

Permit

Environmental Protection Act 1994

Environmental authority P-EA-100112777

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

Environmental authority number: P-EA-100112777

Environmental authority takes effect on 2 November 2022 .

The anniversary date of this environmental authority is 15 September each year.

Environmental authority holder(s)

Name(s)	Registered address
SENEX ASSETS 2 PTY LTD	Level 30, 180 Ann St BRISBANE QUEENSLAND 4001

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL209
Ancillary 15 - Fuel burning - Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	PL209
Ancillary 60 - Waste disposal - 2(b) - Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(b) - 2,000t to 5,000t	PL209
Schedule 3 - 08 - A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL445
Ancillary 60 - Waste disposal - 2(b) - Operating a facility for disposing of, in a year, the following quantity	PL445

Environmentally relevant activity/activities	Location(s)
of waste mentioned in subsection (1)(b) - 2,000t to 5,000t	
Ancillary 15 - Fuel burning - Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	PL445

Additional information for applicants

Environmentally relevant activities

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

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

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

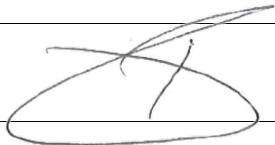
- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority - on the nominated day; or
- b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or
- c) otherwise on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the original take effect date unless you apply to change the anniversary day. The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 April.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.


Signature

Tristan Roberts
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

2 November 2022

Date

Enquiries:

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Privacy statement

Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

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)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Conditions of environmental authority

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

- (A1) This environmental authority authorises the carrying out of the following resource activities:
- a) the petroleum activities and specified relevant activities listed in *Schedule A, Table 1 - Authorised Petroleum Activities* and specified relevant activities to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable);
 - b) petroleum activities, including but not limited to:
 - i. Linear infrastructure;
 - ii. Borrow pits / extracting, other than by dredging; and
 - iii. Laydown areas; and
 - c) The specified relevant activities prescribed by this Environmental Authority at the locations specified on the cover pages of this environmental authority; and
 - d) incidental activities that are not otherwise specified relevant activities.
- (A2) The authorised resource activities are authorised subject to the conditions of this environmental authority.

Schedule A: Table 1 – Authorised Petroleum Activities

Authorised Petroleum Activity	Scale		Intensity
	Maximum size	Location	
Petroleum activities			
Coal seam gas production and exploration wells	270 wells	Within project area	270 wells
Specified relevant activities			
Stimulation activities	-	Within project area	270 wells

Prevent or minimise likelihood of environmental harm

- (A3) This environmental authority does not authorise a relevant act to occur in carrying out an authorised resource activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.
- (A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.
- (A5) All plant and equipment must be maintained and operated in their proper and effective condition.

Monitoring standards

- (A6) All monitoring must be undertaken by a suitably qualified person.
- (A7) All laboratory analyses and tests required to be conducted under this authority must be carried out by a laboratory that has NATA accreditation for such analyses and tests.
- (A8) Notwithstanding condition (A8), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.
- (A9) Monitoring and sampling must be carried out in accordance with the requirements of the following documents (as relevant to the sampling being undertaken), as amended from time to time:
- a) For waters and aquatic environments, the Queensland Government's Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009.
 - b) For groundwater, Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat #6890.1).
 - c) For noise, the Environmental Protection Regulation 2008.
 - d) For air, the Queensland Air Quality Sampling Manual and/or Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions, as appropriate for the relevant measurement and/or Australian Standard AS3580, whichever is appropriate for the relevant measurement.
 - e) For soil, the Guidelines for Surveying Soil and Land Resources, 2nd edition (McKenzie et al. 2008), and/or the Australian Soil and Land Survey Handbook, 3rd edition (National Committee on Soil and Terrain, 2009).
 - f) For dust, Australian Standard AS3580.

Notification

- (A10) In addition to the requirements under Chapter 7, Part 1, Division 2 of the *Environmental Protection Act 1994*, the administering authority must be notified through the Pollution Hotlines and in writing, as soon as possible, but no later than 48 hours of becoming aware of any of the following events:
- (a) Any unauthorised significant disturbance to land;
 - (b) potential or actual loss of structural or hydraulic integrity of a dam;
 - (c) when the level of the contents of any regulated dam reaches the mandatory reporting level;
 - (d) when a regulated dam will not have available storage to meet the design storage allowance on 1 November any Year;
 - (e) potential or actual loss of well integrity;
 - (f) when the seepage trigger action response procedure required under condition (XXX) is or should be implemented;
 - (g) unauthorised releases of any volume of prescribed contaminants to waters;
 - (h) unauthorised releases of volumes of contaminants in any mixture to land greater than
 - i. 200L of hydrocarbons; or
 - ii. 200 L of stimulation additives; or
 - iii. 1 000 L of brine; or
 - iv. 5 000 L of untreated coal seam gas water; or
 - v. 5 000 L of raw sewage; or
 - vi. 10 000 L of treated sewage effluent.
 - (i) The use of restricted stimulation fluids.

- (j) groundwater monitoring results from a landholder's active groundwater bore monitored under the stimulation impact monitoring program which is a 10% or greater increase from a previous baseline value for that bore and which renders the water unfit for its intended use.
- (k) Monitoring results where two out of any five consecutive samples do not comply with the relevant limits in the environmental authority.

Contingency procedures for emergency environmental incidents

(A11) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

- a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.
- b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.
- c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.
- d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused.
- e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.
- f) training of staff to enable them to effectively respond.
- g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Maintenance of plant and equipment

(A12) All plant and equipment must be maintained and operated in their proper and effective condition.

(A13) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

- a) regulated dams;
- b) exploration, appraisal and development wells;
- c) gas processing facilities;
- d) water treatment facilities;
- e) brine encapsulation facilities;
- f) sewage treatment facilities;
- g) authorised discharge points to air, land and waters;
- h) any chemical storage facility associated with the environmentally relevant activity of chemical storage;
- i) field compressor stations; and
- j) central compressor stations.

(A14) Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.

Erosion and sediment control

(A15) For activities involving significant disturbance to land, control measures that are commensurate to the site specific risk of erosion, and risk of sediment release to waters must be implemented to:

- a) allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities
- b) minimise soil erosion resulting from wind, rain, and flowing water

- c) minimise the duration that disturbed soils are exposed to the erosive forces of wind, rain, and flowing water
- d) minimise work-related soil erosion and sediment runoff; and
- e) minimise negative impacts to land or properties adjacent to the activities (including roads).

(A16) Top soil must be managed in a manner that preserves its biological and chemical properties.

Complaints

(A17) Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

(A18) When requested by the administering authority, monitoring must be undertaken as specified by the administering authority, within a reasonable and practical timeframe nominated by the administering authority to investigate any complaint of environmental nuisance at any sensitive place.

Documentation

(A19) All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

(A20) All documents required to be developed under this environmental authority must be kept for five years.

(A21) All documents required to be prepared, held or kept under this environmental authority must be provided to the administering authority upon written request within the requested timeframe.

(A22) A record of all complaints must be kept including the date, complainant's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

SCHEDULE B – Waste Management

General waste management

(B1) All general waste must only be removed from the site and sent to a recycling facility or disposal facility licensed to accept the waste under the *Environmental Protection Act 1994*.

(B2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.

(B3) All waste fluids and muds resulting from drilling and exploration petroleum activities, including hydraulic fracturing activities if authorised by this environmental authority, must be contained in a lined dam or containment structure for off-site disposal, remediation or reuse.

(B4) 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.

(B5) Vegetation waste may be burned if it relates to a state forest, timber reserve or forest entitlement area administered by the *Forestry Act 1959* and a permit has been obtained under the *Fire and Rescue Service Act 1990*.

Pipeline wastewater

(B6) Pipeline waste water, may be released to land provided that it:

- a) can be demonstrated it meets the acceptable standards for release to land; and
- b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.

Authorised uses of produced water for petroleum activities

- (B7) Produced water may be re-used in:
- a) drilling and well hole activities; or
 - b) stimulation activities.
- (B8) Produced water may be used for dust suppression provided the following criteria are met:
- a) the amount applied does not exceed the amount required to effectively suppress dust; and
 - b) the application:
 - I. does not cause on-site ponding or runoff
 - II. is directly applied to the area being dust suppressed
 - III. does not harm vegetation surrounding the area being dust suppressed; and
 - IV. does not cause visible salting.
- (B9) Produced water may be used for construction purposes provided the use:
- a) does not result in negative impacts on the composition and structure of soil or subsoils
 - b) is not directly or indirectly released to waters
 - c) does not result in runoff from the construction site; and
 - d) does not harm vegetation surrounding the construction site.

