

Draft environmental management plan
Existing Santos GLNG
environmental authorities

Y-A

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Environmental Protection Act 1994
Level 1 Environmental Authority
Chapter 5A petroleum activity

Permit¹ Number: PEN100046407

Under section 310M of the *Environmental Protection Act 1994* this permit is issued to:

Principal Holder:

Santos Limited
60 Flinders Street
Adelaide SA 5000
ACN: 007 550 923

in respect to carrying out a level 1 chapter 5A activity(ies) as per Section 23 of the *Environmental Protection Regulation 2008* on the relevant resource authorities listed below:

Project Name	Relevant Resource Authority(ies)	Joint Holder(s)
Naccowlah JV	ATP 259 PLs 23 24 25 26 35 36 62 76 77 78 82 87 105 107 109 133 149 175	Delhi Petroleum Ltd Vamgas Pty Ltd Mawson Petroleum Pty Ltd Bounty Oil and Gas Pty Ltd Australian Gasfields Ltd Inland Oil (Production) Pty Ltd
Tintaburra JV	ATP299 PLs 29 38 39 52 57 95 169 170	Vamgas Pty Ltd Drillsearch Energy Ltd CPC Energy Ltd
Aquitaine A/S/C JV	ATP259 PLs 59 60 61 81 83 85 97 106 108 111 112 131 132 135 137 138 139 146 147 154 205 207 208	Origin Energy Resources Ltd Delhi Petroleum Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd
Total 66 JV	ATP259 PLs 34 37 63 68 75 84 88 110 129 130 134 140 142 143 144 150 168 186	Delhi Petroleum Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd
50/40/10 JOA	PL55	Delhi Petroleum Ltd Vamgas Pty Ltd
Wareena JV	ATP259 PLs 113 114 141 145 148 153 157 158	Origin Energy Resources Ltd Delhi Petroleum Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd Santos Australian Hydrocarbons Pty Ltd
Roma Remainder	PLs 10/320 11/321 12	Santos CSG Pty Ltd Total E&P Australia PAPL (Upstream II) Pty Ltd KGLNG E&P Pty Ltd
Eastern Queensland Various	PL2	Santos QNT Pty Ltd Interstate Energy Pty Ltd Santos Australian Hydrocarbons Pty Ltd Wirriwa Energy Pty Ltd
Waldegrave JV	PLs 28 69	Santos QNT Pty Ltd Oil Investments Pty Ltd Australia Pacific LNG Pty Ltd

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Heritage Protection.

EQ Denison Trough	PLs 41 42 43 44 54	Santos QNT Pty Ltd Australia Pacific LNG Pty Ltd
Innaminka JV	PLs 58 136 137 159	Delhi Petroleum Ltd Vamgas Pty Ltd Santos Australian Hydrocarbons Pty Ltd
Moonie / Cabawin	PL1	Anvil Australian Petroleum Pty Ltd AGL Gas Storage Pty Ltd Petroalbian Pty Ltd Moage Ltd Robert Bruce Hope & Maureen Jean Hope
Scotia	PL176	Santos CSG Pty Ltd Total E&P Australia PAPL (Upstream II) Pty Ltd KGLNG E&P Pty Ltd
Moonie Pipeline	PPL1	Moonie Pipeline Company Limited
Jackson to Moonie Pipeline	PPL6	Bridgefield Pty Ltd Moonie Pipeline Company Pty Ltd Delhi Petroleum Ltd Australia Pacific LNG Pty Ltd Vamgas Pty Ltd

This environmental authority takes effect from **27 March 2013**.

The anniversary date of this environmental authority is **31 August**.

This environmental authority is subject to the attached schedule of conditions.



27/3/2013

Date

Steven Tarte
Delegate of Administering Authority
Department of Environment and Heritage Protection

Additional advice about the approval

1. This approval is for the carrying out the following level 1 chapter 5A activity(ies):

Schedule 5 of the <i>Environmental Protection Regulation 2008</i>
A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam
A petroleum activity, other than a petroleum activity mentioned in items 1 to 7, that includes 1 or more chapter 4 petroleum activities for which an aggregate environmental score is stated, namely: • ERA 8 (3)(a) - storing 10m³ to 500m³ of class C1 or C2 combustible liquids • ERA 8 (3)(b) - storing more than 500m³ of class C1 or C2 combustible liquids • ERA 9(3)(b) – hydrocarbon gas refining in a year of – 200 000 000m³ • ERA 11 (c) - refining or processing, more than 150000m³ of crude or shale oil • ERA 63 (2)(b) - operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 to 1500EP • ERA 15 - using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour • ERA 16 (2)(a) - extracting, other than by dredging, in a year, less than 5000t of material from a wild river • ERA 16 (2)(b) - extracting, other than by dredging, in a year, 5000t to 100000t of material • ERA 57(2)(b) – transporting regulated waste, other than tyres, in 6 to 35 vehicles • ERA 60(1)(a) – operating a facility for disposing of, in a year less than 50000t of waste • ERA 60(1)(b) – operating a facility for disposing of, in a year 50000t to 100000t of waste • ERA 60(1)(c) – operating a facility for disposing of, in a year 100000t to 200000t of waste • ERA 60(1)(d) – operating a facility for disposing of, in a year more than 200000t of waste • ERA 60 (2)(a) - operating a facility for disposing of 50t to 2000t of waste in a year • ERA 60 (2)(c) - operating a facility for disposing of more than 5000t to 10000t of waste in a year • ERA 61 (1) - incinerating waste vegetation, clean paper or cardboard • ERA 61(2) – receiving and storing regulated waste other than tyres • ERA 61(3)(a) - incinerating or thermally treating clinical waste or quarantine waste • ERA 61(3)(b) - incinerating or thermally treating other regulated waste • ERA 57(2)(a) - transporting regulated waste, other than tyres, in 1 to 5 vehicles • ERA 57(2)(b) - transporting regulated waste, other than tyres, in 6 to 35 vehicles • ERA 56 (1) - receiving and storing 5t or more or 500 or more equivalent passenger units, of tyres or parts of tyres • ERA 56 (2) - receiving and storing regulated waste other than tyres • ERA 58 - operating a facility for receiving and treating regulated waste or contaminated soil to render the waste or soil non-hazardous or less hazardous

2. This approval pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for this activity which might be required by other State and / or Commonwealth legislation. Other legislation administered by the Department of Environment and Heritage Protection for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*;
- Contaminated land provisions of the *Environmental Protection Act 1994*;
- *Forestry Act 1959*;
- *Nature Conservation Act 1992*;
- *Water Act 2000*;
- *Water Supply (Safety and Reliability) Act 2008*.

