calculator based on an assessment of the **habitat quality**, and must be consistent with the **EPBC Act Environmental Offsets Policy**. The score is a measure of how well a particular site supports a particular **listed threatened species or community** and contributes to its ongoing viability. The score consists of three components: site condition, site context and species stocking rate, as described in the **Department's Offsets Assessment Guide**.

Impact/s/ed means to suffer any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent audit means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

Independent suitably qualified water resources expert means a person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at

least one year of experience in Australia, who is independent of the **suitably qualified water resources expert**.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT habitat) means any forest or woodland (including remnant, regrowth and modified vegetation communities) containing species that are Koala food trees or any shrub land with emergent Koala food trees.

Legally secure means to secure a covenant or similar legal agreement in relation to a site; to provide enduring protection for the site against development incompatible with conservation.

Limit/s means a threshold greater than a **trigger value** that, should it be reached or exceeded, **cease work provisions** will be implemented.

Listed threatened species and communities/listed threatened species or community means a threatened species or ecological community listed under the **EPBC Act** for which this approval has effect including, but not limited to, the:

- a) South-eastern Long-eared Bat (*Nyctophilus corbeni*);
- b) Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT);
- c) Greater Glider (*Petauroides volans*); and
- d) Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Monitoring data means the data required to be recorded under the conditions of this approval.

New drilling fluid compound/s means drilling fluid compound/s that were not included in the Chemical Risk Assessment submitted to and agreed to by the **Department** in the **preliminary documentation**. However, the use of the chemical identified as “Component 3” in the tables at Attachment B of the *Gap Analysis for Chemical Risk Assessment for Drill Chemicals*, 1 March 2019, provided in the **preliminary documentation** is not agreed by the **Department**. The **chemical risk assessment** process required under Condition 17-19 of this approval must be undertaken prior to the use of the “Component 3” chemical.

New or increased impact means a new or increased environmental impact or risk relating to any **protected matter**, when compared to the likely impact of implementing the action management plan that has been approved by the **Minister** under condition 6, 7, 8, 9 or 10, including any subsequent revisions approved by the **Minister**, as outlined in the *Guidance on ‘New or Increased Impact’ relating to changes to approved management plans under EPBC Act environmental approvals (2017)*.

Offset Assessments Guide values means the offset values for the **EPBC Act** listed threatened South-eastern Long-eared Bat (*Nyctophilus corbeni*), Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) and Greater Glider (*Petauroides volans*), as shown at Attachment C.

Outcomes report peer review means a review carried out by an **independent suitably qualified water resources expert** that evaluates and interprets ongoing monitoring data and whether **trigger values**.

Patch/es means a discrete and mostly continuous area of a **GDE**; it can include small-scale variations, gaps and disturbances.

Performance criteria means specific parameters, associated with and relevant to **GDE function** or the **viability** of a **patch** of a **GDE** that will be monitored to demonstrate that the outcome of no **adverse effect** is being achieved, measured at a specific time and place.

Plan(s) means any of the documents required to be prepared, submitted, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans, pre-clearance survey reports and/or peer review terms of reference).

Preliminary documentation means the *Surat Basin Acreage Development EPBC 2018/8276 – Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, September 2019, Revision 6*, published on the **website** after 9 September 2019.

Project area means the area enclosed by the red line designated 'Project Area' in Attachment A.

Protected matter means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect.

Reinstatement and Rehabilitation Manual means the *QCLNG-Surat Basin Acreage – Remediation, Rehabilitation, Recovery and Monitoring Plan, QCQCLNG-BX00-ENV-PLN-000015, Revision 1*, May 2014, provided to the Department on 13 June 2014 as part of the preliminary documentation for EPBC 2013/7047, or subsequent revision approved by the **Minister**.

Retention area/s means an area/s (in hectares) retained within the **project area** to provide current and future habitat for **listed threatened species and communities**.

Reversed means that the **function** of **GDEs** have been reinstated to their pre-**impact** state and sustained for 10 **business days**.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

Significant Species Management Plan means the *Significant Species Management Plans, QCLNG Surat North Development Area (QCLNG-BX00-ENV-PLN-000010) Revision 0*, January 2014, approved on 5 February 2014, or subsequent revision approved by the **Minister**.

South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat means as described in the *Conservation Advice Nyctophilus corbeni South-eastern Long-eared Bat (2015)*, or subsequent revision.

Stage 1 means the construction and operation of 119 coal seam gas wells with a combined maximum peak rate of groundwater production of 10 ML per day within the area shaded in green designated 'Stage 1' in Attachment B.

Stage 2 means activities associated with the action excluding **Stage 1**.

Subterranean GDEs means aquifer ecosystems, including stygofauna.

Suitably qualified field ecologist means a person who has professional qualifications and at least three years of work experience designing and implementing surveys for **listed threatened species and communities**, and can give an authoritative assessment and advice on the presence of **listed threatened species and communities** using relevant protocols, standards, methods and/or literature. If the person does not have appropriate professional qualifications, the person must have at least five years of work experience designing and implementing surveys for **listed threatened species and communities**.

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

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

Survey Guidelines means the *Matters of National Environmental Significance, Significant Impact Guidelines 1.1*, Environment Protection and Biodiversity Conservation Act 1999 (2013), *Survey Guidelines for Australia's threatened bats* (2010), *Survey Guidelines for Australia's threatened birds* (2010), *Survey Guidelines for Australia's threatened frogs* (2010), *Survey guidelines for Australia's threatened fish* (2011), *Survey guidelines for Australia's threatened mammals* (2011), *Survey guidelines for Australia's threatened reptiles* (2011) and species-specific surveys as described in the Department's Species Profile and Threats Database profile for the relevant EPBC Act-listed threatened species.

Terrestrial GDEs means ecosystems partially or wholly dependent on the subsurface presence of groundwater.

Trigger value/s means a threshold for the **performance criteria** that, should it be reached or exceeded (either through modelling or monitoring), the approval holder will implement an appropriate management response such that a **limit** is not reached and the **trigger value** is no longer exceeded.

Viability means the ability of a **patch** of a **GDE** to sustain itself for the period for which the approval has effect.

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

PROPOSED

ATTACHMENTS

Attachment A: Project Area

Attachment B: Stage 1

Attachment C: Offset Assessment Guide values

Attachment D: Greater Glider habitat

PROPOSED

Attachment C: Offset Assessment Guide values

Relevant protected matter	South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)	Greater Glider (<i>Petauroides volans</i>)	<u>Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) threatened ecological community</u>
Impact area (ha)	80	62	62	<u>9</u>
Impact quality (1-10)	6	6	6	<u>8</u>
Time over which loss is averted (years)	20	20	20	<u>20</u>
Start area (ha)	280	220	220	<u>60</u>
Risk of loss without offset (%)	0	0	0	<u>0</u>
Risk of loss with offset (%)	0	0	0	<u>0</u>
Confidence in risk of loss result (%)	95	95	95	<u>95</u>
Time until ecological benefit (years)	20	20	20	<u>20</u>
Start quality (1-10)	7	7	7	<u>7</u>
Future quality without offset (1-10)	6	6	6	<u>6</u>
Future quality with offset (1-10)	8	8	8	<u>8</u>
Confidence in quality result (%)	90	90	90	<u>90</u>



PROPOSED APPROVAL

Surat North CSG Project, Queensland (EPBC 2018/8276)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). Note that section 134(1A) of the **EPBC Act** applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	QGC Pty Limited
ACN of approval holder	089 642 553
Action	To construct, operate and decommission up to 740 coal seam gas wells, and associated infrastructure, in the Surat Basin Acreage Development, approximately 20 km west of Wandoan in Queensland (see EPBC Act referral 2018/8276).

Proposed Approval decision

My decisions on whether or not to approve the taking of the action for the purposes of each controlling provision for the action are as follows.

Controlling Provisions

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve

Coal seam gas or large coal mining development impact on water resources	
Section 24D	Approve
Section 24E	Approve

Period for which the approval has effect

This approval has effect until 31 December 2082.

Commented [A1]: How was this date determined?

Decision-maker

Name and position	Andrew McNee Assistant Secretary of Assessments and Governance Branch Department of the Environment and Energy
Signature	PROPOSED DECISION DO NOT SIGN
Date of decision	PROPOSED DECISION - DO NOT DATE

Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

Project Area

1. For the purpose of the action, the approval holder must not undertake any activities outside the **project area**.

Disturbance Limits

2. The approval holder must not **clear** more than:
 - a) 80 ha of **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat**.
 - b) 62 ha of **Koala (*Phascolarctos cinerus*) (combined populations of Qld, NSW and the ACT) habitat**.
 - c) 62 ha of **Greater Glider (*Petauroides volans*) habitat**.
 - d) 9 ha of **Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community**.

Pre-clearance Surveys

3. The approval holder must undertake pre-clearance surveys of areas to be **cleared**.
4. Pre-clearance surveys must be undertaken by a **suitably qualified field ecologist** and undertaken in accordance with the **Department's Survey Guidelines** in effect at the time of the pre-clearance survey or other survey methodology endorsed by the **Department** in writing and provide an assessment of the habitat quality of the areas to be cleared.
5. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report which demonstrates a potential impact to listed threatened species and communities must be published on the **website** within **126** months of completion and remain published on the **website** for the period of approval. The approval holder must notify the Department within five business days of publishing each pre-clearance survey report.

Listed Threatened Species and Communities Management Plans

6. The approval holder must manage **impacts to listed threatened species and communities** that are known to occur within the **project area** in accordance with the **Significant Species Management Plan (SSMP)**.
7. If a **listed threatened species or community** which are not addressed in the **SSMP** are identified in the **project area**, the approval holder must revise the **SSMP** to include management measures to avoid and/or mitigate **impacts to that listed threatened species or community** and submit, within 3 months of identifying this **listed threatened species or community**, a copy of the revised **SSMP** to the **Minister** for written approval. The approved revised **SSMP** must be implemented.
8. The approval holder must manage to reduce/minimise **impacts to listed threatened species and communities** from pest and weed species in accordance with the **Biosecurity Control Manual**.
9. The approval holder must undertake the action in accordance with the **Reinstatement and Rehabilitation Manual, Remediation, Rehabilitation and Recovery Monitoring Plan**.
10. The approval holder must undertake the action in accordance with the **Constraints Planning and Field Development Protocol**.

Environmental Offsets

11. The approval holder must implement the approved Offset Management Plan, prepare an Offset Management Plan that details the provision of offsets in accordance with the Offset Assessment Guide values. The Offset Management Plan must:

Commented [A2]: Note that this is not referenced in Offset conditioning. Brigalow offsets have been included in the Offset Management Plan.

Commented [A3]: CRITICAL: Need to remove this additional requirement. Habitat quality has already been assessed in surveys and included in the Preliminary Documentation and in the Offset Management Plan. It is not necessary or practical to include this requirement here. Refer to further comments on Offset conditions below.

Commented [A4]: Suggest removing as this condition is not consistent with more recent approvals and moves backwards towards prescriptive conditioning. Both QGC's Anya 2015/7463 and APLNG's most recent 2017/7902 do not require the submissions of pre-clearance surveys or notifications. These can be provided upon request.

If cannot be removed, need to address:

1. Requirement to only publish survey reports which demonstrate a potential impact to MNES;
2. Additional administrative burden and compliance risks created by requiring subsequent notification to DoEE that report has been published online. This should be removed, or if not possible, requires additional time for QGC to notify DoEE – suggest 20bd.

These changes still allow for provision of the information, but significantly reduces administrative burden for both the Department and QGC.

Commented [A5]: Changed to align with actual document name. This is with the Department for approval. Definition needs to be updated below in definitions section.

Commented [A6]: CRITICAL: Suggest this condition be replaced with "The approval holder must implement the approved Offset Management Plan" as this is very prescriptive and not necessary as the OMP has already been submitted as part of the PD and is consistent with the requirements, and aligned with the OMP for the previous QGC projects which has been informed by extensive feedback from the DoEE post approvals offsets team.

Alternatively, could leave this conditions as is, subject to confirmation that the OMP will be approved at the same time as the overall project..

- a) be prepared by a suitably qualified person, and in accordance with the principles of the EPBC Act Environmental Offsets Policy and the Department's Environmental Management Plan Guidelines;
- b) demonstrate how the offsets compensate for the impacts of the action in accordance with the Offset Assessment Guide values and consistent with the EPBC Act Environmental Offsets Policy; and
- c) include, but not be limited to:
 - i. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses;
 - ii. baseline data and other supporting evidence that documents the presence and baseline quality of the South-eastern Long-eared Bat (*Nyctophilus corbenii*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat within the offset area/s;
 - iii. maps and shapefiles of the offset area/s;
 - iv. specific objectives to demonstrate South-eastern Long-eared Bat (*Nyctophilus corbenii*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat quality improvement over the life of the approval to achieve the nominated completion criteria of the Offset Management Plan;
 - v. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of the South-eastern Long-eared Bat (*Nyctophilus corbenii*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat within the offset area/s;
 - vi. key performance indicators to demonstrate the improvement to the quality of the South-eastern Long-eared Bat (*Nyctophilus corbenii*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat within the offset area/s;
 - vii. the nature, timing and frequency of monitoring to determine the success of management actions against key performance indicators;
 - viii. the timing for the provision of an annual monitoring report to the Department. The monitoring report must include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period;
 - ix. an assessment of risks that the key performance indicators will not be met and identification of the sources of those risks and strategies for managing them;
 - x. indicative corrective actions that will be implemented in the event monitoring activities indicate key performance indicators are not or are unlikely to be achieved;
 - xi. the roles and responsibilities for implementing the management actions;
 - xii.11. evidence of consistency with relevant conservation advices, recovery plans and/or threat abatement plans.
12. The approval holder must not commence groundwater extraction associated with Stage 2 unless the Minister has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.
13. The approval holder must legally secure the offset area/s proposed in the Offset Management Plan approved by the Minister within 9 months of the date of the Minister's approval of the Offset Management Plan.
14. The approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the Minister for written approval. The Revised Offset Management Plan must constitute a revision of the approved Offset Management Plan, taking

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Commented [A7]: This will occur during the life of the approval but could feasibly be achieved prior to the end date of the approval once the completion criteria are met.

Commented [A8]: CRITICAL: The OMP has already been submitted for approval as part of the PD. Remove condition.

If condition must remain, need to include additional wording re groundwater extraction to align with intent of staged approach.

account of all new information, including the results of all pre-clearance surveys. If the residual impact of the action on listed threatened species and communities is greater than that predicted in the approved Offset Management Plan, as demonstrated through the habitat quality assessment of the areas to be cleared, an offset or offsets to compensate for the additional residual impact must be provided. Any additional offset or offsets must be consistent with the EPBC Act Environmental Offsets Policy. The approval holder must implement that Revised Offset Management Plan.

15. The approval holder must legally secure the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the Minister's approval of the Revised Offset Management Plan.

Note 1: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect to impacts to each individual listed threatened species and communities being offset.

Note 2: The Minister may determine that offsets approved by the Queensland Government satisfy the requirements for offsetting listed threatened species and communities as long as any required offsets comply with the principles of the EPBC Act Environmental Offsets Policy or an equivalent Queensland Government offsets policy that ensures the maintenance and protection of listed threatened species and communities.

Chemical Risk Assessment

16. Prior to the use of any drilling fluid compound/s, the approval holder must undertake a chemical risk assessment. The chemical risk assessment must be undertaken in accordance with best practice risk assessment methodology.
17. The approval holder must not use any drilling fluid compound/s determined by the best practice risk assessment technology methodology to be high risk until the chemical risk assessment for that drilling fluid compound has been approved in writing by the Minister.
18. The approval holder must implement the approved chemical risk assessment.

Water Resources Monitoring and Management

19. The approval holder must ensure that there is no adverse effect on the function of groundwater dependent ecosystems (GDEs) in, or within 30 km of, the project area as a result of groundwater extraction for the project.
20. To ensure there is no impact-adverse effect on the function of GDEs, the approval holder must provide for the approval of the Minister:
- description and location of all identified GDEs;
 - performance criteria;
 - trigger values; and
 - limits.
21. The description and location of all identified GDEs, performance criteria, trigger values and limits must be submitted to the Minister with an accompanying GDE Program prepared by a suitably qualified water resources expert and accompanied by a peer review undertaken by an independent suitably qualified water resources expert, which explains the scientific basis on which the performance criteria, trigger values and limits have been derived to ensure that Condition 19 will be met. The terms of reference of the peer review must be approved by the Minister in writing. The GDE Program must include, and provide justification of:
- hydrogeological conceptual modelling, including local scale modelling and consideration of cumulative impacts;
 - a site-specific risk assessment;
 - past and proposed ongoing monitoring;

Commented [A9]: Condition 2 requires that the disturbance areas noted for MNES cannot be exceeded, therefore this condition is not required.

Alternatively, if the intent is to re-assess actual impacts on MNES and adjust offsets accordingly, then would require condition 2 to be modified, and also modify condition 14 to note that if the residual impact is lower than predicted, then the obligation to provide the offset must be reduced accordingly.

Commented [A10]: If condition 14 is removed, then this condition should also be removed.

Commented [A11]: CRITICAL: QGC have completed risk assessments for currently used chemicals. Need to ensure that these existing risk assessments are confirmed as approved by the Minister as part of the application process.

Commented [A12]: What is the rationale for this increasing from 10km to 30km?

Commented [A13]: CRITICAL: This must be linked to groundwater extraction activities by the approval holder.

Commented [A14]: Suggested change to achieve consistency with language in condition 19.

Commented [A15]: This condition specifies the required elements of the GDE Program and therefore forms the scope of the peer review.

- d) proposed mitigation strategy, including corrective action(s) if **trigger values** and/or **limits** are reached or exceeded and consideration of cumulative impacts;
- e) evidence to confirm **adverse effects** on the **function** of **GDEs** have not occurred or are not occurring as a result of **Stage 1** and to demonstrate that the proposed **trigger values** and **limits** have not been influenced by the **commencement of Stage 1**; and
- f) proposed reporting.
22. The approval holder must not **commence groundwater extraction associated with Stage 2** unless the description and location of all identified **GDEs, performance criteria, trigger values and limits** have been approved by the **Minister** in writing.
23. ~~If the description and location of all identified **GDEs, performance criteria, trigger values and limits** have not been approved by the **Minister** in writing within 6-12 months of the commencement of **Stage 1 groundwater extraction**, the approval holder must cease groundwater extraction until the description and location of all identified **GDEs, performance criteria, trigger values and limits** are approved by the **Minister** in writing.~~
24. The approval holder must undertake the action in accordance with the approved **performance criteria, trigger values and limits**.
25. For each 12 month period following the date of **commencement of groundwater extraction**, or in accordance with a date otherwise agreed in writing by the **Minister**, the approval holder must submit an outcomes report prepared by a **suitably qualified water resources expert** and accompanied by a peer review undertaken by an **independent suitably qualified water resources expert**, for the written acceptance of the **Minister**. ~~The scope of the peer review is to provide an assessment of compliance with Conditions 19 – 21 and 26. The terms of reference for the peer reviews must be approved by the **Minister** in writing. The approval holder must not commence the action unless the terms of reference for the peer reviews have been approved by the **Minister** in writing.~~ Each outcomes report, accompanied by the peer review, must be submitted to the **Minister** within ~~3-6~~ six months of the end of the ~~6-12~~ month period that is the subject of the outcomes report.
26. The outcomes report submitted under Condition 25 must include, but not be limited to:
- Performance against the approved **trigger values and limits**, including analysis of trends that indicate that reaching or exceeding an approved **trigger value** or **limit** is likely during or before the next reporting period.
 - Any changes to the existing regulatory arrangements in place to avoid **adverse effects** to the **function** of **GDEs**, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.
27. The **Minister** may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the **function** of **GDEs**.
28. If, on the basis of the information provided (or that has not been provided) under Condition 25 and/or Condition 27, and/or other information available to the **Minister**, the **Minister** determines that the action has had, or is likely to have, an **adverse effect** on the **function** of **GDEs**, the **Minister** may notify the approval holder in writing in accordance with the provisions of Condition 30.

