Permit

Environmental Protection Act 1994

Environmental authority EPPG00903513

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

Environmental authority number: EPPG00903513

Environmental authority takes effect on 16 June 2022**.**

Environmental authority holder(s)

Name(s)	Registered address
QGC PTY LIMITED	Level 30 275 George Street BRISBANE CITY QLD 4000
Tokyo Gas QCLNG Pty Ltd	Level 21 Exchange Plaza 2 The Esplanade PERTH WA 6000
CNOOC Coal Seam Gas Company Pty Ltd	Level 34 123 Eagle Street BRISBANE CITY QLD 4000
ROMA PETROLEUM PTY LIMITED	Level 30 275 George Street BRISBANE CITY QLD 4000
QGC UPSTREAM HOLDINGS PTY LTD	Level 30 275 George Street BRISBANE CITY QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 - 07 - A petroleum activity involving injection of a wastefluid into a natural underground reservoir or aquifer	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 62 - Resource recovery and transfer facility operation - 1(d) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 1 regulated waste	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510

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Environmentally relevant activity/activities	Location(s)
Ancillary 14 - Electricity generation - 2(a) - Generating electricity by using a fuel, other than gas, at a rated capacity of 10MW electrical to 150MW electrical	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 08 - Chemical Storage - 5 - storing 200 cubic metres or more of chemicals that are liquids, other than chemicals mentioned in items 1 to 3, under subsection (1)(d)	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 57 - Regulated Waste Transport - Transporting regulated waste	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 64 - Water treatment - 3 - Treating 10ML or more raw water in a day	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 62 - Resource recovery and transfer facility operation - 1(b) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing general waste	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 62 - Resource recovery and transfer facility operation - 1(c) - Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
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	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 63 - Sewage Treatment - 1(c) - Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 1500 but not more than 4000EP	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Schedule 3 - 05 - Constructing a new pipeline of more than 150km under a petroleum authority	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Schedule 3 - 06 - A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 15 - Fuel burning - Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510
Ancillary 60 - Waste disposal - 1(d) - Operating a facility for disposing of, in a year, the following quantity	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510

Environmentally relevant activity/activities	Location(s)
of waste mentioned in subsection (1)(a) - more than 200,000t	
Schedule 3 - 03 - A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	ATP574, ATP632, ATP768, PL1008, PL276, PL277, PL398, PL399, PL510

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.

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

16 June 2022

Date

Daniel Spelchan
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

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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

(A1) In the carrying out of the petroleum activity(ies), the holder of the environmental authority must not exceed the number and maximum size for each of the specified petroleum activities listed in *Schedule A, Table 1 – Authorised Petroleum Activities* for the project area.

Schedule A, Table 1 – Authorised Petroleum Activities

Tenure number/s	Petroleum activities and infrastructure	Number of activities	Maximum capacity (where applicable)	Maximum disturbance (hectares)
PL 510 PL276 PL 277 PL 398 PL1008 ATP 574 ATP 632	Seismic (kms)	1,200	N/A	144 ha
	Total Wells	1,929	N/A	1,540 ha
	Total Compressor Stations, including:	14	N/A	111 ha
	Central Processing Plants (CPP)	1	N/A	45 ha
	Field compressor stations (**FCS**)	13	N/A	91 ha
	Total **Dam**s, including:			
	Non-**regulated dam**s	1,450	7,200 ML	700 ha
	Regulated dams	23	8,800 ML	223 ha
	Sewage Treatment Plant(s)	3	350 KL/day (1,710 **EP**)	31 ha
	Gathering Network[1], including:			
	Trunk Line Right of Way	125 km	N/A	441 ha
	(a) **Gas trunk lines**	52 km	N/A	
	(b) **Water trunk lines**	150 km	N/A	
	Gathering Line Right of Way	1,444 km	N/A	2,604 ha
	(a) **Gas gathering lines**	1,685 km	N/A	
	(b) **Water gathering lines**	1,417 km	N/A	
	Water Treatment Plant	1	100 ML/day	75 ha
	Power Lines	125 km	N/A	Included in Trunk Line Right of Way
	Borrow Pits	NA	N/A	120 ha
	Salt Landfill	1	N/A	25 ha

[1] Refer to the definition of **gas gathering lines**, **gas trunk lines**, **water gathering lines** and **water trunk lines** in the Definitions of this environmental authority.

(A2) 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.

(A3) In carrying out petroleum activities, the holder of the environmental authority must prevent or minimise the likelihood of environmental harm being caused.

(A4) All plant and equipment must be maintained and operated in their proper and effective condition.

(A5) 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;

(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.

(A6) All monitoring must be undertaken by a suitably qualified person.

(A7) If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 **business day**s.

(A8) All laboratory analyses and tests must be undertaken by a laboratory that has **NATA accreditation** for such analyses and tests.

(A9) 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.

(A10) Monitoring and sampling must be carried out in accordance with the requirements of the following **document**s (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;

(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**;

(A11) A **third party auditor**, nominated by the holder of the environmental authority and accepted by the administering authority, must audit compliance with the conditions of this environmental authority at a minimum frequency of every three **year**s.

(A12) An audit report must be prepared by the third party auditor that presents the findings of each audit carried out.

(A13) The third party auditor must **certify** the findings in the audit report.

(A14) The holder of the environmental authority must immediately act upon any recommendations arising from the audit report by:

(a) investigating any non-compliance issues identified; and

(b) as soon as reasonably practicable, implementing measures or taking necessary action to ensure compliance with the requirements of this environmental authority.

(A15) The holder of the environmental authority must attach to the audit report, a written response to the audit report detailing the actions taken on stated dates:

(a) by the holder to ensure compliance with this environmental authority; and

(b) to prevent a recurrence of any non-compliance issues identified.

(A16) The audit report required by condition (A12) and the written response to the audit report required by condition (A15) must be submitted with the subsequent annual return.

(A17) The financial cost of the third party audit is to be borne by the holder of the environmental authority.

(A18) A certification must be prepared by a **suitably qualified person** within 30 business days of completing every plan, procedure, program and report required to be developed under this environmental authority, which demonstrates that:

(a) relevant material, including current published guidelines (where available) have been considered in the written document;

(b) the content of the written document is accurate and true; and.

(c) the document meets the requirements of the relevant conditions of the environmental authority.

(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.

(A23) The following **infrastructure** must be clearly and permanently marked for the life of the petroleum activities with a unique reference name and/or number in such a way that it is clearly observable:

(a) **regulated dams**;

(b) wells;

(c) **field compressor stations**;

(d) central compressor stations;

(e) sewage treatment facilities;

(f) authorised discharge points to air and waters; and

(g) any chemical storage facility associated with the environmentally relevant activity of chemical storage.

(A24) Testing, evaluating, developing and using natural underground reservoirs for petroleum storage or to store **prescribed storage gases** is not authorised under this environmental authority.

Schedule B – Water

(B1) Contaminants must not be directly or indirectly released to any waters except as permitted under this environmental authority.

(B2) There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.

(B3) For activities involving significant disturbance to land, **control measure**s 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).

(B4) In the carrying out of the petroleum activities the holder of the environmental authority must not clear vegetation or place **fill**, in or within:

(a) 200 m from any **wetland**, **lake** or **spring**; or

(b) 100 m of the **high bank** of any other **watercourse**.

(B5) Despite Condition (B4), the infrastructure (and associated activities necessary for **construction**, operational and maintenance purposes) specified in *Schedule B, Table 1 – Authorised Petroleum Activity(ies) Disturbance* may be located as specified in *Schedule B, Table 1 – Authorised Petroleum Activity(ies) Disturbance*.

Schedule B, Table 1 – Authorised Petroleum Activity(ies) Disturbance

Tenure	Monitoring frequency	Max Disturbance footprint within protection zone (ha)	No.	Protection Zone	Coordinates			
					W intersection	N intersection	E intersection	S intersection
PL276	Mamdal #180	0.33	1	Associated buffer of a watercourse	6) -26.30139 149.81044	4) -26.30033 149.81053 and 5) -26.30034 149.81046	2) -26.30126 149.81071 and 3) -26.30037 149.81054	1) -26.30133 149.81027
PL277	Mamdal #226	0.42	1	Associated buffer of a watercourse	-26.2731 149.768	-26.2724 149.769	-26.2725 149.769	-26.2733 149.769
PL398	Acrux #191	0.38	1	Associated buffer of a watercourse	-26.0337 149.7887	-26.0331 149.7895	-26.0338 149.7901	-26.0344 149.7894
PL399	Acrux #117	0.02	1	Associate buffer of a watercourse	-26.015670 149.778741	-26.014774 149.778860	-26.014903 149.780049	-26.015798 149.779930

PL276	Mamda 179	0.65	1	Associated buffer of a watercourse	1) -26.304591,149.802499 2) -26.304565, 149.803514 3) -26.304573, 149.803569 4) -26.304653, 149.803586 5) -26.304765, 149.804095 6) -26.304852, 149.804072 7) -26.30475, 149.803609 8) -26.304853, 1493803632 9) -26.305006, 149.802818 10) -26.305025, 149.80272 11) -26.30498, 149.80271 12) -26.305, 149.802605 13) -26.304818, 149.803573
PL276	Mamdal 199	0.4	1	Associated buffer of a watercourse	1) -26.313406, 149.80891 2) -26.313408, 149.808758 3) -26.312505, 149.808736 4) -26.312495, 149.809326
PL276	Mamdal 203	0.78	1	Associated buffer of a watercourse	1) -26.321084, 149.763777 2) -26.320913, 149.764734 3) -26.321901, 149.764353 4) -26.321969, 149.763971 5) -26.322013, 149.763981 6) -26.32196, 149.764276
PL276	Mamdal 208	0.45	1	Associated buffer of a watercourse	1) -26.318093, 149.806559 2) -26.3187, 149.806923 3) -26.319129, 149.806042 4) -26.318925, 149.805921
PL276	Mamdal 217	0.25	1	Associated buffer of a watercourse	1) -26.3265, 149.783998 2) -26.326433, 149.784592 3) -26.326428, 149.784642 4) -26.326951, 149.784714 5) -26.326942, 149.784662

(B6) The holder of the environmental authority must not excavate or place fill in a way that adversely interferes with the flow of water in a watercourse, wetland or spring, including works that divert the course of flow of the water or works that impound the water.

(B7) Despite conditions (B5) and (B6), **linear infrastructure** activities such as those relating to the construction of pipelines, access tracks, power lines, communication cables and roads may be undertaken within 200 m of and in a wetland, lake or spring, or within 100 m of and in a watercourse where there is no reasonable and practicable alternative (e.g. **trenchless methods**) for:

(a) a maximum period of 10 business days; or

(b) such other time as is permitted by any relevant statutory Code or Guideline for undertaking works in a watercourse, provided:

i. the relevant statutory Code and/or Guideline is complied with; and

ii. the administering authority is notified and provided details of the relevant statutory Code and/or Guideline under which the works may extend beyond 10 business days; and

iii. the administering authority is notified prior to the commencement of the works beyond the ten day period; or

(c) such other time as the agreed to in writing by the administering authority.

(B8) If activities are to be undertaken in a watercourse in accordance with (B7) (b) or (c), the holder of the environmental authority must notify the administering authority in writing prior to the commencement of the period beyond the 10 business days.