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

3. This approval, issued under the *Environmental Protection Act 1994*, for the carrying out of a level 1 petroleum activity(ies) is not an authority to impact on water levels or pressure heads in groundwater aquifers in or surrounding coal seams. The holder of this environmental authority will have obligations to minimise or mitigate any such impact under other Queensland Government and Australian Government legislation.
4. This environmental authority consists of the following schedules

Schedule A	General Conditions
Schedule B	Air
Schedule C	Water
Schedule D	Noise and Vibration
Schedule E	Waste
Schedule F	Land
Schedule G	Community
Schedule H	Definitions

SCHEDULE A – GENERAL CONDITIONS

- (A1) Emissions that may cause material or serious environmental harm and not specifically authorised by this environmental authority must not be released beyond the boundary of the activity except where they are authorised under an environmental authority.
- (A2) Any record required to be kept by a condition of this environmental authority must be held at the Corporate Environmental Group, Brisbane, and be available for examination by an authorised person.
- (A3) Copies of any record required to be kept by a condition of this environmental authority must be provided to any authorised person or the Administering Authority on request.
- (A4) A copy of this environmental authority must be kept in a location readily accessible to personnel carrying out the activity.
- (A5) All complaints received by the holder of this environmental authority relating to operations at the licensed place must be recorded.
- (A6) As soon as practicable after becoming aware of any emergency or incident which results in emissions not in accordance with the conditions of this environmental authority, the holder of this environmental authority must notify the administering authority of the release by telephone or facsimile and in writing within 14 days following the initial notification.
- (A7) The holder of this environmental authority must notify the administering authority in the relevant region in writing of any monitoring result which indicates an exceedance of any licence limit within 28 days of completion of analysis.
- (A8) The environmental authority holder will also have in place and comply with an environmental management system, with relevant control strategies and standards. The administering authority will be kept informed of assessments against this system.
- (A9) This environmental authority is granted on the condition that breach of the terms of this environmental authority in respect of one Environmentally Relevant Activity at a location will not affect this licence in relation to any other ERA at the same or any other location.
- (A10) The boundary of activities for which this environmental authority is issued is coincident with the outer boundary of the Authority to Prospect or Petroleum Lease on which that activity is carried out.

SCHEDULE B – Air

(B1) The environmental authority holder will comply with the release limits in Table 1.

Schedule B – Table 1

Release Point Number	Release point	Source Description	Minimum Release Height (metres)	Minimum Efflux Velocity (metres/second)
A1	Wallumbilla LPG Plant	Electric Generator Engines	4	8
A2	Wallumbilla LPG Plant	Gas Compressor Engines	9.9	8
A3	Wallumbilla LPG Plant	Process Heaters	3.5	8
A4	Ballera Gas Facility	Electric Generator and Gas Compression Engines (6)	4	8
A4	Ballera Gas Facility	Power Generation Turbines (10)	10.9	26
A4	Ballera Gas Facility	Glycol Regeneration Reboiler (3) a) Reboiler Vent b) Stack	a) 10.5 b) 5.5	a) 1.6 b) 2.4
A4	Ballera Gas Facility	Hot Oil Heater (2) Reboiler	17.8	2.4
A4	Ballera Gas Facility	CO ₂ Tower (2)	53.8	15.7
A4	Ballera Gas Facility	LP Flare	11.5	2.3
A4	Ballera Gas Facility	HP Flare	3.5	7
A4	Ballera Gas Facility	Fire Pump Diesel Engines	2.4	4
A5	Stokes Field	Gas Field Compressor Engines	5	52
A6	Challum Field	Gas Field Compressor Engines	5	52
A7	Ballera Field	Gas Field Compressor Engines	5	52
A8	Scotia Field	Cold Vent	-	5
A9	Epsilon Field	Gas Field Compressor Engines	5	35
A10	Munkah – Wackett Field	Gas Field Compressor Engines (2)	10	52.9

- (B2) There is to be no obstruction to the upward vertical discharge from the chimney (*Wallumbilla LPG Processing Plant* – electric generator, gas compressor engines, process heaters, *Ballera* – electric generator & gas compression engine, Power Generation Turbines, Glycol Regeneration Reboilers, Hot Oil Heaters, CO₂ Towers, LP Flare, Fire Pump Diesel Engines).
- (B3) **Ground Flare**
An automatic monitoring device is to be in operation to warn of flame failure whenever the flame is in use (*Wallumbilla LPG Processing Plant*).
- (B4) Only fuels to be used at:
- *Wallumbilla LPG Processing Plant* (electric generator, gas compressor engines, process heaters) – **natural gas and LPG**
 - *Ballera* – **natural gas**
- (B5) Quantities and destination of carbon dioxide produced from oil and gas extraction operations and processing operations must be determined and reported in the annual environment report.
- (B6) Quantities of methane produced from oil and gas extraction operations and processing operations that are discharged to the atmosphere must be determined and reported in the annual environment report.
- (B7) The sulphur content of fuel burned at *Jackson Oil Field* is not to exceed 0.5 per cent by weight.

SCHEDULE C – WATER

- (C1) Water emissions that may cause material or serious environmental harm must not be released directly or indirectly from the boundary of this activity to any waters or the bed and banks of any waters or into the general environment beyond the boundary of this activity except as permitted under this Schedule.
- (C2) Water emissions must not be released directly or indirectly from locations on the boundary of this activity other than at locations listed in the following –
- Release point W1 (PL 23 Jackson Production Facility): Water emission at the overflow of the last evaporation pond at the Jackson Production Facility.
- Release point W2 (PL 25 Naccowlah Production Facility): Water emission from the fourth pond approximately 3.5km downstream from the Naccowlah Production Facility at the overflow point.
- (C3) The total quantity of water emission released from release point number W1 during any day must not exceed 75000 BWPD (approximately 12000 cubic metres).
- Water emissions released from release point number W2 during any day must not exceed 63000 BWPD (approximately 10000 cubic metres).
- (C4) The water emissions must comply, at the sampling and in-situ measurement point/s specified in this Schedule, with each of the limits specified in Table 2 of this Schedule for each quality characteristics.
- (C5) Notwithstanding the quality characteristic limits specified in Table 2 of this Schedule, the release of water emissions to waters must not produce any slick or other visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter, or other objectionable matter.
- For other quality characteristics not listed in Table 2, the water emissions shall not have any properties, nor contain any matter or organism in concentrations, which in the opinion of the administering authority are likely to make the receiving environment less fit for other water uses, when account is taken of any effective dilution and quality of the water.
- (C6) The holder of this environmental authority is responsible for the making of determinations of the quality of the water emissions for the release points, quality characteristics, and at the frequency specified in Table 2 of this Schedule.
- (C7) Determinations of the quality of contaminants released to waters to check conformity with the emission quality characteristics specified in this Schedule must be undertaken at the sampling and in-situ measurement point(s) described in the following.
- (C8) The environmental authority holder shall monitor and watercourse receiving the discharge waters at the 6 nominated locations for the Jackson discharge and at the 4 nominated locations (W1 and W2), shall also be monitored where possible. Monitoring shall include the quality characteristics listed in Table 2.
- (C9) All determinations of the quality of water emissions to waters must be made in accordance with methods prescribed in the Environmental Protection Agency *Water Quality Sampling Manual*, current edition. Soil sampling must be in accordance with the *Guidelines for the Assessment of Contaminated Land in Queensland* (current edition).
- (C10) All required determinations of the quality of water emissions, as defined by this environmental authority, must be made by a person or body deemed appropriate by the Administering Authority.
- (C11) The quality of water emissions must be determined by a method acceptable to the Administering Authority.
- (C12) Evaporation ponds located in areas frequented by livestock shall be securely fenced.

Erosion Protection Measures and Sediment Controls

- (C13) Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment from all disturbed areas.
- (C14) Prevent any build up of sediment in any stormwater drain.

Stormwater Management Measures

- (C15) The holder must implement and maintain measures to minimise the likelihood of the release of contaminated stormwater from the place where the activities are carried out to any stormwater drain or any waters.
- (C16) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants are unlikely to be released into any waters, roadside gutter or stormwater drainage system.
- (C17) Any spillage of wastes, or contaminants that may cause environmental harm, must be effectively contained and/or cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, or otherwise releasing such waste or contaminants to any stormwater drainage system, roadside gutter or waters.