Note 3: The **Minister** may throughout the life of the approval seek advice from experts, or an expert panel. As a consequence, specific matters identified through such advice may need to be addressed in the GDE Program or any outcomes report. Where such advice is sought, the approval holder will be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure reports are based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the approval.

29. If the approval holder detects that a **trigger value** has been reached or exceeded, the approval holder must report this to the **Minister** within ~~two~~ five business days of the detection. If a **trigger**

Commented [A16]: CRITICAL: Need to link this condition to groundwater extraction associated with Stage 2 wells as this is the activity that could cause a potential impact.

Commented [A17]: CRITICAL: This condition as written would completely negate the benefit of a staged approval. It would not be possible to provide the information in the required timeframe. The potential risk to be managed is associated with Stage 2, for which condition 22 is the key control to prevent any Stage 2 groundwater extraction prior to an approved GDE Program.

Commented [A18]: Compliance with conditions 19-21 and 26 are the key conditions that need to be assessed by the independent reviewer, and therefore forms the scope of the peer review. Also, the condition as written would have an immediate schedule impact and would not allow any works to commence.

Commented [A19]: CRITICAL: 3 months is not adequate time to prepare the report and have a detailed independent expert review.

Commented [A20]: CRITICAL: Updated to reflect earlier change to condition.

Commented [A21]: Adjusted to align with incident notification timeframes in other approvals. Comment applies to other conditions below also.

value is reached or exceeded, the approval holder must submit within ~~20 business days~~ **3 months** of the detection, any proposed corrective action(s) to the **Minister** in writing and demonstrate that the proposed corrective action(s) will not result in **impacts** beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the **Minister** agrees, in writing, that it will not result in **impacts** beyond the scope of the action.

Commented [A22]: CRITICAL: 3 months will be required to enable this to be effectively provided.

30. If the approval holder detects that a **limit** has been reached or exceeded, the approval holder must report this to the **Minister** within ~~one five business days~~ of the detection. The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action in the areas that have been identified to be contributing to the exceedance of the limit within 48 hours of detecting that a **limit** has been reached or exceeded, or of receiving notification that the **Minister** has determined that an **adverse effect** on the **function of GDEs** has occurred ~~or is likely to occur~~.

Commented [A23]: CRITICAL: If a limit were to be exceeded, groundwater extraction should only be ceased in the area contributing to that impact.

Commented [A24]: Suggest that this requirement should be linked to actual effect rather than the possibility of an impact occurring.

31. If the approval holder has been required to cease groundwater extraction pursuant to Condition ~~2930~~, the approval holder must not recommence groundwater extraction until the **impact** has been **reversed**, or the **Minister** has agreed, in writing, that no **adverse effect** on the **function of GDEs** has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the **Minister** in writing. Approval to recommence groundwater extraction may be subject to conditions that the **Minister** considers reasonable. The **Minister** may direct the approval holder to implement corrective action(s) at the approval holder's expense.

32. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all identified **GDEs**, **performance criteria**, **trigger values** and **limits** for the written approval of the **Minister**. The revised **performance criteria**, **trigger values** and **limits** must be in accordance with coal seam gas water management guidelines.

Commented [A25]: QGC understands that this is a reference to the proposed Joint Industry Framework.

Part B – Standard administrative conditions

Notification of date of commencement of Stage 1

33. The approval holder must notify the **Department** in writing of the date of **commencement of Stage 1** within 10 **business days** after the date of **commencement of Stage 1**.
34. If the **commencement of Stage 1** does not occur within 5 years from the date of this approval, then the approval holder must not **commence Stage 1** without the prior written agreement of the **Minister**.

Compliance records

35. The approval holder must maintain accurate and complete **compliance records**.
36. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note 4: Compliance records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department's** website or through the general media.

Preparation and publication of plans

37. The approval holder must:
- submit **plans** electronically to the **Department**;
 - publish each **plan** on the **website** within 20 **business days** of the date the **plan** is approved by the **Minister** or of the date a revised action management plan is submitted to the **Minister** or the **Department**, unless otherwise agreed to in writing by the **Minister**;
 - exclude or redact **sensitive ecological data** from **plans** published on the **website** or provided to a member of the public; and

d. keep **plans** published on the **website** until the end date of this approval.

38. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a **plan** or conditions of this approval, is prepared in accordance with the **Department's Guidelines for biological survey and mapped data** (2018) and submitted electronically to the **Department** in accordance with the requirements of the **plan** or conditions of approval.

Annual compliance reporting

39. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:

- a. publish each **compliance report** on the **website** within **60 business days** following the relevant 12 month period;
- b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within **five-20 business days** of the date of publication;
- c. keep all **compliance reports** publicly available on the **website** until this approval expires;
- d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and
- e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within **205 business days** of publication.

Note 5: **Compliance reports** may be published on the **Department's** website.

Reporting non-compliance

40. The approval holder must notify the **Department** in writing of any: **incident**; non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than **two-five business days** after becoming aware of the **incident** or non-compliance. The notification must specify:

- a. any condition which is or may be in breach;
- b. a short description of the **incident** and/or non-compliance; and
- c. the location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.

41. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than **10-20 business days** after becoming aware of the **incident** or non-compliance, specifying:

- a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;
- b. the potential impacts of the **incident** or non-compliance; and
- c. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

42. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted **for the 12 month period from the date of this approval and for every subsequent 12 period, or as otherwise as** requested in writing by the **Minister**.

43. For each **independent audit**, the approval holder must:

Commented [A26]: Need to discuss as there seems to be duplication of reporting requirements with the outcomes report.

Commented [A27]: This timing does not align with the timeframe required to prepare the peer-reviewed outcomes report.

Commented [A28]: Consistent with other approvals – Anya, Pipeline, LNG Facility...

Commented [A29]: Consistent with 2013/7047 existing condition.

Commented [A30]: CRITICAL: Independently auditing every 12 months has significant time, financial and administrative burdens. The key risk area associated with this approval is already extensively covered by the requirement to submit an independently peer reviewed annual outcomes report. Suggest modifying to align with the existing approval (2013/7047) where an independent audit be completed upon request by the Minister.

- a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;
 - b. only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and
 - c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.
44. The approval holder must publish the audit report on the **website** within **2019 business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.

Revision of action management plans

45. The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister** under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the **EPBC Act**. If the **Minister** approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.
46. The approval holder may choose to revise an action management plan approved by the **Minister** under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the RAMP would not be likely to have a **new or increased impact**.
47. If the approval holder makes the choice under condition 46 to revise an action management plan without submitting it for approval, the approval holder must:
- a. notify the **Department** in writing that the approved action management plan has been revised and provide the **Department** with:
 - i. an electronic copy of the RAMP;
 - ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;
 - iii. an explanation of the differences between the approved action management plan and the RAMP;
 - iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a **new or increased impact**; and
 - v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least **20 business days** after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the **Department**.
 - b. subject to condition 46, implement the RAMP from the RAMP implementation date.
48. The approval holder may revoke their choice to implement a RAMP under condition 46 at any time by giving written notice to the **Department**. If the approval holder revokes the choice under condition 46, the approval holder must implement the action management plan in force immediately prior to the revision undertaken under condition 46.
49. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the RAMP would be likely to have a **new or increased impact**, then:
- a. condition 46 does not apply, or ceases to apply, in relation to the RAMP; and
 - b. the approval holder must implement the action management plan specified by the **Minister** in the notice.

50. At the time of giving the notice under condition 49 the **Minister** may also notify that for a specified period of time, condition 46 does not apply for one or more specified action management plans.

Note 6: conditions 4, 47, 48 and 49 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised action management plan, at any time, to the **Minister** for approval.

Commented [A31]: Should this refer to a different condition?

Completion of the action

51. Within 30 days after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

In these conditions, except where contrary intention is expressed, the following definitions are used:

Adverse effect/s means an exceedance of a **limit** as a result of the project.

Aquatic GDEs means ecosystems dependent on the surface expression of groundwater, including:

- river baseflow systems, aquatic and riparian ecosystems that exist in or adjacent to streams (including the hyporheic zone) which are fed by groundwater; and
- wetlands (aquatic communities and fringing vegetation dependent on groundwater-fed lakes and wetlands), including palustrine and lacustrine wetlands that receive groundwater discharge and spring and swamp ecosystems.

Best practice risk assessment methodology means a risk assessment in accordance with best practice national or international standards and guidelines including, but not limited to:

- a) US EPA (2014). EPA-Expo-Box (A Toolbox for Exposure Assessors), or subsequent revision.
- b) OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management, or subsequent revision.

Biosecurity Control Manual means the *HSSE Risk Control Manual: Biosecurity*, QCQGC-BX00-ENV-MAN-000002, Revision 4, May 2018, approved on 15 May 2018, or subsequent revision approved by the **Minister**.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community means the EPBC listed threatened ecological community as described in the *Approved Conservation Advice for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community* (2013), or subsequent revision.

Business day/s means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Cease work provisions means a protocol to promptly discontinue all aspects of the action which have the potential to cause any impact to the **function** of **GDEs** and to urgently implement corrective action to reduce **performance criteria** below **limits** and **trigger values**.

Chemical risk assessment means an assessment prepared by a **suitably qualified person** to assess the risk of chemicals used in drilling operations for coal seam gas extraction on **protected matters**.

Clear/ed/ing means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Coal seam gas water management guidelines means any **Departmental** policies, guidance or agreements that relate to coal seam gas water management and/or monitoring.

Commencement of clearing means the first instance of any cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Commence/ment of Stage 1 means the first instance of any specified activity associated with **Stage 1** including clearing of vegetation and **construction** of any infrastructure. **Commencement of Stage 1** does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs;
- ii. install signage and /or temporary fencing to prevent unapproved use of the project area;
- iii. protect environmental and property assets from fire, weeds and pests, including **construction** of fencing, and maintenance of existing surface access tracks; and
- iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters**.

~~Commence/ment of Stage 2 means the first instance of any specified activity associated with Stage 2 including clearing of vegetation and construction of any infrastructure.~~

Commencement of groundwater extraction means the first instance of groundwater extraction.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department's** preferred spatial data format is **shapefile**. **Completion data** includes information detailing the date, location, approved project area, and actual total **cleared area/s**, total area and type of **listed and threatened species and communities** habitat **cleared** within the project area, **listed threatened species and communities habitat quality** within **retention area/s**, actual total **retention area/s**, the type of **listed threatened species and communities** habitat within **retention area/s**, actual total area of **listed threatened species and communities** habitat and the **habitat quality** within the offset area/s required under Conditions 11 and 14.

Completion of the action means all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

- i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;
- ii. consistent with the **Department's Annual Compliance Report Guidelines (2014)**;
- iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and
- iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Constraints Planning and Field Development Protocol means the *Constraints Planning and Field Development Protocol – Surat Basin Acreage Revision 2*, November 2017, approved on 4 January 2018, or subsequent revision approved by the **Minister**.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Commented [A32]: Suggest no longer required due to proposed addition of "groundwater extraction associated with stage 2" to conditions above.

Department/al means the Australian Government agency responsible for administering the EPBC Act.

Drilling fluid compound/s means the drilling fluid compound/s that were listed in the **preliminary documentation**, and any drilling fluid compound/s that were not listed in the **preliminary documentation**.

Environmental Management Plan Guidelines means the *Environmental Management Plan Guidelines* (2014), or subsequent revision.

Environmental Offsets Policy means the EPBC Act *Environmental Offsets Policy* (2012), or any subsequent revision, including the Offset Assessment Guide.

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

Function means the groundwater, surface water and ecosystem components (including organisms), processes and benefits/services that characterise and support the occurrence of the GDE, including support for biological diversity or species composition.

Greater Glider (*Petauroides volans*) habitat means [an area where the species is known or considered likely to occur and that contains all habitat values known to be required to support the species, as described in published literature all areas of Eucalypt forests or woodlands that contain, or have the potential to contain, hollow bearing trees.](#)

Groundwater Dependent Ecosystem/s (GDE/s) means **Aquatic GDEs, subterranean GDEs and terrestrial GDEs.**

Habitat quality is a measure of how well the **project area** and/or offset area/s supports **listed threatened species and communities** and contributes to its ongoing viability, relative to the baseline **habitat quality** data provided in Offset Management Plan. The measure of habitat quality should include site condition, site context and species individual or population persistence.

High risk means a product or chemical compound whose solubility allows the potential to enter the environment, and/or is considered hazardous based on its health hazard criteria, environmental hazard criteria and whether it has been identified as a pollutant, contaminant or hazardous good under Australian legislation or regulations.

Impact/s/ed means to suffer any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent audit: means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

Independent suitably qualified water resources expert means a person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia, who is independent of the **suitably qualified water resources expert**.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT habitat means [that as described in EPBC Act referral guidelines for the vulnerable koala \(combined populations of Qld, NSW and the ACT\), Commonwealth of Australia, 2014, or subsequent revision any forest or woodland \(including remnant, regrowth and modified vegetation communities\) containing species that are Koala food trees or any shrub land with emergent Koala food trees.](#)

Legally secure means to secure a covenant or similar legal agreement in relation to a site; to provide enduring protection for the site against development incompatible with conservation.

Commented [A33]: CRITICAL: Suggest a definition that is consistent with the approach taken for south-eastern long-eared bat habitat definition (i.e. reference to conservation advice), but understand that an alternative approach may be required for Greater Glider at this stage. Have suggested suitable alternative.

Commented [A34]: This is consistent with QGC's Anya referral and consistent with assessments provided in QGC's preliminary documentation.

Limit/s means a threshold greater than a **trigger value** that, should it be reached or exceeded ~~(either through modelling or monitoring)~~, **cease work provisions** will be implemented.

Commented [A35]: CRITICAL: Modelling will inform trigger values, but limits will require monitoring to validate.

Listed threatened species and communities/listed threatened species or community means a threatened species or ecological community listed under the **EPBC Act** for which this approval has effect including, but not limited to, the:

- a) South-eastern Long-eared Bat (*Nyctophilus corbeni*);
- b) Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT);
- c) Greater Glider (*Petauroides volans*); and
- d) Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Monitoring data means the data required to be recorded under the conditions of this approval.

Commented [A36]: Very open-ended and potentially onerous requirement. What reasonable limitations can be placed on this definition?

New or increased impact means a new or increased environmental impact or risk relating to any **protected matter**, when compared to the likely impact of implementing the action management plan that has been approved by the **Minister** under condition 6, 7, 8, 9 or 10, including any subsequent revisions approved by the **Minister**, as outlined in the *Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017)*.

Offset Assessments Guide values means the offset values for the **EPBC Act** listed threatened South-eastern Long-eared Bat (*Nyctophilus corbeni*), Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) and Greater Glider (*Petauroides volans*), as shown at **Attachment C**.

Performance criteria means specific parameters, associated with and relevant to **GDE function** that will be monitored to demonstrate that the outcome of no adverse impact is being achieved, measured at a specific time and place.

Plan(s) means any of the documents required to be prepared, submitted, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans, pre-clearance survey reports and/or peer review terms of reference).

Preliminary documentation means the *Surat Basin Acreage Development EPBC 2018/8276 – Final Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, July-September 2019, Revision 46*, provided to the Department on ~~8 July~~ 9 September 2019.

Commented [A37]: Updated to reflect final version which went out for public comment.

Project area means the area enclosed by the red line designated 'Project Area' in **Attachment A**.

Protected matter means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect.

Remediation, Rehabilitation and Recovery Monitoring Plan means the *QCLNG Gasfields-Surat Basin Acreage – Remediation, Rehabilitation, Recovery and Monitoring Plan, QCQGC-BX00-ENV-PLN-000015, Revision 1, May 2014* *QCLNG-BX00-ENV-PLN-000026, Revision 2, October 2011*, ~~approved provided to the Department on 20 October 2011~~ June 2014 under EPBC Act approval ~~2008/4398/2013/7047~~, or subsequent revision approved by the **Minister**.

Commented [A38]: Need to update to Reinstatement and Rehabilitation Manual upon approval by the Department.

Retention area/s means an area/s (in hectares) retained within the **project area** to provide current and future habitat for **listed threatened species and communities**.

Reversed means that the **function** of **GDEs** have been reinstated to their pre-**impact** state and sustained for 10 **business days**.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

Significant Species Management Plan means the *Significant Species Management Plans*, [QCLNG Gas-Field Surat North Development Area \(QCLNG-BX00-ENV-PLN-000010\) Revision 0](#), January 2014, approved on 5 February 2014, or subsequent revision approved by the **Minister**.

South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat means as described in the *Conservation Advice Nyctophilus corbeni South-eastern Long-eared Bat (2015)*, or subsequent revision.

Stage 1 means the construction and operation of 119 coal seam gas wells with a combined maximum peak rate of groundwater production of 10 ML per day within the area shaded in green designated 'Stage 1' in [Attachment B](#).

Stage 2 means activities associated with the action excluding **Stage 1**.

Subterranean GDEs means aquifer ecosystems, including stygofauna.

Suitably qualified field ecologist means a person who has professional qualifications and at least three years of work experience designing and implementing surveys for **listed threatened species and communities**, and can give an authoritative assessment and advice on the presence of **listed threatened species and communities** using relevant protocols, standards, methods and/or literature. If the person does not have appropriate professional qualifications, the person must have at least five years of work experience designing and implementing surveys for **listed threatened species and communities**.

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

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

Survey Guidelines means the *Matters of National Environmental Significance, Significant Impact Guidelines 1.1*, Environment Protection and Biodiversity Conservation Act 1999 (2013), *Survey Guidelines for Australia's threatened bats* (2010), *Survey Guidelines for Australia's threatened birds* (2010), *Survey Guidelines for Australia's threatened frogs* (2010), *Survey guidelines for Australia's threatened fish* (2011), *Survey guidelines for Australia's threatened mammals* (2011), *Survey guidelines for Australia's threatened reptiles* (2011) and species-specific surveys as described in the Department's Species Profile and Threats Database profile for the relevant EPBC Act-listed threatened species.

Terrestrial GDEs means ecosystems partially or wholly dependent on the subsurface presence of groundwater.

Trigger value/s means a threshold for the **performance criteria** that, should it be reached or exceeded (either through modelling or monitoring), the approval holder will implement an appropriate management response such that a **limit** is not reached and the **trigger value** is no longer exceeded. [A trigger value or limit is not considered to have been reached or exceeded if it has been shown to be caused by:](#)

Commented [A39]: CRITICAL: Need to discuss how to capture that there will be some infill wells within the existing operational area.

- [Measurement error or instrument drift, or](#)
- [Other anthropogenic or climatic influences identified by trend analysis or by comparison to a reference site \(analysis methodology and reference sites to be defined in the approved GDE Program\).](#)

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

Commented [A40]: CRITICAL: Need to ensure that "false positives" are screened out.

PROPOSED

ATTACHMENTS

Attachment A: Project Area

Attachment B: Stage 1

Attachment C: Offset Assessment Guide values

PROPOSED

Attachment C: Offset Assessment Guide values

Commented [A41]: CRITICAL: Need OMP to be approved as part of this decision.

