Permit[1]

Environmental Protection Act 1994

Environmental authority

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Permit[1] number: EPVX01704113

Environmental authority takes effect on 08-SEP-2016.

The anniversary date of this environmental authority remains 06-June. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name	Registered address
Bengal Energy (Australia) Pty Ltd	Level 10 300 Ann Street BRISBANE CITY QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum - ATP	ATP732

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority is issued is a restatement of the ERA as defined by legislation at the time the approval is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an environmental authority as to the scale, intensity or manner of carrying out an ERA, then the conditions prevail to the extent of the inconsistency.

An environmental authority authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the authority specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

[1] Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation

Contaminated land

It is a requirement of the EP Act that if an owner or occupier of land becomes aware a notifiable activity (as defined in Schedule 3 and Schedule 4) is being carried out on the land, or that the land has been, or is being, contaminated by a hazardous contaminant, the owner or occupier must, within 22 business days after becoming so aware, give written notice to the chief executive.

	28/09/2016
Signature	Date

Anthony Schmid
Department of Environment and Heritage Protection
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Annemarie Lewis
Permit and Licence Management
Department of Environment and Heritage Protection
GPO Box 2454
BRISBANE QLD 4001
Phone: 1300 130 372
Fax: (07) 3330 5875
Email: palm@ehp.qld.gov.au

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Conditions of environmental authority

The conditions of approval for this environmental authority are contained in the following schedules:

This environmental authority contains eligibility criteria and standard conditions from *Eligibility criteria and standard conditions – Petroleum exploration activities (2013),* version 1, published by the Queensland Government. The eligibility criteria and standard conditions are identified by the code PEEC or PESC, which appears as the condition number (where relevant) throughout this environmental authority.

Eligibility Criteria

PEEC 1.
The applicant for the environmental authority is the holder of, or an applicant for only the following tenure types under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*:

- data acquisition authority (DAA)
- water monitoring authority (WMA)
- authority to prospect (ATP).

PEEC 2.
The petroleum activities are authorised petroleum activities for the purposes of the *Petroleum and Gas (Production and Safety) Act 2004 and the Petroleum Act 1923.*

PEEC 3.
The petroleum activities when combined do not cause a total significant disturbance to more than 1% of the total land area on the relevant tenure(s) at any point in time.

PEEC 4.
The petroleum activity is not, or will not be, carried out under an environmental authority under which any of the following is, or is to be, authorised:

(a) the injection of a waste fluid or gas for gas storage into a natural underground reservoir or aquifer
(b) a regulated dam
(c) the carrying out of the following environmentally relevant activities (ERAs):

i. ERA 8 – Chemical Storage

ii. ERA 60(1a) – (1d) – Regulated waste disposal

iii. ERA 60(2d) – (2h) – General waste disposal > 10,000t/year

iv. ERA 63(1a)(ii) – (1b)(ii), (1c) – (1g) – Sewage treatment with a total daily peak design capacity of greater than 21 equivalent persons (EP) which releases to other than an infiltration trench or irrigation scheme or where the sewage treatment activities have a total combined daily peak design capacity exceeding 1500 EP

v. ERA 64(2a) and (2b) and (4a) and (4b) – Water treatment where desalination of more than 0.5ML of water is treated, allowing the release of waste to waters other than seawater; or carrying out, in a day, advanced treatment of 5ML or more of water, allowing the release of waste only to seawater; or to waters other than seawater.

Schedule A – Authorised activities

PESCA 1.
All reasonable steps must be taken to ensure the petroleum activities comply with the eligibility criteria for the activity.

PESCA 2.
The following types of petroleum activities are not authorised:

(a) processing or storing petroleum or petroleum by-products that are not necessarily associated with well operations

(b) extracting earthen materials (other than drilling waste rock) of more than 100,000t/year

(c) extracting by dredging of more than 1000t/year of material from the bed of naturally occurring surface waters

(d) drilling wells with fluids that are oil-based or synthetic oil-based

(e) carrying out stimulation activities using stimulation fluid that contains chemical additives where polycyclic aromatic hydrocarbons are in concentrations above the reporting limit.

PESCA 3.
Only low impact petroleum activities can be undertaken within Category B Environmentally Sensitive Areas (ESAs) or Category C ESAs other than state forests or timber reserves; or within the primary protection zone of Category A ESAs

Explanatory note: *Category A ESAs are excised from DAA, WMA and ATP tenure types and therefore petroleum activities cannot occur in these areas.*

PESCA 4.
Only essential petroleum activities can be undertaken in:

(a) the primary protection zone of Category B ESAs or Category C ESAs other than state forests or timber reserves
(b) the secondary protection zone of Category A ESAs or Category B ESAs
(c) Category C ESAs that are state forests or timber reserves.