(B9) The holder of the environmental authority must ensure that all activities undertaken in watercourses in accordance with (B7) (a), (b) and (c) are conducted in accordance with the following order of preference:

(a) conducting work in times of no flow; and

(b) conducting work in times of flow but in a way that does not:

i. cause a permanent adverse impact to the flow of water within the watercourse; or

ii. permanently impound water; or

iii. permanently divert the course of flow of water.

(B10) The linear infrastructure activities such as those relating to the construction of pipelines, access tracks, power lines, communication cables and roads resulting in significant disturbance to the **bed and banks** of a watercourse, lake, wetland or spring must:

(a) only be undertaken where necessary for the construction and/or maintenance of the linear infrastructure types included in condition (B7), that are essential for carrying out the authorised petroleum activities and no reasonable or practicable alternative location exists;

(b) be no greater than the minimum area necessary for the purpose of the significant disturbance;

(c) be designed and undertaken by a suitably qualified person taking into account the matters listed in the 'Planning Activities' and 'Impact Management' sections of the Department of Environment and Resource Management's "Guideline – Activities in a watercourse, lake or spring associated with mining operation" December 2010, as amended from time to time; and

(d) upon cessation of the petroleum activities or works, commence **rehabilitation** immediately.

(B11) Sediment control measures must be implemented to minimise any increase in water turbidity due to carrying out petroleum activities in the bed or banks of a watercourse or wetland, or a spring.

(B12) Routine, regular and frequent visual monitoring must be undertaken while carrying out construction work and/or any maintenance of completed works in a watercourse, wetland or spring.

(B13) If, due to the linear infrastructure activities such as those relating to the construction of pipelines, access tracks, power lines, communication cables and roads, water turbidity increases in the watercourse, wetland or spring outside contained areas, works must cease and the sediment control measures must be rectified to limit turbidity before activities recommence.

(B14) All measures must be taken to minimise adverse impacts to or reversal of any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.

Note: Locations and details of River Improvement Areas and River Improvement Trusts are provided in the Schedule to the River Improvement Trust Regulation 1998.

(B15) Where petroleum activities are carried out on floodplain areas, the holder of the environmental authority must ensure that petroleum activities do not:

(a) concentrate flood flows in a way that will or may cause or threaten an adverse 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; or

(e) pose an **unacceptable risk** to the safety of persons from flooding; or

(f) pose an unacceptable risk of damage to property from flooding.

(B16) All infrastructure associated with petroleum activities must be designed to withstand the flood criteria of its location without causing environmental harm.

(B17) The extraction of groundwater as part of the petroleum activities from underground aquifers must not directly or indirectly cause environmental harm to any watercourse, lake, wetland or spring.

(B18) Prior to undertaking fluid injection, the holder of this environmental authority must develop a **Stage 1A – Injection Management Plan**, which must include but not necessarily be limited to:

(a) injection fluid characteristics, including:

i. estimated volumes and rates of water to be injected;

ii. a description of the physical, chemical and biological components and their concentrations of the fluid to be injected;

(b) target aquifer characteristics, based on known data and assumptions including:

i. the pre-existing state of the aquifer including, faults or geological features that exist in the target and adjacent aquifers to the outer extent of the hydraulic impact zone and a history of seismic events within the hydraulic impact zone;

ii. physical characteristics including, storativity, pressure, location, accessibility, inflow, outflow and history of use;

iii. characterisation of the physiochemical properties of the target formation;

iv. compatibility of the injection fluid with the target formation and formation water;

v. identification of the value of the target aquifer in respect to economic output, supported population and natural assets;

vi. groundwater levels and / or pressure;

(c) identification of the hydraulic impact zone;

(d) identification of the water quality impact zone;

(e) identification of the environmental values and water quality objectives of the potential water quality impact zone of the target formation in accordance with the *Environmental Protection (Water) Policy 1997* and the "Queensland Water Quality Guidelines 2009";

(f) identification of the impacts on the environmental values due to the injection fluid;

(g) details of how and where the fluid will be produced, aggregated, stored and kept separate from other waters until it is, treated and reinjected into the target aquifer;

(h) identification of any fluid injection well, all existing **bores**, springs, environmental assets and watercourses connected to groundwater, faults and other geologic features that occur within the water quality impact zone and the hydraulic impact zone;

(i) an assessment of the potential for migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourse**s**, faults or other geologic features likely to impact on other aquifers;

(j) a risk assessment consistent with the risk framework specified in "Australian Guidelines for Water Recycling: Managed Aquifer Recharge", identifying potential hazards, their inherent risk, preventative measures for the management of potential hazards and after consideration of the operational monitoring to manage potential hazards identified in the risk assessment including details on sampling and analysis methods including frequency and locations, and quality assurance and control;

(k) verification methods to assess performance of the injection activities;

(l) control measures that will be implemented for fluid storage, treatment and injection to prevent or control the release of a contaminant or waste to the environment;

(m) the indicators or other criteria against which the performance of fluid injection will be **assessed**;

(n) procedures that will be adopted to regularly review the monitoring program and to report to management and the administering authority should unforeseen or non-compliant monitoring results be recorded;

(o) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;

(p) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and

(q) development of a public consultation program to be implemented at commencement of **Stage 2 – Field Test Program of the Fluid Injection Trial**

(B19) The environmental holder must ensure written agreement of the suitability of the Stage 1A – Injection Management Plan under condition (B18) is obtained from administering authority prior to progressing to **Stage 1B – Field Test Program of the Fluid Injection Trial**.

(B20) Stage 2 – Field Test Program of the CSG Water Injection Trial and **Stage 3 – Full Scale CSG Water Injection** is not authorised under this environmental authority.

(B21) The construction of fluid injection wells must be carried out in accordance with well construction requirements in the most recent version of the Department of Environment and Resource Management's "Standards for the construction of injection wells", as amended from time to time.

(B22) Fluid injection well(s) authorised by this environmental authority must have appropriate records and documents which support and indicate mechanical integrity and which hold a certificate of mechanical integrity prepared and **certified** by a suitably qualified person, available for inspection such that:

(a) there is no significant leakage in the casing, tubing, or packer; and

(b) there is no significant fluid movement into a water resource aquifer through vertical channels adjacent to the well bore hole.

(B23) For fluid injection:

(a) at depth less than 100 m, the injection operation must not exceed the dry overburden pressure of the base of the overlying aquitard; or

(b) at depth greater than 100 m, the injection operation must not exceed 90% of the formation fracture pressure.

(B24) 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 by 20 January 2016.

(B25) The seepage monitoring program required by condition (B24) 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 monitoring sites 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 to 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 bore**s, 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)

(e) monitoring of groundwater at each background and seepage monitoring bore at least quarterly for the trigger parameters identified in condition (B25)(b)

(f) seepage trigger action response procedures for when trigger parameters and trigger levels identified in condition (B25)(b) and condition (B25)(c) trigger the early detection of seepage, or upon becoming aware of any monitoring results that indicate potential groundwater contamination

(g) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis; and

(h) provides for annual updates to the program for new containment facilities **constructed** in each **annual return period**.

(B26) A bore drill log must be completed for each seepage monitoring bore in condition (B25) which must include:

(a) bore identification reference and geographical coordinate location;

(b) specific construction information including but not limited to depth of bore, depth and length of casing, depth and length of screening and bore sealing details;

(c) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible trigger parameters;

(d) lithological data, preferably a stratigraphic interpretation to identify the important features including the identification of any aquifers; and

(e) target formation of the bore.

Schedule C – Dams

(C1) 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 (ESR/2016/1933) at the following times:

(a) prior to the design and construction of the structure, if it is not an **existing structure**; or

(b) prior to any change in its purpose or the nature of its stored contents.

(C2) A **consequence assessment report** and certification must be prepared for each structure assessed and the report may include a **consequence assessment** for more than one structure.

(C3) Certification 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 (ESR/2016/1933).

(C4) Conditions (C5) to (C9) inclusive do not apply to existing structures.

(C5) 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 (ESR/2016/1933).

(C6) Construction of a regulated structure is prohibited unless the holder has submitted a consequence category assessment report and certification to the administering authority has been certified by a suitably qualified and experienced person for the design and **design plan** and the associated operating procedures in compliance with the relevant condition of this authority.

(C7) Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan in the form set out in the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933), and must be recorded in the regulated dams/levees register.

(C8) Regulated structures must:

(a) be designed and constructed in accordance with and conform to the requirements of the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933);

(b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:

i. floodwaters from entering the regulated dam from any watercourse or drainage line; and

ii. wall failure due to erosion by floodwaters arising from any watercourse or drainage line.

(c) have the floor and sides of the dam designed and constructed to prevent or minimise the passage of the wetting front and any entrained contaminants through either the floor or sides of the dam during the operational life of the dam and for any period of decommissioning and rehabilitation of the dam.

(C9) 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;

(b) construction of the regulated structure is in accordance with the design plan.

(C10) Operation of a regulated structure, except for an existing structure, is prohibited unless:

(a) the holder has submitted to the administering authority:

i. one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition (C6), and

ii. a set of 'as constructed' drawings and specifications, and

iii. certification of those 'as constructed drawings and specifications' in accordance with condition (C9), and

iv. where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the **DSA** volume across the system, a copy of the certified **system design plan**.

(b) the requirements of this authority relating to the construction of the regulated structure have been met;

(c) the holder has entered the details required under this authority, into a **Register of regulated dams**; and

(d) there is a current **operational plan** for the regulated structures.

(C11) For existing structures that are regulated structures:

(a) where the existing structure that is a regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the **DSA** volume across the system, the holder must submit to the administering authority within 12 **month**s of the commencement of this condition a copy of the certified system design plan including that structure; and

(b) There must be a current operational plan for the existing structures.

(C12) Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and **rehabilitated**, in a manner that is consistent with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.

(C13) Conditions (C14) to (C17) inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.

(C14) The **Mandatory reporting level** (the **MRL**) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.

(C15) The holder must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.

(C16) The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

(C17) The holder must record any changes to the MRL in the Register of Regulated Structures.

(C18) The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

(C19) By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the **Design storage allowance** (**DSA**) volume for the dam (or network of linked containment systems).

(C20) The holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

(C21) The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

(C22) Each regulated structure must be inspected each calendar year by a **suitably qualified and experienced person**.

(C23) At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an **annual inspection report** containing details of the assessment and include recommended actions to ensure the integrity of the regulated structure.

(C24) The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933).

(C25) The holder must:

(a) within 20 business days of receipt of the annual inspection report, provide to the administering authority:

i. the recommendations section of the annual inspection report; and

ii. if applicable, any actions being taken in response to those recommendations; and

(b) if, following receipt of the recommendations and (if applicable) actions, the administering authority requests a full copy of the annual inspection report from the holder, provide this to the administering authority within 10 business days of receipt of the request.

(C26) The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.

(C27) A Register of regulated dams must be established and maintained by the holder for each regulated dam.

(C28) The holder must provisionally enter the required information in the Register of regulated dams when a design plan for a regulated dam is submitted to the administering authority.

(C29) The holder must make a final entry of the required information in the Register of regulated dams once compliance with condition (C10) and (C11) has been achieved.

(C30) The holder must ensure that the information contained in the Register of regulated dams is current and complete on any given day.

(C31) All entries in the Register of regulated dams must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.

(C32) The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of regulated dams, in the electronic format required by the administering authority.