Schedule C – Table 2: Water Release Quality Characteristic Limits

Quality Characteristics	Release Point Number	Release Limit	Limit Type	Frequency
pH (pH Units)	W1, W2	6.5 – 9.5	Range	Quarterly
Sodium Bicarbonate (mg/L)	W1, W2	3500	maximum	Quarterly
Total Dissolved Solids (mg/L)	W1, W2	4000	maximum	Quarterly
Total Petroleum Hydrocarbons (mg/L)	W1, W2	10 (or no visible film)	maximum	Quarterly
Naphthalene (ug/L)	W1, W2	2.5	maximum	Bi-annually
Phenolic Compounds (ug/L)	W1, W2	85	maximum	Bi-annually
Dissolved Fluoride (as F) (mg/L)	W1, W2	9	maximum	Quarterly
Dissolved Oxygen	W1, W2	-	-	Quarterly

SCHEDULE D — Noise and Vibration

Noise Nuisance

- (D1) Noise from activities must not cause any environmental nuisance at any noise sensitive place.
- (D2) The method of measurement and reporting of noise levels must comply with the latest edition of the Environment Protection Agency's Noise Measurement Manual.

SCHEDULE E — Waste

- (E1) End Point Criteria: Acceptable concentrations of contaminants allowed in soil to be disposed of as fill material by the licensee are as follows:

Contaminant	Maximum Concentration (total) mg/kg dry weight
Total Petroleum Hydrocarbons (C ₆ to C ₉)	100
Total Petroleum Hydrocarbons (C ₁₀ to C ₁₄)	100
Total Petroleum Hydrocarbons (> C ₁₄)	1000
Total Petroleum Hydrocarbons	1000

Or as determined by the Administering Authority.

- (E2) The holder of this environmental authority is responsible for the making of determinations of the quality characteristics and the frequency of sampling of the soil.
- (E3) Progress Reports on landfarming operations (including sampling analysis) to be provided to the Administering Authority on an annual basis. Monitoring will include at least the following characteristics:
- Total Petroleum Hydrocarbons (> C₉)
 - Total Petroleum Hydrocarbons (C₆ – C₉)
- (E4) The environmental authority holder will comply with the document *A Management Strategy for the Remediation of Hydrocarbon-contaminated Soil*.
- (E5) Where regulated waste is removed from within the boundary of the environmental authority, other than by a release as permitted under another schedule of this environmental authority, the holder of this environmental authority must monitor and record the following:
- (a) the date, quantity and type of waste removed; and
 - (b) name of the waste transporter and/or disposal operator that removed the waste.

SCHEDULE F — LAND

Preventing Contaminant Release to Land

- (F1) Contaminants must not be released to land other than as specified in Schedule.

Sewage

- (F2) No sewage contaminants are permitted to be discharged to land. All sewage contaminants are to be contained in relevant evaporation ponds or removed from septic tanks by licensed operators.

Pond Conditions

- (F7) The evaporation pond used for the storage of contaminants must be constructed, installed and maintained:
- so as to prevent any release of contaminants through the bed or banks of the pond to any waters (including ground water);
 - so that an acceptable freeboard is maintained at all times; and
 - so as to ensure the stability of the ponds' construction.
- (F8) Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from entering the evaporation pond or other structures used for the storage or treatment of contaminants or wastes.
- (F9) Decommissioning the evaporation pond must include:
- the management of salt contaminated soil so that it does not cause environmental harm to surface waters or groundwater; and
 - the rehabilitation of the land so as to provide a stable landform and to prevent any environmental harm to the surrounding environment.
- (F10) Investigation and testing of the sites is to be undertaken to determine if the soils are contaminated.
- (F11) Any contaminated soil must be managed in accordance with the procedures and processes set out in the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land – May 1998*.

Land Rehabilitation

- (F12) Rehabilitation of disturbed areas must take place progressively as works are staged and new areas are disturbed.

SCHEDULE G – Community

Complaint Response

- (G1) All complaints received must be recorded including investigations undertaken, conclusions formed and action taken. This information must be made available to the administering authority on request.

SCHEDULE H - DEFINITIONS

Words and phrases used throughout this authority are defined below:

Where a definition for a term used in this authority is sought and the term is not defined within this authority the definitions provided in the *Environmental Protection Act 1994*, its regulations, and the Environmental Protection Policies shall be used.

“administering authority” means the Department of Natural Resources, Mines and Energy or its successor.

“annual return” means the return required by the annual notice (under section 316 of the *Environment Protection Act 1994*) for the section 86(2) licence that applied to the development approval.

“authorised place” means the place authorised under this authority for the carrying out of the specified environmentally relevant activities.

“authority” means level 1 licence (without development approval), or level 1 (without development approval), or level 2 approval (without development approval) under the *Environment Protection Act 1994*.

“contaminant” can be –

- (a) a gas, liquid or solid; or
- (b) an odour; or
- (c) an organism (whether alive or dead), including a virus; or
- (d) energy including noise, heat radioactivity and electromagnetic radiation; or
- (e) a combination of contaminants.

“contaminated land” means land contaminated by a hazardous contaminant.

“commercial place” means a place used for business or commercial purposes.

“dust sensitive place” means:

- a dwelling, mobile home or caravan park, residential marina or other residential place;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens;
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“dwelling” means any of the following structures or vehicles that is principally used as a residence:

- a house, unit, motel, nursing home or other building or part of a building;
- a caravan, mobile home or other vehicle or structure on land;
- a water craft in a marina

“mg/L” means milligrams per litre

“noise sensitive place” means:

- a dwelling, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital; or
- a protected area; or
- a park or gardens; or

a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“noxious” means harmful or injurious to health or physical well being.

“nuisance sensitive place” includes:

- a dwelling, mobile home or caravan park, residential marina or other residential premises;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens; or
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“odour sensitive place” has the same meaning as a “dust sensitive place”.

“offensive” means causing offence or displeasure; is disagreeable to the sense, disgusting, nauseous or repulsive.

“regulated waste” means non-domestic waste mentioned in Schedule 7 of the Environment Protection Regulation 1998 (whether or not it has been treated or immobilised), and includes:

- for any element – any chemical compound containing the element; and
- anything that has contained the waste.

“site” means the place to which this authority relates.

“waters” includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland.

ERA	Description of Activity	ATP	PI	Location Name
ERA 8 (3)(a)	Chemical Storage - storing the following total quantity of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)— (a) 10m3 to 500m3	259P	23	Gunna
				Tinpilla
				Wilson
			25	Pitchery
				Naccowlah #2
			26	Bogala
			34	Mooliampah
				Sigma
			35	Wandilo
			36	Cooroo
			55	Munro
			61	Yanda
			63	Epsilon
			76	Bolan
				Echuburra
			77	Jarrar
			78	Bowen
			84	Stokes
			145	Toby
		299P	38	Toobunyah
			52	Ipundu
			95	Monler
			169	Gimboola
			170	Takyah
				Koorroopa North
			10 / 320	Bony Creek
				Tarrawonga
		JMP	PPL6	JMP Stn 2
				JMP Stn 3
				JMP Stn 5
				JMP Stn 7
ERA 8 (3)(b)	Chemical Storage - storing the following total quantity of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)— (b) more than 500m3	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
			61	Ballera
			68	Genoa
			75	Patroclus
			97	Cook
		299P	29	Tintaburra
			39	Talgeberry
			52	Tarbat
			57	Endeavour
		Moonie	1	Moonie
			2	Alton
		Lytton 1RP104475		Lytton terminal
				Lytton Whyte Island NBP
ERA 63 (2)(b)	Sewage Treatment operating sewage treatment works, other than no-release works, with a total daily peak design capacity of— (c) more than 100 to 1500EP—	259P	23	Jackson
			61	Ballera