Sewerage treatment

- (B10) 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.
- (B11) The release of treated sewage effluent or greywater authorised in condition (B13) must:
- a) be to a fenced and signed contaminant release area(s)
 - b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off
 - c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is:
 - i. not a declared pest species
 - ii. kept in a viable state for transpiration and nutrient uptake; and
 - iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.
- (B12) Treated sewage effluent that meets or exceeds the standards specified in *Schedule B, Table 1 – Treated Sewage Effluent Standards* may be used for dust suppression or construction activities, provided the use meets the criteria in condition (B10 and B11) as relevant to the use.

Schedule B, Table 1 – Treated Sewage Effluent Standards

Discharge Type	Quality Characteristic	Sampling and in-situ measurement Point Location	Limit Type	Release Limit	Frequency
Irrigation at designated contaminant release areas	5-day Biochemical oxygen demand (inhibited)	E.g. Release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
	pH		range	6.0 to 9.0	
	E-Coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples.	1000 cfu per 100 mL	
			maximum	10000 cfu per 100 ml	

Discharge Type	Quality Characteristic	Sampling and in-situ measurement Point Location	Limit Type	Release Limit	Frequency
Use for dust suppression or construction activities	5-day Biochemical oxygen demand (inhibited)	E.g. Release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
	pH		range	6.0 to 8.5	
	e-coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples.	100 cfu per 100 mL	
			maximum	1000 cfu per 100 mL	

(B13) Notwithstanding condition (B10), treated sewage effluent that meets or exceeds secondary treated class A standards may be used for dust suppression or construction activities, provided the use meets the criteria in condition (B8) or (B9), as relevant to the use.

(B14) Sewage pump stations must be fitted with a:

- a) stand-by pump; and
- b) high level alarm to warn of imminent pump station overflow, that operates without mains power or with a back-up power source that starts automatically in the event of a power failure.

(B15) When weather conditions or soil conditions preclude the release of contaminants must be directed to on-site storage or lawfully disposed of off-site.

(B16) Treated effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule B, Table 1 Treated Sewage Effluent Standards* for each quality characteristic.

- (B17) The release of contaminants to land must be monitored at the frequency and at the sampling and in-situ measurement point specified in *Schedule B, Table 1 Treated Sewage Effluent Standards*.

Residual Drilling Material.

- (B18) If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.
- (B19) Residual drilling material can only be disposed of on-site:
- by mix-bury-cover method if the residual drilling material meets the approved quality criteria; or
 - 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.
 - Records must be kept to demonstrate compliance with conditions (B17) and (B18).

SCHEDULE C – NOISE

- (C1) Prior to undertaking petroleum activities that will result in short-term, medium-term or long term noise events that are likely to impact on a sensitive receptor, the holder of this environmental authority must model or calculate any potential noise emissions from the relevant petroleum activity(ies) to ensure that noise emissions will not exceed the noise levels specified in *Schedule C: Table 1 – Noise limits at Sensitive Receptors*.
- (C2) The emission of noise from the petroleum activity(ies) authorised under this environmental authority must not result in levels greater than those specified in *Schedule C: Table 1 – Noise limits at Sensitive Receptors* in the event of a valid complaint about noise being made to the administering authority.

Schedule C: Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	L _{Aeq,qdj,15 min}	45 dBA	43 dBA	40 dBA
6:00 pm – 10:00 pm	L _{Aeq,qdj,15 min}	40 dBA	38 dBA	35 dBA
Noise from drilling activities undertaken from 10:00 pm – 7:00 am	L _{Aeq,qdj,15 min}	30 dBA (measured indoors at any sensitive receptor)		
Noise from fixed plant in gas fields undertaken from 10:00 pm – 7:00 am	L _{Aeq,qdj,15 min}	28 dBA (measured indoors at any sensitive receptor)		

- (C3) If the noise subject to a valid complaint is tonal or impulsive, the adjustments detailed in *Schedule C, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors* are to be added to the measured noise level(s) to derive L_{Aeq, adj, 15 min}.

Schedule C: Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

Noise Characteristic	Adjustment to Noise
Tonal characteristic is just audible	+ 2 dBA
Tonal characteristic is clearly audible	+ 5 dBA
Impulsive characteristic is just audible	+ 2 dBA
Impulsive characteristic is clearly audible	+ 5 dBA

- (C4) Notwithstanding condition (C2), emission of any low frequency noise must not exceed the following limits in the event of a valid complaint about low frequency noise being made to the administering authority:

- a) 60 dB(C) measured outside the sensitive receptor; and
- b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB;
or
- c) 50 dB(Z) measured inside the sensitive receptor; and
- d) the difference between the internal A-weighted and Z-weighted noise levels (Max LpZ, 15 min) is no greater than 15 dB.

SCHEDULE D – Air

(D1) No fuel burning is permitted under this environmental authority.

SCHEDULE E – LAND

General

(E1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.

Top soil management

(E2) Top soil must be managed in a manner that preserves its biological and chemical properties.

Chemical Storage

(E3) Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipeline reinstatement and revegetation

(E4) Backfilled, reinstated and revegetated pipeline trenches and right of ways must be:

- a) a stable landform
- b) re-profiled to a level consistent with surrounding soils
- c) re-profiled to original contours and established drainage lines; and
- d) vegetated with groundcover which is not a declared pest species, and which is established and growing.

SCHEDULE F – BIODIVERSITY

General

(F1) Prior to undertaking activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground biodiversity values of the native vegetation communities at that location must be undertaken by a suitably qualified person.

(F2) A suitably qualified person must develop and certify a methodology so that condition (F1) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.

- (F3) Where mapped biodiversity values differ from those confirmed under conditions (F1) and (F2), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.
- (F4) The holder of this environmental authority, when carrying out (a) petroleum activity(ies) must:
- avoid, minimise or mitigate (in order of preference) any impacts on areas of vegetation or other areas of ecological value;
 - minimise the risk of injury, harm, or entrapment to wildlife and stock;
 - minimise disturbance to land that may otherwise result in land degradation;
 - manage topsoil in a manner that will preserve its biological and chemical properties;
 - utilise stockpiled soils for rehabilitation purposes;
 - prior to carrying out field based activities, make all relevant staff, contractors or agents carrying out those activities, aware of the location of any category A, B or C.

Planning for land disturbance

- (F5) The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles:
- maximise the use of areas of pre-existing disturbance
 - in order of preference, avoid, minimise or mitigate any impacts, including cumulative impacts, on areas of native vegetation or other areas of ecological value
 - minimise disturbance to land that may result in land degradation
 - in order of preference, avoid then minimise isolation, fragmentation, edge effects or dissection of tracts of native vegetation; and
 - in order of preference, avoid then minimise clearing of native mature trees.
- (F6) Linear infrastructure construction corridors must:
- maximise co-location
 - be minimised in width to the greatest practicable extent; and
 - for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area or its protection zone, be no greater than 40m in total width.

Disturbance to Land – Environmentally Sensitive Areas

- (F7) Petroleum activities must be carried out in accordance with Schedule F, Table 1 – Petroleum Activities in Environmentally Sensitive Areas.

Schedule F: Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary protection zone of the ESA (within 200m of ESA)	Secondary protection zone of the ESA (within 300m of ESA)
Category A ESAs	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to Condition (F10) and (F11).

Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to Condition (F10) and (F11).	Petroleum activities permitted.
Category C ESAs that are Nature Refuges Koala Habitat, Declared Catchment Areas	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to Condition (F10) and (F11).	Petroleum activities permitted.
Category B ESAs that are 'Endangered' Regional Ecosystems Category C ESAs that are Essential Habitat, Essential Regrowth Habitat, Critically Limited or Threshold or 'Of Concern' Regional Ecosystems	Only essential petroleum activities permitted. Subject to condition (F8) and (F9).	Only essential petroleum activities permitted. Subject to Condition (F10) and (F11).	Petroleum activities permitted.
Category C ESAs that are Resource Reserves	Only essential petroleum activities permitted. Subject to condition (F8) and (F9).	Only essential petroleum activities permitted. Subject to Condition (F10) and (F11).	Petroleum activities permitted.
Category C ESAs that are State Forests, Timber Reserves.	Only essential petroleum activities permitted. Subject to condition (F8) and F9.	Petroleum activities permitted.	Petroleum activities permitted.