(C33) All existing structures that have not been assessed in accordance with either the **Manual** or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Dams must be assessed and certified in accordance with the Manual within 6 months of amendment of the authority adopting this schedule.

(C34) All existing structures must subsequently comply with the timetable for any further assessments in accordance with the Manual specified in *Schedule C, Table 1 – Transitional requirements for existing structures*, depending on the consequence category for each existing structure assessed in the most recent previous certification for that structure.

Schedule C, Table 1 – Transitional hydraulic performance requirements for existing structures

Transition period required for existing structures to achieve the requirements of the Manual for Assessing Consequence Categories and Hydraulic performance of Dams			
Compliance with criteria	**High**	**Significant**	**Low**
>90% and a history of good compliance performance in the last 5 years	No transition required	No transition required	No transitional conditions apply. Review consequence assessment every 7 years.
>70%-<90%	Within 7 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 10 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	No transitional conditions apply. Review consequence assessment every 7 years.
>50%-<70%	Within 5 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 7 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Review consequence assessment every 7 years.
<50%	Within 5 years or as per compliance requirements (e.g. TEP timing)	Within 5 years or as per compliance requirements (e.g. TEP timing)	Review consequence assessment every 5 years.

(C35) *Schedule C, Table 1 – Transitional hydraulic performance requirements for existing structures* ceases to apply for a structure once any of the following events has occurred:

(a) it has been brought into compliance with the **hydraulic performance** criteria applicable to the structure under the Manual; or

(b) it has been decommissioned; or

(c) it has been certified as no longer being assessed as a regulated structure.

(C36) Certification of the transitional assessment required by condition (C33) and (C34) (as applicable) must be provided to the administering authority within 6 months of amendment of the authority adopting this schedule.

(C37) **Brine dams** must:

(a) have the floor and sides of the dam designed with material that will contain the wetting front and any entrained contaminants during the operational life of the dam and for any period of decommissioning and rehabilitation of the dam; and

(b) have a system to detect any passage of the wetting front or entrained contaminants through either the floor or sides of the dam; and

(c) have a system for the collection and proper disposal of any contaminants that move beyond the bounds of the containment system.

(C38) Regulated dams receiving **brine** produced through the treatment and concentration of **coal seam gas water** must be constructed with the capacity to continuously remove any **leachate** from beneath the floor or beyond the sides of the dam.

Schedule D – Land

(D1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.

(D2) Prior to conducting petroleum activities that involve significant disturbance to land, an assessment must be undertaken of the condition, type and ecological value of any vegetation in such areas where the activity is proposed to take place.

(D3) The assessment required by condition (D2) must be undertaken by a suitably qualified person and include the carrying out of field validation surveys, observations and mapping of any **Category A, B or C Environmentally Sensitive Areas**, wetlands and the presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992.*

(D4) If the assessment required by conditions (D2) to (D3) indicates that that an Environmentally Sensitive Area or wetland is incorrectly identified through State mapping, or is present and not identified by State mapping, the holder of this environmental authority must advise the administering authority in writing before any significant disturbance to land takes place.

(D5) If, within the 20 business days following the lodgement of the notification under condition (D4) the administering authority notifies the holder of this environmental authority, in writing, that further validation of the Environmentally Sensitive Area or wetland is required, then significant disturbance to land within the relevant area is prohibited until the administering authority provides written advice that significant disturbance to land may proceed.

(D6) The holder of the environmental authority, when carrying out the petroleum activities must be able to demonstrate that all reasonable and practicable measures were taken to:

(a) avoid, minimise or mitigate (in order of preference) impacts on areas of vegetation or other areas of ecological value;

(b) avoid significant isolation, fragmentation or dissection of tracts of vegetation that may result in a reduction in the current level of **ecosystem functioning**, ecological connectivity (i.e. stepping stone or contiguous bioregional/local corridor networks) and/or resulted in an increase in **threatening processes** (e.g. potential impacts associated with edge effects or introduced species);

(c) minimise disturbances to land that may otherwise result in land degradation;

(d) ensure that for land that is to be significantly disturbed by the petroleum activities:

i. the top layer of the soil profile is preserved;

ii. soils are stockpiled in a manner that preserve their biological and chemical properties;

iii. soils are used for rehabilitation purposes; and

(e) avoid or minimise the **clearing** of mature trees.

(D7) Prior to carrying out field based petroleum activities, all relevant staff, contractors or agents carrying out those activities must be made aware of the location of any Category A, B or C Environmentally Sensitive Areas and the requirements of this environmental authority.

Note: This environmental authority does not authorise the taking of protected plants, protected animals or the tampering with animal breeding places as defined under the Nature Conservation Act 1992 and Regulations and relevant approvals will need to be obtained.

(D8) Notwithstanding condition (D6), significant disturbance to land caused by the carrying out of the petroleum activities must not involve clearing native vegetation or placing fill:

(a) on slopes greater than 10% for petroleum activities other than wells, pipelines, access tracks, power lines, communication cables, roads and other infrastructure approved by the administering authority in writing; and

(b) in **discharge area**s.

(D9) Clearing of remnant vegetation shall not exceed 10 metres in width for the establishing of tracks or 20 metres in width for dual carriageway roads, unless specified in *Schedule D, Table 2 – Authorised Petroleum Activit(ies) Disturbance.*

(D10) Cleared vegetation must be stockpiled in a manner that facilitates respreading or salvaging and does not impede vehicle, stock or wildlife movements.

(D11) The holder of this environmental authority must ensure that the petroleum activities are only conducted in accordance with *Schedule D, Table 1 – Environmentally Sensitive Areas (ESAs)* below for each of the ESA categories and associated primary and **secondary protection zone**s.

Schedule D, Table 1 – Environmentally Sensitive Areas (ESAs)[2]

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
All Category A ESAs	No petroleum activities permitted.	Only **low impact petroleum** activities permitted.	Only **limited petroleum activities** permitted subject to D13 and D14.
Category B ESAs excluding 'Endangered' **regional ecosystem**s	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted subject to D13 and D14.
Category B ESAs: 'Endangered' regional ecosystems	Only limited petroleum activities permitted subject to D13, D14 D15, D16 and D17.	Only limited petroleum activities permitted subject to D13, D14 D15, D16 and D17.	Petroleum activities permitted.
Category C ESAs excluding 'Of Concern' regional ecosystems, State Forests and Timber Reserves	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted subject to D13 and D14.
Category C ESAs: State Forests, Timber Reserves and 'Of Concern' regional ecosystems[3]	Only limited petroleum activities permitted subject to D13, D14 D15, D16 and D17.	Only limited petroleum activities permitted subject to D13, D14 D15, D16 and D17.	Petroleum activities permitted.

[2] Indicative Environmentally Sensitive Area mapping is available on the administering authority's website at: https://environment.des.qld.gov.au/management/maps-of-environmentally-sensitive-areas

[3] Approvals may be required under the *Forestry Act 1959* where the petroleum activities are proposed to be carried out in Environmentally Sensitive Areas that are State Forests or Timber Reserves.

(D12) Despite condition (D11), the infrastructure (and associated activities necessary for construction, operational and maintenance purposes) specified in *Schedule D, Table 2 – Authorised Petroleum Activity(ies) Disturbance* is permitted in the location specified in *Schedule D, Table 2 – Authorised Petroleum Activity(ies) Disturbance*.

Schedule D, Table 2 – Authorised Petroleum Activity(ies) Disturbance

Tenure	Description of Infrastructure	Max Disturbance footprint (ha)	No.	ESA Protection Zone	Coordinates			
					NW corner	NE corner	SE corner	SW corner
PL276	Gas Trunkline – Mamdal **FCS** to Woleebee Creek **CPP**	-	1	PPZ and SPZ of Category B ESA	-26.289358, 149.720436	-	-26.29579, 149.7563	-
ATP574	Peebs Communication Tower	-	1	SPZ of Category B ESA	-26.3347, 149.9950	-26.3348, 149.9955	-26.3354, 149.9955	-26.3353, 149.9949
PL276	Woleebee Creek Concentrated **Brine** Pond	-	1	PPZ and SPZ of Category B ESA	-26.271900, 149.705745	-26.27218, 149.706699	-26.27301, 149.707066	-26.272176, 149.705681 and -26.272498, 149.705766 and -26.272776, 149.705939 and -26.27296, 149.706290
PL276	Woleebee Creek **Field Compressor Station**	-	1	PPZ and SPZ of Category B ESA	-26.2671, 149.7000	-26.2677, 149.7040	-26.2711, 149.7040	-26.2711, 149.7000
PL276	Gas Trunkline – Woleebee Creek **FCS** to Woleebee Creek **CPP**	1.85	-	PPZ of Category B ESA	Entry Point: -26.2716, 149.7037 Exit Point: -26.2757, 149.7060			
PL276	Dual carriageway road – Woleebee Creek **FCS**	2.13	-	PPZ of Category B ESA	Entry Point: -26.2713, 149.7016 Exit Point: -26.2760, 149.7047			

PL276	Woleebee Creek **CPP** to Ross **FCS** Gas Trunkline	-	1	Category C ESA and its PPZ	-26.2924, 149.6545 and -26.3018, 149.6696	-	-26.2938, 149.36604 and -26.3031, 149.6709	-
PL276	Woleebee Creek **CPP** to Ross **FCS** Dual Carriageway Road	-	1	Category C ESA and its PPZ	-26.2921, 149.6546 and -26.3024, 149.6703	-	-26.2934, 149.6606 and -26.3072, 149.6706	-
PL276	Woleebee Creek to Cam Dual Carriageway Road	1	1	PPZ of Category B	Entry Point: -26.2527, 149.6832 Exit Point: -26.2521, 149.6819 Entry Point: -26.2345, 149.6808 Exit Point: -26.2332, 149.6812			
PL276	Woleebee Creek #170	2	1	PPZ of a Category B ESA	-26.2911, 149.73	-26.2912, 149.731	-26.2925, 149.731	-26.2923, 149.73
PL276	Kathleen Workspace East	0.03ha	1	PPZ of Category C ESA	759633, 7102539	759654, 7102541	759655, 7102531	759619, 7102528
PL276	Kathleen Workspace East	0.03ha	1	PPZ of Category C ESA	759577, 7102533	759607, 7102537	-	759579, 7102516
PL276	WCK137	1	1	PPZ of Category C ESA	-26.27324, 149.69296	-26.27245 149.69396	-26.27335, 149.69383	-26.27324, 149.69284
PL277	Greenacres workspace 1a	0.06 ha	1	PPZ of Category C ESA	-26.182591, 149.637764	-26.182591, 149.637864	-26.183136, 149.637824	-26.183116, 149.637726
PL277	Greenacres workspace 1b	0.009 ha	1	PPZ of Category C ESA	-26.183802, 149.637723	-26.183789, 149.637771	-26.183951, 149.637825	-26.183931, 149.637766
PL277	Greenacres workspace 1c	0.009 ha	1	PPZ of Category C ESA	-26.184207, 149.637859	-26.184226, 149.637918	-26.184355, 149.637965	-26.184372, 149.637919
PL277	Greenacres workspace 2a	0.05 ha	1	PPZ of Category C ESA	-26.205791, 149.645878	-26.205789, 149.646076	-26.206043, 149.646283	-26.206049, 149.646183
PL277	Greenacres workspace 2b	0.06 ha	1	PPZ of Category C ESA	-26.20734, 149.646421	-26.207323, 149.64652	-26.20781, 149.646626	-26.207797, 149.646521

PL277	Greenacres workspace 2c	0.06 ha	1	PPZ of Category C ESA	-26.208253, 149.646624	-26.208293, 149.646713	-26.208784, 149.646786	-26.208796. 149.646687
PL277	Mamdal #149	1.3 ha	1	PPZ of Category B ESA	1) -26.27984, 149.77885 2) -26.28083, 149.77888 3) -26.28081, 149.77998 4) -26.27992, 149.77995 5) -26.27964, 149.78043 6) -26.27954, 149.78042 7) -26.27987, 149.77985 8) -26.27982, 149.77986 9) -26.27982, 149.77976 10) -26.27957, 149.78019 11) -26.27941, 149.78027 12) -26.27983, 149.77956			
PL277	Mamdal #117	1.4 ha	1	PPZ of Category B ESA	1) -26.2592, 149.81895	4) -26.25879, 149.82006	3) -26.25979, 149.82052	2) -26.2602, 149.81941
PL399	Acrux #117	1.2ha	1	PPZ of a Category B ESA and PPZ of a Category C ESA	-26.015670 149.778741	-26.014774 149.778860	-26.014903 149.780049	-26.015798 149.779930
PL276	Lucky Downs borrow pit access track	1ha	-	-	Entry Point: -26.3121, 149.7115 and -26.3121, 149.7119 Exit Point: -26.3152, 149.7161			

(D13) Limited petroleum activities carried out in the secondary protection zone in accordance with condition (D11) must be preferentially located in pre-existing areas of clearing or significant disturbance to the greatest practicable extent and avoid the clearing of mature trees where possible.