ERA 15	Fuel Burning - Fuel burning consists of using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour.	259	23 25 61	Jackson Naccowlah Ballera
		Moonie	1	Moonie
		Scotia	176	Scotia
ERA 16 (2)(a)	Extractive and screening activities - extracting, other than by dredging, in a year, the following quantity of material— (a) less than 5000t, if the material is extracted from a wild river area	259P		Within all of the ATP and PLs
		299P		Within all of the ATP and PLs
		Moonie	1	Moonie
			2	Alton
		Scotia	176	Scotia
ERA 16 (2)(b)	Extractive and screening activities - extracting, other than by dredging, in a year, the following quantity of material— (a) less than 5000t, if the material is extracted from a wild river area – (b) 5000t to 100000t	259P	23 25 61 35 36 59	Pinaroo Wilson Pitchery Ballera Watson Watson South #2 Cooroo North Challum
		299P	29 39 52	Tintaburra Talgeberry Tarbat Ipundu North
ERA 60 (2)(a)	Waste Disposal - 2 operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(b)— (a) 50t to 2000t	259P	23 25 34 35	Jackson Naccowlah Tickalara Watson
		299P	52	Tarbat
ERA 60 (2)(c)	Waste Disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(b)— (c) more than 5000t to 10000t	259P	61	Ballera
ERA 60(1)(a)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of	259P	23 25 26	Gunna Tinpilla Pitchery Naccowlah Bogala

	waste under subsection (1)(a)— (a) less than 50000t		63	Epsilon	
			76	Bolan	
				Echuburra	
			78	Bowen	
			97	Cook	
				145	Toby
		299P	39	Talgeberry	
			57	Endeavour	
			95	Monler	
			169	Gimboola	
			170	Koorroopa North	
			170	Takyah	
			10	Bony Creek	
				Tanawonga	
			13	Grafton Range	
				Mooga	
			Moonie	2	Alton
		Lytton 1RP104475		Lytton terminal	
ERA60(1)(b)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (b) 50000t to 100000t	259P	35	Watson	
		36	Watson Smith		
		77	Cooroo		
299P		52	Tarbat		
Scotia		176	Scotia		
ERA60(1)(c)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (c) more than 100000t to 200000t	259	55	Munro	
		75	Patroclus		
ERA60(1)(d)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (d) more than 200000t	259P	23	Jackson	
			25	Naccowlah	
			34	Tickalara	
			61	Ballera	
		299P	29	Tintaburra	
		Moonie	1	Moonie	
ERA 61 (1)	Waste incineration and thermal treatment - incinerating waste vegetation, clean paper or	259P	23	Jackson	
			25	Naccowlah	
			34	Tickalara	
			35	Watson	
			61	Ballera	
		299P	52	Tarbat	

	cardboard			
ERA 61 (1)	Waste incineration and thermal treatment - incinerating waste vegetation, clean paper or cardboard	259P	23 25 34 35 61	Jackson Naccowlah Tickalara Watson Ballera
		299P	52	Tarbat
ERA 61 (1)	Waste incineration and thermal treatment - incinerating waste vegetation, clean paper or cardboard	299P	23 25 34 35 61	Jackson Naccowlah Tickalara Watson Ballera
		299P	52	Tarbat
ERA 61 (3)(a)	Waste incineration and thermal treatment - incinerating or thermally treating— (a) clinical waste or quarantine waste	259P	23 61	Jackson Ballera
ERA 61 (3)(b)	Waste incineration and thermal treatment - incinerating or thermally treating— (b) other regulated waste	259P	23 61	Jackson Ballera
		299P	52	Tarbat
ERA 57 (2)(a)	Regulated waste transport - transporting regulated waste, other than tyres, in— (a) 1 to 5 vehicles	259P		Within all of the ATP and PL's
		299P		Within all of the ATP and PL's
		Moonie		Within all of the ATP and PL's
		PPL1 & PPL6		Along PPL corridors
ERA 57 (2)(b)	Regulated waste transport - transporting regulated waste, other than tyres, in— (b) 6 to 35 vehicles			
ERA 56(1)	Regulated waste storage - receiving and storing 5t or more or 500 or more equivalent passenger units, of tyres or parts of tyres	259P	23 61	Jackson Ballera
		299P	52	Tarbat
		Lytton 1RP104475		Lytton terminal
ERA 56(2)	Regulated waste storage - receiving and storing			

	regulated waste other than tyres			
ERA 58	Regulated waste treatment - Regulated waste treatment consists of operating a facility for receiving and treating regulated waste or contaminated soil to render the waste or soil non-hazardous or less hazardous.	259P	23	Jackson
			25	Naccowlah
			35	Watson
			34	Tickalara
			61	Ballera
		299P	29	Tintaburra
			52	Tarbat / Ipundu
		Moonie	1	Moonie
			2	Alton

Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

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

Permit¹ number: EPPG00980113

Santos Reference: PEN100046407

Environmental authority takes effect on 04 April 2014

The anniversary date of this environmental authority remains **31 August**. An annual return and the payment of the annual fee will be due each year on this day.

Project Name	Relevant Resource Authority(ies)	Environmental Authority Holder(s)
	ATP 259	Santos Limited Delhi Petroleum Pty Ltd
Naccowlah JV	PLs 23 24 25 26 35 36 62 76 77 78 82 87 496 495 133 149 175	Santos Limited Delhi Petroleum Pty Ltd Vamgas Pty Ltd Mawson Petroleum Pty Ltd Bounty Oil and Gas Pty Ltd Australian Gasfields Ltd Bridgeport (Eromanga) Pty Ltd
Naccowlah JV	PLs 105	Santos Limited Delhi Petroleum Pty Ltd Vamgas Pty Ltd Mawson Petroleum Pty Ltd Australian Gasfields Ltd Bridgeport (Eromanga) Pty Ltd Drillsearch Energy Limited
Tintaburra JV	ATP299 PLs 29 38 39 52 57 95 169 170	Santos QNT Pty Ltd Vamgas Pty Ltd Drillsearch Energy Ltd
Aquitaine A/S JV	ATP259 PLs 59 60 61 81 83 85 86 97 106 108 111 112 131 132 135 139 146 147 205 207 208	Santos Limited Origin Energy Resources Ltd Delhi Petroleum Pty Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd
Aquitaine C JV	PLs 138 154	Santos Limited Origin Energy Resources Ltd Delhi Petroleum Pty Ltd Vamgas Pty Ltd
Total 66 JV	PLs 34 37 63 68 75 84 88 497 129 130 134 140 142 143 144 150 502 186	Santos Limited Delhi Petroleum Pty Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd
50/40/10 JOA	PL55	Santos Limited Delhi Petroleum Pty Ltd Vamgas Pty Ltd
Wareena JV	PLs 113 114 141 145 148 153 157 158	Santos Limited Origin Energy Resources Ltd

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

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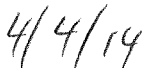
		Delhi Petroleum Ltd Vamgas Pty Ltd Santos Australian Hydrocarbons Pty Ltd
Roma Remainder	PLs 10/320 11/321	Santos QNT Pty Ltd Total E&P Australia PAPL (Upstream II) Pty Ltd
Roma Remainder	PL 12	Santos QNT Pty Ltd
Eastern Queensland Various	PL2	Santos QNT Pty Ltd
Waldegrave JV	PLs 28 69	Santos QNT Pty Ltd Oil Investments Pty Ltd Australia Pacific LNG Pty Ltd
EQ Denison Trough	PLs 41 42 43 44 54	Santos QNT Pty Ltd Australia Pacific LNG Pty Ltd
Innamincka JV	PLs 58 136 137 159	Santos Limited Delhi Petroleum Ltd Vamgas Pty Ltd Santos Australian Hydrocarbons Pty Ltd
Moonie / Cabawin	PL1	Santos QNT Limited
Scotia	PL176	Santos QNT Pty Ltd Total E&P Australia PAPL (Upstream II) Pty Ltd Vamgas Pty Ltd
Moonie Pipeline	PPL1	Moonie Pipeline Company Limited
Jackson to Moonie Pipeline	PPL6	Santos Limited Bridgefield Pty Ltd Moonie Pipeline Company Pty Ltd Delhi Petroleum Ltd Australia Pacific LNG Pty Ltd Vamgas Pty Ltd