PESCA 5.
Essential petroleum activities carried out in a primary protection zone must:

(a) be located in areas of pre-existing disturbance; and
(b) not negatively impact the ESA.

Schedule B – Protecting Environmental Values

PESCB 1.

Petroleum activities that cause significant disturbance to land must not be carried out until financial assurance has been given to the administering authority as security for compliance with the environmental authority and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the *Environmental Protection Act 1994*.

PESCB 2.
Petroleum activities must not cause environmental nuisance from dust, odour, light, smoke or noise at a sensitive place, other than where an alternative arrangement is in place.

PESCB 3.
Contaminants must not be directly or indirectly released to land or air except for those releases authorised by standard conditions (PESCC 11), (PESCC 15), (PESCC 22), (PESCC 23), (PESCC 25), (PESCC26), (PESCC 27), (PESCC 28), (PESCC 29), (PESCC 30), (PESCC 31), (PESCC 32), (PESCC 34) or (PESCC 35).

Activities in the designated precinct

(B4a) Petroleum activities conducted in the former special floodplain management area and in the former high preservation area within the designated precinct, as identified in Appendix A - Map 1, must be in accordance with conditions (B4b) – (B4k).

(B4b) With the exception of activities carried out for specified works and temporary campsites/workforce accommodation, only essential petroleum activities are permitted in the designated precinct.

(B4c) Specified works in the designated precinct must be co-located to the greatest possible extent.

(B4d) Specified works must not be constructed across a watercourse in the designated precinct, or across *Ginniapapa Creek* where an alternative watercourse crossing is already in existence and is within a reasonable distance.

(B4e) The size of any temporary campsites/workforce accommodation in the designated precinct is limited to 2250m2 and no more than 30 people accommodated at any time.

(B4f) Essential petroleum activities and temporary campsites/workforce accommodation in the designated precinct must not increase the natural movement of sediment beyond the work area and must not increase the delivery of sediment to water either during or following construction activities.

(B4g) Essential petroleum activities and temporary campsites/workforce accommodation in the designated precinct must not:

i. concentrate flood flows in a way that will or may cause or threaten an adverse impact on natural values or wetlands, watercourses, lakes and springs; or

ii. divert flood flows from natural drainage paths; or

iii. increase the local duration of floods; or

iv. increase the risk of detaining flood flows.

(B4h) Within the designated precinct, essential petroleum activities and specified works carried out within the bed and banks of a watercourse, wetland, lake or spring must:

i. not result in disturbance to the bed and banks of a watercourse, wetland, lake or spring beyond the minimum area necessary for the purpose of the disturbance; and

ii. be designed and undertaken by a suitably qualified person taking into account the matters listed in the 'Planning Activities' and 'Impact Management During Activities' sections of the administering authority's 'Guideline—Activities in a watercourse, lake or spring associated with mining operations' December 2010, as amended from time to time.

(B4i) Upon cessation of the works described in condition (B4h), rehabilitation must commence immediately.

(B4j) Petroleum activities (other than activities carried out for specified works) must not occur within:

i. 200 lateral metres of a watercourse, lake or spring that is in the designated precinct; or

ii. 100 lateral metres of *Ginniapapa Creek*.

(B4k) For activities carried out for pipelines or flow lines in the designated precinct:

i. any interference with overland flow and the potential for any interference with overland flow, must be temporary; and

ii. works must be planned in such a way as to minimise the potential for, and duration of, interference with overland flow; and

iii. the activities must not interfere with water in a watercourse, lake or spring (other than activities that are of a temporary nature).

Site planning

PESCB 5.

Prior to carrying out petroleum activities, the location of petroleum activities must be selected to:

(a) firstly avoid, then minimise, then mitigate any negative impacts on areas of vegetation or other areas of ecological value

(b) minimise disturbance to land that may otherwise result in land degradation

(c) minimise isolation, fragmentation or dissection of tracts of vegetation that would lead to a reduction in the current level of ecosystem functioning or ecological connectivity

(d) minimise clearing of mature or hollow bearing trees.

PESCB 6.

Records must be kept to demonstrate compliance with standard condition (PESCB 5).

PESCB 7.

Prior to any significant disturbance to land:

(a) an ecological assessment of areas with native vegetation that are to be significantly disturbed, must be conducted in accordance with the Queensland Government's *Biocondition, a Condition Assessment Framework for Terrestrial Biodiversity in Queensland, Assessment Manual; and*

(b) an assessment of the impacts that will occur as a result of significant disturbance to land must be undertaken.

Schedule C – Operating standards

Documentation

PESCC 1.
All plans, procedures and reports must:

(a) be certified by a suitably qualified person

(b) be kept on record for a minimum of 5 years.

PESCC 2.
All plans and procedures required to be developed must be implemented.

Plant and equipment

PESCC 3.
All plant and equipment reasonably necessary to ensure compliance with the standard conditions must be installed.