(D14) Low impact or limited petroleum activities carried out within an environmentally sensitive area, **primary protection zone** or secondary protection zone as authorised under conditions (D11) must not be conducted where there is overlap with another environmentally sensitive area or primary protection zone where low impact or limited petroleum activities are not authorised, unless authorised under condition (D12).

(D15) Where limited petroleum activities are proposed to be undertaken within the primary and secondary protection zones of, or in the Category B and C Environmentally Sensitive Area as authorised in condition (D11), the holder of this environmental authority must be able to demonstrate that no reasonable or practicable alternative exists and that disturbance to land only be located and carried out in areas according to the following order of preference:

(a) pre-existing cleared areas or **significantly disturbed land** within the primary protection zone of a Category C Environmentally Sensitive Area ;

(b) pre-existing cleared areas or significantly disturbed land within the primary protection zone of a Category B Environmentally Sensitive Area;

(c) undisturbed areas within the primary protection zone of a Category C Environmentally Sensitive Area ;

(d) undisturbed areas within the primary protection zone of a Category B Environmentally Sensitive Area;

(e) pre-existing areas of significant disturbance within a Category C Environmentally Sensitive Area (e.g. areas where significant clearing or thinning has been undertaken within a **regional ecosystem**, and / or areas containing high densities of weed or pest species which has inhibited re-colonisation of native regrowth);

(f) pre-existing areas of significant disturbance within a Category B Environmentally Sensitive Area (e.g. areas where significant clearing or thinning has been undertaken within a regional ecosystem and / or areas containing high densities of weed or pest species which has inhibited re-colonisation of native regrowth);

(g) areas where clearing of a Category C Environmentally Sensitive Area is unavoidable; and

(h) areas where clearing of a Category B Environmentally Sensitive Area is unavoidable.

(D16) Notwithstanding conditions (D13) and (D14), where limited petroleum activities, and other activities authorised in *Schedule D, Table 2 - Authorised Petroleum Activity(ies) Disturbance* are proposed to be undertaken within the primary protection zone of, or in a Category B or C Environmentally Sensitive Area specified in conditions (D11) any vegetation clearing must not exceed any of the following areas:

(a) for the life of the project and before any activity commences, if the disturbance relates to an Endangered or Of Concern Regional ecosystem, 10% of the remnant unit of Endangered or Of Concern Regional ecosystem as ground truthed and mapped as per conditions (D2) and (D3) of this environmental authority;

(b) six metres in width for tracks;

(c) 15 metres if there are one or two parallel gas or water gathering lines;

(d) 20 metres if there are three, four or five parallel gas or water gathering lines;

(e) 25 metres if there are six, seven of eight parallel gas or water gathering lines;

(f) 30 metres if there are greater than eight parallel gas or water gathering lines;

(g) 30 metres if there are one or two gas and water trunk lines, underground 33kV power lines and fibre optic cables in parallel;

(h) 30 plus an additional four metres for every additional gas or water trunk lines in parallel with the initial one or two gas or water trunk lines, underground 33kV power lines and fibre optic cable; or

(i) disturbance in the corridor described for the Upstream Infrastructure Corridor.

(D17) Access tracks are not permitted within Category B or C Environmentally Sensitive Areas unless they are co-located with gas collection or coal seam gas **associated water** pipelines.

(D18) For each well site within the primary protection zone of, or in a Category B or C Environmentally Sensitive Area specified in condition (D11), all reasonable and practical measures must be taken to minimize the area cleared which must include but not be limited to, for each well site, ranked constraints mapping and a risk assessment which considers safety and environmental impacts.

(D19) Details of any significant disturbance to land undertaken within the primary protection zone of, or in a Category B or C Environmentally Sensitive Area, along with a record of the assessment required by

conditions (D2) and (D3) must be kept and submitted to the administering authority with each annual return.

(D20) The environmental authority holder must assess the use of multi-well pad drilling and horizontal directional drilling where high environmental constraints will be potentially impacted by the petroleum activities, and in rural residential areas. The environmental authority holder must demonstrate that where pad drilling is shown not to be feasible, alternative ways of siting drilling rigs and other petroleum facilities to protect environmental values.

(D21) The environmental authority holder must enter in to an environmental offset agreement with the administering authority where disturbance to land caused by the carrying out of the petroleum activities will have a remaining adverse environmental impact on an environmental value.

(D22) The environmental offset agreement must be entered in to within six months after submitting the record of disturbance required by Condition (D19), unless otherwise agreed to by the administering authority.

(D23) The environmental authority holder must implement any environmental offset agreement entered in to in accordance with conditions (D21) and (D22) as soon as practicable after finalisation.

(D24) Top soil must be managed in a manner that preserves its biological and chemical properties.

(D25) Land that has been significantly disturbed by the petroleum activities must be managed to ensure that mass movement, gully erosion, rill erosion, sheet erosion and tunnel erosion do not occur on that land.

(D26) **Acid sulfate soils** must be treated and managed in accordance with the latest edition of the Queensland Acid Sulfate Soil Technical Manual.

(D27) **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.

(D28) The holder of this environmental authority must ensure that coal seam gas **produced water** is contained, is not released to land or waters and is only used for purposes specifically authorised:

(a) under this environmental authority; or

(b) under the *Petroleum and Gas (Production and Safety) Act 2004*; or

(c) under the *Petroleum Act 1923*; or

(d) under a current beneficial use approval or end of waste code or approval issued under the *Waste Reduction and Recycling Act 2011*.

(D29) **Produced water** that is supplied or used under separate authorisation and in accordance with condition (D28) is not further regulated under the conditions of this authority.

(D30) **Produced water** may be used for dust suppression provided the following criteria are met:

(a) the amount of dust suppressant applied should not exceed the amount required to effectively suppress dust; and

(b) the application of dust suppressant must:

i. not cause on-site ponding or runoff

ii. be directly applied to the area being dust suppressed

iii. not harm vegetation surrounding the area being dust suppressed; and

iv. not cause visible salting.

(D31) **Produced water** may be used for construction purposes provided the use:

(a) does not result in runoff from the construction site; and

(b) does not harm vegetation surrounding the construction site.

(D32) **Produced water** may be re-used in:

(a) Drilling and well hole activities; or

(b) **stimulation** activities.

(D33) **Produced water** may be transferred to a third party to be used for the following purposes, subject to condition (D34):

(a) coal washing;

(b) dust suppression;

(c) construction;

(d) landscaping and **revegetation**, subject compliance with condition (D35)(a), condition (D35)(b) and condition (D35)(c); and

(e) industrial and manufacturing operations subject to compliance with condition (D37)(a).

(D34) If the responsibility of **produced water** is given or transferred to a third party in accordance with condition (D33), the holder of the environmental authority must ensure:

(a) the responsibility of the **produced water** is given or transferred in accordance with a written agreement (third party agreement); and

(b) the third party is made aware of the General Environmental Duty under section 319 of the *Environmental Protection Act 1994*.

(D35) **Produced water** may be used for landscaping and revegetation provided the following criteria are met:

(a) total dissolved solids (TDS) does not exceed 1000 mg/L;

(b) pH range is between 6.0 and 9.5;

(c) does not contain any substances in concentrations that may be toxic to plant growth;

(d) the amount of resource applied should not exceed what is required to effectively undertake landscaping or revegetation activities; and

(e) the application of the resource must:

i. not cause on-site ponding or runoff;

ii. be directly applied to the area being landscapes or **revegetated**;

iii. not harm vegetation surrounding the area being landscaped or revegetated; and

iv. not cause visible salting.

(D36) If there is any indication that any of the circumstances in condition (D30), condition (D31), condition (D35)(e)(i), condition (D35)(e)(iii) or condition (D35)(e)(iv), is occurring the use must cease immediately, the administering authority notified as soon as possible, but within 48 hours of becoming aware and the affected area must be remediated without delay.

(D37) **Produced water** may be used for industrial and manufacturing operations provided the following criteria are met:

(a) pH range is between 6.0 to 9.5; and

(b) the resource is not directly or indirectly released to land.

(D38) **Produced water** may be used for research and development provided the resource is not directly or indirectly released to land.

(D39) **Produced water** may be used for domestic stock, stock intensive and incidental land management provided the following criteria are met:

(a) the water quality of the resource complies with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000) Volume 1: Chapter 4.3, Table 4.3.1, 4.3.2 and 4.3.3; and

(b) stock and stock intensive drinking water is limited to watering livestock mentioned in Table 4.3.1 of Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000) Volume 1: Chapter 4.3.

(D40) Water quality criteria listed in condition (D35), condition (D37) and condition (D39) must be undertaken and include, at a minimum:

(a) in situ fortnightly sampling for pH and total dissolved solids (TDS); and

(b) initially monthly for other water quality parameters, and then six monthly after three consecutive detects which are less than 50 percent of the relevant parameter.

(D41) Despite condition (A8), on-line monitoring equipment is appropriate for pH and total dissolved solids (TDS) measurements, where they are operated in accordance with condition (A4).

(D42) Treated sewage effluent or greywater from a treatment system with a daily peak design capacity of less than 1710 **EP** may be released to land provided it:

(a) is to a fenced and signed contaminant release area(s);

(b) does not contain any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm;

(c) does not result in pooling or run-off or aerosols or spray drift or vegetation die-off;

(d) minimises deep drainage below the root zone of any vegetation;

(e) does not adversely affect the quality of shallow aquifers;

(f) does not adversely impact soil quality; and

(g) is to a contaminant release area(s) that is kept vegetated with groundcover, that is:

i. not a **declared pest species**; and

ii. kept in a viable state for transpiration and nutrient uptake.

(D43) Sewage pump stations must be fitted with a stand-by pump and a visible or audible high-level alarm. All alarms must be able to operate without mains power.