Relevant protected matter	South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)	Greater Glider (<i>Petauroides volans</i>)
Impact area (ha)	80	62	62
Impact quality (1-10)	6	6	6
Time over which loss is averted (years)	20	20	20
Start area (ha)	280	220	220
Risk of loss without offset (%)	0	0	0
Risk of loss with offset (%)	0	0	0
Confidence in risk of loss result (%)	95	95	95
Time until ecological benefit (years)	20	20	20
Start quality (1-10)	7	7	7
Future quality without offset (1-10)	6	6	6
Future quality with offset (1-10)	8	8	8
Confidence in quality result (%)	90	90	90



PROPOSED APPROVAL

Surat North CSG Project, Queensland (EPBC 2018/8276)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). Note that section 134(1A) of the **EPBC Act** applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	QGC Pty Limited
ACN of approval holder	089 642 553
Action	To construct, operate and decommission up to 740 coal seam gas wells, and associated infrastructure, in the Surat Basin Acreage Development, approximately 20 km west of Wandoan in Queensland (see EPBC Act referral 2018/8276).

Proposed Approval decision

My decisions on whether or not to approve the taking of the action for the purposes of each controlling provision for the action are as follows.

Controlling Provisions

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve

Coal seam gas or large coal mining development impact on water resources	
Section 24D	Approve
Section 24E	Approve

Period for which the approval has effect

This approval has effect until 31 December 2082.

Decision-maker

Name and position	Andrew McNee Assistant Secretary of Assessments and Governance Branch Department of the Environment and Energy
Signature	PROPOSED DECISION DO NOT SIGN
Date of decision	PROPOSED DECISION - DO NOT DATE

Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

Project Area

1. For the purpose of the action, the approval holder must not take any activities outside the project area.

Commented [A1]: Should this be “undertake any activities”, or “take any action”?

Disturbance Limits

2. The approval holder must not clear more than:
 - a) 80 ha of **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat.**
 - b) 62 ha of **Koala (*Phascolarctos cinerus*) (combined populations of Qld, NSW and the ACT) habitat.**
 - c) 62 ha of **Greater Glider (*Petauroides volans*) habitat.**
 - d) 9 ha of **Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.**

Pre-clearance Surveys

3. The approval holder must undertake pre-clearance surveys of areas to be cleared prior to clearing.
4. Pre-clearance surveys must be undertaken by a **suitably qualified field ecologist** and undertaken in accordance with the **Department’s Survey Guidelines** in effect at the time of the pre-clearance survey or other survey methodology endorsed by the **Department** in writing ~~and provide an assessment of the habitat quality of the areas to be cleared.~~
5. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report which demonstrates a potential **impact to listed threatened species and communities** as a result of **clearing** must be published on the **website** within 6 months of completion and remain published on the **website** for the period of approval. The approval holder must notify the **Department** within five **business days** of publishing each pre-clearance survey report.

Commented [A2]: Need to remove from here based on discussion of existing habitat quality data availability and offset requirements.

Listed Threatened Species and Communities Management Plans

6. The approval holder must manage **impacts to listed threatened species and communities** that are known to occur within the **project area** in accordance with the **Significant Species Management Plan (SSMP)**.
7. If a **listed threatened species or community** which are not addressed in the **SSMP** are identified in the **project area**, the approval holder must revise the **SSMP** to include management measures to avoid and/or mitigate **impacts** to that **listed threatened species or community** and submit, within 3 months of identifying this **listed threatened species or community**, a copy of the revised **SSMP** to the **Minister** for written approval. The approved revised **SSMP** must be implemented.
8. The approval holder must manage to reduce/minimise **impacts to listed threatened species and communities** from pest and weed species in accordance with the **Biosecurity Control Manual**.
9. The approval holder must undertake the action in accordance with the **Reinstatement and Rehabilitation Manual**.
10. The approval holder must undertake the action in accordance with the **Constraints Planning and Field Development Protocol**.

Environmental Offsets

11. The approval holder must prepare an Offset Management Plan that details the provision of offsets in accordance with the **Offset Assessment Guide values**. The Offset Management Plan must:

Commented [A3]: Conditions 11-15 require further discussion. QGC will review proposed alternative conditions provided by DoEE today.

- a) be prepared by a **suitably qualified person**, and in accordance with the principles of the **EPBC Act Environmental Offsets Policy** and the **Department's Environmental Management Plan Guidelines**;
- b) demonstrate how the offsets compensate for the **impacts** of the action in accordance with the **Offset Assessment Guide values** and consistent with the **EPBC Act Environmental Offsets Policy**; and
- c) include, but not be limited to:
 - i. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses;
 - ii. baseline data and other supporting evidence that documents the presence and baseline quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** within the offset area/s;
 - iii. maps and **shapefiles** of the offset area/s;
 - iv. specific objectives to demonstrate **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** quality improvement over the life of the approval;
 - v. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** within the offset area/s;
 - vi. key performance indicators to demonstrate the improvement to the quality of the **South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat, Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (*Petauroides volans*) habitat** within the offset area/s;
 - vii. the nature, timing and frequency of monitoring to determine the success of management actions against key performance indicators;
 - viii. the timing for the provision of an annual monitoring report to the **Department**. The monitoring report must include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period;
 - ix. an assessment of risks that the key performance indicators will not be met and identification of the sources of those risks and strategies for managing them;
 - x. indicative corrective actions that will be implemented in the event monitoring activities indicate key performance indicators are not or are unlikely to be achieved;
 - xi. the roles and responsibilities for implementing the management actions;
 - xii. evidence of consistency with relevant conservation advices, recovery plans and/or threat abatement plans.
12. The approval holder must not **commence clearing** associated with **Stage 2** unless the **Minister** has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.
13. The approval holder must **legally secure** the offset area/s proposed in the Offset Management Plan approved by the **Minister** within 9 months of the date of the **Minister's** approval of the Offset Management Plan.
14. The approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the **Minister** for written approval. The Revised Offset

Management Plan must constitute a revision of the approved Offset Management Plan, taking account of all new information, including the results of all pre-clearance surveys. If the residual **impact** of the action on **listed threatened species and communities** is greater than that predicted in the approved Offset Management Plan, as demonstrated through the **habitat quality** assessment of the areas to be **cleared**, an offset or offsets to compensate for the additional residual **impact** must be provided. Any additional offset or offsets must be consistent with the **EPBC Act Environmental Offsets Policy**. The approval holder must implement that Revised Offset Management Plan.

15. The approval holder must **legally secure** the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the **Minister's** approval of the Revised Offset Management Plan.

Note 1: Offsets for some species may be accommodated within ecological communities or overlap State approval requirements or other species habitat requirements, as long as they meet the requirements of these conditions of approval in respect to impacts to each individual **listed threatened species and communities** being offset.

Note 2: The **Minister** may determine that offsets approved by the Queensland Government satisfy the requirements for offsetting **listed threatened species and communities** as long as any required offsets comply with the principles of the **EPBC Act Environmental Offsets Policy** or an equivalent Queensland Government offsets policy that ensures the maintenance and protection of **listed threatened species and communities**.

Chemical Risk Assessment

16. Prior to the use of any **new drilling fluid compound/s**, the approval holder must undertake a **chemical risk assessment**. The **chemical risk assessment** must be undertaken in accordance with **best practice risk assessment methodology**.
17. The approval holder must not use any **new drilling fluid compound/s** determined by the **best practice risk assessment methodology** to be high risk until the **chemical risk assessment** for that **new drilling fluid compound** has been approved in writing by the **Minister**. For any **new drilling fluid compound** identified as medium or high hazard, the **chemical risk assessment** must be provided to the **Minister** prior to the use of the **new drilling fluid compound**.
18. The approval holder must implement the approved **chemical risk assessment**.

Groundwater Dependent Ecosystem Monitoring and Management

19. The approval holder must ensure that there is no **adverse effect** on the **function** of **groundwater dependent ecosystems (GDEs)** in, or within 30 km of, the **project area** as a result of the project.
20. To ensure there is no **adverse effect** on the **function** of **GDEs**, the approval holder must provide for the approval of the **Minister**:
 - a) description and location of all **GDEs**;
 - b) **performance criteria**;
 - c) **trigger values**; and
 - d) **limits**.
21. The description and location of all **GDEs**, **performance criteria**, **trigger values** and **limits** must be submitted to the **Minister** with an accompanying GDE Program prepared by a **suitably qualified water resources expert** and accompanied by a **GDE Program peer review** undertaken by an **independent suitably qualified water resources expert**, which explains the scientific basis on which the description and location of all **GDEs**, **performance criteria**, **trigger values** and **limits** have been derived to ensure that Condition 19 will be met. The GDE Program must include, and provide justification of:
 - a) hydrogeological conceptual modelling, including an ecohydrological model incorporating the stressor-response relationships for all **GDEs**, local scale numerical modelling and consideration of cumulative impacts;
 - b) a site-specific risk assessment;

- c) past and proposed ongoing monitoring;
 - d) the procedure/methodology used to detect whether a **trigger value** and/or **limit** has been reached or exceeded;
 - e) proposed mitigation strategy, including corrective action(s) if **trigger values** and/or **limits** are reached or exceeded and consideration of cumulative impacts;
 - f) evidence to confirm **adverse effects** on the **function** of **GDEs** have not occurred or are not occurring as a result of **Stage 1** and to demonstrate that the proposed **trigger values** and **limits** have not been influenced by the **commencement of Stage 1**; and
 - g) proposed reporting.
22. The approval holder must not **commence groundwater extraction** associated with **Stage 2** unless the description and location of all **GDEs, performance criteria, trigger values** and **limits** have been approved by the **Minister** in writing.
23. The description and location of all **patches of GDEs, performance criteria, trigger values** and **limits** must be provided to the **Minister** for written approval within 6 months of the **commencement of groundwater extraction associated with Stage 1**. The approval holder not **commence groundwater extraction** associated with **Stage 2** until the description and location of all **GDEs, performance criteria, trigger values** and **limits** are approved by the **Minister** in writing.
24. The approval holder must undertake the action in accordance with the approved **performance criteria, trigger values** and **limits**.
25. For each 12 month period following the date of **commencement of groundwater extraction**, or in accordance with a date otherwise agreed in writing by the **Minister**, the approval holder must submit an outcomes report prepared by a **suitably qualified water resources expert** and accompanied by an **outcomes report peer review** undertaken by an **independent suitably qualified water resources expert**, for the written acceptance of the **Minister**. Each outcomes report, accompanied by the **peer review**, must be submitted to the **Minister** within 6 months of the end of the 12 month period that is the subject of the outcomes report.
26. The outcomes report submitted under Condition 25 must include, but not be limited to:
- a) Performance against the approved **trigger values** and **limits**, including analysis of trends that indicate that reaching or exceeding an approved **trigger value** or **limit** is likely during or before the next reporting period
 - b) Any changes to the existing regulatory arrangements in place to avoid **adverse effects** to the **function** of **GDEs**, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.
27. The **Minister** may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the **function** of **GDEs**.
28. If, on the basis of the information provided (or that has not been provided) under Condition 25 and/or Condition 27, and/or other information available to the **Minister**, the **Minister** determines that the action has had, or is likely to have, an **adverse effect** on the **function** of **GDEs**, the **Minister** may notify the approval holder in writing in accordance with the provisions of Condition 30.

Note 3: The **Minister** may throughout the life of the approval seek advice from experts, or an expert panel. As a consequence, specific matters identified through such advice may need to be addressed in the GDE Program or any outcomes report. Where such advice is sought, the approval holder will be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure reports are based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes available over the life of the approval.

29. If the approval holder detects that a **trigger value** has been reached or exceeded, the approval holder must report this to the **Minister** within **two-five business days** of the detection. If a **trigger**

Commented [A4]: Need to include reference to groundwater extraction – agreed in previous meeting.

Commented [A5]: Agreed in previous meeting.

value is reached or exceeded, the approval holder must submit within 3 months of the detection, any proposed corrective action(s) to the **Minister** in writing and demonstrate that the proposed corrective action(s) will not result in **impacts** beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the **Minister** agrees, in writing, that it will not result in **impacts** beyond the scope of the action.

30. If the approval holder detects that a **limit** has been reached or exceeded, the approval holder must report this to the **Minister** within one **business day** of the detection. The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action [in the areas that have been identified to be contributing to the exceedance of the limit](#) within 48 hours of detecting that a **limit** has been reached or exceeded, or of receiving notification that the **Minister** has determined that an **adverse effect** on the **function of GDEs** has occurred or is likely to occur.
31. If the approval holder has been required to cease groundwater extraction pursuant to Condition 30, the approval holder must not recommence groundwater extraction until the **impact** has been **reversed**, or the **Minister** has agreed, in writing, that no **adverse effect** on the **function of GDEs** has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the **Minister** in writing. Approval to recommence groundwater extraction may be subject to conditions that the **Minister** considers reasonable. The **Minister** may direct the approval holder to implement corrective action(s) at the approval holder's expense.
32. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all **GDEs**, **performance criteria**, **trigger values** and **limits** for the written approval of the **Minister**. The revised **performance criteria**, **trigger values** and **limits** must be in accordance with **coal seam gas water management guidelines**.

Commented [A6]: Need to include this additional statement – this was agreed in the previous meeting.

Part B – Standard administrative conditions

Notification of date of commencement of Stage 1

33. The approval holder must notify the **Department** in writing of the date of **commencement of Stage 1** within 10 **business days** after the date of **commencement of Stage 1**.
34. If the **commencement of Stage 1** does not occur within 5 years from the date of this approval, then the approval holder must not **commence Stage 1** without the prior written agreement of the **Minister**.

Compliance records

35. The approval holder must maintain accurate and complete **compliance records**.
36. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note 4: Compliance records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department's** website or through the general media.

Preparation and publication of plans

37. The approval holder must:
 - a. submit **plans** electronically to the **Department**;
 - b. publish each **plan** on the **website** within 20 **business days** of the date the **plan** is approved by the **Minister** or of the date a revised action management plan is submitted to the **Minister** or the **Department**, unless otherwise agreed to in writing by the **Minister**;
 - c. exclude or redact **sensitive ecological data** from **plans** published on the **website** or provided to a member of the public; and

- d. keep **plans** published on the **website** until the end date of this approval.
38. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a **plan** or conditions of this approval, is prepared in accordance with the **Department's Guidelines for biological survey and mapped data** (2018) and submitted electronically to the **Department** in accordance with the requirements of the **plan** or conditions of approval.

Annual compliance reporting

39. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:
- a. publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;
 - b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within five **business days** of the date of publication;
 - c. keep all **compliance reports** publicly available on the **website** until this approval expires;
 - d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and
 - e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within five **business days** of publication.

Note 5: **Compliance reports** may be published on the **Department's** website.

Reporting non-compliance

40. The approval holder must notify the **Department** in writing of any: **incident**; non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than two **business days** after becoming aware of the **incident** or non-compliance. The notification must specify:
- a. any condition which is or may be in breach;
 - b. a short description of the **incident** and/or non-compliance; and
 - c. the location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.
41. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying:
- a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;
 - b. the potential impacts of the **incident** or non-compliance; and
 - c. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

42. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted for the 12 month period from the date of this approval and for every subsequent 12 period every 12 months for a period of 5 years from the date of the approval. After this 5 year period, the approval holder must ensure that independent audits of compliance with the conditions are conducted, or as otherwise as requested in writing by the **Minister**.

Commented [A7]: The key risk area associated with this approval is already extensively covered by the requirement to submit an independently peer reviewed annual outcomes report. This proposed change will also ensure consistency with existing approval 2013/7047.

43. For each **independent audit**, the approval holder must:
- a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;
 - b. only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and
 - c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.
44. The approval holder must publish the audit report on the **website** within 10 **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.

Revision of action management plans

45. The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister** under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the **EPBC Act**. If the **Minister** approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.
46. The approval holder may choose to revise an action management plan approved by the **Minister** under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the RAMP would not be likely to have a **new or increased impact**.
47. If the approval holder makes the choice under condition 46 to revise an action management plan without submitting it for approval, the approval holder must:
- a. notify the **Department** in writing that the approved action management plan has been revised and provide the **Department** with:
 - i. an electronic copy of the RAMP;
 - ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;
 - iii. an explanation of the differences between the approved action management plan and the RAMP;
 - iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a **new or increased impact**; and
 - v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 **business days** after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the **Department**.
 - b. subject to condition 46, implement the RAMP from the RAMP implementation date.
48. The approval holder may revoke their choice to implement a RAMP under condition 46 at any time by giving written notice to the **Department**. If the approval holder revokes the choice under condition 46, the approval holder must implement the action management plan in force immediately prior to the revision undertaken under condition 46.
49. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the RAMP would be likely to have a **new or increased impact**, then:
- a. condition 46 does not apply, or ceases to apply, in relation to the RAMP; and

- b. the approval holder must implement the action management plan specified by the **Minister** in the notice.

50. At the time of giving the notice under condition 49 the **Minister** may also notify that for a specified period of time, condition 46 does not apply for one or more specified action management plans.

Note 6: conditions 4, 47, 48 and 49 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised action management plan, at any time, to the **Minister** for approval.

Completion of the action

51. Within 30 days after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

In these conditions, except where contrary intention is expressed, the following definitions are used:

Adverse effect/s means an exceedance of a **limit** as a result of the project.

Aquatic GDEs means ecosystems dependent on the surface expression of groundwater, including:

- river baseflow systems, aquatic and riparian ecosystems that exist in or adjacent to streams (including the hyporheic zone) which are fed by groundwater; and
- wetlands (aquatic communities and fringing vegetation dependent on groundwater-fed lakes and wetlands), including palustrine and lacustrine wetlands that receive groundwater discharge and spring and swamp ecosystems.

Best practice risk assessment methodology means a risk assessment in accordance with best practice national or international standards and guidelines including, but not limited to:

- a) US EPA (2014). EPA-Expo-Box (A Toolbox for Exposure Assessors), or subsequent revision.
- b) OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management, or subsequent revision.

Biosecurity Control Manual means the *HSSE Risk Control Manual, QCQGC-BX00-ENV-MAN-000002, Revision 4*, May 2018, approved on 15 May 2018, or subsequent revision approved by the **Minister**.

Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community means the EPBC listed threatened ecological community as described in the *Approved Conservation Advice for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community* (2013), or subsequent revision.

Business day/s means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Cease work provisions means a protocol to promptly discontinue all aspects of the action which have the potential to cause any impact to the **function** of **GDEs** and to urgently implement corrective action to reduce **performance criteria** below **limits** and **trigger values**.

Chemical risk assessment means an assessment prepared by a **suitably qualified person** to assess the risk of chemicals used in drilling operations for coal seam gas extraction on **protected matters**.

Clear/ed/ing means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Coal seam gas water management guidelines means any **Departmental** policies, guidance or agreements that relate to coal seam gas water management and/or monitoring.

Commencement of clearing means the first instance of any cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Commence/ment of Stage 1 means the first instance of any specified activity associated with **Stage 1** including clearing of vegetation and **construction** of any infrastructure. **Commencement of Stage 1** does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs;
- ii. install signage and /or temporary fencing to prevent unapproved use of the project area;
- iii. protect environmental and property assets from fire, weeds and pests, including **construction** of fencing, and maintenance of existing surface access tracks; and
- iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters**.

Commence/ment of Stage 2 means the first instance of any specified activity associated with **Stage 2** including clearing of vegetation and **construction** of any infrastructure.