(F8) Prior to carrying out essential petroleum activities undertaken within environmentally sensitive areas or their protection zones in accordance with Schedule E: Table 1 - Petroleum Activities in Environmentally Sensitive Areas, it must be demonstrated, in the following order of preference that:

- a) no reasonable or practicable alternative exists for carrying out the essential petroleum activities within the environmentally sensitive area;
- b) the essential petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance.

Disturbance to Land – Endangered and Of Concern Regional Ecosystems

(F9) Details of any significant disturbance to land in or within 200m of Endangered or Of Concern regional ecosystems, along with a record of the assessment required by Conditions (F1) and (F2) must be kept and submitted to the administering authority upon request.

(F10) Where mapped biodiversity values differ from those confirmed under conditions (F1) and (F2), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.

Offsets

- (F11) Significant residual impacts to prescribed environmental matters, are not authorised under this environmental authority or the *Environmental Offsets Act 2014*.
- (F12) Records demonstrating that each impact to a prescribed environmental matter did not, or is not likely to, result in a significant residual impact to that matter must be:
- a) completed by an appropriately qualified person; and
 - b) kept for the life of the environmental authority.

SCHEDULE G – WATER

Authorised impacts to wetlands

- (G1) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

Authorised activities in waters

- (G2) Petroleum activities must not occur in or within 200m of a:
- a) wetland of high ecological significance
 - b) Great Artesian Basin Spring
 - c) subterranean cave GDE.
- (G3) Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.
- (G4) The construction or maintenance of linear infrastructure in a wetland of other environmental value must not result in the:
- a) clearing of riparian vegetation outside of the minimum area practicable to carry out the works; or
 - b) ingress of saline water into freshwater aquifers; or
 - c) draining or filling of the wetland beyond the minimum area practicable to carry out the works.
- (G5) After the construction or maintenance works for linear infrastructure in a wetland of other environmental value are completed, the linear infrastructure must not:
- a) drain or fill the wetland
 - b) prohibit the flow of surface water in or out of the wetland
 - c) lower or raise the water table and hydrostatic pressure outside the bounds of natural variability that existed before the activities commenced
 - d) result in ongoing negative impacts to water quality; or
 - e) result in bank instability; or
 - f) result in fauna ceasing to use adjacent area for habitat, feeding, roosting or nesting.

- (G6) The construction or maintenance of linear infrastructure activities in a watercourse must be conducted in the following preferential order:
- a) firstly, in times where there is no water present
 - b) secondly, in times of no flow
 - c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.
- (G7) The construction or maintenance of linear infrastructure authorised under condition (G4) must comply with the water quality limits as specified in *Protecting water values, Table 2—Release limits for construction or maintenance of linear infrastructure*.

Protecting water values, Table 2—Release limits for construction or maintenance of linear infrastructure

Water quality parameters	Units	Assessment procedure
Turbidity	Nephelometric Turbidity Units (NTU)	For a wetland of other environmental value, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within 50m downstream of the construction or maintenance activity. For a wetland of other environmental value, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within 50m downstream of the construction or maintenance activity.
Hydrocarbons	-	For a wetland of other environmental value, or watercourse, no visible sheen or slick.

- (G8) Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (G8).

Register of activities in wetlands and watercourses

- (G9) A register must be kept of all linear infrastructure construction and maintenance activities in a wetland of other environmental value and watercourses, which must include:
- a) location of the activity (e.g. GPS coordinates (GDA94) and watercourse name)
 - b) estimated flow rate of surface water at the time of the activity
 - c) duration of works, and
 - d) results of impact monitoring carried out under condition (G9).

Activities in floodplains

- (G10) Petroleum activity(ies) on floodplains must be carried out in a way that does not:
- a) concentrate flood flows in a way that will or may cause or threaten a negative environmental impact; or
 - b) divert flood flows from natural drainage paths and alter flow distribution; or
 - c) increase the local duration of floods; or
 - d) increase the risk of detaining flood flows.

SCHEDULE GG – GROUNDWATER

Seepage Monitoring Program

(GG1) A seepage monitoring program must be developed by a suitably qualified person which is commensurate with the site-specific risks of contaminant seepage from containment facilities, and which requires and plans for detection of any seepage of contaminants to groundwater as a result of storing contaminants prior to the commissioning of any containment facility.

(GG2) The seepage monitoring program required by condition (GG1) must include but not necessarily be limited to:

- a) identification of the containment facilities for which seepage will be monitored;
- b) identification of trigger parameters that are associated with the potential or actual contaminants held in the containment facilities;
- c) identification of trigger concentration levels that are suitable for early detection of contaminant releases at the containment facilities;
- d) installation of background seepage monitoring bores where groundwater quality will not have been affected by the petroleum activities authorised under this environmental authority to use as reference sites for determining impacts;
- e) installation of seepage monitoring bores that:
 - i. are within formations potentially affected by the containment facilities authorised under this environmental authority (i.e. within the potential area of impact);
 - ii. provide for the early detection of negative impacts prior to reaching groundwater dependent ecosystems, landholder's active groundwater bores, or water supply bores;
 - iii. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e. faults, areas of unconformities known to connect two or more formations);
- f) monitoring of groundwater at background and seepage monitoring bores for the trigger parameters identified in condition (GG2)(b) at a frequency, determined by a suitably qualified person and:
 - i. at least once every two years where baseline data has been established; or
 - ii. at least quarterly for two years to establish baseline data for any impact to groundwaters, after which time monitoring may continue at the frequency according to condition (GG2)(f)(i),
- g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (GG2)(b) and (GG2)(c) trigger the early detection of seepage, or upon becoming aware of any monitoring results that indicate potential groundwater contamination;
- h) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis; and
- i) provides for annual updates to the program for new containment facilities constructed in each annual return period.

(GG3) If groundwater monitoring results indicate any significant changes in groundwater quality caused by petroleum activities, investigations into the potential for environmental harm, including the validation and verification of the source, cause and extent of contamination, must be completed.

(GG4) The findings of the investigation must be included in a written report that is submitted in the next annual return. The report must detail the investigations that were carried out and the actions that were taken to prevent environmental harm.

SCHEDULE H – REHABILITATION

Rehabilitation planning

(H1) A Rehabilitation Plan must be developed by a suitably qualified person and must include the:

- a) rehabilitation goals; and
- b) procedures to be undertaken for rehabilitation that will:

- i. achieve the requirements of conditions (H2) to (H7), inclusive; and
- ii. provide for appropriate monitoring and maintenance.

Transitional rehabilitation

- (H2) Significantly disturbed areas that are no longer required for the on-going petroleum activities, must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria:
- a) contaminated land resulting from petroleum activities is remediated and rehabilitated
 - b) the areas are:
 - i. non-polluting
 - ii. a stable landform
 - iii. re-profiled to contours consistent with the surrounding landform
 - c) surface drainage lines are re-established
 - d) top soil is reinstated; and (e) either:
 - i. groundcover, that is not a prohibited or restricted pest species, is growing; or
 - ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final rehabilitation acceptance criteria

- (H3) Following the completion of the petroleum activity(ies), any residual brine and/or solid salt present in any dam must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994*.
- (H4) All significantly disturbed areas caused by petroleum activities which are not being or intended to be utilised by the landholder or overlapping tenure holder, must be rehabilitated to meet the following final acceptance criteria measured either against the highest ecological value adjacent land use or the pre-disturbed land use:
- a) greater than or equal to 70% of native ground cover species richness;
 - b) greater than or equal to the total per cent of ground cover;
 - c) less than or equal to the per cent species richness of declared plant pest species; and
 - d) where the adjacent land use contains, or the pre-clearing land use contained, one or more regional ecosystem(s), then at least one regional ecosystem(s) from the same broad vegetation group, and with the equivalent biodiversity status or a biodiversity status with a higher conservation value as any of the regional ecosystem(s) in either the adjacent land or pre-disturbed land, must be present.
- (H5) Dams (including low consequence dams) must;
- a) Be decommissioned and rehabilitated; or
 - b) Be left in-situ for beneficial use provided that:
 - i. The dam is decommissioned to no longer accept inflow from the petroleum activities; and
 - ii. The contained water quality must be suitable for the intended on-going use(s) by the land holder or overlapping tenure holder.