(D44) All nominated locations and minimum contaminant release areas of land in condition (D42) for sewage treatment works with a daily peak design capacity of greater than 100 EP must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.

(D45) A copy of the MEDLI program (or recognised equivalent) required in condition (D44) must be submitted to the administering authority.

(D46) If, within 20 business days following the submission of the MEDLI program results the administering authority provides comments on the submission, the holder of the environmental authority must:

(a) have due regard to that comment in the finalisation of the amended MEDLI program results; and

(b) submit the finalised amended MEDLI program results within 40 business days after the administering authority provided comments; and

(c) implement the amended MEDLI program results.

(D47) All treated sewage effluent or greywater released to land from a treatment system with a daily peak design capacity of greater than 100 EP must be in accordance with the contaminant release limits and monitored at the frequency as stated in *Schedule D, Table 3 – Treated Sewage Effluent Release Limits to Land* and the conditions of this environmental authority.

Schedule D, Table 3 – Treated Sewage Effluent Release Limits to Land

Quality Characteristic / Contaminant	Sampling and in situ measurement point location	Unit	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment plant	mg/L	Maximum	20	Quarterly
TSS		mg/L	Maximum	30	
E. coli		CFU[5] / 100 mL	80th %ile [6]	1000	
		CFU / 100 mL	Maximum	10,000	
EC		-	Monitor only	-	Monthly in situ monitoring
pH		-	Range	6.0-9.0	

[5] CFU = coliform forming units.
[6] Based on at least 5 samples with not less than 30 minutes between samples.

(D48) If the water quality assessment required by condition (D47) demonstrates that the water is not suitable for release to land, then water must be collected and disposed of at an appropriate facility.

(D49) Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.

(D50) Chemicals and fuel stored, must be effectively contained where relevant, meet Australian Standards, where such a standard is applicable.

(D51) Pipeline operation and maintenance must be in accordance, to the greatest practicable extent, with the relevant section of the APIA Code of Environmental Practice: Onshore Pipelines (2009).

(D52) Pipeline trenches must be backfilled and **topsoil**s reinstated within three months after pipe laying.

(D53) **Reinstatement** and revegetation of the pipeline right of way must commence within 6 months after cessation of petroleum activities for the purpose of pipeline construction.

(D54) 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) be 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 E – Environmental Nuisance

(E1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activities must not cause an environmental nuisance at any **sensitive place** or **commercial place**.

(E2) Prior to the commencement of any petroleum activities that may generate dust at a sensitive place or commercial place, the holder of this authority must notify and consult with any potentially affected person.

(E3) Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an **alternative arrangement** is in place for noise.

(E4) Notwithstanding condition (E3), emission of noise from the petroleum activity(ies) when measured at a sensitive place must be at levels less than or equal to those specified in *Schedule E, Table 1 – Noise Limits at Sensitive Receptors*.

Schedule E, Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short-term noise event	Medium-term noise event	Long-term noise event
7:00am – 6:00pm	**$L_{Aeq,adj,15\ min}$**	45 dBA	43 dBA	40 dBA
6:00pm – 10:00pm	**$L_{Aeq,adj,15\ min}$**	40 dBA	38 dBA	35 dBA
10:00pm – 6:00am	**$L_{Aeq,adj,15\ min}$**	28 dBA	28 dBA	28 dBA
	Max $L_{pA,\ 15\ mins}$	55 dBA	55 dBA	55 dBA
6:00am – 7:00am	**$L_{Aeq,adj,15\ min}$**	40 dBA	38 dBA	35 dBA
Drilling activities undertaken from 10:00pm – 7:00am	**$L_{Aeq,adj,15\ min}$**	30 dBA Must be measured indoors at any **sensitive receptor**		

*The noise limits in Schedule E, Table 1 – Noise Limits at Sensitive Receptors have been set based on the following deemed **background noise levels** (LABG):*

7:00 am – 6:00 pm: 35 dBA

6:00 pm – 10:00 pm: 30 dBA

10:00 pm – 6:00 am: 25 dBA

6:00 am – 7:00 am: 30 dBA

(E5) If the noise subject to a **valid complaint** is tonal or impulsive, the adjustments detailed in *Schedule E, 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 E, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

Noise Characteristic	Adjustment to Noise
Tonal characteristic is just audible	+ 2 dB(A)
Tonal characteristic is clearly audible	+ 5 dB(A)
Impulsive characteristic is detectable	+ 2 to + 5 dB(A)

(E6) Notwithstanding condition (E4), emission of any low frequency noise must not exceed either condition (E6)(a), and condition (E6)(b) or condition (E6)(c) and condition (E6)(d) 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 20dB; or

(c) 50 dB(z) measured inside the sensitive receptor; and

(d) the difference between the internal A-weighted and Z-weighted (**Max** $_{LpZ,\ 15\ min}$) noise levels is no greater than 15 dB.

(E7) A Blast Management Plan must be developed in accordance with Australian Standard 2187.

(E8) Blasting operations must be designed to not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive place.

(E9) Blasting operations must be designed to not exceed a ground-borne vibration peak particle velocity of 10 mm/s at any time, when measured at or extrapolated to any sensitive place.

Schedule F – Air

(F1) Contaminant releases to air emitted from fuel burning and combustion equipment point sources that are capable of burning at least 500 kg in an hour must be directed vertically upwards without any impedance or hindrance.

(F2) The holder of this environmental authority must maintain a register of fuel burning and combustion equipment that is capable of burning at least 500 kg of fuel in an hour that must include, as a minimum, the following information for each piece of equipment:

(a) fuel burning or combustion equipment name and location;

(b) stack emission height (metres);

(c) minimum efflux velocity (m/s);

(d) mass emission rates (g/s); and

(e) contaminant concentrations (mg/Nm^3 @ x %O_2 dry gas at 0°Celsius and 1 atmosphere).

(F3) The holder of this environmental authority must ensure that the information contained in the register of fuel burning and combustion equipment is always current and complete.

(F4) All entries in the register of fuel burning and combustion equipment must be certified by the chief executive officer for the tenure holder, or their delegate, as being accurate and correct.

(F5) Prior to the installation and operation of any new fuel burning or combustion equipment that is capable of burning at least 500 kg of fuel in an hour, the holder of this environmental authority must conduct air dispersion modelling to calculate the ground level concentrations of emissions from all existing and proposed fuel burning or combustion equipment under maximum operating conditions (including other industry) within the ambient air shed and identify any potential impacts to air quality within the study area.

(F6) The holder of this environmental authority must ensure that the calculated ground level concentrations required under condition (F5) do not exceed the criteria for each air contaminant in *Schedule F, Table 1 – Maximum Ground Level Concentration Criteria*.

Schedule F, Table 1 – Maximum Ground Level Concentration Criteria

Contaminant	Environmental Value	Concentration at 0° Celsius	Units	Averaging time
NO_x as Nitrogen Dioxide	health and wellbeing	250	µg/m^3	1 hour
		62	µg/m^3	1 year
NO_x as Nitrogen Dioxide	health and biodiversity of ecosystems	33	µg/m^3	1 year
Carbon monoxide	health and wellbeing	11	mg/m^3	8 hour

(F7) The holder of this environmental authority must undertake emissions testing within three months post commissioning of any fuel burning and combustion equipment capable of burning at least 500 kg of fuel in an hour to verify the estimates used in the air dispersion modelling.

(F8) Where the results of the emissions testing required under condition (F7) indicate that the emission estimates used in the air dispersion modelling required under condition (F5) are exceeded, the holder of this environmental authority must:

(a) provide details to the administering authority within 10 business days;

(b) re-undertake the modelling based on the new information; and

(c) determine and implement appropriate pollution control measures to bring the emissions into compliance with the limits specified in *Schedule F, Table 1 – Maximum Ground Level Concentration Criteria.*

(F9) Fuel burning or combustion equipment that is capable of burning at least 500 kg of fuel in an hour must not be located in **hub**s or in places within five km of a **populated area** unless specified in *Schedule F, Table 2 – Release of Contaminants to Air*.

(F10) Fuel burning or combustion equipment that is capable of burning at least 500 kg of fuel in an hour located in hubs or in places within five km of a populated area must only release contaminants to the atmosphere at a height and an efflux velocity not less than the corresponding height and velocity stated for that release point as provided for in *Schedule F, Table 2 – Release of Contaminants to Air*.

(F11) Fuel burning or combustion equipment that is capable of burning at least 500 kg of fuel in an hour located in hubs or in places within five km of a populated area must not release contaminants to the atmosphere from a release point at a mass emission rate or concentration in excess of that stated in *Schedule F, Table 2 – Release of Contaminants to Air.*

Schedule F, Table 2 – Releases of Contaminants to Air

Facility	Release Point Ref.	Unit Description	Min. Release Height (m)	Min. Efflux Velocity (m/sec)	NO_x as Nitrogen Dioxide		Carbon Monoxide	
					Max. conc.** (mg/Nm^3) @ 5% O_2 dry	Mass emission rate* (g/sec) @ 5% O_2 dry	Max. conc.** (mg/Nm^3) @ 5% O^2 dry	Mass emission rate* (g/sec) @ 5% O_2 dry
Mobile generator units (Temporary Power for WTP commissioning)*								
1MW Diesel Generators PL 276	DG1-11	12 x 1250kVA diesel generator sets	7	10	4800	3.6	1500	1.1
Mobile diesel generator units (temporary power for accommodation camp)*								
800kW diesel generators PL276	AG 1-4	5 x 800kW diesel general units	5	10	4000	2.5	1500	0.9
Woleebee Creek Water Treatment Facility*, including:								
10MW Gas Fired Boilers PL 276	AB 1-3	3 x 10MW gas fired boilers (incl. burners)	12	10	200	1.0	100	0.2

** All units may have separate individual release points, rates are based on per-release point volumes.*

*** Minimum efflux velocity, maximum concentration maximum mass emission and are to be measured at the Maximum Continuous Rating.*

(F12) The holder of this environmental authority must conduct a monitoring program of contaminants released to the atmosphere at each release point stated in *Schedule F, Table 2 – Release of Contaminants to Air* and at the frequencies specified in *Schedule F, Table 3 – Monitoring Frequency for Contaminants.*

Schedule F, Table 3 – Monitoring Frequency for Contaminants

Contaminant	Monitoring frequency
NO_x as nitrogen dioxide	Within three (3) months after commissioning of any fuel burning equipment; and biennially thereafter.
Carbon monoxide	

(F13) The point source air monitoring program must include, but not necessarily be limited to:

(a) monitoring provisions for the release points which complies with Australian Standard 4323 as amended from time to time;

(b) testing and sampling at each release point stated in *Schedule F, Table 2 – Release of Contaminants to Air* for the following:

i. gas velocity, volume and mass flow rate;

ii. contaminant concentration and mass emission rate

iii. temperature;

iv. water vapour concentration (for non-continuous sampling);

(c) representative samples of the contaminants discharged when operating under maximum operating conditions;

(d) the collection of production rate and plant status during sampling periods; and

(e) monitoring of contaminant release carried out in accordance with the latest edition of the Department of Environment and Resource Management's "Air Quality Sampling Manual 1997", as amended from time to time.

(F14) When requested by the administering authority, contaminant monitoring and recording must be undertaken to investigate any valid complaint, and the results notified within 10 business days to the administering authority of becoming available to the holder of this environmental authority.