Commence/ment of groundwater extraction means the first instance of groundwater extraction.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department's** preferred spatial data format is **shapefile**. **Completion data** includes information detailing the date, location, approved project area, and actual total **cleared area/s**, total area and type of **listed and threatened species and communities** habitat **cleared** within the project area, **listed threatened species and communities habitat quality** within **retention area/s**, actual total **retention area/s**, the type of **listed threatened species and communities** habitat within **retention area/s**, actual total area of **listed threatened species and communities** habitat and the **habitat quality** within the offset area/s required under Conditions 11 and 14.

Completion of the action means all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

- i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;
- ii. consistent with the **Department's Annual Compliance Report Guidelines** (2014);
- iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and
- iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Constraints Planning and Field Development Protocol means the *Constraints Planning and Field Development Protocol – Surat Basin Acreage Revision 2*, November 2017, approved on 4 January 2018, or subsequent revision approved by the **Minister**.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Department/al means the Australian Government agency responsible for administering the **EPBC Act**.

Environmental Management Plan Guidelines means the *Environmental Management Plan Guidelines* (2014), or subsequent revision.

Environmental Offsets Policy means the **EPBC Act** *Environmental Offsets Policy* (2012), or any subsequent revision, including the Offset Assessment Guide.

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

Function means the groundwater, surface water and ecosystem components (including organisms), processes and benefits/services that characterise and support the occurrence of the **GDE**, including support for biological diversity or species composition.

GDE Program peer review means a review carried out by an **independent suitably qualified water resources expert** which will evaluate whether the GDE Program required under Condition 21 will ensure Condition 19 will be met. As a minimum, this must include, but not be limited to a review of the adequacy of the:

- a) hydrogeology and conceptualisation, including the review of all historical monitoring data to determine trends and its ability to set appropriate **trigger values and limits**;
- b) groundwater flow modelling;
- c) accuracy of **GDE** surveying and characterisation;
- d) scope of groundwater, surface water and ecological monitoring;
- e) applicability and scientific robustness of **performance criteria, trigger values and limits** in meeting Condition 19;
- f) methodology for confirming exceedance of a **trigger value or limit**, including the area of influence; and
- g) feasibility of mitigation measures.

Where inadequacies are identified, the **independent suitably qualified water resources expert** must state what the inadequacy is, why it has occurred and what work must be taken to rectify it.

Greater Glider (*Petauroides volans*) habitat means an area where the species is known or considered likely to occur and that contains all habitat values known to be required to support the species, as described in published literature ~~all areas of Eucalypt forests or woodlands that contain, or have the potential to contain, hollow-bearing trees.~~

Groundwater Dependent Ecosystem/s (GDE/s) means **Aquatic GDEs, subterranean GDEs and terrestrial GDEs**.

Habitat quality is a measure of how well the **project area** and/or offset area/s supports **listed threatened species and communities** and contributes to its ongoing viability, relative to the baseline **habitat quality** data provided in Offset Management Plan. The measure of habitat quality should include site condition, site context and species individual or population persistence.

Impact/s/ed means to suffer any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent audit means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

Commented [A8]: Need to amend definition as current wording is too broad, and would not be reflective of actual habitat.

Independent suitably qualified water resources expert means a person with at least a postgraduate degree (or equivalent) in a suitable area (such as hydrology or hydrogeology) and a minimum of 10 years relevant experience in water resources assessment, including at least one year of experience in Australia, who is independent of the **suitably qualified water resources expert**.

Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT habitat) means any forest or woodland (including remnant, regrowth and modified vegetation communities) containing species that are Koala food trees or any shrub land with emergent Koala food trees.

Legally secure means to secure a covenant or similar legal agreement in relation to a site; to provide enduring protection for the site against development incompatible with conservation.

Limit/s means a threshold greater than a **trigger value** that, should it be reached or exceeded, **cease work provisions** will be implemented.

Listed threatened species and communities/listed threatened species or community means a threatened species or ecological community listed under the **EPBC Act** for which this approval has effect including, but not limited to, the:

- a) South-eastern Long-eared Bat (*Nyctophilus corbeni*);
- b) Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT);
- c) Greater Glider (*Petauroides volans*); and
- d) Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Monitoring data means the data required to be recorded under the conditions of this approval.

New drilling fluid compound/s means drilling fluid compound/s that were not included in the Chemical Risk Assessment submitted to the **Department** in the **preliminary documentation**.

New or increased impact means a new or increased environmental impact or risk relating to any **protected matter**, when compared to the likely impact of implementing the action management plan that has been approved by the **Minister** under condition 6, 7, 8, 9 or 10, including any subsequent revisions approved by the **Minister**, as outlined in the *Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017)*.

Offset Assessments Guide values means the offset values for the **EPBC Act** listed threatened South-eastern Long-eared Bat (*Nyctophilus corbeni*), Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) and Greater Glider (*Petauroides volans*), as shown at Attachment C.

Performance criteria means specific parameters, associated with and relevant to GDE **function** that will be monitored to demonstrate that the outcome of no **adverse impact** is being achieved, measured at a specific time and place.

Plan(s) means any of the documents required to be prepared, submitted, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans, pre-clearance survey reports and/or peer review terms of reference).

Preliminary documentation means the *Surat Basin Acreage Development EPBC 2018/8276 – Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, September 2019, Revision 6*, provided to the Department on 9 September 2019.

Project area means the area enclosed by the red line designated 'Project Area' in Attachment A.

Protected matter means a matter protected under a controlling provision in Part 3 of the EPBC Act for which this approval has effect.

Remediation, Rehabilitation and Recovery Monitoring Plan Reinstatement and Rehabilitation Manual means the *QCLNG Gasfields Surat Basin Acreage – Remediation, Rehabilitation, Recovery and Monitoring Plan, QCOGCLNG-BX00-ENV-PLN-00001526, Revision 21, May 2014* October 2011, provided to the Department on 13 June 2014 approved on 20 October 2011 under EPBC Act approval 2008/4398, or subsequent revision approved by the Minister.

Commented [A9]: Need to align with plan for this project area.

Retention area/s means an area/s (in hectares) retained within the project area to provide current and future habitat for listed threatened species and communities.

Reversed means that the function of GDEs have been reinstated to their pre-impact state and sustained for 10 business days.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

Significant Species Management Plan means the *Significant Species Management Plans, Surat North Development Area QCLNG Gas Field (QCLNG-BX00-ENV-PLN-000010) Revision 0*, January 2014, approved on 5 February 2014, or subsequent revision approved by the Minister.

Commented [A10]: Need to align with plan for this project area.

South-eastern Long-eared Bat (*Nyctophilus corbeni*) habitat means as described in the *Conservation Advice Nyctophilus corbeni South-eastern Long-eared Bat (2015)*, or subsequent revision.

Stage 1 means the construction and operation of 119 coal seam gas wells with a combined maximum peak rate of groundwater production of 10 ML per day within the area shaded in green designated 'Stage 1' in Attachment B.

Stage 2 means activities associated with the action excluding Stage 1.

Subterranean GDEs means aquifer ecosystems, including stygofauna.

Suitably qualified field ecologist means a person who has professional qualifications and at least three years of work experience designing and implementing surveys for listed threatened species and communities, and can give an authoritative assessment and advice on the presence of listed threatened species and communities using relevant protocols, standards, methods and/or literature. If the person does not have appropriate professional qualifications, the person must have at least five years of work experience designing and implementing surveys for listed threatened species and communities.

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

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

Survey Guidelines means the *Matters of National Environmental Significance, Significant Impact Guidelines 1.1*, Environment Protection and Biodiversity Conservation Act 1999 (2013), *Survey Guidelines for Australia's threatened bats* (2010), *Survey Guidelines for Australia's threatened birds* (2010), *Survey Guidelines for Australia's threatened frogs* (2010), *Survey guidelines for Australia's*

threatened fish (2011), Survey guidelines for Australia's threatened mammals (2011), Survey guidelines for Australia's threatened reptiles (2011) and species-specific surveys as described in the Department's Species Profile and Threats Database profile for the relevant EPBC Act-listed threatened species.

Terrestrial GDEs means ecosystems partially or wholly dependent on the subsurface presence of groundwater.

Trigger value/s means a threshold for the **performance criteria** that, should it be reached or exceeded (either through modelling or monitoring), the approval holder will implement an appropriate management response such that a **limit** is not reached and the **trigger value** is no longer exceeded.

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

PROPOSED

ATTACHMENTS

Attachment A: Project Area

Attachment B: Stage 1

Attachment C: Offset Assessment Guide values

PROPOSED

Attachment C: Offset Assessment Guide values

Relevant protected matter	South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)	Greater Glider (<i>Petauroides volans</i>)
Impact area (ha)	80	62	62
Impact quality (1-10)	6	6	6
Time over which loss is averted (years)	20	20	20
Start area (ha)	280	220	220
Risk of loss without offset (%)	0	0	0
Risk of loss with offset (%)	0	0	0
Confidence in risk of loss result (%)	95	95	95
Time until ecological benefit (years)	20	20	20
Start quality (1-10)	7	7	7
Future quality without offset (1-10)	6	6	6
Future quality with offset (1-10)	8	8	8
Confidence in quality result (%)	90	90	90



Department of
Environment and Science

Ref 101/0003868-006

25 November 2019

Mr Andrew McNee
Assistant Secretary
Assessments and Governance Branch
Department of the Environment and Energy
GPO Box 787
CANBERRA ACT 2601

Dear Mr McNee

Invitation to comment on proposed approval decision – Surat North CSG Project, Qld (EPBC 2018/8276)

Thank you for your letter dated 5 November 2019, advising the Department of Environment and Science on the above proposed approval decision under the *Environment Protection and Biodiversity Conservation Act 1999*.

I advise that the department has no comment on the proposed approval decision.

Should you have any further enquiries, please contact me on telephone [s. 47F\(1\)](tel:0755477111).

Yours sincerely

s. 47F(1)

A/ Director, Operational Support

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Attachment C: Summary of comments received on proposed approval conditions and Department's responses

Proposed approval condition	Comment received	Department's response	Revised approval condition
<p>General comment – Groundwater dependent ecosystems</p>	<p>Geoscience Australia: The approval conditions relating to water resource management focus solely on impacts to Groundwater Dependent Ecosystems (GDEs). GA notes that impacts to groundwater resources may be significant however there are no explicit requirements in the conditions to monitor these potential impacts.</p> <p>The approval conditions focus on monitoring and measuring the condition of the GDEs, and place triggers and limits on parameters representing the condition of the GDEs. This approach may prove difficult to enforce as there is no requirement for adequate baseline monitoring with which to compare a change in GDE condition with the impact on groundwater resources resulting from the CSG extraction. Without this evidence of correlation it will be very difficult to demonstrate the cause of any decline in the condition of the GDE.</p>	<p>The Department considers the conditions relating to the protection of GDEs adequately address the advice received from the Independent Expert Scientific Committee (IESC), which identified the key potential impacts of the proposed action as:</p> <ul style="list-style-type: none"> • declines in shallow groundwater level due to depressurisation of underlying aquifers and Walloon Coal Measures; and • reductions in water availability to springs, riparian ecosystems, fringing vegetation of a wetland of High Ecological Significance, several regional ecosystems listed as 'Of Concern' (both under Queensland legislation) and other GDEs as a result of groundwater depressurisation and drawdown. <p>The Department also understands that the proponent has sufficient baseline data relevant to water</p>	<p>No change.</p>

	<p>For example, seasonal and climate variability may have a significant impact on the GDE, as will cumulative impacts from surrounding resource extraction and agriculture. It is not clear how the proponent would differentiate the impacts of these factors from the impacts of the project without adequate baseline data and without monitoring the groundwater system supporting the GDE.</p> <p>The technical and statistical challenges in developing a 'GDE Program' that provides measurable parameters that are able to show an enforceable link between groundwater condition and GDE condition, for each GDE in the area of interest, are non-trivial. The evidence to support such a program will be substantial and require a significant time to collect.</p>	<p>resources as a result of current operations within the project area.</p> <p>In correspondence with the Department on 14 October 2019, the proponent provided a draft GDE Management Strategy that outlined how the proponent's commitment to no adverse effect on GDEs as a result of groundwater extraction will be achieved. The nature of this document is similar to that of the GDE Program outlined in the proposed conditions of approval.</p>	
<p>General comment – Timeframes</p>	<p><u>Geoscience Australia:</u> GA is concerned that some of the conditions reflect unrealistic timeframes that will mean the proponent is unable to address the condition appropriately or that the condition is not enforceable. For</p>	<p>Specific timeframes relating to each condition are discussed under the section on each relevant condition.</p>	

	<p>example condition 21(e) requires that the 'description and location of all identified GDEs, performance criteria, trigger values and limits' be submitted with a 'GDE Program' that includes an analysis of impacts during Stage 1 of the project. However, condition 23 requires that 'the description and location of all identified GDEs, performance criteria, trigger values and limits' be approved within 6 months of the commencement of Stage 1. This timeframe does not allow enough time to analyse the Stage 1 impacts, the required peer review, and Ministerial approvals.</p> <p>Condition 29 requires that exceedance of trigger values must be reported to the Minister within two business days of detection, and the definitions indicate that trigger values may be reached through modelling or monitoring. Both monitoring and modelling require considerable data analysis and review and it is not clear at what point the approval holder must consider an exceedance to be 'detected'. Similar concerns arise</p>		
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	<p>for condition 30, which sets a one business day reporting timeframe on any exceedance of a limit.</p> <p>GA notes that impacts may propagate very slowly through groundwater systems. For example it may take years for an impact to groundwater, resulting from CSG extraction, to propagate to a GDE. Triggers, limits and mitigation actions should be chosen with respect to these potential timeframes.</p>		
<p>Period for which the approval has effect: 31 December 2082.</p>	<p>Proponent: How was this date determined?</p>	<p>Discussed verbally with the proponent on 11 November 2019: The period of approval was determined with consideration of the expected operating period of the proposed action (until 2060) and an estimated time for decommissioning and rehabilitation activities to be undertaken. The Department advised that this could be better informed by an estimate from the proponent; however, the date was agreed.</p>	<p>No change.</p>
<p>1. For the purpose of the action, the approval holder must not</p>		<p>Minor edit.</p>	<p>1. For the purpose of the action, the approval holder must not</p>

take any activities outside the project area .			undertake any activities outside the project area .
<p>2. The approval holder must not clear more than:</p> <p>a) 80 ha of South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat.</p> <p>b) 62 ha of Koala (<i>Phascolarctos cinerus</i>) (combined populations of Qld, NSW and the ACT) habitat.</p> <p>c) 62 ha of Greater Glider (<i>Petauroides volans</i>) habitat.</p> <p>d) 9 ha of Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) threatened ecological community.</p>	<p>Proponent: This [Brigalow TEC] is not referenced in Offset conditioning. Brigalow offsets have been included in the Offset Management Plan.</p>	<p>The Department does not consider the proposed action will result in a significant impact on Brigalow TEC if it is undertaken in compliance with the proposed disturbance limits. Therefore, no offset for Brigalow TEC is required.</p>	<p>No change.</p>
<p>3. The approval holder must undertake pre-clearance surveys of areas to be cleared.</p>		<p>Minor edit.</p>	<p>3. The approval holder must undertake pre-clearance surveys of areas to be cleared prior to clearing.</p>
<p>4. Pre-clearance surveys must be undertaken by a suitably qualified field ecologist and</p>	<p>Proponent: Need to remove this extra requirement [assessment of habitat quality]. Habitat quality has</p>	<p>The Department considers that adequate information to validate the habitat values within the project</p>	<p>Pre-clearance surveys must be undertaken by a suitably qualified field ecologist and undertaken in</p>

<p>undertaken in accordance with the Department’s Survey Guidelines in effect at the time of the pre-clearance survey or other survey methodology endorsed by the Department in writing and provide an assessment of the habitat quality of the areas to be cleared.</p>	<p>already been assessed in surveys and included in the Preliminary Documentation and in the Offset Management Plan. It is not necessary or practical to include this requirement here.</p>	<p>area has not been provided so far. A habitat assessment is needed to inform the quantum of the overall offset and to ensure any offsets provided are in accordance with the principles of the <i>EPBC Act Environmental Offsets Policy</i> (2012).</p> <p>Given the proponent’s comment in the draft Offset Management Plan that habitat quality assessments have been determined through the Queensland Governments <i>Guide for determining terrestrial habitat quality</i>, the Department considers that habitat quality scores can be validated through the provision of data gathered in accordance with the Queensland policy in the submission of the Offset Management Plan for the Minister’s approval.</p>	<p>accordance with the Department’s Survey Guidelines in effect at the time of the pre-clearance survey or other survey methodology endorsed by the Department in writing and provide an assessment of the habitat quality of the areas to be cleared.</p>
<p>5. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report must be published on the website within 6 months of completion and remain</p>	<p>Proponent: Suggest removing as this condition is not consistent with more recent approvals and moves backwards towards prescriptive conditioning. Both QGC’s Anya 2015/7463 and APLNG’s most recent 2017/7902 do not require the submissions of pre-clearance</p>	<p>The Department considers that only publishing survey reports that demonstrate a potential impact to listed threatened species and communities as a result of clearing is acceptable.</p>	<p>6. The results of pre-clearance surveys must be presented in pre-clearance survey reports. Each pre-clearance survey report which demonstrates a potential impact to listed threatened species and</p>

<p>published on the website for the period of approval. The approval holder must notify the Department within five business days of publishing each pre-clearance survey report.</p>	<p>surveys or notifications. These can be provided upon request.</p> <p>If cannot be removed, need to address:</p> <ol style="list-style-type: none"> 1. Requirement to only publish survey reports which demonstrate a potential impact to MNES; 2. Additional administrative burden and compliance risks created by requiring subsequent notification to DoEE that report has been published online. This should be removed, or if not possible, requires additional time for QGC to notify DoEE – suggest 20bd. <p>These changes still allow for provision of the information, but significantly reduces administrative burden for both the Department and QGC.</p>	<p>The Department considers that the timeframes specified are achievable and ensure compliance with the conditions of approval.</p>	<p>communities as a result of clearing must be published on the website within 6 months of completion and remain published on the website for the period of approval. The approval holder must notify the Department within five business days of publishing each pre-clearance survey report.</p>
<p>9. The approval holder must undertake the action in accordance with the Remediation, Rehabilitation</p>	<p>Proponent: Changed to align with actual document name. This [a revision of the plan] is with the Department [Post Approval Section] for approval. Definition</p>	<p>Agreed.</p>	<p>9. The approval holder must undertake the action in accordance with the Remediation, Rehabilitation and Recovery Monitoring</p>