PESCC 4.
All plant and equipment must be maintained and operated in their proper and effective condition.

PESCC 5.
All measures reasonably necessary to ensure compliance with the standard conditions must be implemented.

PESCC 6.
Measures to prevent fauna entrapment must be implemented during the construction and operation of well infrastructure and dams.

Contingency and emergency response

PESCC 7.
Petroleum activities involving significant disturbance to land or which have the potential to cause environmental harm can only commence after the development of written contingency procedures which address the risks of non-compliance with Schedule B standard conditions.

PESCC 8.
The contingency procedures must include, but not necessarily be limited to:

(a) environmental nuisance and complaint management procedures including:

  i. a description of the petroleum activities that might result in non-compliance with Schedule B standard conditions and what mitigation measures are required to be implemented; and

  ii. the action that will be undertaken when a member of the public makes a valid complaint

(b) management procedures including details of what actions will be taken to protect environmental values and minimise potential environmental harm from petroleum activities as a result of floods, severe storms and fires

(c) environmental emergency management procedures including details of the response and mitigation measures that will be actioned to reduce negative impacts to environmental values in the event of a non-compliance with Schedule B standard conditions.

Explanatory note: *The contingency procedures may incorporate other documents by reference.*

Activities in wetlands, lakes, springs and watercourses

PESCC9

Petroleum activities that require earthworks, vegetation clearing and/or placing fill, other than that associated with the construction of linear infrastructure, are not permitted in or within:

(a) 200 metres of any wetland, lake or spring; or

(b) 100 metres of the outer bank of any other watercourse.

C9A

Despite standard condition (PESCC9), the Tangalooma-1 well, located at -27.0139, 142.9182 (GDA 94), and associated activities are permitted within 100m from the outer bank of a watercourse.

C9B

The Tangalooma-1 well and associated activities must not negatively impact a watercourse.

PESCC 10.

The construction and/or maintenance of linear infrastructure that will result in significant disturbance to a wetland, lake, spring or watercourse must be conducted in accordance with the following order of preference. Conducting works:

1. firstly, in times where there is no water present
2. secondly, in times of no flow
3. thirdly, in times of flow, but in a way that does not impede low flow.

PESCC 11.

Petroleum activities must not result in water turbidity increases of more than 10% in high ecological value waters outside contained construction or maintenance areas.

PESCC 12.

The construction and/or maintenance of linear infrastructure that will result in significant disturbance to a lake, spring or watercourse must be designed and undertaken by a suitably qualified person in accordance with the guideline *Activities in a watercourse, lake or spring associated with a resource activity or mining operations.*

PESCC 13.

The construction and/or maintenance of linear infrastructure that will result in significant disturbance to a wetland must be designed and undertaken by a suitably qualified person taking into consideration sections 5 and 6 of the guideline *Activities in a watercourse, lake or spring associated with a resource activity or mining operations.*

Soil management

PESCC 14.

Measures to minimise stormwater entry onto significantly disturbed land must be implemented and maintained.

PESCC 15.

Sediment and erosion control measures to prevent soil loss and deposition beyond significantly disturbed land must be implemented and maintained.

Chemical Storage

PESCC 16.

Chemicals and fuels on the relevant tenures must be stored in, or serviced by, an effective containment system that meets Australian Standards, where such a standard is relevant.

Structures that are dams or levees

PESCC 17.

Other than for flare pits and sumps used to store residual drilling material and drilling fluids, the hazard category of any dam or levee to be used in carrying out petroleum activities must be assessed in accordance with the Queensland Government *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.*

PESCC 18.

Low hazard dams must be:

(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.

PESCC 19.

All low hazard dams must be monitored for early signs of loss of structural or hydraulic integrity as specified in the initial hazard assessment.

PESCC 20.

When no longer required all low hazard dams must be decommissioned to no longer accept inflow from the petroleum activities and be either:

(a) rehabilitated; or

(b) agreed to in writing by the administering authority and the landholder to remain in situ following the cessation of the petroleum activity(ies) associated with the dam, with the contained water of a quality suitable for the intended ongoing uses(s) by that landholder.

Blasting

PESCC 21.

A Blast Management Plan must be developed for each blasting activity in accordance with Australian Standard 2187.

PESCC 22.

Blasting operations must be designed to not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive place.

PESCC 23.

Blasting operations must be designed to not exceed a ground-borne vibration peak particle velocity of 10mm/s at any time, when measured at or extrapolated to any sensitive place.

Waste management

PESCC 24.
Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.

PESCC 25.
Waste, including waste fluids but excluding waste gas, must be transported off-site for lawful re-use, remediation, recycling or disposal unless the waste is specifically authorised by standard conditions (PESCC 26), (PESCC 27), (PESCC 28), (PESCC 29), (PESCC 30), (PESCC 31), (PESCC 32) or (PESCC 34) to be disposed of or used on-site.