Schedule G – Waste

(G1) 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**.

(G2) Waste, including **waste fluids**, but excluding waste used in **closed-loop systems**, must be transported off-site (or re-use site) for lawful reuse, remediation, recycling or disposal, unless the waste is specifically authorised by conditions of the Environmental Authority to be disposed of or used on site.

(G3) The holder of this environmental authority may transport treated coal seam gas water, raw coal seam gas water, coal seam gas concentrate or brine to be stored, treated and used in accordance with any other environmental authority to allow for the aggregation and management of wastes.

(G4) Waste fluids, other than **flare precipitant** stored in **flare pit**s, or **residual drilling material** or drilling fluids stored in **sump**s, must be contained in either:

(a) an above ground container or;

(b) a structure which contains the wetting front.

(G5) If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.

(G6) Residual drilling material can only be disposed of on-site:

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

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

(G7) Records must be kept to demonstrate compliance with condition (G5) and (G6).

(G8) **Green waste** may be used on-site for either rehabilitation or sediment and erosion control, or both.

(G9) 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*.

(G10) All waste fluids and muds resulting from drilling and exploration activities must be contained in a dam or containment structure for disposal, remediation or reuse where applicable.

(G11) The holder of this environmental authority must continually investigate the following:

(a) the viability of waste reuse or recycling through chemically processing or treating brine or salt residues to create useable or saleable products;

(b) the viability of the injection of brine into a natural underground structure that is geologically isolated and does not contain groundwater that does or could supply water for potable or agricultural purposes;

(c) procedures for identifying and implementing opportunities to improve coal seam gas water management practices;

(d) any plan for reinjection of brine or untreated water;

(e) any long term plan for the beneficial uses of brine and/or salts extracted from coal seam gas water; and

(f) an assessment of the potential impacts of options considered and appropriate mitigation measures for the preferred option having regard to the decision hierarchy identified in government policy and guidelines.

(G12) The holder must include details of the outcomes of the ongoing investigations required by condition (G11) in each annual return.

(G13) A final submission must be made to the administering authority with the outcomes of the investigations and proposed actions forward, and the preferred solution for the beneficial use of brine and salt by March 2015.

(G14) Following the completion of the petroleum activities, 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*.

Schedule H - Rehabilitation

(H1) Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.

(H2) Reinstatement and revegetation of the pipeline right of way must commence within six months after cessation of petroleum activities for the purpose of pipeline construction.

(H3) 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.

(H4) 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 (H5) to (H11), inclusive; and

ii. provide for appropriate monitoring and maintenance.

(H5) 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; and

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 declared pest species, is growing; or

ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

(H6) 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 percent 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.

(H7) 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 (D2) and (D3)) 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.

(H8) Conditions (H5), (H6) and (H7) continue to apply after this environmental authority has ended or ceased to have effect.

(H9) Prior to relinquishing all or part of an authority to prospect area, a rehabilitation report must be prepared which specifically relates to the area to be relinquished and demonstrates condition (H5), (H6) and (H7) has been met.

(H10) The report required under condition (H9) must be submitted to the administering authority at least 40 business days prior to the relinquishment notice being lodged with the administering authority for the *Petroleum and Gas (Production and Safety) Act 2004*.

(H11) Where there is a dam (including a **low consequence dam**) that is being or intended to be utilised by the landholder or overlapping tenure holder, the dam must be decommissioned to no longer accept inflow from the petroleum activity(ies) and the contained water must be of a quality suitable for the intended on-going uses(s) by the landholder or overlapping tenure holder.

Schedule I – Stimulation Activities

(I1) The holder of this environmental authority must ensure that **restricted stimulation fluids** are not used in stimulation.

(I2) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in **stimulation fluid**s in concentrations above the **reporting limit**.

(I3) **Oil based drilling mud**s must not be used in the carrying out of the petroleum activities.

(I4) **Synthetic based drilling mud**s must not be used in the carrying out of the petroleum activities.

(I5) Accurate and current material safety data sheets for all fluids used in stimulation activities must be published on the environmental authority holder's website.

(I6) Stimulation activities must not negatively affect water quality at:

(a) any landholders' active groundwater bores (subject to access being permitted by the landholder) that are located within a two kilometre horizontal radius from the location of the stimulation initiation point; and

(b) any active landholders' groundwater bores within 200 metres vertically of the stimulation initiation point; and

(c) 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 (I11) and (I12).

(I7) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.

(I8) The holder of this authority must ensure the internal and external mechanical integrity of the well system prior to and during stimulation such that there is:

(a) no significant leakage in the casing, tubing, or packer; and

(b) there is no significant fluid movement into another aquifer through vertical channels adjacent to the well bore hole.

(I9) 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.

Note: Detection measures will need to be determined through the risk assessment and could include microseismic monitoring, tracer analysis and water quality signature analysis. Such measures will be required to be outlined in the Environmental Management Plan accompanying the application.

(I10) Rectification measures must be taken immediately if the holder of this environmental authority either becomes aware that stimulation activities have resulted in a change in water quality at any of the bores that are referred to in condition (I6), or that stimulation activities have caused the connection of the target gas producing formation and another aquifer.

(I11) Prior to undertaking well stimulation activities, the holder of the environmental authority must develop a Stimulation Risk Assessment that is consistent with the "Addendum to Environmental Authority Applications – Hydraulic Fracturing – Risk Assessment and Management Plan, March 2011" to ensure that stimulation activities are managed to prevent environmental harm.

(I12) The Stimulation Risk Assessment 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 coal seam gas producing formation;

(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 coal seam gas producing formation;

(h) the environmental values of groundwater in the area;

(i) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;

(j) consideration of barriers or known direct connections between the target coal seam gas producing formation and the overlying and underlying aquifers;

(k) a description of the well mechanical integrity testing program;

(l) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc);

(m) practices and procedures to ensure that the stimulation activities are designed to be contained within the barriers of the target coal seam gas producing formation having regard to its identification under Condition (B18)(j);

(n) locations of landholders' active groundwater bores;

(o) groundwater **transmissivity**, flow rate, hydraulic conductivity and direction(s) of flow;

(p) a description of the chemicals 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;

(q) a mass balance estimating the concentrations and absolute masses of chemicals that will be reacted, returned to the surface or left in the target coal seam gas producing formation subsequent to stimulation;

(r) 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 chemicals used;

  ii. information on the persistence and bioaccumulation potential of the chemicals used; and

  iii. identification of the stimulation fluid chemicals of potential concern derived from the risk assessment;

(s) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities;

(t) an environmental hazard assessment of leaving stimulation chemicals in the target coal seam gas producing formation for extended periods subsequent to stimulation;

(u) human health exposure pathways to operators and the regional population;

(v) risk characterisation of environmental impacts based on the environmental hazard assessment; and

(w) 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.

(I13) The stimulation risk assessment must be carried out for every well or group of wells in an area of like geological and hydrogeological characteristics to be stimulated prior to stimulation activities being carried out at that well.

(I14) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the quality of:

(a) all active landholders' groundwater bores (subject to access being permitted by the landholder) that are located within a two kilometre horizontal radius from the location of the stimulation initiation point; and

(b) all active landholders' groundwater bores within 200 metres vertically of the stimulation initiation point; and

(c) 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 (I11) and (I12).

(I15) Prior to undertaking stimulation activities at a well, the holder of this environmental authority must have sufficient water quality data to accurately represent the water quality in the well to be stimulated. The data must include as a minimum the results of analyses for the parameters in condition (I16).

(I16) Baseline bore and well assessments must include relevant **analytes** and physico-chemical 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 [µS/m];

(c) total suspended solids [mg/L];

(d) dissolved gases (e.g. methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L];

(e) alkalinity (bicarbonate, carbonate, hydroxide and total as $CaCO_3$) [mg/L];

(f) sodium adsorption ratio (SAR);

(g) anions (bicarbonate, carbonate, hydroxide, chloride, fluoride, sulphate) [mg/L];

(h) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];

(i) dissolved metals (including but not necessarily being limited to: aluminium, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc) [µg/L];

(j) total arsenic [µg/L];

(k) total petroleum hydrocarbons [µg/L];

(l) **BTEX** (as benzene, toluene, ethylbenzene and total xylene) [µg/L];

(m) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [µg/L];

(n) sodium hypochlorite [mg/L];

(o) sodium hydroxide [mg/L];

(p) formaldehyde [mg/L];

(q) ethanol [mg/L]; and

(r) gross alpha or gross beta or radionuclides by gamma spectroscopy [Bq/L].

(I17) A Stimulation Impact Monitoring Program, which has been certified by a suitably qualified person, must be developed prior to the carrying out of stimulation activities.

(I18) The Stimulation Impact Monitoring Program must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (I11) and (I12) 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; and

(b) flow back waters from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and

(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 landholders' active groundwater bores (subject to access being permitted by the landholder) that are:

i. within a two kilometre horizontal radius from the location of the stimulation initiation point; and

ii. that draw water from the target coal seam gas producing formation; or

iii. within 200 vertical meters of the stimulation initiation point; and

(e) any other bore that could potentially be adversely impacted by the stimulation activities in accordance with the findings risk assessment required by conditions (I11) and (I12).

(I19) 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 (I16); 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.

(I20) The Stimulation Impact Monitoring Program must provide for monitoring of the bores in condition (I18)(d) at the following minimum frequency:

(a) monthly for the first six months subsequent to the stimulation activities being undertaken; then

(b) annually for the first five years subsequent to the stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (I16)(b), (I16)(l) – (I16)(r) are not detected in concentrations above baseline bore monitoring data on two consecutive monitoring occasions.

(I21) The holder of this environmental authority must implement the Stimulation Impact Monitoring Program.

(I22) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

Schedule J – Notification Procedures

(J1) 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 Hotline and in writing, as soon as possible, but within 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 of any year;

(e) potential or actual loss of **well integrity**;

(f) when the seepage trigger action response procedure required under Condition (B25)(f) 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. 200 L of hydrocarbons; or

ii. 200 L of stimulation additives; or

iii. 500 L of stimulation fluids; or

iv. 1000 L of brine; or

v. 5000 L of untreated coal seam gas water; or

vi. 5000 L of raw sewage; or

vii. 10000 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.

Definitions

*Note: Terms which are defined in this environmental authority are **bolded** at the beginning of each schedule. Where a term is not defined in this environmental authority, the definition in the* Environmental Protection Act 1994*, its regulations and Environmental Protection Policies, then the* Acts Interpretation Act 1954*, then the Macquarie Dictionary then the* Petroleum and Gas (Production and Safety) Act 2004 *or its regulations must be used in that order.*

"**acceptable standards for release to land"** means wastewater of the following quality as determined by monitoring results or by characterisation:

- electrical conductivity (EC) not exceeding 3000 µS/cm
- sodium adsorption ratio (SAR) not exceeding 8
- pH between 6.0 and 9.0
- 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
- does not contain biocides.

"acid sulfate soils" means a soil or soil horizon which contains sulfides or an acid soil horizon affected by oxidation of sulfides.

"adjacent land use(s)" means the ecosystem function adjacent to an area of significant disturbance, or where there is no ecosystem function, the use of the land. An adjacent land use does not include an adjacent area that shows evidence of edge effect.

"administering authority" means:

(a) 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

(b) for all other matters—the Chief Executive of the Department of Environment and Science or its successor; or

(c) another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.