Final rehabilitation acceptance criteria in environmentally sensitive areas

- (H6) Where significant disturbance to land has occurred in an environmentally sensitive area, the following final rehabilitation criteria as measured against the pre-disturbance biodiversity values assessment (required by conditions (H1) and (H2)) must be met:
- a) greater than or equal to 70% of native ground cover species richness;

- b) greater than or equal to the total per cent ground cover;
- c) less than or equal to the per cent species richness of declared plant pest species;
- d) greater than or equal to 50% of organic litter cover;
- e) greater than or equal to 50% of total density of coarse woody material; and
- f) all predominant species in the ecologically dominant layer, that define the pre-disturbance regional ecosystem(s) are present.

Continuing conditions

- (H7) Conditions (H2), (H3) and (H4) continue to apply after this environmental authority has ended or ceased to have effect.

SCHEDULE I – WELL CONSTRUCTION, MAINTAINANCE AND HYDRAULIC FRACTURING ACTIVITIES

Drilling Activities

- (I1) Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).
- (I2) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

Stimulation Risk Assessment

- (I3) Prior to undertaking stimulation activities, a risk assessment must be developed to ensure that stimulation activities are managed to prevent environmental harm.
- (I4) The stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation being carried out at that well and address issues at a relevant geospatial scale such that changes to features and attributes are adequately described and must include, but not necessarily be limited to:
- a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice
 - b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority
 - c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s)
 - d) naturally occurring geological faults
 - e) seismic history of the region (e.g. earth tremors, earthquakes)
 - f) proximity of overlying and underlying aquifers
 - g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation
 - h) identification and proximity of landholder' active groundwater bores in the area where stimulation activities are to be carried out
 - i) the environmental values of groundwater in the area
 - j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to stimulation monitoring in order to accurately assess the risks to environmental values of groundwater

- k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity
- l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers
- m) a description of the well mechanical integrity testing program
- n) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc.)
- o) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation
- p) groundwater transmissivity, flow rate, hydraulic conductivity and direction(s) of flow
- q) a description of the chemical compounds used in stimulation activities (including estimated total mass, estimated composition, chemical abstract service numbers and properties), their mixtures and the resultant compounds that are formed after stimulation
- r) a mass balance estimating the concentrations and absolute masses of chemical compounds that will be reacted, returned to the surface or left in the target gas producing formation subsequent to stimulation
- s) an environmental hazard assessment of the chemicals used including their mixtures and the resultant chemicals that are formed after stimulation including:
 - i. toxicological and ecotoxicological information of chemical compounds used
 - ii. information on the persistence and bioaccumulation potential of the chemical compounds used; and
 - iii. identification of the chemicals of potential concern in stimulation fluids derived from the risk assessment
- t) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities
- u) identification and an environmental hazard assessment of using radioactive tracer beads in stimulation activities
- v) an environmental hazard assessment of leaving chemical compounds in stimulation fluids in the target gas producing formation for extended periods subsequent to stimulation
- w) human health exposure pathways to operators and the regional population
- x) risk characterisation of environmental impacts based on the environmental hazard assessment
- y) potential impacts to landholder bores as a result of stimulation activities
- z) an assessment of cumulative underground impacts, spatially and temporally of the stimulation activities to be carried out on the tenures covered by this environmental authority; and
- aa) potential environmental or health impacts which may result from stimulation activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

- (I5) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the quality of:
 - a) all landholder's active groundwater bores (subject to access being permitted by the landholder) that are:
 - spatially located within one kilometre horizontal radius from the location of the stimulation activity(ies); and
 - within 200 meters vertically of the target location for the stimulation activity(ies); and
 - b) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the risk assessment required by conditions (I10) and (I11).

- (I6) Prior to undertaking any stimulation activity(ies), the holder of this environmental authority must undertake a baseline well assessment of the quality of water in each well to be stimulated provided the formation has sufficient yield to produce a representative sample.
- (I7) The baseline bore and well assessments must include relevant parameters to be monitored in order to establish baseline water quality and must include, but not necessarily be limited to:
- a) pH;
 - b) electrical conductivity [S/m];
 - c) turbidity [NTU];
 - d) total dissolved solids [mg/L];
 - e) temperature [°C];
 - f) dissolved oxygen [mg/L];
 - g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L];
 - h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO₃) [mg/L];
 - i) sodium adsorption ratio (SAR);
 - j) anions (bicarbonate, carbonate, hydroxide, chloride, fluoride, sulphate) [mg/L];
 - k) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];
 - l) dissolved and total metals (including but not necessarily being limited to: aluminium, arsenic III, cadmium, copper, iron, lead, manganese, mercury, nickel and zinc) [g/L];
 - m) total petroleum hydrocarbons [g/L];
 - n) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [g/L];
 - o) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [g/L];
 - p) sodium hypochlorite [mg/L];
 - q) sodium hydroxide [mg/L];
 - r) formaldehyde [mg/L];
 - s) ethanol [mg/L]; and
 - t) gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L].
- (I8) A stimulation impact monitoring program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by condition (I9) that relate to stimulation activities and must include, as a minimum, monitoring of:
- a) the stimulation fluids to be used in stimulation activities at sufficient frequency and which sufficiently represents the quantity and quality of the fluids used
 - b) flow back waters from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water
 - c) flow back waters from stimulation activities at sufficient frequency and accuracy to demonstrate that 150% of the volume used in stimulation activities has been extracted from the stimulated well.
 - d) all bores in accordance with condition (I11)
- (I9) The stimulation impact monitoring program must provide for monitoring of:

- a) analytes and physico-chemical parameters relevant to baseline bore and well assessments to enable data referencing and comparison including, but not necessarily being limited to the analytes and physico-chemical parameters in condition (I15); and
- b) any other analyte or physico-chemical parameters that will enable detection of adverse water quality impacts and the inter-connection with a non-target aquifer as a result of stimulation activities including chemical compounds that are actually or potentially formed by chemical reactions with each other or coal seam materials during stimulation activities.

(I10) The Stimulation Impact Monitoring Program must provide for the analysis of the quality and quantity of stimulation fluids to be used for the stimulation event at least once prior to undertaking the stimulation activity. Quality monitoring must include, but not be necessarily limited to, the parameters in Condition (I15)(a) – (I15)(t).

(I11) The stimulation impact monitoring program must provide for monitoring of the bores in condition (I16)(d) at the following minimum frequency:

- a) monthly for the first six (6) months subsequent to stimulation activities being undertaken; then
- b) annually for the first five (5) years subsequent to stimulation being undertaken or until analytes and physico-chemical parameters listed in conditions (I14(a)) to (I14(t)) inclusive, are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.

(I12) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE J – REGULATED STRUCTURES

Assessment of Consequence Category

- (J1) The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.
- (J2) The consequence assessment required under condition (J1) must occur in any of the following situations:
- a) prior to the design and construction of the structure;
 - b) prior to any change in its purpose or its stored contents;
 - c) for a structure assessed and certified as a high or significant consequence structure, at least biennially after its construction.
- (J3) A consequence assessment report and certification must be prepared for any structure assessed and the report may include a consequence assessment for more than one structure.
- (J4) On receipt, one paper copy and one electronic copy of the consequence assessment report and certification must be provided to the administering authority.
- (J5) All certifications must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time. Construction of Low Consequence Dam to Contain Wetting Front.

(J6) Where a dam is assessed as low consequence, it 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.

(J7) Where a dam is for the first time assessed as significant or high, the dam must meet the conditions required for regulated dams under this environmental authority within 12 months of that assessment.

(J8) In the event of early signs of loss of structural or hydrological integrity of a low consequence dam:

- a) immediate action to prevent or minimise any actual or potential environmental harm must be taken; and
- b) any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Consequence Dams

(J9) The condition of all low consequence dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the consequence assessment based on the particular circumstances of each dam.