PESCC 26.
Sumps may be used for residual drilling material and drilling fluids only for the duration of drilling activities.

PESCC 27.
Green waste may be used on-site for rehabilitation and/or sediment and erosion control purposes.

Treated sewage effluent

PESCC 28.
Treated sewage effluent or greywater can be released to land provided it:

(a) meets or exceeds secondary treated class B standards for a treatment system with a daily peak design capacity of between 150 EP and 1500 EP; or

(b) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of less than 150 EP; and

(c) is released within fenced and signed contaminant release area(s) and does not result in pooling or run-off or aerosols or spray drift or vegetation die-off.

Produced water

PESCC 29.
Produced water and stimulation flow-back water may be reused in:

(a) drilling and well hole activities; or

(b) stimulation activities where its use will not result in negative effects on waters beyond the stimulation impact zone.

PESCC 30.
Produced water may be used for dust suppression and construction activities provided that it does not result in adverse effects on the composition and structure of soil or subsoils and can be demonstrated to meet the following standards:

(a) pH between 6–9
(b) electrical conductivity (EC) not exceeding 3000µS/cm
(c) sodium adsorption ratio (SAR) not exceeding 8
(d) bicarbonate ion concentration not exceeding 100mg/L.

PESCC 31.
Produced water used by an owner or occupier for domestic purposes or stock purposes in accordance with section 186 of the *Petroleum and Gas (Production and Safety) Act 2004* or section 86 of the *Petroleum Act 1923* must meet the irrigation or livestock watering criteria as relevant to those purposes in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).*

Residual drilling material
PESCC 32.
Residual drilling material can only be disposed of on-site:

(a) by mix-bury-cover method if the residual drilling material meets the approved quality criteria; or

(b) if it is certified by a suitably qualified third party as being of acceptable quality for disposal to land by the proposed method and that environmental harm will not result from the proposed disposal.

PESCC 33.
Records must be kept of drilling fluids and all additives used in drilling activities.

Venting and well flaring
PESCC 34.
Unless venting is authorised under section 72 of the *Petroleum and Gas (Production and Safety) Act 2004* or section 74M of the *Petroleum Act 1923*, waste gas from production testing must be flared in a manner such that:

(a) an automatic ignition system is used; and
(b) a flame is visible at all times while the waste gas is being flared; and
(c) there is no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours; or
(d) it uses an enclosed flare.

Explanatory note: *If an enclosed flare is used, the requirements in relation to the ignition system, flame and smoke do not apply.*

Stimulation
PESCC 35.
The petroleum activities must not involve well stimulation activities at a well located within 2 kilometres laterally of a landholder's active groundwater bore and sourced from a formation within 200 metres vertically of the stimulation impact zone.

PESCC 36.
Prior to undertaking well stimulation activities, written stimulation management procedures must be developed.

Explanatory note: *The stimulation management procedures may incorporate other documents by reference.*

PESCC 37.
Stimulation activities must not result in:

(a) negative impacts to groundwater quality beyond the stimulation impact zone; or

(b) negative impacts to water quality in landholder's active groundwater bore(s) which tap into the target formation; or

(c) interconnectivity between the target formation and another aquifer.

Rehabilitation and financial assurance

PESCC 38.
Significantly disturbed areas that are no longer required for the ongoing conduct of the petroleum activities must be progressively rehabilitated within 6 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) so that:

(a) the areas are reshaped to a stable landform

(b) the areas are re-profiled to contours consistent with the surrounding landform

(c) surface drainage lines are re-established

(d) top soil is reinstated.

PESCC 39.
All significantly disturbed land caused by the carrying out of the petroleum activity(ies) must be rehabilitated to meet standard condition (PESCC 38) and the following final acceptance criteria:

(a) any contaminated land (e.g. contaminated soils, decommissioned dams containing salt) is remediated and rehabilitated

(b) rehabilitation is undertaken in a manner such that any actual or potential acid sulfate soils on the area of significant disturbance are treated to prevent or minimise environmental harm in accordance with the *Instructions for the treatment and management of acid sulfate soils* (2001)

(c) for land that is not being cultivated by the landholder:

  i. groundcover, that is not a declared pest species is established and self-sustaining

  ii. vegetation of similar species richness and species diversity to pre-selected analogue sites is established and self-sustaining

(d) for land that is to be cultivated by the landholder, cover crop is reinstated, unless the landholder will be preparing the site for cropping within 3 months of petroleum activities being completed.

PESCC 40.
Monitoring of performance indicators must be carried out on rehabilitation activities until final acceptance criteria in standard condition (PESCC 39) have been met for the rehabilitated area.

PESCC 41.
Prior to any changes in petroleum activities which would result in an increase to the maximum disturbance since the last financial assurance calculation was submitted, the holder of the environmental authority must submit, and the administering authority must have approved, an application to amend the financial assurance.