"aggregation dam" means a regulated dam that receives and contains coal seam gas water or coal seam gas water concentrate. 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 arrangements 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 required under the Land Schedule of this environmental authority.

"**analytes**" means a chemical parameter determined by either physical measurement in the field or by laboratory analysis.

"annual exceedance probability" or "**AEP**" is the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year.

"**annual inspection report"** means an assessment prepared by a suitably qualified and experienced person containing details of the assessment:

(a) against the most recent consequence assessment report and design plan (or system design plan);

(b) against recommendations contained in previous annual inspections reports;

(c) against recognised dam safety deficiency indicators;

(d) for changes in circumstances potentially leading to a change in consequence category;

(e) for conformance with the conditions of this authority;

(f) for conformance with the 'as constructed' drawings;

(g) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations 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 (or network of linked containment systems);

(h) for evidence of conformance with the current operational plan.

"annual return period" means the most current 12-month period between two anniversary dates.

"approved quality criteria" for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:

Part A in all cases:

Parameter	Maximum concentration
pH	6–10.5 (range)
Electrical Conductivity	20 dS/m (20,000 µS/cm)
Chloride*	8000 mg/L

*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.

Part B If any of the following metals are a component of the drilling fluids, then for that metal:

Parameter	Maximum concentration
Arsenic	20 mg/kg
Selenium	5 mg/kg
Boron	100 mg/kg
Cadmium	3 mg/kg
Chromium (total)	400 mg/kg
Copper	100 mg/kg
Lead	600 mg/kg

The limits in Part B and Part C refer to the post soil/by-product mix.

Part C If a hydrocarbon sheen is visible, the following hydrocarbon fractions:

TPH	Maximum concentration
C6-C10	170 mg/kg
C10-C16	150 mg/kg
C16-C34	1300 mg/kg
C34-C40	5600 mg/kg
Total Polycyclic Aromatic Hydrocarbons (PAHs)	20 mg/kg
Phenols (halogenated)	1 mg/kg
Phenols (non-halogenated)	60 mg/kg
Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)	7 mg/kg
Benzene	1 mg/kg

"assessed" or **"assessment"** by a suitably qualified and experienced person in relation to a consequence assessment of a dam, 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 of the assessment:

(a) exactly what has been assessed and the precise nature of that determination;

(b) the relevant legislative, regulatory and technical criteria on which the assessment has been based;

(c) the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and

(d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

"associated water" means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.

"associated works" in relation to a dam, means:

- operations of any kind and all things constructed, erected or installed for that dam; and

  (a) any land used for those operations.

"Australian Standard AS3580" means any of the following publications:

- AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method.
- AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet—Gravimetric method
- AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter— PM10 low volume sampler—Gravimetric sampler.

"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.

"being or intended to be utilised by the landholder or overlapping tenure holder for significantly disturbed land", means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.

"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.

"business day" has the meaning in the *Acts Interpretation Act 1954* 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.

"Category A Environmentally Sensitive Area" means any area listed in Schedule 12, Part 1, section 1 of the Environmental Protection Regulation 2008.

"Category B Environmentally Sensitive Area" means any area listed in Schedule 12, Part 1, section 2 of the Environmental Protection Regulation 2008.

"Category C Environmentally Sensitive Area " means any of the following areas:

- nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992*
- koala habitat areas as defined under the *Nature Conservation (Koala) Conservation Plan 2006*
- state forests or timber reserves as defined under the *Forestry Act 1959*
- regional parks (previously known as resource reserves) under the *Nature Conservation Act 1992*
- an area validated as 'essential habitat' or 'essential regrowth habitat' from ground-truthing surveys in accordance with the *Vegetation Management Act 1999* for a species of wildlife listed as endangered or vulnerable under the *Nature Conservation Act 1992*
- 'of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.

"central processing plants" or **"CPPs"** means the process plants used to compress gas to the required pressure and dehydrate gas for supply to the gas collection header pipeline and export pipelines connecting the gas fields to the LNG Plant.

"certification" means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this Manual, including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).

"certified" or **"certification"** in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams, means a Statutory Declaration by a suitably qualified person or suitably qualified third party accompanying the written document stating:

- the person's qualifications and experience relevant to the function
- that the person has not knowingly included false, misleading or incomplete information in the document
- that the person has not knowingly failed to reveal any relevant information or document to the administering authority
- that the document addresses the relevant matters for the function and is factually correct; and
- that the opinions expressed in the document are honestly and reasonably held.

"certifying, certify or certified" have a corresponding meaning as 'certification'.

"**clearing**" has the meaning in the dictionary of the *Vegetation Management Act 1999* and for vegetation—

(a) means remove, cut down, ringbark, push over, poison or destroy in any way including by burning, flooding or draining; but

(b) does not include destroying standing vegetation by stock, or 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" means underground water brought to the surface of the earth, or moved underground in connection with exploring for, or producing coal seam gas.

"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.

"commercial place" means a work place used as an office or for business or commercial purposes, which is not part of the petroleum activities and does not include employees accommodation or public roads.

"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 (ESR/2016/1933).

"construction or constructed" 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 47 of the Environmental Protection Regulation 2008 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 contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

"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).

"declared pest species" has the meaning in the *Land Protection (Pest and Stock Route Management) Regulation 2003* and is a live animal or plant declared to be a declared pest under section 36 (Declaring Pests by Regulation) or section 37(2) (Declaring Pest under Emergency Pest Notice) of that Act and includes reproductive material of the animal or plant.

"design plan" is a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.

"**design storage allowance or DSA"** means an available volume, estimated in accordance with the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933), published by the

administering authority, must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that Manual.

"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 Natural Resources, 1997, as amended from time to time; or
- identified by an approved salinity hazard map held by the Department of Environment and Resource Management.

"**document**" has the meaning in the *Acts Interpretation Act 1954* 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).

"ecologically dominant layer" has the meaning in the Methodology for Surveying and and means the layer making the greatest contribution to the overall biomass of the site and the vegetation community (NLWRA 2001). This is also referred to as the ecologically dominant stratum or the predominant canopy in woody ecosystems.

"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.

"environmental harm" has the meaning in section 14 of the *Environmental Protection Act 1994* and means any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance. Environmental harm may be caused by an activity—

(a) whether the harm is a direct or indirect result of the activity; or

(b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

"equivalent person" or **"EP**" has the meaning under section 3 of the Planning Guidelines For Water Supply and Sewerage, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the Environmental Protection Regulation 2008 where:

- EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or
- EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.

"existing structure" means a structure that prior to 20 October 2015 meets any or both of the following, a structure:

(a) with a design that is in accordance with the November 2013, Version 4 Manual for Assessing Consequence Categories and Hydraulic performance of Structures and that is considerably in progress;

(b) that is under considerable construction or that is constructed.

"field compressor stations" or **"FCS"** mean processing plants that remove free water from the raw gas and undertake the initial compression of gas in order for this to be piped to the Central Processing Plant for further processing.

"**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.

"flare pit" has the meaning in the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933)and means containment area where any hydrocarbon that is discovered in an over-pressured reservoir during a drilling operation is diverted to, and combusted, The flare pit is only used during the drilling and work over process on a petroleum well.

"flare precipitant" means waste fluid which result from the operation of a flare.

"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.

"gas gathering lines" are pipelines with the purpose of transporting gas from well heads to field compressor stations.

"gas trunk lines" are pipelines with purpose of transport gas from field compressor stations to central processing plants.

"green waste" means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature but does not include declared pest species.

"groundwater dependent ecosystem (GDE)" means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services.

"growing" means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.

"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 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 the design criteria specified for the relevant consequence in the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933).

"hydraulic integrity" refers to the capacity of a dam to contain or safely pass flowable substances based on its design.

"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.

"infrastructure" means plant or works including for example, communication systems, compressors, power lines, 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.

"$L_{A 90, adj, 15 mins}$" means the A-weighted sound pressure level, adjusted for tonal character that is equal to or exceeded for 90% 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.

"landfill monocell" means a specialised, isolated landfill facility where a single specific waste type is exclusively disposed (i.e. salt).

"landholder's active groundwater bore" means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *Water Act 2000*.

"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 an embankment that only provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.

"limited petroleum activities" means activities undertaken for the purpose of extraction of coal seam gas. Limited petroleum activities may include:

- single well sites not exceeding 1 hectare of disturbance, and multi-well sites not exceeding 1.5 hectares of disturbance. Well sites may include:
  - well pads;
  - water pumps and generators associated with well operations;
  - sumps for storing drilling muds;
  - flare pits;
  - ponds used to contain and/or store stimulation fluid;
  - mobile camp sites associated with well sites for the purpose of establishing the limited petroleum activity, so long as the mobile camp site is established in previously disturbed areas.
  - geophysical surveys (including seismic petroleum activities);
- ecological, geological, topographic and cadastral surveys, etc.;
- gas gathering lines;
- water gathering lines;
- supporting access tracks; and
- communication and power lines that are necessary for the undertaking of petroleum activities and can be located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities.
- temporary workspaces, necessary for the construction of other limited petroleum activities, which will not have a significant residual impact on any Matters of State Environmental Significance in accordance with the *Environmental Offsets Act 2014*.

For clarity, **limited petroleum activities** exclude and are not necessarily limited to:

- single well sites of disturbance greater than 1 hectare or multi-well sites of disturbance greater than 1.5 hectares;
- the construction of infrastructure for processing or storing petroleum or by-products;
- regulated dams;
- low hazard dams (excluding ponds used to contain and/or store stimulation fluid, and sumps for storing drilling muds if located within a well site, or immediately adjacent to a well site);
- borrow pits;

- compressor stations;
- campsites / workforce accommodation other than mobile campsites;
- power supplies;
- pipelines which are used to transport gas after the field compressor stations (e.g. trunk pipelines, transmission pipelines or pipelines that require a pipeline licence)
- waste disposal; or
- other supporting infrastructure for the project (e.g. sewage treatment plants)

"linear infrastructure" means power lines, pipelines, flow lines, roads and access tracks.

"liquid" means a substance, which is flowing and offers no permanent resistance to changes of shape.

"long term noise event" is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (5) days, even when there are respite periods when the noise is inaudible within those five (5) days.

"**lopping**" a tree, means cutting or pruning its branches, but does not include—

(a) removing its trunk; and

(b) 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 (ESR/2016/1933).

"Low Impact Petroleum Activities" means Petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.

"**Max $_{LpZ,\ 15\ min}$**" means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.

"Max $_{LpA,\ 15\ min}$" 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 (ESR/2016/1933)", published by the administering authority.

"**Manual**" means the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933) published by the administering authority.

"map of referrable wetlands" has the meaning in Schedule 12 of the Environmental Protection Regulation 2008 and means the 'Map of referable wetlands', 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.

"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.

"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 (kw=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 *Acts Interpretation Act 1954* 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.

"operational plan" includes:

(a) normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance);

(b) contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from an overtopping or loss of structural integrity of the regulated structure.

"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.

"predominant species" has the meaning in the Methodology for Surveying and Mapping of Regional ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.

"pre-disturbed land use" means the function or use of the land as documented prior to significant disturbance occurring at that location.

"prescribed contaminants" has the meaning in section 440ZD of the *Environmental Protection Act 1994* and means:

(a) earth; or

(b) a contaminated prescribed under section 440ZF.