Design and Construction of a Regulated Structure

(J10) All regulated structures must be designed by and constructed under the supervision of a suitably qualified and experienced person in accordance with the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(J11) Construction of a regulated structure is prohibited unless:

- a) a consequence category assessment report and certification has been submitted to the administering authority;
- b) a suitably qualified and experienced person has been commissioned to prepare a design plan for the structure; and
- c) the holder of the environmental authority has received the design plan for the structure, together with certification of that plan from the suitably qualified and experienced person, that:
 - i. the design plan is in accordance with the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time;
 - ii. the structure is capable of delivering the performance stated in the design plan; and
- d) when constructed and operated in accordance with the design plan, the structure will be compliant in all respects with conditions to (J10) to (J18) of this environmental authority.

(J12) Regulated dams must be designed and constructed to prevent:

- a) floodwaters from entering the regulated structure from a watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time; and

- b) wall failure due to erosion by floodwaters arising from the watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time; and
- c) overtopping as a result of a flood event of the annual exceedance probability specified for determining spillway capacity in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(J13) The design plan for a regulated structure must include, but not necessarily be limited to:

- a) a design report which provides:
 - i. certification of the design plan;
 - ii. a description of all the documents which constitute the design plan; iii. a statement of:
 - 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 consequence category of the structure; and
 - D. the reasoning of the certifying suitably qualified and experienced person as to how the design plan provides the necessary required performance;
 - iii. documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;
 - iv. detailed criteria for the design, operation, maintenance and decommissioning of the structure including any assumptions;
 - v. design, specification and operational rules for any related structures and systems used to prevent failure scenarios;
 - vi. reasoning for how the design plan provides the required performance;
 - vii. details of any other matter which may substantially affect, or is critical to, the design plan; and
 - viii. evidence that the certifier is a suitably qualified and experienced person.
- b) drawings showing the lines and dimensions of built structures and land forms associated with the regulated structure;
- c) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;
- d) a description of any containment systems;
- e) an operational plan that includes:
 - i. normal operating procedures and rules;
 - ii. emergency and contingency 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 structure;
- f) a plan for the decommissioning and rehabilitation of the structure at the end of its operational life;
- g) details of reports on investigations and studies done in support of the design plan; and
- h) any other matter required by the suitably qualified and experienced person.

- (J14) Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:
- a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - b) construction of the regulated structure is in accordance with the design plan.
- (J15) Where a regulated dam is to be managed as part of an integrated containment system and the design storage allowance volume is to be shared across the integrated containment system, the design and operating rules for the system as a whole must be documented in a system design plan that is certified by a suitably qualified and experienced person.
- (J16) The system design plan must contain:
- a) the design plans; and
 - b) the 'as constructed' plans; and
 - c) the operational rules for each individual regulated dam that forms part of the integrated system; and
 - d) the standards of serviceability and accessibility of water transfer equipment or structures; and (e) the operational rules for the system as a whole.
- (J17) All aggregation dams must:
- a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and rehabilitation; and
 - b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the dam.
- (J18) All brine dams must:
- a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and rehabilitation; and
 - b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the dam; and
 - c) have a system for the collection and proper disposal of any contaminants that move beyond the bounds of the containment system; and
 - d) be constructed with the capacity to continuously remove any leachate from beneath the floor or beyond the sides of the dam.
- (J19) Evaporation dams for CSG production activities are not permitted.

Operation of a Regulated Structure

- (J20) Operation of a regulated structure is prohibited unless:
- a) one paper copy and one electronic copy of the design plan and certification, and a set of 'as constructed' drawings and specifications has been submitted to the administering authority, together with certification that the structure:
 - i. has been constructed in accordance with the design plan;

- ii. is capable of delivering the performance stated in the design plan; and
 - iii. is compliant with the relevant conditions of this environmental authority;
 - b) the conditions of this environmental authority relating to the construction of the structure have been met; and
 - c) for regulated dams, the details required under this environmental authority have been entered into a Register of Regulated Dams.
- (J21) Each regulated structure 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.

Mandatory Reporting Level

- (J22) The mandatory reporting level must be marked on a regulated dam in such a way that it is clearly visible.
- (J23) On becoming aware that the mandatory reporting level has been reached, action must be taken to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Annual Inspection Report

- (J24) Each regulated structure must be inspected annually by a suitably qualified and experienced person.
- (J25) At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed:
- a) against the most recent consequence assessment report and design plan;
 - b) against recommendations contained in previous annual inspections reports;
 - c) against recognised structure safety deficiency indicators;
 - d) for changes in circumstances potentially leading to a change in consequence category;
 - e) for conformance with the relevant conditions of this environmental authority;
 - f) for conformance with the drawings of the certified design plan;
 - g) for the adequacy of the available storage in each regulated dam, based on an actual observation(s) taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam.
- (J26) 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 structure.
- (J27) The suitably qualified and experienced person who prepared the annual inspection report must certify that report in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.
- (J28) Upon receipt of the annual inspection report, the report and its recommendations must be considered and actions taken to ensure that the regulated structure will safely perform its intended function.
- (J29) Within 20 business days of receipt of the annual inspection report, the administering authority must be notified in writing, of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each regulated structure.

Design Storage Allowance

- (J30) On 1 November of each year, storage must be available in each regulated dam to meet the design storage allowance estimated for the dam in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.
- (J31) On becoming aware that a regulated dam will not have the available storage to meet the design storage allowance on 1 November of any year, action must be taken to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Performance review

- (J32) The performance of each regulated dam over the preceding November to May period must be assessed based on actual observations of the available storage in each regulated dam taken prior to 1 July of each year.
- (J33) Action must be taken to modify the water management system if required so that the regulated dam will perform in accordance with the requirements of this authority, for the subsequent November to May period.

Repair requirements

- (J34) Where any passage of the wetting front through the floor or sides of a regulated dam or low consequence dam is detected, action must be taken as soon as practicable to:
- 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
 - b) decommission and rehabilitate the dam.

Transfer arrangements

- (J35) A copy of any reports, documentation and certifications prepared under this environmental authority, including but not limited to any Register of Regulated Dams, consequence assessment, design plan and other supporting documentation, must be provided to a new holder of an environmental authority and the administering authority on transfer of the environmental authority.

Register of Regulated Dams

- (J36) A register of regulated dams must be established and maintained which must include, but not necessarily be limited to, the following information for each regulated dam:
- 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 (GDA94) within five metres at any point from the outside of the dam including its storage area;
 - d) the consequence category of the dam as assessed using the Manual for Assessing Consequence;
 - 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 certifier of the design plan and 'as constructed' drawings;
 - g) for the regulated dam, other than in relation to any levees:

- i dimensions (metres) and surface area (hectares) of the dam measured at the foot print 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);
- vii mandatory reporting level (metres AHD);
- h) design plan title and reference relevant to the dam;
- i) date construction was certified as compliant with the design plan;
- j) name and qualifications of certifier;
- k) details of the composition and construction of any liner;
- l) the system for the detection of any leakage through the floor and sides of the dam;(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; (n) dates when the dam was inspected for the detection of leakage through the liner; (o) dates when the dam was inspected for the purpose of annually ascertaining the available storage capacity;
- m) dates when recommendations and actions in the annual inspection report were provided to the administering authority; and
- n) dam water quality as obtained from monitoring required under conditions (J43) to (J45).

- (J37) The required information in the register of regulated dams must be provisionally entered when a design plan for a regulated dam is submitted to the administering authority.
- (J38) A final entry of the required information in the register of regulated dams must be made once compliance with condition (J20) has been achieved.
- (J39) The information contained in the register of regulated dams must always be current and complete on any given day.
- (J40) All entries in the register of regulated dams must be approved by the chief executive officer for the holder of this environmental authority, or their delegate, as being accurate and correct.
- (J41) A copy of the records contained in the Register of Regulated Dams in the electronic format required by the administering authority must be provided with the annual return.

Annual regulated dam water quality monitoring

- (J42) The quality of water in all regulated dams on the relevant resource authority(ies) must be monitored in the month of October every year.
- (J43) 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:
- a) pH;
 - b) electrical conductivity [S/m];
 - c) anions (bicarbonate, carbonate, chloride, sulphate) [mg/L]; and

d) cations (calcium, magnesium, potassium, sodium) [mg/L].

- (J44) Water quality samples of regulated dams must be taken from at least three different dam profile depths for each sampling event and be taken as far as practicable from the edge of the regulated dam.