<p>and Recovery Monitoring Plan.</p>	<p>needs to be updated below in definitions section.</p>		<p>Plan Reinstatement and Rehabilitation Manual.</p>
<p>11. The approval holder must prepare an Offset Management Plan that details the provision of offsets in accordance with the Offset Assessment Guide values. The Offset Management Plan must:</p> <p>a) be prepared by a suitably qualified person, and in accordance with the principles of the EPBC Act Environmental Offsets Policy and the Department’s Environmental Management Plan Guidelines;</p> <p>b) demonstrate how the offsets compensate for the impacts of the action in accordance with the Offset Assessment Guide values and consistent with the EPBC Act Environmental Offsets Policy; and</p>	<p>Proponent: Suggest this condition be replaced with “The approval holder must implement the approved Offset Management Plan” as this is very prescriptive and not necessary as the OMP has already been submitted as part of the PD and is consistent with the requirements, and aligned with the OMP for the previous QGC projects which has been informed by extensive feedback from the DoEE post approvals offsets team.</p> <p>Alternatively, could leave this conditions as is, subject to confirmation that the OMP will be approved at the same time as the overall project.</p> <p>On 2 December 2019, the proponent made suggested changes, to Condition 11 and subsequent offset conditions, to include a requirement for offsets to compensate for impacts on Brigalow TEC.</p>	<p>The Department does not consider the draft OMP provided in the preliminary documentation is suitable for approval. The Department has provided comments on the adequacy of the draft OMP on multiple occasions. Approved OMPs for previous projects were not in line with the Department’s current practice and were subject to differing conditions of approval. The Department considers that the draft OMP will need to be approved post-approval.</p> <p>Additionally, on the basis of raw data provided to the Department on the habitat quality of the offset site on 13 November 2019, the Department has concerns that the quality of the proposed offset site may be lower than indicated in the Offset Assessment Guide values attached to the proposed conditions of approval. Therefore, the Department recommends including a requirement for the approval holder to provide an</p>	<p>11. The approval holder must prepare an Offset Management Plan that details the provision of offsets in accordance with the Offset Assessment Guide values. If offsets in accordance with the Offset Assessment Guide values cannot be provided, an alternative offset or offsets must be proposed. The Offset Management Plan must:</p> <p>a) be prepared by a suitably qualified person, and in accordance with the principles of the EPBC Act Environmental Offsets Policy and the Department’s Environmental Management Plan Guidelines;</p> <p>b) demonstrate how the offsets compensate for the impacts of the action in accordance with the Offset Assessment Guide values and consistent with the</p>

<p>c) include, but not be limited to:</p> <ul style="list-style-type: none"> i. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses; ii. baseline data and other supporting evidence that documents the presence and baseline quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat within the offset area/s; iii. maps and shapefiles of the offset area/s; iv. specific objectives to demonstrate South- 		<p>alternative offset proposal if an offset cannot be provided in accordance with the Offset Assessment Guide values.</p> <p>The Department’s recommendation report, which is based on the Preliminary Documentation provided by the proponent, considers that the clearance of a maximum of 9 ha of Brigalow TEC will not result in a significant impact on the TEC and therefore an offset is not required.</p> <p>Minor edits.</p>	<p>EPBC Act Environmental Offsets Policy; and</p> <p>c) include, but not be limited to:</p> <ul style="list-style-type: none"> i. baseline data that validates the habitat quality score of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat cleared for the purpose of undertaking Stage 1 in the Offset Assessment Guide values. The approval holder may also elect to provide baseline data that validates the habitat quality score of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala
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<p>eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat quality improvement over the life of the approval;</p> <p>v. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides</i></p>			<p>(<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat cleared for the purpose of undertaking Stage 2 in the Offset Assessment Guide values in the Offset Management Plan;</p> <p>ii. a description of the offsets, including location, size, condition, environmental values present and surrounding land uses;</p> <p>iii. baseline data and other supporting evidence that documents the presence, suitability and baseline quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos</i></p>
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<p>vi. volans) habitat within the offset area/s;</p> <p>key performance indicators to demonstrate the improvement to the quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans) habitat</i> within the offset area/s;</p> <p>vii. the nature, timing and frequency of monitoring to determine the success of management actions against key performance indicators;</p> <p>viii. the timing for the provision of an annual monitoring report to the Department. The monitoring report must</p>			<p>cinereus) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans) habitat</i> within the offset area/s;</p> <p>iv. maps and shapefiles of the offset area/s;</p> <p>v. specific objectives to demonstrate South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans) habitat</i> quality improvement over the life of the approval;</p> <p>vi. specific management actions, and timeframes for implementation, to be carried out to meet the specific objectives to improve the quality of</p>
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<p>include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period;</p> <p>ix. an assessment of risks that the key performance indicators will not be met and identification of the sources of those risks and strategies for managing them;</p> <p>x. indicative corrective actions that will be implemented in the event monitoring activities indicate key performance indicators are not or are unlikely to be achieved;</p> <p>xi. the roles and responsibilities for implementing the management actions;</p> <p>xii. evidence of consistency with</p>			<p>the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat within the offset area/s;</p> <p>vii. key performance indicators to demonstrate the improvement to the quality of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat within the offset area/s;</p> <p>viii. the nature, timing and frequency of monitoring</p>
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<p>relevant conservation advices, recovery plans and/or threat abatement plans.</p>			<p>to determine the success of management actions against key performance indicators;</p> <p>ix. the timing for the provision of an annual monitoring report to the Department. The monitoring report must include data relating to the key performance indicators and provide a table of management measures taken during the previous 12 month period;</p> <p>x. an assessment of risks that the key performance indicators and/or plan objectives will not be met and identification of the sources of those risks and strategies for managing them;</p> <p>xi. indicative corrective actions that will be implemented in the event monitoring</p>
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			<p>activities indicate key performance indicators are not or are unlikely to be achieved;</p> <p>xii. the roles and responsibilities for implementing the management actions;</p> <p>xiii. evidence of consistency with relevant conservation advices, recovery plans and/or threat abatement plans.</p>
<p>12. The approval holder must not commence Stage 2 unless the Minister has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.</p>	<p>Proponent: The OMP has already been submitted for approval as part of the PD. Remove condition.</p> <p>If condition must remain, need to include additional wording re groundwater extraction to align with intent of staged approach.</p>	<p>As discussed under Condition 11, the Department considers the draft OMP is not adequate for approval.</p> <p>The Department considers requiring the approval of the draft OMP prior to the commencement of clearing of listed threatened species habitat associated with Stage 2 is appropriate as it aligns with the impact.</p>	<p>12. The approval holder must not commence clearing of South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) habitat or Greater Glider (<i>Petauroides volans</i>) habitat associated with Stage 2 unless the Minister has approved the Offset Management Plan in writing. The approval holder must implement the approved Offset Management Plan.</p>

<p>14. The approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the Minister for written approval. The Revised Offset Management Plan must constitute a revision of the approved Offset Management Plan, taking account of all new information, including the results of all pre-clearance surveys. If the residual impact of the action on listed threatened species and communities is greater than that predicted in the approved Offset Management Plan, as demonstrated through the habitat quality assessment of the areas to be cleared, an offset or offsets to compensate for the additional residual impact must be provided. Any additional offset or offsets must be consistent with the EPBC Act Environmental Offsets Policy. The approval holder</p>	<p>Proponent: Condition 2 requires that the disturbance areas noted for MNES cannot be exceeded, therefore this condition is not required.</p> <p>Alternatively, if the intent is to re-assess actual impacts on MNES and adjust offsets accordingly, then would require condition 2 to be modified, and also modify condition 14 to note that if the residual impact is lower than predicted, then the obligation to provide the offset must be reduced accordingly.</p>	<p>The Department notes that the revision of the approved OMP required under this condition is relevant to habitat quality, not quantity, and compensates for inadequacies in the proponent's surveys of the project area.</p> <p>The proponent has committed to maximum disturbance limits, implementing the precautionary principle in the absence of robust data. Therefore, the Department does not consider a reduction in offset liability is appropriate.</p>	<p>14. If the approval holder did not provide baseline data that validates the habitat quality score of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat cleared for the purpose of undertaking Stage 2 in the Offset Assessment Guide values under Condition 11(c)(i), tThe approval holder must, within 50 months of the approval of the Offsets Management Plan, submit a Revised Offset Management Plan to the Minister for written approval. The Revised Offset Management Plan must constitute a revision of the approved Offset Management Plan, taking account of all new information, including the results of all pre-clearance surveys. If the residual impact of the action on listed threatened species and communities is</p>
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<p>must implement that Revised Offset Management Plan.</p>			<p>greater than that predicted in the approved Offset Management Plan, as demonstrated through the habitat quality assessment of the areas to be cleared, an offset or offsets to compensate for the additional residual impact must be provided. Any additional offset or offsets must be consistent with the EPBC Act Environmental Offsets Policy. The approval holder must implement that Revised Offset Management Plan.</p>
		<p>Inserted from original Condition 14. Additional text specifying that the Minister may request specific changes to be made within a specified timeframe has been added to ensure timeframes relating to revisions and the provision of adequate information are enforceable.</p>	<p>15. The Revised Offset Management Plan must constitute a revision of the approved Offset Management Plan, taking account of all new information, including the results of all pre-clearance surveys and include baseline data that validates the habitat quality score of the South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)</p>

			<p>habitat and Greater Glider (<i>Petauroides volans</i>) habitat cleared for the purpose of undertaking Stage 2. If the residual impact of the action on listed threatened species and communities is greater than that predicted in the approved Offset Management Plan, as demonstrated through the habitat quality assessment of the areas to be cleared habitat quality score of the areas cleared for the purpose of undertaking Stage 2, an offset or offsets to compensate for the additional residual impact must be provided. Any additional offset or offsets must be consistent with the EPBC Act Environmental Offsets Policy. The Minister may request specified changes to the revised Offsets Management Plan, and specify a timeframe to make the changes. If the Minister requests changes, the approval holder must make the specified changes to the revised Offsets Management Plan and resubmit it within the specified timeframe.</p>
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			The approval holder must implement that Revised Offset Management Plan.
15. The approval holder must legally secure the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the Minister's approval of the Revised Offset Management Plan.	As above.	As above.	15. 16. The approval holder must legally secure the offset area/s proposed in the approved Revised Offset Management Plan within 12 months of the date of the Minister's approval of the Revised Offset Management Plan.
16. Prior to the use of any drilling fluid compound/s , the approval holder must undertake a chemical risk assessment . The chemical risk assessment must be undertaken in accordance with best practice risk assessment methodology .	Proponent: QGC have completed risk assessments for currently used chemicals. Need to ensure that these existing risk assessments are confirmed as approved by the Minister as part of the application process.	The Department's Chemicals and Biotechnology Assessments Section has advised that the chemical risk assessments presented in the preliminary documentation are acceptable. Therefore, this condition applies only to chemicals not listed in the preliminary documentation.	16. 17. Prior to the use of any new drilling fluid compound/s, the approval holder must undertake a chemical risk assessment. The chemical risk assessment must be undertaken in accordance with best practice risk assessment methodology.
17. The approval holder must not use any drilling fluid compound/s determined by the best practice risk assessment technology to be high risk until the chemical risk assessment for that drilling fluid compound has been	As above.	As above. Additionally, advice from the Department's Chemicals and Biotechnology Assessments Section suggested that the risk assessments for chemicals determined medium or high hazard	17. 18. The approval holder must not use any new drilling fluid compound/s determined by the best practice risk assessment technology methodology to be high risk until the chemical risk assessment for that new drilling fluid compound has been approved in writing by the

<p>approved in writing by the Minister.</p>		<p>should be provided to the Minister for information.</p>	<p>Minister. For any new drilling fluid compound identified as medium or high hazard, the chemical risk assessment must be provided to the Minister prior to the use of the new drilling fluid compound.</p>
<p>18. The approval holder must implement the approved chemical risk assessment.</p>			<p>18. 19. The approval holder must implement the approved chemical risk assessment.</p>
<p>19. The approval holder must ensure that there is no adverse effect on the function of groundwater dependent ecosystems (GDEs) in, or within 30 km of, the project area as a result of the project.</p>	<p>Proponent: What is the rationale for this increasing from 10km to 30km?</p> <p>This [no adverse effect] must be linked to groundwater extraction activities by the approval holder [not the project].</p> <p>Geoscience Australia: While there is an implied meaning of the condition based on the plain English interpretation of the words, the [definitions provided for adverse effect and function make the meaning of this condition confusing] and it will be difficult for the proponent to ensure they are</p>	<p>The Department notes that two EPBC Act-listed spring complexes occur within 30 km of the proposed action area. The buffer is 30 km for their protection.</p> <p>The Department needs to consider impacts to GDEs from groundwater extraction and surface disturbance, while ensuring that the proponent can comply. The Department notes that the definition of function, which contributes to definitions for performance criteria, trigger value and limit, encompasses both groundwater and surface elements of GDEs. This definition would prohibit the proponent from any surface disturbance, i.e. clearing, of GDEs and the Department</p>	<p>19. 20. The approval holder must ensure that there is no adverse effect on the function of groundwater dependent ecosystems (GDEs) in, or within 30 km of, the project area as a result of the project groundwater extraction. The approval holder must minimise the surface disturbance of GDEs and ensure that there is no adverse effect on the viability of any patch of a GDE.</p>

	<p>addressing it as intended, without further clarification.</p>	<p>understands that the proponent is likely to need clearing along drainage lines for access tracks or similar.</p> <p>As a solution and to ensure that proposed triggers and limits remain scientifically robust in identifying adverse impacts on GDEs as a result of both groundwater extraction and surface clearance, the Department suggests including a secondary component to this condition. This component relates to the ongoing viability of patches of GDEs under which, if surface disturbance to GDEs is to occur, the approval holder must implement and report on relevant performance criteria, trigger values and limits to ensure that any patch of GDE is able to sustain itself over the life of the approval despite the surface disturbance, i.e. a portion of a GDE may be cleared as long as the overall patch is able to sustain its ecological function.</p> <p>In response to GA's comment, the proponent has not raised any concerns about the clarity of</p>	
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		Condition 20 or the definitions relating to adverse effect or function.	
<p>20. To ensure there is no impact on the function of GDEs, the approval holder must provide for the approval of the Minister:</p> <ul style="list-style-type: none"> a) description and location of all identified GDEs; b) performance criteria; c) trigger values; and d) limits. 	<p>Geoscience Australia: [This condition uses different terminology to Condition 19]. Conditions 10 and 20 therefore impose two different requirements on the protection of GDEs ...</p>	<p>Minor edits to align with requirements of Condition 20.</p>	<p>20. 21. To ensure there is no impact adverse effect on the function of GDEs or viability of patches of GDEs, the approval holder must provide for the approval of the Minister:</p> <ul style="list-style-type: none"> a) description and location of all patches of GDEs; b) performance criteria; c) trigger values; and d) limits.
<p>21. The description and location of all identified GDEs, performance criteria, trigger values and limits must be submitted to the Minister with an accompanying GDE Program prepared by a suitably qualified water resources expert and accompanied by a peer review undertaken by an independent suitably qualified water resources expert, which explains the scientific basis on</p>	<p>Proponent: This condition specifies the required elements of the GDE Program and therefore forms the scope of the peer review [delete terms of reference approval].</p> <p>Geoscience Australia: Cumulative impacts are mentioned against both sub-conditions a) and d) of condition 21, and could be removed from d) to avoid unnecessary repetition and potential confusion.</p>	<p>The Department has included the scope of the peer review in the definition of GDE Program peer review.</p> <p>The Department has included a requirement for the GDE Program to set out the procedure for determine whether a trigger value or limit has been exceeded and the area contributing to the exceedance in light of the proponent’s comments on</p>	<p>21. 22. The description and location of all patches of identified GDEs, performance criteria, trigger values and limits must be submitted to the Minister with an accompanying GDE Program prepared by a suitably qualified water resources expert and accompanied by a GDE Program peer review undertaken by an independent suitably qualified water resources expert, which explains the scientific basis on</p>

<p>which the performance criteria, trigger values and limits have been derived to ensure that Condition 19 will be met. The terms of reference of the peer review must be approved by the Minister in writing. The GDE Program must include, and provide justification of:</p> <ul style="list-style-type: none"> a) hydrogeological conceptual modelling, including local scale modelling and consideration of cumulative impacts; b) a site-specific risk assessment; c) past and proposed ongoing monitoring; d) proposed mitigation strategy, including corrective action(s) if trigger values and/or limits are reached or exceeded and consideration of cumulative impacts; e) evidence to confirm adverse effects on the function of GDEs have not occurred or are not 	<p>Sub-condition e) requires ‘evidence to confirm adverse effects [i.e. the exceedance of a limit] on the function of GDEs have not occurred or are occurring as a result of Stage 1 and to demonstrate that the proposed trigger values and limits have not been influenced by the commencement of Stage 1’.</p> <p>GA notes that the proposed trigger values and limits will not be ‘influenced’ by the commencement of Stage 1 as they are static values, and the wording of the condition may require clarification. GA also notes that it is highly unlikely that the groundwater impacts from the project will propagate to a GDE in the short timeframe between the commencement of Sage 1 and the submission of the ‘GDE Program’.</p>	<p>Condition 31 and the definition of trigger value/s.</p> <p>Minor edits to align with requirements of Condition 20.</p> <p>Minor edits to improve clarity.</p>	<p>which the description and location of all patches of GDEs, performance criteria, trigger values and limits have been derived to ensure that Condition 19 20 will be met. The terms of reference of the peer review must be approved by the Minister in writing. The GDE Program must include, and provide justification of:</p> <ul style="list-style-type: none"> a) hydrogeological conceptual modelling, including an ecohydrological model incorporating the stressor-response relationships for all GDEs, local scale numerical modelling and consideration of cumulative impacts; b) a site-specific risk assessment; c) past and proposed ongoing monitoring; d) the procedure/methodology used to detect whether a trigger value and/or limit has been reached or exceeded and to identify the
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<p>occurring as a result of Stage 1 and to demonstrate that the proposed trigger values and limits have not been influenced by the commencement of Stage 1; and</p> <p>f) proposed reporting.</p>			<p>area contributing to the exceedance;</p> <p>e) proposed mitigation strategy, including corrective action(s) if trigger values and/or limits are reached or exceeded and consideration of cumulative impacts;</p> <p>f) evidence to confirm adverse effects on the function of GDEs or the viability of patches of GDEs have not occurred or are not occurring as a result of Stage 1 and to demonstrate that the setting of the proposed trigger values and limits have not been influenced by groundwater extraction associated with the commencement of Stage 1; and</p> <p>g) proposed reporting.</p>
<p>22. The approval holder must not commence Stage 2 unless the description and location of all identified GDEs, performance criteria, trigger values and</p>	<p>Proponent: Need to link this condition to groundwater extraction associated with Stage 2 wells as this is the activity that could cause a potential impact.</p>	<p>Agreed. Minor edits to align with requirements of Condition 20.</p>	<p>22. 23. The approval holder must not commence groundwater extraction associated with Stage 2 unless the description and location of all identified patches of GDEs,</p>

<p>limits have been approved by the Minister in writing.</p>			<p>performance criteria, trigger values and limits have been approved by the Minister in writing.</p>
<p>23. If the description and location of all identified GDEs, performance criteria, trigger values and limits have not been approved by the Minister in writing within 6 months of the commencement of Stage 1, the approval holder must cease groundwater extraction until the description and location of all identified GDEs, performance criteria, trigger values and limits are approved by the Minister in writing.</p>	<p>Proponent: This condition as written would completely negate the benefit of a staged approval. It would not be possible to provide the information in the required timeframe. The potential risk to be managed is associated with Stage 2, for which condition 22 is the key control to prevent any Stage 2 groundwater extraction prior to an approved GDE Program.</p>	<p>The Department considers that amending the condition to require the approval of the description and location of patches of GDEs, performance criteria, trigger values and limits prior to the commencement of Stage 2 groundwater extraction is appropriate as it aligns with the impact.</p> <p>In discussions with the proponent on 11 November 2019, the Department raised concerns about the investment risk of the proponent installing production wells and being unable to use them if the relevant values are not approved. The proponent acknowledged this risk and agreed to the condition.</p> <p>Minor edit to align timing of provision with relevant impact.</p>	<p>23. 24. If † The description and location of all patches of GDEs, performance criteria, trigger values and limits have not been approved must be provided to by the Minister in writing for written approval within 6 months of the commencement of groundwater extraction associated with Stage 1. † The approval holder must cease groundwater extraction not commence groundwater extraction associated with Stage 2 until the description and location of all identified patches of GDEs, performance criteria, trigger values and limits are approved by the Minister in writing.</p>
<p>24. The approval holder must undertake the action in</p>	<p>Geoscience Australia: This wording is confusing, as the</p>	<p>The Department considers this condition is necessary to enforce</p>	<p>24. 25. The approval holder must undertake the action in</p>