Schedule D – Monitoring and reporting conditions

Monitoring

PESCD 1.
All monitoring must be undertaken by a suitably qualified person.

PESCD 2.
If requested by the administering authority in relation to investigating a valid complaint, monitoring must be undertaken within 10 business days.

PESCD 3.
All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests, except as otherwise authorised in writing by the administering authority.

PESCD 4.
Notwithstanding standard condition (PESCD 3), where there are no NATA accredited laboratories available to test for a specific analyte or substance, then duplicate samples must be sent to separate laboratories for independent testing or evaluation.

Rehabilitation reporting for relinquishment of part of an authority to prospect area under the *Petroleum and Gas (Production and Safety) Act 2004.*

PESCD 5.
Prior to relinquishing all or part of an authority to prospect area, a rehabilitation report must be prepared which specifically relates to the area to be relinquished and which:

(a) reports on the condition of the area to be relinquished against the requirements of standard conditions (PESCC 38) and (PESCC 39); and

(b) includes the results of all rehabilitation monitoring undertaken in the area to be relinquished in accordance with standard condition (PESCC 40).

PESCD 6.
The report required under standard condition (PESCD 5) must be submitted to the administering authority at least 20 business days prior to the relinquishment notice being lodged with the administering authority for the *Petroleum and Gas (Production and Safety) Act 2004*.

Sampling

PESCD 7.
The methods of surface water sampling must comply with that set out in the Queensland Government's *Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009*.

PESCD 8.
The methods of groundwater sampling must comply with the Australian Government's *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1).

PESCD 9.
Noise must be measured in accordance with the prescribed standards in the *Environmental Protection Regulation 2008*.

PESCD 10.
The method of measurement of ambient air quality or point source contaminant releases to air must comply with the *Queensland Air Quality Sampling Manual* and/or Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*, whichever is appropriate for the relevant measurement.

Notification
PESCD 11.
In addition to the requirements under section 320A of the *Environmental Protection Act 1994*, the administering authority must be notified in writing within 5 business days of any event which has resulted in the contingency procedures required by standard conditions (PESCC 7) and (PESCC 8) being activated.

***Explanatory note**: Notification under standard condition (PESCD 11) should occur using the form, Incident notification for resource activities other than mining (EM706) available from the administering authority's website.*

Reporting
PESCD 12.
The annual return must include an Update Report detailing activities during the annual return period, demonstrating:

(a) significant disturbance during the period

(b) rehabilitation undertaken

(c) a list of all valid complaints relating to environmental issues made including the date, source, reason for the complaint and a description of investigations undertaken in resolving the complaint

(d) the results of all monitoring undertaken.

Definitions

***Explanatory note**: Where a term is not defined in this document, the definition in the Environmental Protection Act 1994, its regulations and environmental protection policies, then the Acts Interpretation Act 1954 then the Macquarie Dictionary should be used in that order.*

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td>acid sulfate soil(s)</td><td>means a soil or soil horizon which contains sulfides or an acid soil horizon affected by oxidation of sulfides.</td></tr>
<tr><td>accepted engineering standards</td><td>in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the Australian National Committee on Large Dams (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.</td></tr>
<tr><td>administering authority</td><td>has the meaning in Schedule 4 of the Environmental Protection Act 1994.</td></tr>
<tr><td>alternative arrangement</td><td>means a written agreement about the way in which a particular nuisance impact will be dealt with at a sensitive place, and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.</td></tr>
<tr><td>analogue site(s)</td><td>means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters.</td></tr>
<tr><td>analyte</td><td>means a chemical parameter determined by either physical measurement in the field or by laboratory analysis.</td></tr>
<tr><td>annual return period</td><td>means the most current 12-month period between 2 anniversary dates.</td></tr>
<tr><td>approved quality criteria</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:
<u>Part A</u>
In all cases:
<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>pH</td><td>6–10.5 (range)</td></tr>
<tr><td>Electrical Conductivity</td><td>20dS/m (20,000µS/cm)</td></tr>
<tr><td>Chloride*</td><td>8000mg/L</td></tr>
</table>
*Chloride analysis is only required if an additive containing chloride was used in the drilling process
The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing.