SCHEDULE M – DEFINITIONS

Key terms and/or phrases used in this document are defined in this section. Applicants should note that where a term is not defined, the definition in the Environmental Protection Act 1994, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Term	Definition
acceptable standards for release to land	means wastewater of the following quality as determined by monitoring results or by characterisation: a) electrical conductivity (EC) not exceeding 3000µS/cm b) sodium adsorption ratio (SAR) not exceeding 8 pH between 6.0 and 9.0 c) heavy metals (measured as total) meets the respective short term trigger value in section 4.2.6, Table 4.2.10—Heavy metals and metalloids in Australian and New Zealand Guidelines for Fresh and Marine Water Quality d) does not contain biocides.
accepted engineering standards	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.
acid sulfate soils	means soil or sediment containing highly acidic soil horizons or layers affected by the oxidation of iron sulfides (actual acid sulfate soils) and / or soil or sediment containing iron sulfides or other sulfidic material that has not been exposed to air and oxidised (potential acid sulfate soils). The term acid sulfate soil generally includes both actual and potential acid sulfate soils. Actual and potential acid sulfate soils are often found in the same soil profile, with actual acid sulfate soils generally overlying potential acid sulfate soil horizons.
active	for the purposes of landholders' groundwater bores 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.
administering authority	means: • for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the Environmental Protection Act 1994 – the local government; or • for all other matters – the Chief Executive of the Department of Environment and Science; or another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.
Aggregation dam	means a dam that is used to aggregate and contain CSG water prior to use, treatment or disposal of that water (by means other than evaporation). The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.
AHD	means Australian Height Datum and is the datum used for the determination of elevations in Australia. The determination uses a national network of benchmarks and tide gauges and sets mean sea level at zero elevation.
alternative arrangement	means a written agreement between the holder of this environmental authority and an affected or potentially affected person at a sensitive receptor for a defined noise nuisance impact and may include an agreed period of time for which the arrangement is in place. An agreement for alternative arrangement may include, but not necessarily be limited to a range of noise abatement measures to be installed at a sensitive receptor and / or provision of alternative accommodation for the duration of the defined noise nuisance impact.

analogue site	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 such as that ground truthing assessment.																																				
analytes	means a chemical parameter determined by either physical measurement in the field or by laboratory analysis.																																				
annual exceedence probability or AEP	is the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year.																																				
appraisal well	means a petroleum well to test the potential of one or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.																																				
Approved quality criteria for mix-bury-cover	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 border="1"> <thead> <tr> <th>Parameter</th><th>Maximum concentration</th></tr> </thead> <tbody> <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> </tbody> </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 border="1"> <thead> <tr> <th>Parameter</th><th>Maximum concentration</th></tr> </thead> <tbody> <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> <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> </tbody> </table> The limits in Part B and Part C refer to the post soil/by-product mix. <u>Part C</u> If a hydrocarbon sheen is visible, the following hydrocarbon fractions: <table border="1"> <thead> <tr> <th>TPH</th><th>Maximum concentration</th></tr> </thead> <tbody> <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> </tbody> </table>	Parameter	Maximum concentration	pH	6–10.5 (range)	Electrical Conductivity	20dS/m (20,000µS/cm)	Chloride*	8000mg/L	Parameter	Maximum concentration	Arsenic	20mg/kg	Selenium	5mg/kg	Boron	100mg/kg	Cadmium	3mg/kg	Chromium (total)	400mg/kg	Copper	100mg/kg	Lead	600mg/kg	TPH	Maximum concentration	C6-C10	170mg/kg	C10-C16	150mg/kg	C16-C34	1300mg/kg	C34-C40	5600mg/kg	Total Polycyclic Aromatic Hydrocarbons (PAHs)	20mg/kg
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	Phenols (non-halogenated)	60mg/kg
	Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)	7mg/kg
	Benzene	1mg/kg
areas of pre-disturbance	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.	
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associated works	in relation to a dam, means: - any kind and all things associated with the construction and operation of a dam; and - any land used for those operations.	
Australian Standard 1055	means Australian Standard 1055.1:1997 Description and Measurement of Environmental Noise – General procedures.	
Australian Standard 2187	means Australian Standard 2187.0:1998 Explosives—Storage, transport and use, Part 0, Australian Standard 2187.1:1998 Explosives—Storage, transport and use Part 1 and Australian Standard 2187.2:2006 Explosives—Storage and use, Part 2 or any updated versions that becomes available from time to time.	
Australian Standard 2885	means Australian Standard 2885.0:2008 Pipelines – Gas and Liquid Petroleum General Requirements, Australian Standard 2885.1:2007 Pipelines – Gas and Liquid Petroleum Design and Construction and Australian Standard 2885.3:2001 Pipelines – Gas and Liquid Petroleum Operation and Maintenance, or any updated versions that becomes available from time to time.	
Australian Standard 4323	means Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions.	
Australian / New Zealand Standard 5667.11	means Australian / New Zealand Standard 5667.11: 1998 Water Quality – Sampling – Guidance on sampling at Groundwaters.	
Australian / New Zealand Standard 5667.12	means Australian / New Zealand Standard 5667.12:1999 Guidance on Sampling of Bottom Sediments for permanent, semi-permanent water holes and water storages.	
authorised person	means a person holding office as an authorised person under an appointment under the <i>Environmental Protection Act 1994</i> by the chief executive or chief executive officer of a local government.	

authorised resource activities	for this environmental authority means the resource activities authorised to be carried out under condition (A1).
background noise level	means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.
bed and banks	for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.
beneficial use	means • with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is: ○ of benefit to that owner in that it adds real value to their business or to the general community ○ in accordance with relevant provisions of the <i>Environmental Protection Act 1994</i> and <i>Waste Reduction and Recycling Act 2011</i>. ○ sustainable by virtue of written undertakings given by that owner to maintain that dam; and ○ the transfer and use have been approved or authorised under any relevant legislation; or with respect to coal seam gas water, refer to the Queensland Government Operational Policy - Management of water produced in association with petroleum activities and Notice of decision to approve a resource for beneficial use – CSG water as amended from time to time.
biodiversity values	for the purposes of this environmental authority, means (a) environmentally sensitive areas; (b) wetlands; (c) ecosystem functioning; and ecological connectivity (i.e. stepping stone or contiguous bioregional/local corridor networks).
black earth	means a type of soil, also known as vertosols and is a soil order of the Australian Soil Classification. These are clay soils with shrink / swell properties that display strong cracks when dry and / or lenticular structural aggregates at depth. They have high soil fertility and a large water holding capacity.
bore	means a water observation bore or a water supply bore that is either sub-artesian or artesian.
brine	means saline water with a total dissolved solid concentration greater than 40 000 mg/l.
brine dam	means a regulated dam that is designed to receive, contain or evaporate brine.

bund or banded	in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.
business day	has the meaning in the <i>Acts Interpretation Act 1954</i> and means a day that is not— a Saturday or Sunday; or a public holiday, special holiday or bank holiday in the place in which any relevant act is to be or may be done.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.
calendar year	means a period of 365 or 366 days beginning 1 January and ending 31 December.
Category A Environmentally Sensitive Area (ESA)	means any area listed in Schedule 19, Part 1, section 1 of the Environmental Protection Regulation 2019.
Category B Environmentally Sensitive Area (ESA)	means any area listed in Schedule 19, Part 1, section 2 of the Environmental Protection Regulation 2019.
Category C Environmentally Sensitive Area (ESA)	means any of the following areas: - Nature Refuges as defined in the conservation agreement for that refuge under the <i>Nature Conservation Act 1992</i>; - Koala Habitat Areas as defined under the <i>Nature Conservation (Koala) Conservation Plan 2006</i>; - State Forests or Timber Reserves as defined under the <i>Forestry Act 1959</i>; - Declared catchment areas under the <i>Water Act 2000</i>; - Resources reserves under the <i>Nature Conservation Act 1992</i>; - An area identified as “Essential Habitat” or “Essential Regrowth Habitat” under the <i>Vegetation Management Act 1999</i> for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the <i>Nature Conservation Act 1992</i>; or Of Concern Regional Ecosystems’ that are remnant vegetation and identified in the database called ‘RE description database’ containing regional ecosystem numbers and descriptions.
certification or certified by a suitably qualified and experienced person	in relation to a design plan, ‘as constructed’ drawings or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time: exactly what is being certified and the precise nature of that certification.