<p>accordance with the approved performance criteria, trigger values and limits.</p>	<p>performance criteria, trigger values and limits do not control how the action is undertaken, they only relate to the potential impacts the action may cause [to] GDEs. GA suggests the condition is reworded to clarify the intended meaning. If the intention is that the project does not exceed the limits and triggers, this is already stated in other conditions.</p>	<p>that the approved performance criteria, trigger values and limits are implemented.</p>	<p>accordance with the approved performance criteria, trigger values and limits.</p>
<p>25. For each 12 month period following the date of commencement of groundwater extraction, or in accordance with a date otherwise agreed in writing by the Minister, the approval holder must submit an outcomes report prepared by a suitably qualified water resources expert and accompanied by a peer review undertaken by an independent suitably qualified water resources expert, for the written acceptance of the Minister. The terms of reference for the peer reviews must be approved by the</p>	<p>Proponent: Compliance with conditions 19-21 and 26 are the key conditions that need to be assessed by the independent reviewer, and therefore forms the scope of the peer review. Also, the condition as written would have an immediate schedule impact and would not allow any works to commence.</p> <p>3 months is not adequate time to prepare the report and have a detailed independent expert review.</p> <p>Geoscience Australia: [This condition] relates to ‘outcomes reports’ which are to be prepared every 12 months, however the last line of condition 25 refers to ‘the 6</p>	<p>The Department has amended this condition to include a definition for outcomes report peer review which outlines the aspects of the document the Department expects the peer reviewer to provide an adequacy evaluation of. The intention of the peer review is not to ensure compliance with the conditions, but to ensure that the information provided to the Department to demonstrate compliance with the conditions is scientifically sound and robust.</p> <p>The Department has also amended the relevant time periods.</p>	<p>25. 26. For each 12 month period following the date of commencement of groundwater extraction, or in accordance with a date otherwise agreed in writing by the Minister, the approval holder must submit an outcomes report prepared by a suitably qualified water resources expert and accompanied by an outcomes report peer review undertaken by an independent suitably qualified water resources expert, for the written acceptance of the Minister. The terms of reference for the peer reviews must be approved by</p>

<p>Minister in writing. The approval holder must not commence the action unless the terms of reference for the peer reviews have been approved by the Minister in writing. Each outcomes report, accompanied by the peer review, must be submitted to the Minister within 3 months of the end of the 6 month period that is the subject of the outcomes report.</p>	<p>month period that is the subject of the outcomes report'. GA recommends this condition be reviewed to clarify if the outcomes reports are reporting on 6 months or 12 months.</p>		<p>the Minister in writing. The approval holder must not commence the action unless the terms of reference for the peer reviews have been approved by the Minister in writing. Each outcomes report, accompanied by the peer review, must be submitted to the Minister within 3 6 months of the end of the 6 12 month period that is the subject of the outcomes report.</p>
<p>26. The outcomes report submitted under Condition 25 must include, but not be limited to:</p> <ul style="list-style-type: none"> a) Performance against the approved trigger values and limits, including analysis of trends that indicate that reaching or exceeding an approved trigger value or limit is likely during or before the next reporting period. b) Any changes to the existing regulatory arrangements in place to avoid adverse effects to the function of 		<p>Minor edit to align with the requirements of Condition 20.</p>	<p>26. 27. The outcomes report submitted under Condition 25 26 must include, but not be limited to:</p> <ul style="list-style-type: none"> a) Performance against the approved trigger values and limits, including analysis of trends that indicate that reaching or exceeding an approved trigger value or limit is likely during or before the next reporting period and demonstration of how adverse effects on the

<p>GDEs, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.</p>			<p>viability of patches of GDEs has been minimised.</p> <p>b) Any changes to the existing regulatory arrangements in place to avoid adverse effects to the function of GDEs or viability of patches of GDEs, not limited to legislation, standards or codes or practice, governance arrangements and existing controls.</p>
<p>27. The Minister may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the function of GDEs.</p>		<p>Minor edit to align with the requirements of Condition 20.</p>	<p>27. 28. The Minister may request the provision of additional information, and specify a deadline by which the approval holder must provide this information, to substantiate an outcomes report and/or to verify the risk to the function of GDEs or viability of patches of GDEs.</p>
<p>28. If, on the basis of the information provided (or that has not been provided) under Condition 25 and/or Condition 27, and/or other information available to the Minister, the</p>		<p>Minor edit to align with the requirements of Condition 20.</p>	<p>28. 29. If, on the basis of the information provided (or that has not been provided) under Condition 25 26 and/or Condition 27 28, and/or other information available to the Minister, the Minister</p>

<p>Minister determines that the action has had, or is likely to have, an adverse effect on the function of GDEs, the Minister may notify the approval holder in writing in accordance with the provisions of Condition 30.</p>			<p>determines that the action has had, or is likely to have, an adverse effect on the function of GDEs or viability of patches of GDEs, the Minister may notify the approval holder in writing in accordance with the provisions of Condition 30 31.</p>
<p>Note 3: The Minister may throughout the life of the approval seek advice from experts, or an expert panel. As a consequence, specific matters identified through such advice may need to be addressed in the GDE Program or any outcomes report. Where such advice is sought, the approval holder will be provided with opportunity to submit information and respond to the specific matters identified, in order to ensure reports are based on the best available information. Review requirements will facilitate adaptive management, align with Queensland Government approval requirements, and account for potential cumulative impacts as new scientific information becomes</p>	<p>Geoscience Australia: [This note] indicates that the proponent may be required by the Minister to update the GDE Program at some point in the future. GA suggests that this requirement be formalised in a condition (rather than just a note), and that a regular review process be considered to ensure GDE impact management and monitoring is based on all the available data and best system understanding in an adaptive management framework.</p>	<p>The GDE Program is not for the approval of the Minister and the proponent is able to update the document as necessary to take new information into account. The notes advises that if the Minister seeks expert advice, this advice may need to be responded to in the GDE Program or subsequent outcomes reports.</p> <p>The Department considers the review of the approved description and locations of all patches of GDEs performance criteria, trigger values and limits required under Condition 33 is sufficient.</p>	<p>No change.</p>

<p>available over the life of the approval.</p>			
<p>29. If the approval holder detects that a trigger value has been reached or exceeded, the approval holder must report this to the Minister within two business days of the detection. If a trigger value is reached or exceeded, the approval holder must submit within 20 business days of the detection, any proposed corrective action(s) to the Minister in writing and demonstrate that the proposed corrective action(s) will not result in impacts beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the Minister agrees, in writing, that it will not result in impacts beyond the scope of the action.</p>	<p>Proponent: Adjusted to align with incident notification timeframes in other approvals [two business days to five business days]. Comment applies to other conditions below also.</p> <p>3 months will be required to enable this to be effectively provided [provision of corrective actions].</p> <p>Geoscience Australia: [This condition] imposes a 20 business day timeframe for approval holders to provide mitigation plans following any trigger exceedance. This is a tight timeframe, and may be unrealistic if trying to ensure best practice, evidence based actions. GA recommends mitigation measures be presented in the GDE Program, which can then be refined following an exceedance.</p>	<p>The two business day timeframe aligns with the Department’s standard administrative condition requirements for incident reporting. However, given that the exceedance of the trigger value is not an incidence of non-compliance, the Department agrees with the proposed timeframe.</p> <p>Timeframe to submit corrective actions has been extended to 3 months.</p> <p>In response to Geoscience Australia, a mitigation strategy is already included as a requirement of the GDE Program required under Condition 22.</p>	<p>29. 30. If the approval holder detects that a trigger value has been reached or exceeded, the approval holder must report this to the Minister within two five business days of the detection. If a trigger value is reached or exceeded, the approval holder must submit within 20-business days 3 months of the detection, any proposed corrective action(s) to the Minister in writing and demonstrate that the proposed corrective action(s) will not result in impacts beyond the scope of the action. Proposed corrective action(s) must not be implemented unless the Minister agrees, in writing, that it will not result in impacts beyond the scope of the action.</p>
<p>30. If the approval holder detects that a limit has been reached or exceeded, the approval holder must report this to the Minister within one business</p>	<p>Proponent: If a limit were to be exceeded, groundwater extraction should only be ceased in the area contributing to that impact.</p>	<p>As discussed under Condition 22. Agreed.</p>	<p>30. 31. If the approval holder detects that a limit has been reached or exceeded, the approval holder must report this to the Minister within one business day of the detection.</p>

<p>day of the detection. The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action within 48 hours of detecting that a limit has been reached or exceeded, or of receiving notification that the Minister has determined that an adverse effect on the function of GDEs has occurred or is likely to occur.</p>	<p>Suggest that this requirement should be linked to actual effect rather than the possibility of an impact occurring.</p>	<p>Minor edit to align with requirements of Condition 20.</p>	<p>The approval holder must also cease groundwater extraction associated with the action and with the EPBC 2013/7047 approved action in the area identified as contributing to the exceedance of the limit as determined using the procedure/methodology required under Condition 24-22(d) within 48 hours of detecting that a limit has been reached or exceeded, or of receiving notification that the Minister has determined that an adverse effect on the function of GDEs or viability of patches of GDEs has occurred or is likely to occur.</p>
<p>31. If the approval holder has been required to cease groundwater extraction pursuant to Condition 28, the approval holder must not recommence groundwater extraction until the impact has been reversed, or the Minister has agreed, in writing, that no adverse effect on the function of GDEs has occurred, is occurring or likely to occur, and</p>	<p>Geoscience Australia: ... GA notes that this wording indicates that groundwater extraction cannot recommence if an impact has occurred. Additionally, it may take years for the impact to be 'reversed'. Impact reversal is unlikely to be possible.</p>	<p>Minor edits. Aligns with requirements of Condition 20 and refers to correct condition number.</p>	<p>31. 32. If the approval holder has been required to cease groundwater extraction pursuant to Condition 28 31, the approval holder must not recommence groundwater extraction until the impact has been reversed, or the Minister has agreed, in writing, that no adverse effect on the function of GDEs or viability of patches of GDEs</p>

<p>approval to recommence groundwater extraction has been given by the Minister in writing. Approval to recommence groundwater extraction may be subject to conditions that the Minister considers reasonable. The Minister may direct the approval holder to implement corrective action(s) at the approval holder's expense.</p>			<p>has occurred, is occurring or likely to occur, and approval to recommence groundwater extraction has been given by the Minister in writing. Approval to recommence groundwater extraction may be subject to conditions that the Minister considers reasonable. The Minister may direct the approval holder to implement corrective action(s) at the approval holder's expense.</p>
<p>32. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all identified GDEs, performance criteria, trigger values and limits for the written approval of the Minister. The revised performance criteria, trigger values and limits must be in accordance with coal seam gas water management guidelines.</p>	<p>Geoscience Australia: [This condition] requires revision of the 'description and location of all identified GDEs, performance criteria, trigger values and limits' within 2 years of the date of approval. GA suggests the revision be linked with a revision of the GDE Program to ensure explanation of the scientific basis of the values is updated.</p>	<p>Agreed.</p>	<p>32. 33. Within two years of the date of this approval, the approval holder must submit revised descriptions and locations of all patches of identified GDEs, performance criteria, trigger values and limits, accompanied by a revised GDE Program as required under Condition 21, for the written approval of the Minister. The revised performance criteria, trigger values and limits must be in accordance with coal seam gas water management guidelines.</p>

33. The approval holder must notify the Department in writing of the date of commencement of Stage 1 within 10 business days after the date of commencement of Stage 1 .			33. 34. The approval holder must notify the Department in writing of the date of commencement of Stage 1 within 10 business days after the date of commencement of Stage 1 .
34. If the commencement of Stage 1 does not occur within 5 years from the date of this approval, then the approval holder must not commence Stage 1 without the prior written agreement of the Minister .			34. 35. If the commencement of Stage 1 does not occur within 5 years from the date of this approval, then the approval holder must not commence Stage 1 without the prior written agreement of the Minister .
35. The approval holder must maintain accurate and complete compliance records .			35. 36. The approval holder must maintain accurate and complete compliance records .
36. If the Department makes a request in writing, the approval holder must provide electronic copies of compliance records to the Department within the timeframe specified in the request.			36. 37. If the Department makes a request in writing, the approval holder must provide electronic copies of compliance records to the Department within the timeframe specified in the request.
37. The approval holder must:			37. 38. The approval holder must:

<p>a. submit plans electronically to the Department;</p> <p>b. publish each plan on the website within 20 business days of the date the plan is approved by the Minister or of the date a revised action management plan is submitted to the Minister or the Department, unless otherwise agreed to in writing by the Minister;</p> <p>c. exclude or redact sensitive ecological data from plans published on the website or provided to a member of the public; and</p> <p>d. keep plans published on the website until the end date of this approval.</p>			<p>a. submit plans electronically to the Department;</p> <p>b. publish each plan on the website within 20 business days of the date the plan is approved by the Minister or of the date a revised action management plan is submitted to the Minister or the Department, unless otherwise agreed to in writing by the Minister;</p> <p>c. exclude or redact sensitive ecological data from plans published on the website or provided to a member of the public; and</p> <p>d. keep plans published on the website until the end date of this approval.</p>
<p>38. The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under a plan or conditions of this approval, is prepared in accordance with the</p>			<p>38. 39. The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under a plan or conditions of this approval, is prepared in accordance with the</p>

<p>Department's <i>Guidelines for biological survey and mapped data (2018)</i> and submitted electronically to the Department in accordance with the requirements of the plan or conditions of approval.</p>			<p>Department's <i>Guidelines for biological survey and mapped data (2018)</i> and submitted electronically to the Department in accordance with the requirements of the plan or conditions of approval.</p>
<p>39. The approval holder must prepare a compliance report for each 12 month period following the date of commencement of the action, or otherwise in accordance with an annual date that has been agreed to in writing by the Minister. The approval holder must:</p> <ul style="list-style-type: none"> a. publish each compliance report on the website within 60 business days following the relevant 12 month period; b. notify the Department by email that a compliance report has been published on the website and provide the weblink for the compliance report within 	<p>Proponent: Need to discuss as there seems to be duplication of reporting requirements with the outcomes report.</p> <p>This timing [60 business days] does not align with the timeframe required to prepare the peer-reviewed outcomes report.</p>	<p>The Department notes that these are standard administrative conditions and will not impact on the provision of the outcomes reports required under Condition 26.</p>	<p>39. 40. The approval holder must prepare a compliance report for each 12 month period following the date of commencement of the action, or otherwise in accordance with an annual date that has been agreed to in writing by the Minister. The approval holder must:</p> <ul style="list-style-type: none"> a. publish each compliance report on the website within 60 business days following the relevant 12 month period; b. notify the Department by email that a compliance report has been published on the website and provide the weblink for the compliance report within

<p>five business days of the date of publication;</p> <p>c. keep all compliance reports publicly available on the website until this approval expires;</p> <p>d. exclude or redact sensitive ecological data from compliance reports published on the website; and</p> <p>e. where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within 5 business days of publication.</p>			<p>five business days of the date of publication;</p> <p>c. keep all compliance reports publicly available on the website until this approval expires;</p> <p>d. exclude or redact sensitive ecological data from compliance reports published on the website; and</p> <p>e. where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within five 5 business days of publication</p>
<p>40. The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than two business days after becoming aware of the</p>	<p>Proponent: Consistent with other approvals – Anya, Pipeline, LNG Facility [five business days to report incidents, not two].</p>	<p>This is a Departmental standard condition to ensure adequate reporting.</p>	<p>40. 41. The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than two business days after becoming aware of the</p>

<p>incident or non-compliance. The notification must specify:</p> <ul style="list-style-type: none"> a. any condition which is or may be in breach; b. a short description of the incident and/or non-compliance; and c. the location (including coordinates), date, and time of the incident and/or non-compliance. In the event the exact information cannot be provided, provide the best information available. 			<p>incident or non-compliance. The notification must specify:</p> <ul style="list-style-type: none"> a. any condition which is or may be in breach; b. a short description of the incident and/or non-compliance; and <p>the location (including coordinates), date, and time of the incident and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.</p>
<p>41. The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:</p> <ul style="list-style-type: none"> a. any corrective action or investigation which the approval holder has already 	<p>Proponent: Consistent with 2013/7047 existing condition [five business days].</p>	<p>This is a Departmental standard condition to ensure adequate reporting.</p>	<p>41. 42. The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:</p> <ul style="list-style-type: none"> a. any corrective action or investigation which the approval holder has already

<p>taken or intends to take in the immediate future;</p> <p>b. the potential impacts of the incident or non-compliance; and</p> <p>c. the method and timing of any remedial action that will be undertaken by the approval holder.</p>			<p>taken or intends to take in the immediate future;</p> <p>b. the potential impacts of the incident or non-compliance; and</p> <p>c. the method and timing of any remedial action that will be undertaken by the approval holder.</p>
<p>42. The approval holder must ensure that independent audits of compliance with the conditions are conducted for the 12 month period from the date of this approval and for every subsequent 12 period, or as otherwise requested in writing by the Minister.</p>	<p>Proponent: Independently auditing every 12 months has significant time, financial and administrative burdens. The key risk area associated with this approval is already extensively covered by the requirement to submit an independently peer reviewed annual outcomes report. Suggest modifying to align with the existing approval (2013/7047) where an independent audit be completed upon request by the Minister.</p>	<p>Agreed.</p>	<p>42. 43. The approval holder must ensure that independent audits of compliance with the conditions are conducted for the 12 month period from the date of this approval and for every subsequent 12 month period, or as otherwise requested in writing by the Minister.</p>
<p>43. For each independent audit, the approval holder must:</p> <p>a. provide the name and qualifications of the independent auditor and</p>			<p>43. 44. For each independent audit, the approval holder must:</p> <p>a. provide the name and qualifications of the independent auditor and</p>

<p>the draft audit criteria to the Department;</p> <p>b. only commence the independent audit once the audit criteria have been approved in writing by the Department; and</p> <p>c. submit an audit report to the Department within the timeframe specified in the approved audit criteria.</p>			<p>the draft audit criteria to the Department;</p> <p>b. only commence the independent audit once the audit criteria have been approved in writing by the Department; and</p> <p>c. submit an audit report to the Department within the timeframe specified in the approved audit criteria.</p>
<p>44. The approval holder must publish the audit report on the website within 10 business days of receiving the Department's approval of the audit report and keep the audit report published on the website until the end date of this approval.</p>	<p>Proponent: [Change 10 business days to 20].</p>	<p>This is a Departmental standard condition to ensure adequate reporting.</p>	<p>44. 45. The approval holder must publish the audit report on the website within 10 business days of receiving the Department's approval of the audit report and keep the audit report published on the website until the end date of this approval.</p>
<p>45. The approval holder may, at any time, apply to the Minister for a variation to an action management plan approved by the Minister under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an</p>			<p>45. 46. The approval holder may, at any time, apply to the Minister for a variation to an action management plan approved by the Minister under condition 6, 7, 8, 9, 10, 11 or 14, or as subsequently revised in accordance with these conditions, by submitting an</p>