Environmentally relevant activity(ies)*Environmental Protection Regulation 2008 (effective as of 9 November 2012, Reprint No. 2F)*

Schedule 2A – 6 – a petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam

Schedule 2A – 8 – a petroleum activity, other than a petroleum activity in 1 to 7, that includes one or more prescribed ERAs for which an aggregate environmental score is stated, namely:

- those stated in Attachment A "Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland"



Medina Hasan

Delegate of the Administering Authority
Environmental Protection Act 1994

Date**Enquiries:**

Energy Assessment
Level 7, 400 George St BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001
Phone: (07) 3330 5715 Fax: (07) 3330 5634



Additional information for applicants

Environmentally relevant activities

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

An environmental authority authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the authority specifically authorises environmental harm. A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

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

Responsibilities under the Environmental Protection Act 1994

Separate to the requirements of the conditions of this environmental authority, the holder of the environmental authority must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act. For example, the holder must be aware of the following provisions of the *Environmental Protection Act 1994*:

General environmental duty

Section 319 of the *Environmental Protection Act 1994* states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of the successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty, however maintaining your general environmental duty is a defence against the following acts:

- a) an act that causes serious or material environmental harm or an environmental nuisance
- b) an act that contravenes a noise standard
- c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Heritage Protection website www.ehp.qld.gov.au

Duty to notify

Section 320 of the *Environmental Protection Act 1994* explains the duty to notify. The duty to notify applies to all persons and requires a person or company to give notice where serious or material environmental harm is caused or threatened. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

The duty to notify arises where:

- a person carries out activities or becomes aware of an act of another person arising from or connected to those activities which causes or threatens serious or material environmental harm
- while carrying out activities a person becomes aware of the happening of one or both of the following events:
 - the activity negatively affects (or is reasonably likely to negatively affect) the water quality of an aquifer

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- the activity has caused the unauthorised connection of 2 or more aquifers.

For more information on the duty to notify requirements refer to the guideline *Duty to notify of environmental harm (EM467)*.

Notifiable activities

It is a requirement under the *Environmental Protection Act 1994* that if an owner or occupier of land becomes aware that a Notifiable Activity (as defined by Schedule 4 of the *Environmental Protection Act 1994*) is being carried out on the land or that the land has been affected by a hazardous contaminant, they must, within 22 business days after becoming so aware, give notice to the administering authority.

Some relevant offences under the *Environmental Protection Act 1994*

Non-compliance with a condition of an environmental authority (section 430)

Section 430 of the *Environmental Protection Act 1994* requires that a person who is the holder of, or is acting under, an environmental authority must not wilfully contravene, or contravene a condition of the authority.

Environmental authority holder responsible for ensuring conditions complied with (section 431)

Section 431 of the *Environmental Protection Act 1994* requires that the holder of an environmental authority must ensure everyone acting under the authority complies with the conditions of the authority. If another person acting under the authority commits an offence against section 430, the holder also commits an offence, namely, the offence of failing to ensure the other person complies with the conditions.

Causing serious or material environmental harm (sections 437–39)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the *Environmental Protection Act 1994*.

It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some relevant offences under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200L or more) at a place. Illegal dumping can also include abandoned vehicles.

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Responsibilities under other legislation

An environmental authority pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for the activity that might be required by other State and/or Commonwealth legislation. Other legislation for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Strategic Cropping Land Act 2011*
- *Sustainable Planning Act 2009*
- *Waste Reduction and Recycling Act 2011*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Act 2000*

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

An environmental authority for petroleum activities is not an authority to negatively impact on water levels or pressure heads in groundwater aquifers in or surrounding formations. There are obligations to minimise or mitigate any such negative impact under other Queensland Government and Commonwealth Government legislation.

This environmental authority consists of the following schedules:

- Schedule A General Conditions
- Schedule B Air
- Schedule C Water
- Schedule D Noise and Vibration
- Schedule E Waste
- Schedule F Land
- Schedule G Community
- Schedule H Definitions

Attachment A Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland

SCHEDULE A – GENERAL CONDITIONS

- (A1) Emissions that may cause material or serious environmental harm and not specifically authorised by this environmental authority must not be released beyond the boundary of the activity except where they are authorised under an environmental authority.
- (A2) Any record required to be kept by a condition of this environmental authority must be held at the Corporate Environmental Group, Brisbane, and be available for examination by an authorised person.
- (A3) Copies of any record required to be kept by a condition of this environmental authority must be provided to any authorised person or the Administering Authority on request.
- (A4) A copy of this environmental authority must be kept in a location readily accessible to personnel carrying out the activity.
- (A5) All complaints received by the holder of this environmental authority relating to operations at the licensed place must be recorded.
- (A6) As soon as practicable after becoming aware of any emergency or incident which results in emissions not in accordance with the conditions of this environmental authority, the holder of this environmental authority must notify the administering authority of the release by telephone or facsimile and in writing within 14 days following the initial notification.
- (A7) The holder of this environmental authority must notify the administering authority in the relevant region in writing of any monitoring result which indicates an exceedance of any licence limit within 28 days of completion of analysis.
- (A8) The environmental authority holder will also have in place and comply with an environmental management system, with relevant control strategies and standards. The administering authority will be kept informed of assessments against this system.
- (A9) This environmental authority is granted on the condition that breach of the terms of this environmental authority in respect of one Environmentally Relevant Activity at a location will not affect this licence in relation to any other ERA at the same or any other location.
- (A10) The boundary of activities for which this environmental authority is issued is coincident with the outer boundary of the Authority to Prospect or Petroleum Lease on which that activity is carried out.

SCHEDULE B – Air

(B1) The environmental authority holder will comply with the release limits in Table 1.

Schedule B – Table 1

Release Point Number	Release point	Source Description	Minimum Release Height (metres)	Minimum Efflux Velocity (metres/second)
A1	Wallumbilla LPG Plant	Electric Generator Engines	4	8
A2	Wallumbilla LPG Plant	Gas Compressor Engines	9.9	8
A3	Wallumbilla LPG Plant	Process Heaters	3.5	8
A4	Ballera Gas Facility	Electric Generator and Gas Compression Engines (6)	4	8
A4	Ballera Gas Facility	Power Generation Turbines (10)	10.9	26
A4	Ballera Gas Facility	Glycol Regeneration Reboiler (3) a) Reboiler Vent b) Stack	a) 10.5 b) 5.5	a) 1.6 b) 2.4
A4	Ballera Gas Facility	Hot Oil Heater (2) Reboiler	17.8	2.4
A4	Ballera Gas Facility	CO ₂ Tower (2)	53.8	15.7
A4	Ballera Gas Facility	LP Flare	11.5	2.3
A4	Ballera Gas Facility	HP Flare	3.5	7
A4	Ballera Gas Facility	Fire Pump Diesel Engines	2.4	4
A5	Stokes Field	Gas Field Compressor Engines	5	52
A6	Challum Field	Gas Field Compressor Engines	5	52
A7	Ballera Field	Gas Field Compressor Engines	5	52
A8	Scotia Field	Cold Vent	-	5
A9	Epsilon Field	Gas Field Compressor Engines	5	35
A10	Munkah – Wackett Field	Gas Field Compressor Engines (2)	10	52.9

(B2) There is to be no obstruction to the upward vertical discharge from the chimney (*Wallumbilla LPG Processing Plant* – electric generator, gas compressor engines, process heaters, *Ballera* – electric generator & gas compression engine, Power Generation Turbines, Glycol Regeneration Reboilers, Hot Oil Heaters, CO₂ Towers, LP Flare, Fire Pump Diesel Engines).