	- the relevant legislative, regulatory and technical criteria on which the certification has been based; - the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.
certify or certification or certified	in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that: - all relevant material has been considered in the written document; and - that the content of the written document is accurate and true; and that the written document meets the requirements of the relevant conditions of the environmental authority.
clearing	means: - in relation to grass, scrub or bush—the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include— - the flattening or compaction of vegetation by vehicles if the vegetation remains living; or - the slashing or mowing of vegetation to facilitate access tracks; or - the clearing of noxious or introduced plant species; or - destroying standing vegetation by stock ; and - in relation to trees—cutting down, ringbarking, pushing over, poisoning or destroying in any way, but does not include – - lopping a tree.
closed-loop systems	means using waste on site in a way that does not release waste or contaminants in the waste to the environment.
coal seam gas water concentrate	means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.
coal seam gas water	means underground water brought to the surface of the earth, or moved underground in connection with exploring for, or producing coal seam gas.
consequence	in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.
consequence 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 the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures.

construction	in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.
control measure	has the meaning in section 31 of the Environmental Protection Regulation 2019 and means a device, equipment, structure, or management strategy used to prevent or control the release of a contaminant or waste to the environment.
dam	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 <i>not</i> 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.
dam crest volume	means the volume of material that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls without regard to flows entering or leaving (e.g. via a spillway).
design plan	is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.
design storage allowance or DSA	means an available volume, estimated in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, prepared by the Department of Environment and Heritage Protection, as amended from time to time, that must be provided in a dam to an annual exceedence probability specified in that Manual.
development well	means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.
discharge area	means: • that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and • identified by an assessment process consistent with the document Salinity Management Handbook Queensland Department of Environment and Resource Management 2011, as amended from time to time; or identified by an approved salinity hazard map held by the Department of Environment and Science
document	has the meaning in the <i>Acts Interpretation Act 1954</i> and means: • any paper or other material on which there is writing; and • any paper or other material on which there are marks; and • figures, symbols or perforations having a meaning for a person qualified to interpret them; and any disc, tape or other article or any material from which sounds, images, writings or messages are capable of being produced or reproduced (with or without the aid of another article or device).

drilling by-product	means waste drilling materials including muds, liquids and cuttings from well holes which do not contain hydrocarbon sheen above the following hydrocarbon fractions:	
	TPH	Maximum concentration
	C6-C10	170mg/kg
	C10-C16	150mg/kg
	C16-C34	1300mg/kg
	C34-C40	5600mg/kg
	Total Polycyclic Aromatic Hydrocarbons (PAHs)	20mg/kg
	Phenols (halogenated)	1mg/kg
	Phenols (non-halogenated)	60mg/kg
	Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)	7mg/kg
Benzene	1mg/kg	
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 an area of vegetation.	
electrical distribution equipment	means infrastructure that does not exceed a capacity of 500 kilo-volt amps (kVA) and is necessary for providing electric power to wellheads for undertaking petroleum activities.	
end	means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related petroleum activities such as rehabilitation. In other words, it does not refer to the 'completion' of the petroleum activity(ies), the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.	
equivalent person or EP	means an equivalent person under volume 1, section 2 of the Guidelines for Planning and Design of Sewerage Schemes, October 1991, published by the Water Resources Commission, Department of Primary Industries, Fisheries and Forestry.	
essential petroleum activities	means activities that are essential to bringing the resource to the surface and are only the following: • low impact petroleum activities; • geophysical, geotechnical, geological, topographic and cadastral surveys (including seismic, sample / test / geotechnical pits / core holes); • single well sites not exceeding 1 hectare of disturbance and multi-well sites not exceeding 1.5 hectares of disturbance. • well sites with monitoring equipment (including monitoring bores) or tanks for above ground fluid storage: ○ for single well sites, not exceeding 1.25 hectares disturbance; ○ for multi-well sites, not exceeding 1.75 hectares disturbance. • well sites with monitoring equipment (including monitoring bores) and tanks (minimum 1 ML) for above ground fluid storage: ○ for single well sites, not exceeding 1.5 hectares disturbance;	

	○ for multi-well sites, not exceeding 2.0 hectares disturbance. • associated infrastructure located on a well site necessary for the construction and operations of wells: ○ water pumps and generators; ○ flare pits; ○ chemical / fuel storages; ○ sumps for residual drilling material and drilling fluids; ○ tanks, or dams which are not significant or high consequence dams to contain wastewater (e.g. stimulation flow back waters, produced water) ○ pipe laydown areas; ○ soil and vegetation stockpile areas; ○ a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works; ○ temporary administration sites and warehouses; ○ dust suppression activities using water that meets the quality and operational standards approved under the environmental authority • communication and powerlines 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. • supporting access tracks; • gathering / flow pipelines from a well head to the initial compression facility; activities necessary to achieve compliance with the conditions of the environmental authority in relation to another essential petroleum activity (e.g. sediment and erosion control measures, rehabilitation).
evaporation dam	means an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.
exploration well	means a petroleum well that is drilled to: • explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or • obtain stratigraphic information for the purpose of exploring for petroleum. For clarity, an exploration well does not include an appraisal or development well.
exploring for petroleum	means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the <i>Petroleum and Gas (Production and Safety) Act 2004</i> for example including: • conducting a geochemical, geological or geophysical survey; • drilling a well; • carrying out testing in relation to a well; taking a sample for chemical or other analysis.
facilities	in the context of waste disposal, refers to the definition provided in Schedule 2, Part 12 (60)(4)(a) of the <i>Environment Protection Regulation 2019</i> .
feed pond	means a land based structure used to contain untreated coal seam gas water prior to its treatment in a water treatment facility.

fill	means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.
floodplain	has the meaning in the <i>Water Act 2000</i> and means an area of reasonably flat land adjacent to a watercourse that— • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.
flowable substance	means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.
foliage cover	means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.
foreseeable future	means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.
GDA	means Geocentric Datum of Australia.
geophysical survey	means a systematic collection of geophysical data
Great Artesian Basin (GAB) spring	means an area protected under the Environment Protection and Biodiversity Conservation Act 1999 because it is considered to be a Matter of National Environmental Significance and identified as a: • community of native species dependent on natural discharge of groundwater from the Great Artesian Basin; or • Great Artesian Basin spring; or • Great Artesian Basin discharge spring wetland. A GAB spring includes a spring vent, spring complex or watercourse spring and includes the land to which water rises naturally from below the ground and the land over which the water then flows. Note: The Australian Government's Protected Matters Search Tool should be used to get an indication of whether the area of interest may contain an MNES spring. Note: The GAB springs dataset can be requested from the Queensland Government Herbarium

general ecologically significant wetland	otherwise known as “wetlands of other environmental value”, is a wetland that meets the definition of a wetland and that is shown as a general ecologically significant wetland or “wetlands of other environmental value” on the map of referable wetlands.
high bank	means the defining terrace or bank or, if no bank is present, the point on the active floodplain, which confines the average annual peak flows in a watercourse.
hub	means more than one unit of fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined, located within five (5) km of any other fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined.
hydraulic performance	means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant consequence category <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> , prepared by the Department of Environment and Science , as amended from time to time.
impulsive noise	means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.
incidental activity	for this environmental authority means an activity that is reasonably necessary for carrying out a petroleum activity.
incidental land management	includes the use of the produced water associated with stock and stock intensive drinking water, for purposes associated with occasional low risk or emergency uses. Examples include vehicle wash down and fire prevention.
infrastructure	means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps. Infrastructure does not include other facilities required for the long term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation dams), pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.
L _{Aeq} , adj, 15 mins	means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.

LA 90, adj, 15 mins	means the A-weighted sound pressure level, adjusted for tonal character, that is equal to or exceeded for 90 percent of any 15 minutes sample period equal, using Fast response.
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.
landholders' active groundwater bores	for the purposes of hydraulic fracturing baseline and impact monitoring in this environmental authority, 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 <i>Water Act 2000</i> .
leachate	means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of on-site which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.
levee	means a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.
linear infrastructure	means, powerlines, pipelines, flowlines, roads and access tracks.
long term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five days, even when there are respite periods when the noise is inaudible within those five days.
lopping	a tree, means cutting or pruning its branches, but does not include— removing its trunk; and cutting or pruning its branches so severely that it is likely to die.
low consequence dam	means any dam that is not a high or significant consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures.
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. Examples of such activities include but are not necessarily limited to soil surveys, topographic surveys, cadastral surveys and ecological surveys 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.