<u>Part B</u>
If any of the following metals are a component of the drilling fluids, then for that metal:
<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>Arsenic</td><td>20mg/kg</td></tr>
<tr><td>Selenium</td><td>5mg/kg</td></tr>
<tr><td>Boron</td><td>100mg/kg</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td></td><td>
<table>
<tr><td>Cadmium</td><td>3mg/kg</td></tr>
<tr><td>Chromium (total)</td><td>400mg/kg</td></tr>
<tr><td>Copper</td><td>100mg/kg</td></tr>
<tr><td>Lead</td><td>600mg/kg</td></tr>
<tr><td>Nickel</td><td>60mg/kg</td></tr>
<tr><td>Zinc</td><td>200mg/kg</td></tr>
<tr><td>Mercury</td><td>1mg/kg</td></tr>
</table>
The limits in Part B refer to the post soil/by-product mix.
Part C
If a hydrocarbon sheen is visible, the following hydrocarbon fractions:
<table>
<tr><th>TPH</th><th>Maximum concentration</th></tr>
<tr><td>C6-C10</td><td>170mg/kg</td></tr>
<tr><td>C10-C16</td><td>150mg/kg</td></tr>
<tr><td>C16-C34</td><td>1300mg/kg</td></tr>
<tr><td>C34-C40</td><td>5600mg/kg</td></tr>
<tr><td>Total Polycyclic Aromatic Hydrocarbons (PAHs)</td><td>20mg/kg</td></tr>
<tr><td>Phenols (halogenated)</td><td>1mg/kg</td></tr>
<tr><td>Phenols (non-halogenated)</td><td>60mg/kg</td></tr>
<tr><td>Monocyclic aromatic hydrocarbons[1]</td><td>7mg/kg</td></tr>
<tr><td>Benzene</td><td>1mg/kg</td></tr>
</table>
The limits in Part C refer to the post soil/by-product mix.
</td></tr>
<tr><td>aquifer</td><td>means an identifiable stratigraphic formation that has the potential to produce useful flows of water.</td></tr>
<tr><td>areas of pre-existing disturbance</td><td>means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term 'areas of pre-disturbance' does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.</td></tr>
<tr><td>bed</td><td>of any waters, has the meaning in Schedule 12 Part 2 of the Environmental Protection Regulation 2008.</td></tr>
<tr><td>business day</td><td>has the meaning in section 36 of the Acts Interpretation Act 1954.</td></tr>
<tr><td>Category A ESA</td><td>means any area listed in Schedule 12, Section 1 of the Environmental Protection Regulation 2008.</td></tr>
<tr><td>Category B ESA</td><td>means any area listed in Schedule 12, Section 2 of the Environmental Protection Regulation 2008.</td></tr>
</table>

Term	Definition
Category C ESA	means any of the following areas: • nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992* • State forests or timber reserves as defined under the *Forestry Act 1959* • resources 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, vulnerable, rare or near threatened under the *Nature Conservation Act 1992* • 'of concern regional ecosystems' identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions • threshold regional ecosystems as defined and listed in Appendix 6 of the *Queensland Biodiversity Offsets Policy* • critically limited regional ecosystems as defined and listed in Appendix 5 of the *Queensland Biodiversity Offsets Policy*.
certified	in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams means, a Statutory Declaration by a suitably qualified person or suitably qualified third party accompanying the written document stating: • the person's qualifications and experience relevant to the function • that the person has not knowingly included false, misleading or incomplete information in the document • that the person has not knowingly failed to reveal any relevant information or document to the administering authority • that the document addresses the relevant matters for the function and is factually correct; and • that the opinions expressed in the document are honestly and reasonably held.
clearing	has the meaning in the dictionary of the *Vegetation Management Act 2000.*
cultivated	means used for cropping or gardening.
dam(s)	means a land-based structure or a void that is designed to contain, divert or control flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.
daily peak design capacity	for sewage treatment works, has the meaning in Schedule 2, section 63(4) of the *Environmental Protection Regulation 2008* as the higher equivalent person (EP) for the works calculated using each of the formulae found in the definition for EP.
declared pest species	has the meaning in the *Land Protection (Pest and Stock Route Management) Regulation 2003* and is a live animal or plant declared to be a declared pest under section 36 (Declaring Pests by Regulation) or section 37(2) (Declaring Pest under Emergency Pest Notice) of that Act and includes reproductive material of the animal or plant.
designated precinct	has the meaning in Schedule 2 of the *Regional Planning Interests Regulation 2014.*
documents	has the meaning in section 36 of the *Acts Interpretation Act 1954.*
domestic purposes	has the meaning in Schedule 2 of the *Petroleum and Gas (Production and Safety) Act 2004* and section 86 of the *Petroleum Act 1923* .
ecological connectivity	is a measure of ecological condition and means the flow or connection of organisms and ecological processes across landscapes at multiple scales. Ecological connectivity has a positive relationship with landscape connectivity and habitat connectivity and effects vary between species. It includes connectivity by stepping stone or contiguous bioregional/local corridor networks.