"prescribed storage gases" has the meaning provided in section 12 of the *Petroleum and Gas (Production and Safety) Act 2004.*

"primary protection zone" means an area within a 200 metre buffer from the boundary of any Category A, B or C Environmentally Sensitive Area.

"produced water" has the meaning in Section 15A of the *Petroleum and Gas (Production and Safety) Act 2004* and means CSG water or associated water for a petroleum tenure.

"programmed and approved" means when the location of infrastructure has been approved by the authorised person(s) with the organisation(s).

"protection zone" means the primary protection zone of any Category A, B or C ESA or the secondary protection zone of any Category A or B ESA.

"regional ecosystem" has the meaning in the Methodology for Surveying and Mapping of Regional ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.

"register of regulated dams" includes:

(a) Date of entry in the register;

(b) Name of the dam, its purpose and intended/actual contents;

(c) The consequence category of the dam as assessed using the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933);

(d) Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;

(e) Name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings;

(f) For the regulated dam, other than in relation to any levees –

i. The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;

ii. Coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area

iii. Dam crest volume (megalitres);

iv. Spillway crest level (metres AHD).

v. Maximum operating level (metres AHD);

vi. Storage rating table of stored volume versus level (metres AHD);

vii. Design storage allowance (megalitres) and associated level of the dam (metres AHD);

viii. Mandatory reporting level (metres AHD);

(g) The design plan title and reference relevant to the dam;

(h) The date construction was certified as compliant with the design plan;

(i) The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan;

(j) Details of the composition and construction of any liner;

(k) The system for the detection of any leakage through the floor and sides of the dam;

(l) Dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;

(m) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority;

(n) Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.

"regulated dam" means any dam in the significant or high consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic performance of Structures (ESR/2016/1933), published by the administering authority, as amended from time to time.

"rehabilitation or rehabilitated" means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria and, where relevant, includes remediation of contaminated land. For the purposes of pipeline rehabilitation, rehabilitation includes reinstatement, revegetation and restoration.

"reinstate or reinstatement for pipelines", means the process of bulk earth works and structural replacement of pre-existing conditions of a site (i.e. soil surface typography, watercourses, culverts, fences and gates and other landscape(d) features) and is detailed in the Australian Pipeline Industry Association (APIA) Code of Environmental Practice: Onshore Pipelines (2013).

"reporting limit" means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as "less than" the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or

the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L–0.02 ug/L.

"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.

"restoration" means the replacement of structural habitat complexity, ecosystem processes, services and function from a disturbed or degraded site to that of a pre-determined or analogue site. For the purposes of pipelines, restoration applies to final rehabilitation after pipeline decommissioning.

"restricted stimulation fluids" means restricted stimulation fluids as defined in the Environmental Protection Regulation 2008, or where it is not defined, means a fluid(s) used for the purpose of stimulation, including fracturing, that contain, produce or are likely to produce the following chemicals above the following concentrations:

- Benzene 1 part per billion (ppb);
- Toluene 180 ppb;
- Ethylbenzene 80 ppb;
- o-xylene 350 ppb
- m-xylene 75 ppb
- p-xylene 200 ppb

"revegetation or revegetating or revegetate" means to actively re-establish vegetation through seeding or planting techniques in accordance with site specific management plans.

"secondary protection zone" in relation to a Category A or Category B ESA means an area within 100 metres 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 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 or significant disturbance or significant disturbance to land or areas" has the meaning in Schedule 12, section 4 of the Environmental Protection Regulation 2008. Land is significantly disturbed if—

(a) it is contaminated land; or

(b) it has been disturbed and human intervention is needed to rehabilitate it—

i. to a condition required under the relevant environmental authority; or

ii. if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance.

"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.

"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" has the meaning in Schedule 5 of the Environmental Protection Regulation 2008 and, for a site, means the rehabilitation and restoration of the site is enduring or permanent so that the site is unlikely to collapse, erode or subside.

"Stage 1A – Injection Management Plan" means data gathering, well construction for hydrology and geochemistry, injection fluid characterisation, hydrological assessment, initial hydrogeological conceptual modelling.

"Stage 1B – Field Test Program of the Fluid Injection Trial" means the fluid injection trial of the source water removed from either the Precipice or Hutton formation, and reinjected back into the same source formation.

"Stage 2 – Field Test Program of the CSG Water Injection Trial" means the CSG injection trial, hydrogeochemical reaction assessment, full field hydrogeological model development and injection system design.

"Stage 3 – Full Scale CSG Water Injection" means the construction and operation of a full scale system for CSG water injection and hydrogeological model verification and refinement.

"State significant biodiversity values" means those regional ecosystems, essential habitat, wetlands, watercourses, legally secured offset areas and connectivity areas provided in Appendix 1 of the "Queensland Biodiversity Offset Policy" (Department of Environment and Resource Management, 2011).

"stimulation" means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments.

"stimulation fluid" means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir.

"structure" means a dam or levee.

"**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.

"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.

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.

"suitably qualified third party" means a person who:

(a) has qualifications and experience relevant to performing the function including but not limited to:

i. a bachelor's degree in science or engineering; and

ii. 3 years' experience in undertaking soil contamination assessments; and

(b) is a member of at least one organisation prescribed in Schedule 8 of the Environmental Protection Regulation 2008; and

(c) not be an employee of, nor have a financial interest or any involvement, which would lead to a conflict of interest with the holder(s) of the environmental authority.

"sump" means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.

"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 and/or ESS 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).

"topsoil" 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.

"total density of coarse woody material" means the total length of logs on the ground greater than or equal to 10cm diameter per hectare and number of logs on the ground greater than or equal to 10cm diameter per hectare.

"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" is when the results of a hazard assessment indicates that there is both a high consequence and a high likelihood of an event occurring such that the risk is classified as "high", "very high" or "extreme".

"valid complaint" means a complaint the administering authority considers is not frivolous, nor vexatious, nor based on mistaken belief.

"void" means any constructed, open excavation in the ground.

"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—

- AVOID unnecessary resource consumption
- REDUCE waste generation and disposal
- RE-USE waste resources without further manufacturing
- RECYCLE waste resources to make the same or different products
- RECOVER waste resources, including the recovery of energy
- TREAT waste before disposal, including reducing the hazardous nature of waste
- 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 *Waste Reduction and Recycling Act 2011* and means the:

- polluter pays principle
- user pays principle
- proximity principle
- product stewardship principle.

"waste fluids" has the meaning in section 13 of the *Environmental Protection Act 1994* in conjunction with the common meaning of "fluid" which is "a substance which is capable of flowing and offers no permanent resistance to changes of shape". Accordingly, to be a waste fluid, the waste must be a substance which is capable of flowing and offers no permanent resistance to changes of shape.

"water gathering lines" mean pipelines with the purpose of transporting coal seam gas water from well heads to an aggregation dam.

"water trunk lines" means pipelines with the purpose of transporting coal seam gas water from an aggregation dam to a water treatment facility.

"**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 provided in section 5 of the *Water Act 2000* and includes the bed and banks and any other element of a river, creek or stream confining or containing water.

"well integrity" the ability of a well to contain the substances flowing through it.

"well lease infrastructure" means infrastructure required for the construction and completion of a well including but not limited to cellar pits, dams and drill sumps.

"**wetland**" for the purpose of this environmental authority, wetland means:

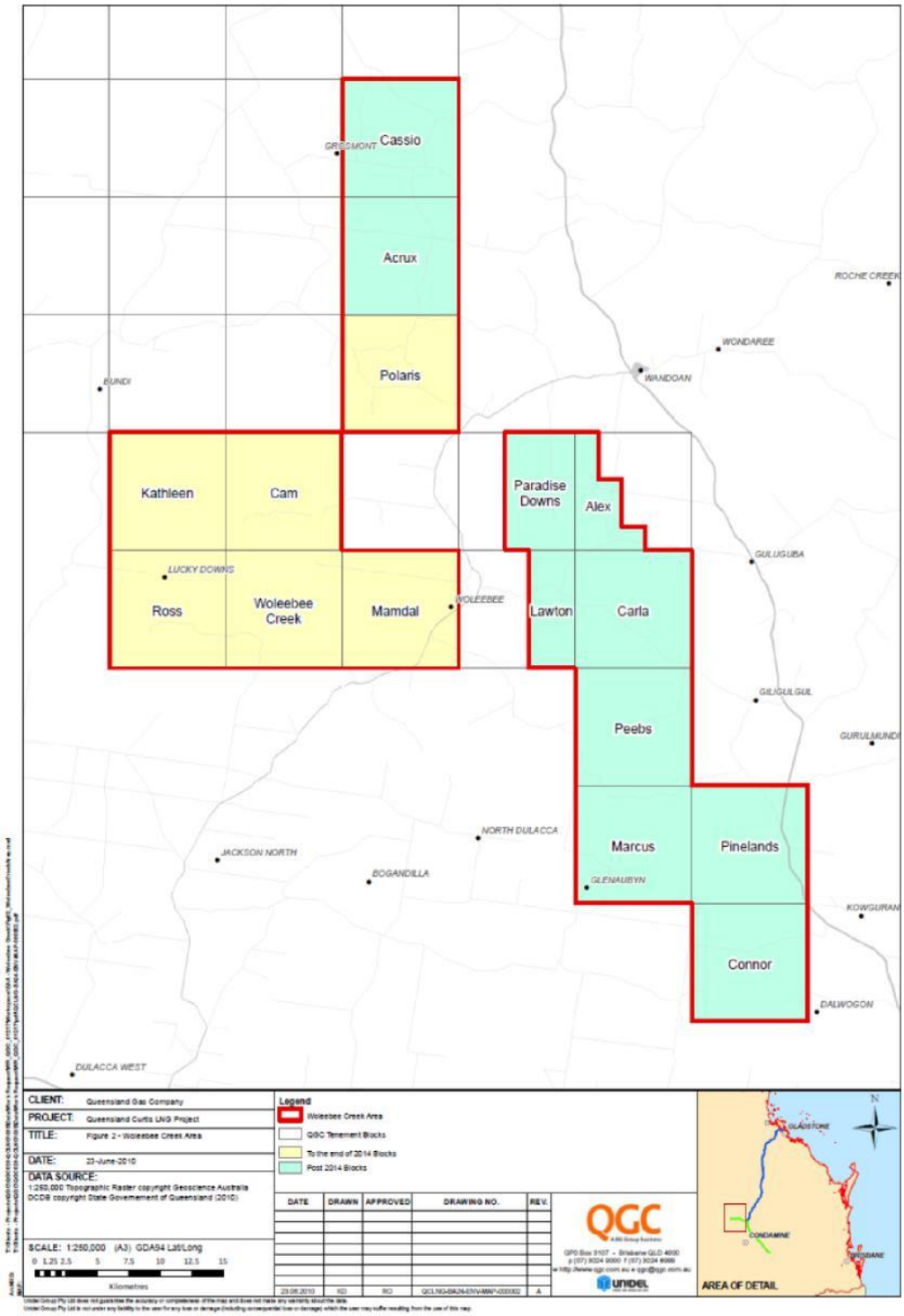
- an area shown on the Map of referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and must also be
- an area defined under the Queensland Wetlands Program as 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.

"year" means a period of 12 months.

APPENDIX 1 – Map of Woleebee Creek Project Area showing block development to the end of 2014



END OF ENVIRONMENTAL AUTHORITY