(B3) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas associated with the activities on PL35 must be flared in a manner that complies with all of (B3)(a) and (B3)(b) and (B3)(c), or (B3)(d):

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

(B4) An automatic monitoring device is to be in operation to warn of flame failure whenever the flame is in use at the *Wallumbilla LPG Processing Plant ground flare*.

(B5) Only fuels to be used at:

- *Wallumbilla LPG Processing Plant* (electric generator, gas compressor engines, process heaters) – **natural gas and LPG**
- *Ballera* – **natural gas**

(B6) Quantities and destination of carbon dioxide produced from oil and gas extraction operations and processing operations must be determined and reported in the annual environment report.

(B7) Quantities of methane produced from oil and gas extraction operations and processing operations that are discharged to the atmosphere must be determined and reported in the annual environment report.

(B8) The sulphur content of fuel burned at *Jackson Oil Field* is not to exceed 0.5 per cent by weight.

SCHEDULE C – WATER

- (C1) Water emissions that may cause material or serious environmental harm must not be released directly or indirectly from the boundary of this activity to any waters or the bed and banks of any waters or into the general environment beyond the boundary of this activity except as permitted under this Schedule.
- (C2) Water emissions must not be released directly or indirectly from locations on the boundary of this activity other than at locations listed in the following –
- Release point W1 (PL 23 Jackson Production Facility): Water emission at the overflow of the last evaporation pond at the Jackson Production Facility.
- Release point W2 (PL 25 Naccowlah Production Facility): Water emission from the fourth pond approximately 3.5km downstream from the Naccowlah Production Facility at the overflow point.
- (C3) The total quantity of water emission released from release point number W1 during any day must not exceed 75000 BWPD (approximately 12000 cubic metres).
- Water emissions released from release point number W2 during any day must not exceed 63000 BWPD (approximately 10000 cubic metres).
- (C4) The water emissions must comply, at the sampling and in-situ measurement point/s specified in this Schedule, with each of the limits specified in Table 2 of this Schedule for each quality characteristics.
- (C5) Notwithstanding the quality characteristic limits specified in Table 2 of this Schedule, the release of water emissions to waters must not produce any slick or other visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter, or other objectionable matter.
- For other quality characteristics not listed in Table 2, the water emissions shall not have any properties, nor contain any matter or organism in concentrations, which in the opinion of the administering authority are likely to make the receiving environment less fit for other water uses, when account is taken of any effective dilution and quality of the water.
- (C6) The holder of this environmental authority is responsible for the making of determinations of the quality of the water emissions for the release points, quality characteristics, and at the frequency specified in Table 2 of this Schedule.
- (C7) Determinations of the quality of contaminants released to waters to check conformity with the emission quality characteristics specified in this Schedule must be undertaken at the sampling and in-situ measurement point(s) described in the following.
- (C8) The environmental authority holder shall monitor and watercourse receiving the discharge waters at the 6 nominated locations for the Jackson discharge and at the 4 nominated locations (W1 and W2), shall also be monitored where possible. Monitoring shall include the quality characteristics listed in Table 2.
- (C9) All determinations of the quality of water emissions to waters must be made in accordance with methods prescribed in the Environmental Protection Agency *Water Quality Sampling Manual*, current edition. Soil sampling must be in accordance with the *Guidelines for the Assessment of Contaminated Land in Queensland* (current edition).
- (C10) All required determinations of the quality of water emissions, as defined by this environmental authority, must be made by a person or body deemed appropriate by the Administering Authority.
- (C11) The quality of water emissions must be determined by a method acceptable to the Administering Authority.
- (C12) Evaporation ponds located in areas frequented by livestock shall be securely fenced.

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Erosion Protection Measures and Sediment Controls

- (C13) Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment from all disturbed areas.
- (C14) Prevent any build up of sediment in any stormwater drain.

Stormwater Management Measures

- (C15) The holder must implement and maintain measures to minimise the likelihood of the release of contaminated stormwater from the place where the activities are carried out to any stormwater drain or any waters.
- (C16) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants are unlikely to be released into any waters, roadside gutter or stormwater drainage system.
- (C17) Any spillage of wastes, or contaminants that may cause environmental harm, must be effectively contained and/or cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, or otherwise releasing such waste or contaminants to any stormwater drainage system, roadside gutter or waters.

Schedule C – Table 2: Water Release Quality Characteristic Limits

Quality Characteristics	Release Point Number	Release Limit	Limit Type	Frequency
pH (pH Units)	W1, W2	6.5 – 9.5	Range	Quarterly
Sodium Bicarbonate (mg/L)	W1, W2	3500	maximum	Quarterly
Total Dissolved Solids (mg/L)	W1, W2	4000	maximum	Quarterly
Total Petroleum Hydrocarbons (mg/L)	W1, W2	10 (or no visible film)	maximum	Quarterly
Naphthalene (ug/L)	W1, W2	2.5	maximum	Bi-annually
Phenolic Compounds (ug/L)	W1, W2	85	maximum	Bi-annually
Dissolved Fluoride (as F) (mg/L)	W1, W2	9	maximum	Quarterly
Dissolved Oxygen	W1, W2	-	-	Quarterly

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SCHEDULE D — Noise and Vibration

Noise Nuisance

- (D1) Noise from activities must not cause any environmental nuisance at any noise sensitive place.
- (D2) The method of measurement and reporting of noise levels must comply with the latest edition of the Environment Protection Agency's Noise Measurement Manual.

SCHEDULE E — Waste

- (E1) End Point Criteria: Acceptable concentrations of contaminants allowed in soil to be disposed of as fill material by the licensee are as follows:

Contaminant	Maximum Concentration (total) mg/kg dry weight
Total Petroleum Hydrocarbons (C ₆ to C ₉)	100
Total Petroleum Hydrocarbons (C ₁₀ to C ₁₄)	100
Total Petroleum Hydrocarbons (> C ₁₄)	1000
Total Petroleum Hydrocarbons	1000

Or as determined by the Administering Authority.

- (E2) The holder of this environmental authority is responsible for the making of determinations of the quality characteristics and the frequency of sampling of the soil.
- (E3) Progress Reports on landfarming operations (including sampling analysis) to be provided to the Administering Authority on an annual basis. Monitoring will include at least the following characteristics:
- Total Petroleum Hydrocarbons (> C₉)
 - Total Petroleum Hydrocarbons (C₆ – C₉)
- (E4) The environmental authority holder will comply with the document *A Management Strategy for the Remediation of Hydrocarbon-contaminated Soil*.
- (E5) Where regulated waste is removed from within the boundary of the environmental authority, other than by a release as permitted under another schedule of this environmental authority, the holder of this environmental authority must monitor and record the following:
- (a) the date, quantity and type of waste removed; and
 - (b) name of the waste transporter and/or disposal operator that removed the waste.

SCHEDULE F — LAND

Preventing Contaminant Release to Land

- (F1) Contaminants must not be released to land other than as specified in Schedule.

Sewage

- (F2) No sewage contaminants are permitted to be discharged to land. All sewage contaminants are to be contained in relevant evaporation ponds or removed from septic tanks by licensed operators.