Max L_{pZ} , 15 min	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
Max L_{pA} , 15 min	means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.
mandatory reporting level or MRL	means a warning and reporting level determined in accordance with the criteria in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures prepared by the Department of Environment and Science, as amended from time to time.
medium term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five days and does not re-occur for a period of at least four weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.
meter	means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe.
mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in 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 ($k_w=10-8m/s$) or subsoil with a clay content of greater than 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 the <i>Acts Interpretation Act 1954</i> and means a calendar month and is a period starting at the beginning of any day of one of the 12 named months and ending— immediately before the beginning of the corresponding day of the next named month; or if there is no such corresponding day—at the end of the next named month.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
oil-based drilling mud	means mud where the base fluid is a petroleum product such as diesel fuel.

permanent	means infrastructure or facilities that are lasting or intended to last for the life of the project and is not temporary or mobile.
pest	means species: • declared under the <i>Land Protection (Pest and Stock route Management) Act 2002</i>; • declared under Local Government model local laws; and which may become invasive in the future.
petroleum activity	for this environmental authority means an authorised resource activity listed under the heading Petroleum activities in <i>Schedule A, Table 1 – Authorised petroleum activities</i> .
pipeline waste water	means hydrostatic testing water, flush water or water from low point drains.
populated area	includes towns and cities which have a populated of 200 or more people and with a minimum density of 40 people / km ² .
prescribed storage gases	has the meaning provided in section 12 of the <i>Petroleum and Gas (Production and Safety) Act 2004</i> .
Primary Protection Zone	means an area within a 200 metre buffer from the boundary of any Category A, B or C Environmentally Sensitive Area.
project area	means the Woleebee Development Area located within the boundaries of Petroleum Lease (PL) PL209 and PL445.
regulated dam	means any dam in the significant or high consequence category as assessed using the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/19339)</i> , published by the administering authority, as amended from time to time.
rehabilitation	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

regrowth vegetation map	means a map certified by the chief executive as the regrowth vegetation map for the State and showing for the State: • areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that— ○ are any of the following: ▪ an endangered regional ecosystem; ▪ an of concern regional ecosystem; ▪ a least concern regional ecosystem; and ○ have not been cleared since 31 December 1989; and • particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and • areas the chief executive decides under section 20AI of the <i>Vegetation Management Act 1999</i> to show on the map as high value regrowth vegetation.
remnant vegetation	means vegetation, part of which forms the predominant canopy of the vegetation— • covering more than 50 percent of the undisturbed predominant canopy; and • averaging more than 70 percent of the vegetation's undisturbed height; and • composed of species characteristic of the vegetation's undisturbed predominant canopy cover.
residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.
restricted stimulation fluids	For Part 2, means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 81B of the Environmental Protection Regulation 2008: • petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene; or • chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment. • The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.
Secondary Protection Zone	in relation to a Category A, Category B or Category C Environmentally Sensitive Area means an area within a 100 metre buffer from the boundary of the Primary Protection Zone.
sensitive place	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or • a library, childcare centre, kindergarten, school, university or other educational institution; • a medical centre, surgery or hospital; or • a protected area; or • 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; or 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.
sensitive receptor	means an area or place where noise (including low frequency, vibration and blasting) is measured to investigate whether nuisance impacts are occurring and includes: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or • a library, childcare centre, kindergarten, school, university or other educational institution; • a medical centre, surgery or hospital; or • a protected area; or • 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; or

	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.
short term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than eight hours and does not re-occur for a period of at least seven days. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.
significantly disturbed land or significant disturbance to land or significant disturbance	means disturbance to land as defined in Schedule 12, section 4 of the <i>Environmental Protection Regulation 2008</i> .
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.
specified relevant activity	for this environmental authority means an activity that: • but for being carried out as a resource activity, would otherwise be a prescribed ERA; • stimulation activities; • extracting material, other than by dredging; • point source discharge of treated produced water to surface waters; • storing waste that is not regulated waste (including coal seam gas water) in a regulated dam; or storing coal seam gas water that is not regulated waste in a low consequence dam.
spring	means the land to which water rises naturally from below the ground and the land over which the water then flows.
spillway	means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.
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	For Part 2, means a technique used to increase the permeability of a natural underground reservoir that is undertaken above the formation pressure and involved the addition of chemicals. It includes hydraulic fracturing / hydrofracking, fracture acidizing and the use of proppant treatments.
Stimulation fluid	For Part 2, means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.
stimulation impact zone	means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.
subterranean cave GDE	• means an area identified as a subterranean cave in the mapping produced by the Queensland Government and identified in the Queensland Government Information System, as amended from time to time; and • means a cave ecosystem which requires access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain its communities of plants and animals, ecological processes and ecosystem services. Subterranean cave GDEs are caves dependent on the subterranean presence of groundwater. Subterranean cave GDEs have some degree of groundwater connectivity and are indicated by either high moisture levels or the presence of stygofauna,

	or both, referred to in the Queensland Government WetlandsInfo mapping program, as amended from time to time. <i>Note: the Subterranean GDE (caves) dataset can be displayed through the Queensland Government WetlandInfo mapping program.</i> <i>Note: the Subterranean GDE (caves) dataset can be obtained from the Queensland Government Information System.</i>
suitably qualified and experienced person	in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the Professional Engineers Act 2002, and has demonstrated competency and relevant experience: • for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design. • for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments. <i>Note: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.</i>
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.
synthetic based drilling mud	means a mud where the base fluid is 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.
system design plan	means a plan that manages an integrated containment system that shares the required DSA volume across the integrated containment system.
third party auditor	means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.
threatening processes	means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).
tolerable limits	means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).
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 300 mm in depth from the natural surface.
transmissivity	means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
trenchless methods	means construction methods for the installation of pipelines and cables below the ground with minimal excavation. Trenchless methods can include, but not necessarily be limited to: • moling • pipe ramming method • horizontal directional drilling • utility tunneling, pipe jacking, auger boring • microtunnelling and pipe jacking • on-line replacement.
unacceptable risk	means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 <i>Risk Management</i> or any updated version that becomes available from time to time.

valid complaint	means a complaint the administering authority considers is not frivolous, nor vexatious, nor based on mistaken belief.
void	means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).
waste and resource management hierarchy	has the meaning provided in section 9 of the Waste Reduction and Recycling Act 2011 and is the following precepts, listed in the preferred order in which waste and resource management options should be considered— (a) AVOID unnecessary resource consumption (b) REDUCE waste generation and disposal (c) RE-USE waste resources without further manufacturing (d) RECYCLE waste resources to make the same or different products (e) RECOVER waste resources, including the recovery of energy (f) TREAT waste before disposal, including reducing the hazardous nature of waste (g) DISPOSE of waste only if there is no viable alternative.
waste and resource management principles	has the meaning provided in section 4(2)(b) of the <i>Waste Reduction and Recycling Act 2011</i> and means the: (a) polluter pays principle (b) user pays principle (c) proximity principle (d) product stewardship principle.
waters	includes 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 in Schedule 4 of the Environmental Protection Act 1994 and means: 1. a river, creek or stream in which water flows permanently or intermittently— a) in a natural channel, whether artificially improved or not; or b) in an artificial channel that has changed the course of the watercourse. 2. Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
watercourse, wetland, lake or spring with state significant biodiversity values	are those described in Appendix 1 of the Queensland Biodiversity Offsets Policy.
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, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.
wetlands	for the purposes of the environmental authority means: • areas shown on the Map of Referable Wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and • are wetlands as defined under the Queensland Wetlands Program as 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 six metres, and possess 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. The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
wetland of high ecological significance	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'high ecological significance' or wetland of 'high ecological value' on the Map of referable wetlands.
wetland of other environmental value	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'general environmental significance' or wetland of 'other environmental value' on the Map of referable wetlands.
year	means a period of 12 months.
80th percentile	in relation to release limits means that not more than one of the measured values is to exceed the stated release limit for any five consecutive samples where: • the consecutive samples are taken over a five month period; and the consecutive samples are taken at approximately equal periods.

END OF ENVIRONMENTAL AUTHORITY