<p>application in accordance with the requirements of section 143A of the EPBC Act. If the Minister approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.</p>			<p>application in accordance with the requirements of section 143A of the EPBC Act. If the Minister approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.</p>
<p>46. The approval holder may choose to revise an action management plan approved by the Minister under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the RAMP would not be likely to have a new or increased impact.</p>			<p>46. 47. The approval holder may choose to revise an action management plan approved by the Minister under condition 6, 7, 8, 9 or 10 or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the RAMP would not be likely to have a new or increased impact.</p>
<p>47. If the approval holder makes the choice under condition 46 to revise an action management plan without submitting it for approval, the approval holder must:</p>			<p>47. 48. If the approval holder makes the choice under condition 4647 to revise an action management plan without submitting it for approval, the approval holder must:</p>

<p>a. notify the Department in writing that the approved action management plan has been revised and provide the Department with:</p> <ul style="list-style-type: none">i. an electronic copy of the RAMP;ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;iii. an explanation of the differences between the approved action management plan and the RAMP;iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a new or increased impact; and			<p>a. notify the Department in writing that the approved action management plan has been revised and provide the Department with:</p> <ul style="list-style-type: none">i. an electronic copy of the RAMP;ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;iii. an explanation of the differences between the approved action management plan and the RAMP;iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a new or increased impact; and
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<p>v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 business days after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the Department.</p> <p>b. subject to condition 46, implement the RAMP from the RAMP implementation date.</p>			<p>v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 business days after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the Department.</p> <p>b. subject to condition 4647, implement the RAMP from the RAMP implementation date.</p>
<p>48. The approval holder may revoke their choice to implement a RAMP under condition 46 at any time by giving written notice to the Department. If the approval holder revokes the choice under condition 46, the approval holder must implement the action management plan in force immediately prior to the</p>			<p>48. 49. The approval holder may revoke their choice to implement a RAMP under condition 4647 at any time by giving written notice to the Department. If the approval holder revokes the choice under condition 4647, the approval holder must implement the action management plan in force immediately prior to the</p>

<p>revision undertaken under condition 46.</p>			<p>revision undertaken under condition 4647.</p>
<p>49. If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the RAMP would be likely to have a new or increased impact, then:</p> <ol style="list-style-type: none"> a. condition 46 does not apply, or ceases to apply, in relation to the RAMP; and b. the approval holder must implement the action management plan specified by the Minister in the notice. 			<p>49- 50. If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the RAMP would be likely to have a new or increased impact, then:</p> <ol style="list-style-type: none"> a. condition 4647 does not apply, or ceases to apply, in relation to the RAMP; and b. the approval holder must implement the action management plan specified by the Minister in the notice.
<p>50. At the time of giving the notice under condition 49 the Minister may also notify that for a specified period of time, condition 46 does not apply for one or more specified action management plans.</p>			<p>50- 51. At the time of giving the notice under condition 4950 the Minister may also notify that for a specified period of time, condition 4647 does not apply for one or more specified action management plans.</p>
<p>Note 6: conditions 46, 47, 48 and 49 are not intended to limit the operation of section 143A of the EPBC Act which allows the</p>			<p>Note 6: conditions 4647, 4748, 4849 and 4950 are not intended to limit the operation of section 143A of the EPBC Act which</p>

<p>approval holder to submit a revised action management plan, at any time, to the Minister for approval.</p>			<p>allows the approval holder to submit a revised action management plan, at any time, to the Minister for approval.</p>
<p>Biosecurity Control Manual means the <i>HSSE Risk Control Manual, QCQGC-BX00-ENV-MAN-000002, Revision 4, May 2018</i>, approved on 15 May 2018, or subsequent revision approved by the Minister.</p>		<p>Minor edit.</p>	<p>Biosecurity Control Manual means the <i>HSSE Risk Control Manual: Biosecurity, QCQGC-BX00-ENV-MAN-000002, Revision 4, May 2018</i>, approved on 15 May 2018, or subsequent revision approved by the Minister.</p>
<p>Commence/ment of Stage 2 means the first instance of any specified activity associated with Stage 2 including clearing of vegetation and construction of any infrastructure.</p>		<p>No longer relevant.</p>	<p>Commence/ment of Stage 2 means the first instance of any specified activity associated with Stage 2 including clearing of vegetation and construction of any infrastructure.</p>
<p>Commencement of groundwater extraction means the first instance of groundwater extraction.</p>		<p>Minor edit.</p>	<p>Commence/ment of groundwater extraction means the first instance of groundwater extraction.</p>
		<p>Insert definition. See habitat quality.</p>	<p>DEHP Guide means the <i>Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets</i></p>

			<i>Policy</i> (Qld Department of Environment and Science, 2017).
Drilling fluid compound/s means the drilling fluid compound/s that were listed in the preliminary documentation , and any drilling fluid compound/s that were not listed in the preliminary documentation .		No longer relevant. See new drilling fluid compound/s .	Drilling fluid compound/s means the drilling fluid compound/s that were listed in the preliminary documentation, and any drilling fluid compound/s that were not listed in the preliminary documentation.
		Insert definition. See Condition 21.	GDE Program peer review means a review carried out by an independent suitably qualified water resources expert which will evaluate whether the GDE Program required under Condition 22 will ensure Condition 20 will be met. As a minimum, this must include, but not be limited to a review of the adequacy of the: <ul style="list-style-type: none"> a) hydrogeology and conceptualisation, including the review of all historical monitoring data to determine trends and its ability to set appropriate trigger values and limits; b) groundwater flow modelling;

			<ul style="list-style-type: none"> c) accuracy of GDE surveying and characterisation; d) scope of groundwater, surface water and ecological monitoring; e) applicability and scientific robustness of performance criteria, trigger values and limits in meeting Condition 12; f) methodology for confirming exceedance of a trigger value or limit, including the area of influence; and g) feasibility of mitigation measures. <p>Where inadequacies are identified, the independent suitably qualified water resources expert must state what the inadequacy is, why it has occurred and what work must be taken to rectify it.</p>
<p>Greater Glider (<i>Petauroides volans</i>) habitat means all areas of Eucalypt forests or woodlands that</p>	<p>Proponent: Suggest a definition that is consistent with the approach taken for south-eastern long-eared bat habitat definition (i.e. reference to conservation advice), but</p>	<p>The Department considers the proposed definition aligns with that used in recent approval decisions</p>	<p>Greater Glider (<i>Petauroides volans</i>) habitat means all areas of Eucalypt forests or woodlands that contain, or have the potential to contain, hollow-bearing trees. For</p>

<p>contain, or have the potential to contain, hollow-bearing trees.</p>	<p>understand that an alternative approach may be required for Greater Glider at this stage. Have suggested suitable alternative.</p>	<p>and provides the proponent with greater certainty.</p>	<p>the impact site, the relevant habitat is shaded in yellow and designated 'Greater Glider Habitat' at Attachment D.</p>
<p>Habitat quality is a measure of how well the project area and/or offset area/s supports listed threatened species and communities and contributes to its ongoing viability, relative to the baseline habitat quality data provided in Offset Management Plan. The measure of habitat quality should include site condition, site context and species individual or population persistence.</p>		<p>Amended to align with the DEHP Guide and survey methodology applied by the proponent.</p>	<p>Habitat quality is a measure of how well the project area and/or offset area/s supports listed threatened species and communities and contributes to its ongoing viability, relative to the baseline habitat quality data provided in Offset Management Plan. The measure of habitat quality should include site condition, site context and species individual or population persistence. means the baseline condition of South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>) habitat, Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT) habitat and Greater Glider (<i>Petauroides volans</i>) habitat determined by ecological surveys undertaken in accordance with the DEHP Guide.</p>

		Inserted. See Condition 11.	<p>Habitat quality score/s means the score out of 10 which is input into the Offsets Assessment Guide calculator based on an assessment of the habitat quality, and must be consistent with the EPBC Act Environmental Offsets Policy. The score is a measure of how well a particular site supports a particular listed threatened species or community and contributes to its ongoing viability. The score consists of three components: site condition, site context and species stocking rate, as described in the Department's Offsets Assessment Guide.</p>
<p>High risk means a product or chemical compound whose solubility allows the potential to enter the environment, and/or is considered hazardous based on its health hazard criteria, environmental hazard criteria and whether it has been identified as a pollutant, contaminant or hazardous good under Australian legislation or regulations.</p>		No longer relevant.	<p>High risk means a product or chemical compound whose solubility allows the potential to enter the environment, and/or is considered hazardous based on its health hazard criteria, environmental hazard criteria and whether it has been identified as a pollutant, contaminant or hazardous good under Australian legislation or regulations.</p>

<p>Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT habitat means any forest or woodland (including remnant, regrowth and modified vegetation communities) containing species that are Koala food trees or any shrub land with emergent Koala food trees.</p>	<p>Proponent: This is consistent with QGC's Anya referral and consistent with assessments provided in QGC's preliminary documentation [means as described in <i>EPBC Act referral guidelines for the vulnerable koala (combined populations of Qld, NSW and the ACT)</i>, Commonwealth of Australia, 2014, or subsequent revision].</p>	<p>The Department considers the definition aligns with that used in recent approval decisions.</p>	<p>No change.</p>
<p>Limit/s means a threshold greater than a trigger value that, should it be reached or exceeded (either through modelling or monitoring), cease work provisions will be implemented.</p>	<p>Proponent: Modelling will inform trigger values, but limits will require monitoring to validate.</p>	<p>Agreed.</p>	<p>Limit/s means a threshold greater than a trigger value that, should it be reached or exceeded (either through modelling or monitoring), cease work provisions will be implemented.</p>
<p>Monitoring data means the data required to be recorded under the conditions of this approval.</p>	<p>Proponent: Very open-ended and potentially onerous requirement. What reasonable limitations can be placed on this definition?</p>	<p>Standard administrative definition.</p>	<p>No change.</p>
		<p>Insert. Replaces drilling fluid compound/s.</p>	<p>New drilling fluid compound/s means drilling fluid compound/s that were not included in the Chemical Risk Assessment submitted to the Department in the preliminary documentation. However, the use</p>

			of the chemical identified as “Component 3” in the tables at Attachment B of the <i>Gap Analysis for Chemical Risk Assessment for Drill Chemicals</i> , 1 March 2019, provided in the preliminary documentation is not agreed by the Department . The chemical risk assessment process required under Condition 17-19 of this approval must be undertaken prior to the use of the “Component 3” chemical.
		Insert. See Condition 26.	Outcomes report peer review means a review carried out by an independent suitably qualified water resources expert that evaluates and interprets ongoing monitoring data and whether trigger values .
		Insert. See Condition 20.	Patch/es means a discrete and mostly continuous area of a GDE ; it can include small-scale variations, gaps and disturbances.
Performance criteria means specific parameters, associated with and relevant to GDE function that will be monitored to		Minor edit to align with requirements of Condition 20.	Performance criteria means specific parameters, associated with and relevant to GDE function or the viability of a patch of a GDE

<p>demonstrate that the outcome of no adverse impact is being achieved, measured at a specific time and place.</p>			<p>that will be monitored to demonstrate that the outcome of no adverse effect impact is being achieved, measured at a specific time and place.</p>
<p>Preliminary documentation means the <i>Surat Basin Acreage Development EPBC 2018/8276 – Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, July 2019, Revision 4</i>, provided to the Department on 8 July 2019.</p>	<p>Proponent: Updated to reflect final version which went out for public comment [<i>September 2019, Revision 6, 9 September 2019</i>].</p>	<p>The Department notes that the most recent revision on the preliminary documentation provided to the Department was Revision 4, which was the revision approved for publishing. The proponent advised on 9 September 2019 that no comments were received on the preliminary documentation and that no amendments were made.</p> <p>The Department followed up with the proponent and understands that no material changes were made between Revision 4, which was last received and approved by the Department, and Revision 6 (see correspondence at <u>Attachment G</u>).</p>	<p>Preliminary documentation means the <i>Surat Basin Acreage Development EPBC 2018/8276 – Preliminary Documentation, Matters of National Environmental Significance Impact Assessment Report, July September 2019, Revision 4 6</i>, provided to the Department on 8 July published on the website after 9 September 2019.</p>
<p>Remediation, Rehabilitation and Recovery Monitoring Plan means the <i>QCLNG Gasfields – Remediation, Rehabilitation,</i></p>	<p>Proponent: Need to update to Reinstatement and Rehabilitation Manual upon approval by the Department.</p>	<p>The Department noted in discussions with the proponent on 11 November 2019 that as the definition includes ‘any subsequent revision approved by the Minister’ a</p>	<p>Remediation, Rehabilitation and Recovery Monitoring Plan Reinstatement and Rehabilitation Manual means the QCLNG</p>

<p><i>Recovery and Monitoring Plan, QCLNG-BX00-ENV-PLN-000026, Revision 2, October 2011, approved on 20 October 2011 under EPBC Act approval 2008/4398, or subsequent revision approved by the Minister.</i></p>		<p>variation will not be needed.</p> <p>Minor edit to current approved revision details.</p>	<p>Gasfields Surat Basin Acreage – Remediation, Rehabilitation, Recovery and Monitoring Plan, QCQGLNG-BX00-ENV-PLN-00002615, Revision 2 1, October 2014 May 2014, approved on 20 October 2014 under EPBC Act approval 2008/4398 provided to the Department on 13 June 2014, or subsequent revision approved by the Minister.</p>
<p>Significant Species Management Plan means the <i>Significant Species Management Plans, QCLNG Gas Field (QCLNG-BX00-ENV-PLN-000010) Revision 0, January 2014, approved on 5 February 2014, or subsequent revision approved by the Minister.</i></p>		<p>Minor edit to current approved revision details.</p>	<p>Significant Species Management Plan means the <i>Significant Species Management Plans, QCLNG Gas Field-Surat North Development Area (QCLNG-BX00-ENV-PLN-000010) Revision 0, January 2014, approved on 5 February 2014, or subsequent revision approved by the Minister.</i></p>
<p>Stage 1 means the construction and operation of 119 coal seam gas wells with a combined maximum peak rate of groundwater production of 10 ML per day within the area shaded in green designated ‘Stage 1’ in <u>Attachment B</u>.</p>	<p>Proponent: Need to discuss how to capture that there will be some infill wells within the existing operational area.</p>	<p>The Department notes that this was discussed on 11 November 2019 and the definitions of Stage 1 and Stage 2 are adequate.</p>	<p>No change.</p>

<p>Trigger value/s means a threshold for the performance criteria that, should it be reached or exceeded (either through modelling or monitoring), the approval holder will implement an appropriate management response such that a limit is not reached and the trigger value is no longer exceeded.</p>	<p>Proponent: Need to ensure that “false positives” are screened out.</p> <p>[Insert ‘A trigger value or limit is not considered to have been reached or exceeded if it has been shown to be caused by:</p> <ul style="list-style-type: none"> • Measurement error or instrument drift, or • Other anthropogenic or climatic influences identified by trend analysis or by comparison to a reference site (analysis methodology and reference sites to be defined in the approved GDE Program).] 	<p>Addressed in requirements for GDE Program required under Condition 21.</p>	<p>No change.</p>
		<p>Insert. Aligns with requirements under Condition 20.</p>	<p>Viability means the ability of a patch of a GDE to sustain itself for the period for which the approval has effect.</p>

Senator the Hon Bridget McKenzie
Minister for Agriculture
Parliament House
CANBERRA ACT 2600

Dear Minister McKenzie

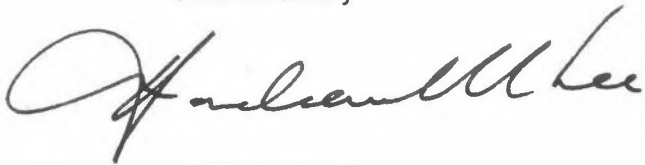
Decision on approval
Surat North CSG Project, Qld

I am writing to you in relation to the proposal by QGC Pty Ltd to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland.

I have considered the proposal in accordance with Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and have decided to grant an approval to QGC Pty Ltd. A notice of my decision is attached for your information.

If you have any questions about this decision, please contact the project manager, [s. 22\(1\)\(a\)\(ii\)](#), by email to [s. 22\(1\)\(a\)\(ii\)](#) @environment.gov.au, or telephone [s. 22\(1\)\(a\)\(ii\)](#) and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

9 December 2019

The Hon Ken Wyatt AM MP
Minister for Indigenous Australians
Parliament House
CANBERRA ACT 2600

Dear Minister Wyatt

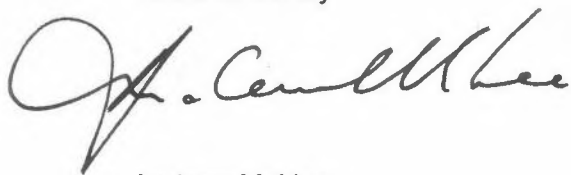
**Decision on approval
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I am writing to you in relation to the proposal by QGC Pty Ltd to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland.

I have considered the proposal in accordance with Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and have decided to grant an approval to QGC Pty Ltd. A notice of my decision is attached for your information.

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Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

9 December 2019

s. 47F(1)

Manager – Access
QGC Pty Ltd
GPO Box 3107
BRISBANE QLD 4001

Dear **s. 47F(1)**

**Decision on approval
Surat North CSG Project, Qld**

I am writing to you in relation to a proposal to construct, operate and decommission up to 740 coal seam gas wells in the Surat Basin Acreage Development, approximately 20 km west of Wandoan, Queensland.

I have considered the proposal in accordance with Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and have decided to grant an approval to QGC Pty Ltd. The details of my decision are attached. The proposal must be undertaken in accordance with the conditions specified in the approval.

I also note and appreciate our collaborative commitment to approach the management of impacts on water resources from both this action and the EPBC 2013/7047 action in the same manner. The Department is expecting a request to vary the EPBC 2013/7047 conditions of approval relating to the management of impacts to water resources to reflect those of this action in the near future.

I would appreciate your assistance by informing me when you start the action and who will be the contact person responsible for the administration of the approval decision.

Please note, any plans required as conditions of approval will be regarded as public documents unless you provide sufficient justification to warrant commercial-in-confidence status.

You should also note that this EPBC Act approval does not affect obligations to comply with any other laws of the Commonwealth, state or territory that are applicable to the action. Neither does this approval confer any right, title or interest that may be required to access land or waters to take the action.

The Department has an active audit program for proposals that have been referred or approved under the EPBC Act. The audit program aims to ensure that proposals are implemented as planned and that there is a high degree of compliance with any associated conditions. Please note that your project may be selected for audit by the Department at any time and all related records and documents may be subject to scrutiny. Information about the Department's compliance monitoring and auditing program is enclosed.

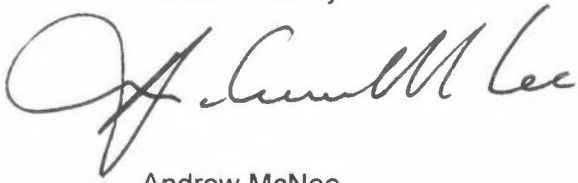
I have also written to Commonwealth Ministers with relevant responsibilities and the Queensland Government to advise them of this decision.

If you have any questions about this decision, please contact the project manager,

s. 22(1)(a)(ii) , by email to s. 22(1)(a)(ii) :@environment.gov.au, or telephone

s. 22(1)(a)(ii) } and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely



Andrew McNee

Assistant Secretary

Assessments and Governance Branch

9 December 2019



COMPLIANCE MONITORING AND AUDITING

This fact sheet provides an overview of the compliance monitoring and auditing program in place for projects referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and permits granted under the *Environment Protection (Sea Dumping) Act 1981* (the Sea Dumping Act).