Term	Definition
ecosystem functioning	means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.
eligibility criteria	for an environmentally relevant activity, has the meaning in section 112 of the *Environmental Protection Act 1994*.
enclosed flare	means a device where the residual gas is burned in a cylindrical or rectilinear enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.
environmental harm	has the meaning in section 14 of the *Environmental Protection Act 1994*.
environmental value(s)	has the meaning in section 9 of the *Environmental Protection Act 1994*.
environmental nuisance	has the meaning in section 15 of the *Environmental Protection Act 1994*.
equivalent person or EP	has the meaning under section 3 of the *Planning Guidelines For Water Supply and Sewerage*, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the *Environmental Protection Regulation 2008* where: • EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or • EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.
environmentally relevant activity or ERA	has the meaning in section 18 of the *Environmental Protection Act 1994*.

essential petroleum activities	means activities that are essential to bringing the resource to the surface and are only the following:
	• low impact petroleum activities
	• single well sites not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance
	• associated infrastructure located on a well site necessary for the construction and operations of wells:
	  ○ water pumps and generators
	  ○ flare pits
	  ○ above ground containers and chemical / fuel storages
	  ○ sumps for residual drilling material and drilling fluids
	  ○ dams to contain stimulation flow back waters that are not significant or high hazard dams
	  ○ erosion and sediment and control structures
	  ○ pipe laydown and vegetation stockpile areas
	  ○ a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works.
	• communication and power lines that are necessary for the undertaking of petroleum activities and that are located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities
	• ecological surveys, geophysical surveys, topographic or cadastral surveys or geological surveys (including seismic and geotechnical petroleum activities)
	• gathering / flow pipelines from a well head to the initial compression facility
	• supporting access tracks

financial assurance	for an environmental authority, means financial assurance given for the authority under Chapter 5, part 12, division 2 of the *Environmental Protection Act 1994*.

Term	Definition
flare pit	means a containment area where any hydrocarbon that is discovered in an over-pressured reservoir during the drilling operation is diverted to, and combusted. The flare pit is only used during the drilling and workover process.
green waste	means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature but does not include declared pest species.
greywater	means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.
hazard category	means a category, either low, significant or high, into which a dam is assessed as a result of the application of tables and other criteria in *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Queensland Government, as amended from time to time.
high ecological value waters	means Queensland waters that are scheduled waters under the Environmental Protection (Water) Policy 2009 as high value ecological waters.
lake	means: • a lagoon, swamp or other natural collection of water, whether permanent or intermittent; and • the bed and banks and any other element confining or containing the water.
landholder's active groundwater bore	means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *Water Act 2000*.
levee	means an embankment that only provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.
linear infrastructure	means powerlines, pipelines, roads and access tracks.
low hazard dam	means any dam that is not classified as high or significant as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Queensland Government and which contains contaminants in concentrations which exceed or will exceed, during the dam's operational life, the values or range shown in Table 3 of the manual.
low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.

Term	Definition
mix-bury-cover	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in a accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=$10^{-9m/s}$) or subsoil with a clay content of >20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and • topsoil is replaced.
month	has the meaning in s36 of the *Acts Interpretation Act 1954*.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
oil-based	in relation to a fluid, means where the base fluid is a petroleum product such as diesel fuel.
outer bank	has the meaning in section 5A of the *Water Act 2000*.
performance indicator(s)	means a quantitative measure against which success can be assessed and audited in a consistent, objective and repeatable manner.
primary protection zone	means an area within 200 metres from the boundary of any Category A, B or C environmentally sensitive area.
produced water	has the meaning in section 15A of *the Petroleum and Gas (Production and Safety) Act 2004*.
production testing	has the meaning in section 73 of the *Petroleum and Gas (Production and Safety) Act 2004*.
regulated dam(s)	means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Queensland Government, as amended from time to time.
rehabilitation or rehabilitated	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria and, where relevant, includes remediation of contaminated land.
release, releases or released	has the meaning in Schedule 4 of the *Environmental Protection Act 1994*.
reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as 'less than' the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005µg/L – 0.02µg/L.
residual drilling material	means waste drilling materials including muds and cuttings returned from well holes and which have been left behind after the drilling fluids are pumped out.
secondary protection zone	in relation to a Category A or Category B environmentally sensitive area means an area within 100 metres from the boundary of the primary protection zone.

Term	Definition
secondary treated class B standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g. release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 1000cfu per 100mL, maximum 10000cfu per 100mL.
secondary treated class C standards	means treated sewage effluent or greywater which meets the following standards: • total Phosphorous as P, maximum 20mg/L • total Nitrogen as N, maximum 30mg/L • 5-day Biochemical oxygen demand (inhibited) (e.g. Release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-Coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 10000cfu per 100mL, maximum 100000cfu per 100mL.
sensitive place	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel) • a library, childcare centre, kindergarten, school, university or other educational institution • a medical centre, surgery or hospital • a protected area • a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment • a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads • for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2008.
significantly disturbed or significant disturbance or significant disturbance to land or areas	means disturbance to land as defined in Schedule 12, section 4 of the *Environmental Protection Regulation 2008*.
species richness	means the number of different species in a given area.
species diversity	means the diversity within an ecological community that incorporates both species richness and the evenness of species' abundances.