Pond Conditions

- (F7) The evaporation pond used for the storage of contaminants must be constructed, installed and maintained:
- so as to prevent any release of contaminants through the bed or banks of the pond to any waters (including ground water);
 - so that an acceptable freeboard is maintained at all times; and
 - so as to ensure the stability of the ponds' construction.
- (F8) Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from entering the evaporation pond or other structures used for the storage or treatment of contaminants or wastes.
- (F9) Decommissioning the evaporation pond must include:
- the management of salt contaminated soil so that it does not cause environmental harm to surface waters or groundwater; and
 - the rehabilitation of the land so as to provide a stable landform and to prevent any environmental harm to the surrounding environment.
- (F10) Investigation and testing of the sites is to be undertaken to determine if the soils are contaminated.
- (F11) Any contaminated soil must be managed in accordance with the procedures and processes set out in the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land – May 1998*.

Land Rehabilitation

- (F12) Rehabilitation of disturbed areas must take place progressively as works are staged and new areas are disturbed.

SCHEDULE G – Community

Complaint Response

- (G1) All complaints received must be recorded including investigations undertaken, conclusions formed and action taken. This information must be made available to the administering authority on request.

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SCHEDULE H - DEFINITIONS

Words and phrases used throughout this authority are defined below:

Where a definition for a term used in this authority is sought and the term is not defined within this authority the definitions provided in the *Environmental Protection Act 1994*, its regulations, and the Environmental Protection Policies shall be used.

“administering authority” means the Department of Natural Resources, Mines and Energy or its successor.

“annual return” means the return required by the annual notice (under section 316 of the *Environment Protection Act 1994*) for the section 86(2) licence that applied to the development approval.

“authorised place” means the place authorised under this authority for the carrying out of the specified environmentally relevant activities.

“authority” means level 1 licence (without development approval), or level 1 (without development approval), or level 2 approval (without development approval) under the *Environment Protection Act 1994*.

“contaminant” can be –

- (a) a gas, liquid or solid; or
- (b) an odour; or
- (c) an organism (whether alive or dead), including a virus; or
- (d) energy including noise, heat radioactivity and electromagnetic radiation; or
- (e) a combination of contaminants.

“contaminated land” means land contaminated by a hazardous contaminant.

“commercial place” means a place used for business or commercial purposes.

“dust sensitive place” means:

- a dwelling, mobile home or caravan park, residential marina or other residential place;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens;
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“dwelling” means any of the following structures or vehicles that is principally used as a residence:

- a house, unit, motel, nursing home or other building or part of a building;
- a caravan, mobile home or other vehicle or structure on land;
- a water craft in a marina

“mg/L” means milligrams per litre

“noise sensitive place” means:

- a dwelling, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- a kindergarten, school, university or other educational institution; or
- a medical centre or hospital; or
- a protected area; or
- a park or gardens; or
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“noxious” means harmful or injurious to health or physical well being.

“nuisance sensitive place” includes:

- a dwelling, mobile home or caravan park, residential marina or other residential premises;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens; or
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“odour sensitive place” has the same meaning as a “dust sensitive place”.

“offensive” means causing offence or displeasure; is disagreeable to the sense, disgusting, nauseous or repulsive.

“regulated waste” means non-domestic waste mentioned in Schedule 7 of the Environment Protection Regulation 1998 (whether or not it has been treated or immobilised), and includes:

- for any element – any chemical compound containing the element; and
- anything that has contained the waste.

“site” means the place to which this authority relates.

“waters” includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

Attachment A: Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland.

ERA	Description of Activity	ATP	PL	Location Name
ERA 8 (3)	Chemical Storage - storing more than 500m ³ of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)—	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
			61	Ballera
			68	Genoa
			75	Patroclus
			97	Cook
		299P	29	Tintaburra
			39	Talgeberry
			52	Tarbat
			57	Endeavour
		Moonie	1	Moonie
		Lytton 1RP104475	2	Alton
				Lytton terminal
				Lytton Whyte Island NBP
ERA 63 (1)(b)	Sewage Treatment- operating sewage treatment works, other than no-release works, with a total daily peak design capacity of— (c) more than 100 to 1500EP—	259P	23	Jackson
			61	Ballera
ERA 15	Fuel Burning - Fuel burning consists of using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour.	259	23	Jackson
			25	Naccowlah
			61	Ballera
		Moonie	1	Moonie
		Scotia	176	Scotia
ERA 60 (2)(a)	Waste Disposal - 2 operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(b)— (a) 50t to 2000t	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
		299P	52	Tarbat
ERA 60 (2)(c)	Waste Disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(b)— (c) more than 5000t but no more than 10000t	259P	61	Ballera
ERA 60(1)(a)	Waste disposal -	259P	23	Gunna

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	operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (a) less than 50000t			Tinpilla	
			25	Pitchery	
				Naccowlah	
			26	Bogala	
			63	Epsilon	
			76	Bolan	
				Echuburra	
			78	Bowen	
			97	Cook	
			145	Toby	
			299P	39	Talgeberry
				57	Endeavour
				95	Monler
				169	Gimboola
		170		Koorroopa North	
		170		Takyah	
		10		Bony Creek	
				Tanawonga	
		13	Grafton Range		
			Mooga		
		Moonie	2	Alton	
		Lytton 1RP104475		Lytton terminal	
ERA60(1)(b)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (b) 50000t to 100000t	259P	35	Watson	
			36	Watson Smith	
			77	Cooroo	
		299P	52	Tarbat	
		Scotia	176	Scotia	
ERA60(1)(c)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (c) more than 100000t to 200000t	259	55	Munro	
			75	Patroclus	
ERA60(1)(d)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (d) more than 200000t	259P	23	Jackson	
			25	Naccowlah	
			34	Tickalara	
			61	Ballera	
		299P	29	Tintaburra	
		Moonie	1	Moonie	
ERA 61 (1)	Waste incineration and thermal treatment - incinerating waste	259P	23	Jackson	
			25	Naccowlah	
			34	Tickalara	
			35	Watson	

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	vegetation, clean paper or cardboard		61	Ballera
		299P	52	Tarbat
ERA 61 (1)	Waste incineration and thermal treatment - incinerating waste vegetation, clean paper or cardboard	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
			61	Ballera
		299P	52	Tarbat
ERA 61 (3)(a)	Waste incineration and thermal treatment - incinerating or thermally treating— (a) clinical waste or quarantine waste	259P	23	Jackson
			61	Ballera
ERA 61 (3)(b)	Waste incineration and thermal treatment - incinerating or thermally treating— (b) other regulated waste	259P	23	Jackson
			61	Ballera
		299P	52	Tarbat
ERA 57 (2)(a)	Regulated waste transport - transporting regulated waste, other than tyres, in— (a) 1 to 5 vehicles	259P		Within all of the ATP and PL's
		299P		Within all of the ATP and PL's
		Moonie		Within all of the ATP and PL's
ERA 57 (2)(b)	Regulated waste transport - transporting regulated waste, other than tyres, in— (b) 6 to 35 vehicles	PPL1 & PPL6		Along PPL corridors
ERA 56	Regulated waste storage - receiving and storing regulated waste.	259P	23	Jackson
			61	Ballera
		299P	52	Tarbat
		Lytton 1RP104475		Lytton terminal
ERA 58	Regulated waste treatment - Regulated waste treatment consists of operating a facility for receiving and treating regulated waste or contaminated soil	259P	23	Jackson
			25	Naccowlah
			35	Watson
			34	Tickalara
			61	Ballera
		299P	29	Tintaburra
			52	Tarbat / Ipundu
		Moonie	1	Moonie
			2	Alton

	to render the waste or soil non- hazardous or less hazardous.			
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Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

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

Permit¹ number: EPPG00980113

Environmental authority takes effect on 21 July 2014

The anniversary date of this environmental authority remains **31 August**. An annual return and the payment of the annual fee will be due each year on this day.