What is the EPBC Act?

The EPBC Act is Australia's key national environment law. Under the EPBC Act, proposals which are likely to have a significant impact on matters of national environmental significance must be referred, assessed, and a decision made by the Minister or his delegate on whether to approve the proposal.

What is the Sea Dumping Act?

The Sea Dumping Act regulates the loading and dumping of waste at sea. The Sea Dumping Act fulfils Australia's international obligations under the London Protocol to prevent marine pollution by dumping of wastes and other matter. Permits are required from the Department for all ocean disposal activities.

What is compliance monitoring and auditing for?

The Department has implemented a program to monitor and audit projects that have been referred under the EPBC Act and the Sea Dumping Act to ensure they are complying with their approval/permit conditions or particular manner requirements and the legislation.

Compliance monitoring activities, including inspections and audits, aim to ensure projects with the potential to impact on nationally protected matters are implemented as planned. Monitoring and audits help the Australian Government to understand how well conditions or requirements are being understood and applied, and contribute to improving the effectiveness of the Department's operations.

All compliance monitoring activities, and any subsequent enforcement activities, are conducted in accordance with the Department's Compliance and Enforcement Policy.

What is a monitoring inspection?

Approved projects are subject to monitoring inspections to ensure and verify compliance with the conditions or requirements of the approval or permit. Projects are selected for a monitoring inspection based on a risk-based process informed through a number of factors, including sector, location, compliance history and the potential impact on listed matters (such as threatened species and ecological communities).

What is a compliance audit?

A compliance audit is an objective assessment of a project's compliance against selected criteria. Projects are audited against conditions or requirements. A compliance audit usually takes the form of a desktop document review and may include a site inspection, if necessary. In some cases, the document review provides the Department with enough information to verify that a project is compliant.

Projects can be chosen for audit based on a random selection process or a risk-focused selection process. If your project is selected for an audit, you will be contacted by a Departmental officer who will explain the process. All audit report summaries are posted on the Department's website. The results of audits may also be publicised through the general media.

Further information

For further information on the compliance monitoring and auditing program, please visit the Department's website at www.environment.gov.au or contact:

The Director, Compliance Monitoring Section
Department of the Environment
GPO Box 787 CANBERRA ACT 2601
Telephone: (02) 6274 1111
Email: EPBCmonitoring@environment.gov.au



The Hon Leeanne Enoch MP
Minister for Environment and the
Great Barrier Reef, Minister for
Science and Minister for the Arts
c/o Department of the Environment and Science
GPO Box 2454
BRISBANE QLD 4001

Dear Minister Enoch

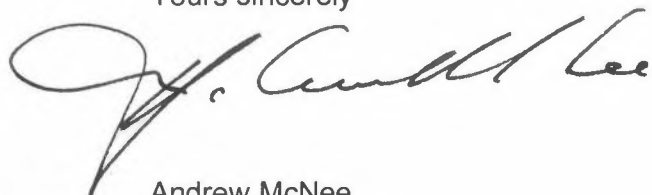
**Decision on approval
Surat North CSG Project, Qld**

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I have considered the proposal in accordance with Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and have decided to grant an approval to QGC Pty Ltd. A notice of my decision is attached for your information.

If you have any questions about this decision, please contact the project manager, [s. 22\(1\)\(a\)\(ii\)](#) by email to [s. 22\(1\)\(a\)\(ii\)](#) @environment.gov.au, or telephone [s. 22\(1\)\(a\)\(ii\)](#) and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

16 December 2019

EPBC Ref: 2018/8276

Senator the Hon Matt Canavan
Minister for Resources and Northern Australia
Parliament House
CANBERRA ACT 2600

Dear Minister Canavan

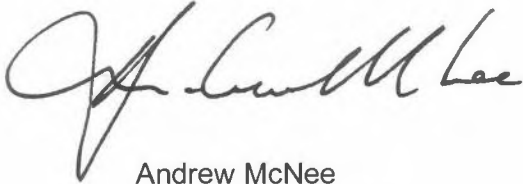
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Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

9 December 2019

EPBC Ref: 2018/8276

The Hon David Littleproud MP
Minister for Water Resources, Drought,
Rural Finance, Natural Disasters and
Emergency Management
Parliament House
CANBERRA ACT 2600

Dear Minister Littleproud

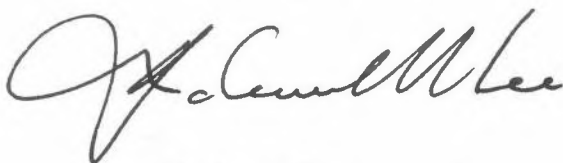
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Yours sincerely



Andrew McNee
Assistant Secretary
Assessments and Governance Branch

9 December 2019

EPBC Act Species and Ecological Communities Weekly Report – 1 November 2019

Recent and imminent decisions to list, transfer or delist threatened and migratory species or threatened ecological communities, approve conservation advices, and make or adopt recovery plans, wildlife conservation plans and threat abatement plans.

There have been no significant changes since the last update.

Changes since the last report are highlighted in yellow. Statutory decision timeframes are in bold red text.

Abbreviations for threat categories: EX: Extinct, EW: Extinct in the Wild, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, CD: Conservation Dependent.

Type	Description	State/ Territory	Decision (made/ recommended)	Brief number and status
RECENT DECISIONS – made by Minister or delegate in the past six weeks. The most recent decisions are listed first.				
There have been no listing or statutory document decisions in the past six weeks. See SPRAT for current information on listed species and ecological communities.				
IMMINENT Decisions – currently with Minister or delegate. Decisions with the most imminent deadline are listed first.				
Conservation advice	New Conservation Advice for three species which have not previously had a Recovery Plan or Conservation Advice: <ul style="list-style-type: none"> <i>Caladenia colorata</i> (Coloured Spider-orchid) <i>Lissotes latidens</i> (Broad-toothed Stag Beetle) <i>Potorous tridactylus tridactylus</i> (Long-nosed Potoroo (SE Mainland)) 	<ul style="list-style-type: none"> Qld, NSW, Vic, SA Tas SA, Vic 	Approve new conservation advice	Minister decision. Decision brief (MS19-000780) provided to Minister on 18 Sep 2019, with a decision requested by 4 Oct 2019.
Threatened Species Listing	Listing decisions for 2 species from the September 2019 TSSC meeting: <ul style="list-style-type: none"> <i>Falco hypoleucos</i> (Grey Falcon): List as VU <i>Petaurus australis</i> Wet Tropics subspecies (Yellow-bellied Glider (Wet Tropics)): Transfer from VU to EN 	<ul style="list-style-type: none"> Mainland states and territories Qld 	Amend the list and approve conservation advices	Minister decision. Decision brief (MS19-000798) provided to the Minister on 30 Sep 2019. Decision due by 10 Feb 2020.
PENDING DECISIONS – anticipated to go to Minister or delegate in coming six weeks. Items with the most imminent decision are listed first.				
Conservation advice	New Conservation Advices for 32 species which have Recovery Plans which are due to sunset in the coming three years: <ul style="list-style-type: none"> <i>Acacia latzii</i> (Latz's Wattle) <i>Acacia undoolyana</i> (Undoolya Wattle) <i>Allocasuarina emuina</i> (Mt Emu She-oak) <i>Aquila audax fleayi</i> (Tasmanian Wedge-tailed Eagle) <i>Boronia quadrilata</i> <i>Boronia viridiflora</i> 	<ul style="list-style-type: none"> NT NT Qld Tas NT NT 	Approve new conservation advice	Confirming approval arrangements with the Minister's office

	<ul style="list-style-type: none"> • <i>Caladenia actensis</i> (Canberra Spider Orchid) • <i>Caladenia argocalla</i> (White-beauty Spider-orchid) • <i>Caladenia behrii</i> (Pink-lipped Spider-orchid) • <i>Caladenia bryceana</i> subsp. <i>bryceana</i> (Dwarf Spider-orchid) • <i>Caladenia busselliana</i> (Bussell's Spider-orchid) • <i>Caladenia caesarea</i> subsp. <i>maritima</i> (Cape Spider-orchid) • <i>Caladenia gladiolata</i> (Bayonet Spider-orchid) • <i>Caladenia huegelii</i> (King Spider-orchid) • <i>Caladenia insularis</i> (French Island Spider-orchid) • <i>Caladenia macroclavia</i> (Large-club Spider-orchid) • <i>Caladenia rigida</i> (Stiff White Spider-orchid) • <i>Caladenia tessellata</i> (Thick-lipped Spider-orchid) • <i>Caladenia viridescens</i> (Dunsborough Spider-orchid) • <i>Caladenia winfieldii</i> (Majestic Spider-orchid) • <i>Caladenia woolcockiorum</i> (Woolcock's Spider-orchid) • <i>Calyptorhynchus banksii graptogyne</i> (South-eastern Red-tailed Black-cockatoo) • <i>Conostylis setigera</i> subsp. <i>dasys</i> (Boscabel Conostylis) • <i>Eucalyptus alligatrix</i> subsp. <i>limaensis</i> (Lima Stringybark) • <i>Litoria olongburensis</i> (Wallum Sedge Frog) • <i>Poephila cincta cincta</i> (Southern Black-throated Finch) • <i>Prostanthera askania</i> (Tranquillity Mintbush) • <i>Pterodroma leucoptera leucoptera</i> (Gould's Petrel) • <i>Pterostylis lepida</i> (Halbury Greenhood) • <i>Ptilotus beckerianus</i> (Ironstone Mulla Mulla) • <i>Ricinocarpos gloria-medii</i> (Glory of the Centre) • <i>Sagina diemensis</i> (Tasmanian Pearlwort) 	<ul style="list-style-type: none"> • ACT • SA • SA • WA • WA • WA • SA • WA • Vic • SA • SA • WA • WA • WA • SA • SA, Vic • WA • Vic • NSW, Qld • Qld (EX in NSW) • NSW • NSW • SA • SA • NT • Tas 		
Conservation advice	<p>New Conservation Advice for two threatened ecological communities which have Recovery Plans which are due to sunset in the coming three years:</p> <ul style="list-style-type: none"> • Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions • Mabi Forest (Complex Notophyll Vine Forest 5b) 	<ul style="list-style-type: none"> • Qld, NSW • Qld 	Approve new conservation advice	Confirming approval arrangements with the Minister's office
Conservation advice	<p>Updated Conservation Advice for <i>Pteropus conspicillatus</i> (Spectacled Flying-fox) to incorporate the threat from heat stress</p>	<ul style="list-style-type: none"> • Qld 	Approve updated conservation advice	Confirming approval arrangements with the Minister's office

Conservation advice	Updated and enhanced Conservation Advice for <i>Fregata andrewsi</i> (Christmas Island Frigatebird)	<ul style="list-style-type: none"> • Christmas Island 	Approve updated conservation advice	Confirming approval arrangements with the Minister's office
Conservation advice	Updated Conservation Advice, with minor changes to enable the states and territories to align their listing of these species with the EPBC Act, for: <ul style="list-style-type: none"> • <i>Antechinus argentus</i> (Silver-headed Antechinus) • <i>Antechinus arktos</i> (Black-tailed Antechinus) • <i>Argyannis hyperbius inconstans</i> (Australian Fritillary) • <i>Lathamus discolor</i> (Swift Parrot) • <i>Calidris ferruginea</i> (Curlew Sandpiper) 	<ul style="list-style-type: none"> • Qld • NSW, Qld • NSW, Qld • Qld, NSW, Vic, SA, Tas • All 	Approve updated conservation advice	Confirming approval arrangements with the Minister's office
Threatened Ecological Community Listing	List the 'Elderslie Banksia Scrub Forest and intergrades of the Nepean River region' as CR	<ul style="list-style-type: none"> • NSW 	Amend the list and approve conservation advice	Minister decision. Committee's advice provided to the Minister on 27 Sep 2019 – returned to the Department for decision briefing, which is being finalised (MS19-000804). Decision due by 7 Feb 2020.
Recovery Plan	Adopt the 'National Recovery Plan for the Southern Bent-wing Bat (<i>Miniopterus orianae bassanii</i>)'	<ul style="list-style-type: none"> • Vic, SA 	Adopt the recovery plan	Minister decision. Brief being finalised (MS19-000431).

Future assessments and other changes...

The full list of species and ecological communities currently undergoing assessment, and the timeframe by which the assessments are due to the Minister, is available here:

www.environment.gov.au/biodiversity/threatened/assessments/fpal

Listing assessments open for public comment are available here:

www.environment.gov.au/biodiversity/threatened/nominations/comment

Draft recovery plans open for public comment are available here:

www.environment.gov.au/biodiversity/threatened/recovery-plans/comment

The change log for [SPRAT](#) which describes updates to distribution maps and other changes is available here: http://apps.internal.environment.gov.au/cgi-bin/erin/change_control/cc_list.pl?application=EPBC

All weekly reports are available on the [Information products for threatened species and ecological communities](#) page on the intranet.

Subscribe to receive an email alert when new reports are added

1. Click on this link – [Subscribe to the weekly report](#)
2. Select your preferred alert options. Consider altering the 'Change Type' from the default 'All changes' to when 'New items are added'.
3. Click the OK button to subscribe.
4. You should receive an email confirming that you have successfully created an alert for 'Species and communities weekly reports'.

s. 22(1)(a)(ii)

From: Species Policy
Sent: Monday, 9 December 2019 10:54 AM
To: s. 22(1)(a)(ii)
Cc: Environment Protection; s. 22(1)(a)(ii) ; Species Policy
Subject: RE: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

On behalf of the Protected Species and Communities Branch, I confirm that we are not anticipating any changes to the documents relating to the threatened species and ecological communities identified by EAD in the email below in the coming six weeks.

Please note that PSCB has not re-checked whether the correct documents are present or that the citation information is correct.

Regards, s. 22(1)(a)(ii)

s. 22(1)(a)(ii) | Assistant Director | Species Information and Policy Section | Department of the Environment and Energy
PO Box 787 | CANBERRA ACT 2600
s. 22(1)(a)(ii)@environment.gov.au
Ph: s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Monday, 9 December 2019 9:49 AM
To: Species Policy <SpeciesPolicy@environment.gov.au>
Cc: Environment Protection <Environment.Protection@environment.gov.au>; s. 22(1)(a)(ii) <s. 22(1)(a)(ii)@environment.gov.au>; s. 22(1)(a)(ii) <s. 22(1)(a)(ii)@environment.gov.au>
Subject: RE: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi Species Policy

The Minister or the Minister's delegate is likely to make an approval decision on the Surat North CSG Project, Qld (EPBC 2018/8276) this week. I note that your advice provided on 25 October 2019 has now expired.

The relevant species and statutory documents considered remain as listed below. I would be grateful if you could please advise on whether or not there are any likely upcoming changes to these documents.

Thank you.

Kind regards,

s. 22(1)(a)(ii)
A/g Assistant Director | Post Approvals Strategies Section
Environment Approvals Division
Department of the Environment and Energy
T s. 22(1)(a)(ii) | E s. 22(1)(a)(ii) @environment.gov.au

We acknowledge the traditional custodians of this land and celebrate their ongoing culture and contribution to society.



From: Species Policy
Sent: Friday, 25 October 2019 2:57 PM
To: s. 22(1)(a)(ii) @environment.gov.au
Cc: Environment Protection <Environment.Protection@environment.gov.au>; s. 22(1)(a)(ii) <s. 22(1)(a)(ii) @environment.gov.au>; s. 22(1)(a)(ii) @environment.gov.au; Species Policy <SpeciesPolicy@environment.gov.au>
Subject: RE: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

On behalf of the Protected Species and Communities Branch, I confirm that we are not anticipating any changes to the documents relating to the threatened species and ecological communities identified by EAD in the email below in the coming six weeks.

Please note that PSCB has not re-checked whether the correct documents are present or that the citation information is correct.

Regards, s. 22(1)(a)(ii)

s. 22(1)(a)(ii) | Assistant Director | Species Information and Policy Section | Department of the Environment and Energy
PO Box 787 | CANBERRA ACT 2600
[s. 22\(1\)\(a\)\(ii\)@environment.gov.au](mailto:s. 22(1)(a)(ii)@environment.gov.au)
Ph: s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Thursday, 24 October 2019 12:18 PM
To: Species Policy <SpeciesPolicy@environment.gov.au>
Cc: Environment Protection <Environment.Protection@environment.gov.au>; s. 22(1)(a)(ii) <s. 22(1)(a)(ii) @environment.gov.au>; s. 22(1)(a)(ii) @environment.gov.au
Subject: FW: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi Species Information and Policy Section,

The proposed decision for the Surat North CSG Project, approximately 20 km west of Wandoan, Queensland (EPBC 2018/8276), is likely to be signed by the delegate, Andrew McNee, on 4 November 2019.

I would be grateful if you could please advise on whether or not there are any new, revised or imminent conservation advices, recovery plans or threat abatement plans that may be relevant to this project.

I have reviewed the information below, and can confirm the relevant statutory documents have been correctly identified for the listed threatened species and ecological communities.

The last check of SPRAT for new or revised conservation advices, recovery plans or threat abatement plans was done 24 October 2019.

Thanks,

s. 22(1)(a)(ii)

Queensland Assessments North Section
Environment Approvals Division
Department of the Environment and Energy

t s. 22(1)(a)(ii) | e s. 22(1)(a)(ii) @environment.gov.au

From: s. 22(1)(a)(ii)

Sent: Thursday, 24 October 2019 11:23 AM

To: s. 22(1)(a)(ii) @environment.gov.au; s. 22(1)(a)(ii)

<s. 22(1)(a)(ii) @environment.gov.au>

Cc: Environment Protection <Environment.Protection@environment.gov.au>; s. 22(1)(a)(ii)

<s. 22(1)(a)(ii) @environment.gov.au>

Subject: Surat North CSG Project (EPBC 2018/8276) Request for check on new listings, advices and plans [SEC=OFFICIAL]

Hi QA Officer

The proposed decision for the Surat North CSG Project (EPBC 2018/8276) is likely to be signed by the delegate, Andrew McNee, on 4 November 2019.

The project is located in the QGC Surat Basin Acreage Development (SBAD), approximately 20 km west of Wandoan, Queensland. Could you please provide advice as to whether or not there are any new, revised or imminent conservation advices, recovery plans or threat abatement plans that may be relevant to this project?

I have listed the species and ecological communities which are likely to be significantly impacted by the project and the CAs, RPs and TAPs that have been considered in the decision below.

The last check of SPRAT for new or revised conservation advices, recovery plans or threat abatement plans was done on 23 October 2019.

Please let me know if you require any further information.

Are you able to provide this advice by **29 November 2019**?

Thanks.

s. 22(1)(a)(ii)

Environment Approvals Division

T s. 22(1)(a)(ii) | E s. 22(1)(a)(ii) @environment.gov.au

Relevant listed threatened species and communities:

- Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – Vulnerable
- Greater Glider (*Petauroides volans*) – Vulnerable
- South-eastern Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable

Conservation advices:

- Threatened Species Scientific Committee (2015). *Conservation Advice Nyctophilus corbeni south-eastern long-eared bat*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83395-conservation_advice-01102015.pdf.

- Threatened Species Scientific Committee (2016). *Conservation Advice* Petauroides volans greater glider. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-20160525.pdf>.
- Department of Sustainability, Environment, Water, Population and Communities (2012). *Approved Conservation Advice for Phascolarctos cinereus (combined populations in Queensland, New South Wales and the Australian Capital Territory)*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/197-conservation-advice.pdf>.

Recovery Plans:

Nil.

Threat abatement plans:

Nil.