Term	Definition
specified works	Means (a) infrastructure and works prescribed under a regulation to be necessary for disaster management; or (b) desnagging that is the minimum necessary to allow safe navigation of a marked navigable channel; or (c) the following infrastructure and works— (i) roads; (ii) railways; (iii) jetties and boat ramps for use by the public; (iv) works for the rehabilitation of land, including, for example, rehabilitation of abandoned mines; (v) infrastructure for the transmission or distribution of electricity; (vi) pipelines; (vii) conveyor belts; (viii) cables; (ix) other infrastructure, prescribed under a regulation, that relates to the transportation, movement, transmission or flow of anything through the strategic environmental area including, for example, goods, materials, substances, matter, particles with or without charge, light, energy, information and anything generated or produced.
spring(s)	has the meaning in Schedule 4 of the *Water Act 2000*
stable	in relation to land, means landform dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.
stimulation	means a technique used to increase the permeability of a natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing/hydrofraccing, fracture acidizing and the use of proppant treatments. ***Explanatory note:*** *This definition is restricted from that in the* Petroleum and Gas (Production and Safety) Act 2004 *in order to only capture the types of stimulation activities that pose a risk to the environmental values of water quality in aquifers.*
stimulation fluid	means the fluid injected underground to increase permeability. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.
stimulation impact zone	means a 100m maximum radial distance from the stimulation target location within a gas producing formation.
stimulation management procedures	means procedures for the management of stimulation activities that include, but is not necessarily limited to information on: • the local stratigraphy including aquifers, faults, linear features, hydraulic conductivity, porosity, seismic risk and groundwater dependent assets • the impacts of applied stresses including aquifer drawdown, on connectivity to aquifers above and below the fractured zone subsequent to the stimulation activity • the extent to which there are vertically impermeable formations between the fractured zone and other aquifers • methods to ensure isolation of hydrocarbon bearing formations from aquifers and internal and external mechanical integrity of well(s) • process control techniques incorporating real-time analysis, fracture modelling and formation understanding utilising techniques such as micro-seismic measurements • quantity and quality monitoring of flow back water.
stock purposes	has the meaning in Schedule 2 of the *Petroleum and Gas (Production and Safety) Act 2004* and section 86 of the *Petroleum Act 1923*.
strategic environmental area	has the meaning in section 11 of the *Regional Planning Act 2014*.
structure	means a dam or levee.

Term	Definition
suitably qualified person	means a person who has qualifications, training, skills and 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.
suitably qualified third party	means a person who: (a) has qualifications and experience relevant to performing the function including but not limited to: i. a bachelor's degree in science or engineering; and ii. 3 years experience in undertaking soil contamination assessments; and (b) is a member of at least one organisation prescribed in Schedule 8 of the Environmental Protection Regulation 2008; and (c) not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
synthetic oil-based	means for a mud or drilling fluid, the base fluid being a synthetic oil, consisting of chemical compounds which are artificially made or synthesised by chemically modifying petroleum components or other raw materials rather than the whole crude oil.
top soil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300mm in depth from the natural surface.
valid complaint	means a complaint that is not considered by the administering authority or holder of the environmental authority to be frivolous, vexatious or based on mistaken belief.
waste and resource management hierarchy	has the meaning provided in section 9 of the *Waste Reduction and Recycling Act 2011*.
waste and resource management principles	has the meaning provided in section 4(2)(b) of the *Waste Reduction and Recycling Act 2011*.
waters	means all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
watercourse	has the meaning provided in Schedule 4 of the *Environmental Protection Act 1994*.
well infrastructure	means infrastructure required for the construction, completion and operation of a well including but not limited to cellar pits, dams and drill sumps.
well site	means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration well or such wells as part of a multi-well arrangement and includes well lease infrastructure.

Term	Definition
wetland	means a wetland as defined under the Queensland Wetlands Program and are areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed 6 metres. To be classified as a wetland, the area must have one or more of the following attributes: • at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle; or • the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers; or • the substratum is not soil and is saturated with water, or covered by water at some time. For the purposes of petroleum activities, wetlands do not include springs and watercourses and those wetlands that are defined in the *Wetland Mapping and Classification Methodology* (2005) published by the Queensland Government as: • H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel • H2M3p Ponded pastures • H2M5 Palustrine/lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (e.g. cropping) • H2M6 Palustrine/lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage • H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels • H3C1 Artificial stand-alone water storages not within a natural water body or channel; or • H3C2 Artificial Channel drain/canal – bore drains, swales, bores and irrigation channel overflows/ponding. ***Explanatory note:*** *This definition has been amended from the Queensland Wetlands Program definition so that low value wetlands and man-made water bodies are excluded.*
year(s)	has the meaning in s36 of the *Acts Interpretation Act 1954*.

END OF PERMIT

Appendix A

Map 1: ATP732