Project Name	Relevant Resource Authority(ies)	Environmental Authority Holder(s)
	ATP 259	Santos Limited Delhi Petroleum Pty Ltd
Naccowlah JV	PLs 23 24 25 26 35 36 62 76 77 78 82 87 496 495 133 149 175	Santos Limited Delhi Petroleum Pty Ltd Vamgas Pty Ltd Mawson Petroleum Pty Ltd Bounty Oil and Gas Pty Ltd Australian Gasfields Ltd Bridgeport (Eromanga) Pty Ltd
Naccowlah JV	PLs 105/287	Santos Limited Delhi Petroleum Pty Ltd Vamgas Pty Ltd Mawson Petroleum Pty Ltd Australian Gasfields Ltd Bridgeport (Eromanga) Pty Ltd Drillsearch Energy Limited
Tintaburra JV	ATP299 PLs 29 38 39 52 57 95 169 170 293 294 298	Santos QNT Pty Ltd Vamgas Pty Ltd Drillsearch Energy Limited
Aquitaine A/S JV	ATP259 PLs 59 60 61 81 83 85 86 97 106 108 111 112 131 132 135 139 146 147 205 207 208	Santos Limited Origin Energy Resources Ltd Delhi Petroleum Pty Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd
Aquitaine C JV	PLs 138 154	Santos Limited Origin Energy Resources Ltd Delhi Petroleum Pty Ltd Vamgas Pty Ltd
Total 66 JV	PLs 34 37 63 68 75 84 88 497 129 130 134 140 142 143 144 150 502 186	Santos Limited Delhi Petroleum Pty Ltd Santos Petroleum Pty Ltd Vamgas Pty Ltd
50/40/10 JOA	PL55	Santos Limited Delhi Petroleum Pty Ltd Vamgas Pty Ltd
Wareena JV	PLs 113 114 141 145 148 153 157 158	Santos Limited Origin Energy Resources Ltd Delhi Petroleum Ltd Vamgas Pty Ltd

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

Roma Remainder	PLs 10/320 11/321	Santos Australian Hydrocarbons Pty Ltd Santos QNT Pty Ltd Total E&P Australia PAPL (Upstream II) Pty Ltd
Roma Remainder	PL 12	Santos QNT Pty Ltd
Eastern Queensland Various	PL2	Santos QNT Pty Ltd
Waldegrave JV	PLs 28 69	Santos QNT Pty Ltd Oil Investments Pty Ltd Australia Pacific LNG Pty Ltd
EQ Denison Trough	PLs 41 42 43 44 54	Santos QNT Pty Ltd Australia Pacific LNG Pty Ltd
Innaminka JV	PLs 58 136 137 159	Santos Limited Delhi Petroleum Ltd Vamgas Pty Ltd Santos Australian Hydrocarbons Pty Ltd
Moonie / Cabawin	PL1	Santos QNT Limited
Scotia	PL176	Santos QNT Pty Ltd Total E&P Australia PAPL (Upstream II) Pty Ltd Vamgas Pty Ltd
Moonie Pipeline	PPL1	Moonie Pipeline Company Limited
Jackson to Moonie Pipeline	PPL6	Santos Limited Bridgefield Pty Ltd Moonie Pipeline Company Pty Ltd Delhi Petroleum Ltd Australia Pacific LNG Pty Ltd Vamgas Pty Ltd

Environmentally relevant activity(ies)*Environmental Protection Regulation 2008 (effective as of 9 November 2012, Reprint No. 2F)*

Schedule 2A – 6 – a petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam

Schedule 2A – 8 – a petroleum activity, other than a petroleum activity in 1 to 7, that includes one or more prescribed ERAs for which an aggregate environmental score is stated, namely:

- those stated in Attachment A "Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland"

M. Hasan

21/7/14

Medina Hasan

Delegate of the Administering Authority
Environmental Protection Act 1994

Date**Enquiries:**

Energy Assessment
Level 7, 400 George St BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001
Phone: (07) 3330 5715 Fax: (07) 3330 5634

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Additional Information for Applicants

Environmentally relevant activities

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

An environmental authority authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the authority specifically authorises environmental harm. A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated Land

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

Responsibilities under the Environmental Protection Act 1994

Separate to the requirements of the conditions of this environmental authority, the holder of the environmental authority must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act. For example, the holder must be aware of the following provisions of the *Environmental Protection Act 1994*:

General environmental duty

Section 319 of the *Environmental Protection Act 1994* states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of the successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty, however maintaining your general environmental duty is a defence against the following acts:

- a) an act that causes serious or material environmental harm or an environmental nuisance
- b) an act that contravenes a noise standard
- c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Heritage Protection website www.ehp.qld.gov.au.

Duty to notify

Section 320 of the *Environmental Protection Act 1994* explains the duty to notify. The duty to notify applies to all persons and requires a person or company to give notice where serious or material environmental harm is caused or threatened. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

The duty to notify arises where:

- a person carries out activities or becomes aware of an act of another person arising from or connected to those activities which causes or threatens serious or material environmental harm
- while carrying out activities a person becomes aware of the happening of one or both of the following events:
 - the activity negatively affects (or is reasonably likely to negatively affect) the water quality of an aquifer
 - the activity has caused the unauthorised connection of 2 or more aquifers.

For more information on the duty to notify requirements refer to the guideline *Duty to notify of environmental harm (EM467)*.

Notifiable activities

It is a requirement under the *Environmental Protection Act 1994* that if an owner or occupier of land becomes aware that a Notifiable Activity (as defined by Schedule 4 of the *Environmental Protection Act 1994*) is being carried out on the land or that the land has been affected by a hazardous contaminant, they must, within 22 business days after becoming so aware, give notice to the administering authority.

Some Relevant Offences under the *Environmental Protection Act 1994*

Non-compliance with a condition of an environmental authority (section 430)

Section 430 of the *Environmental Protection Act 1994* requires that a person who is the holder of, or is acting under, an environmental authority must not wilfully contravene, or contravene a condition of the authority.

Environmental authority holder responsible for ensuring conditions complied with (section 431)

Section 431 of the *Environmental Protection Act 1994* requires that the holder of an environmental authority must ensure everyone acting under the authority complies with the conditions of the authority. If another person acting under the authority commits an offence against section 430, the holder also commits an offence, namely, the offence of failing to ensure the other person complies with the conditions.

Causing serious or material environmental harm (sections 437–39)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the *Environmental Protection Act 1994*.

It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some Relevant Offences under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200L or more) at a place. Illegal dumping can also include abandoned vehicles.

Responsibilities under Other Legislation

An environmental authority pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for the activity that might be required by other State and/or Commonwealth legislation. Other legislation for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Strategic Cropping Land Act 2011*
- *Sustainable Planning Act 2009*
- *Waste Reduction and Recycling Act 2011*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Act 2000*

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

An environmental authority for petroleum activities is not an authority to negatively impact on water levels or pressure heads in groundwater aquifers in or surrounding formations. There are obligations to minimise or mitigate any such negative impact under other Queensland Government and Commonwealth Government legislation.

This environmental authority consists of the following schedules:

- Schedule A General Conditions
- Schedule B Air
- Schedule C Water
- Schedule D Noise and Vibration
- Schedule E Waste
- Schedule F Land
- Schedule G Community
- Schedule H Definitions

Attachment A Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland

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SCHEDULE A — General Conditions

- (A1) Emissions that may cause material or serious environmental harm and not specifically authorised by this environmental authority must not be released beyond the boundary of the activity except where they are authorised under an environmental authority.
- (A2) Any record required to be kept by a condition of this environmental authority must be held at the Corporate Environmental Group, Brisbane, and be available for examination by an authorised person.
- (A3) Copies of any record required to be kept by a condition of this environmental authority must be provided to any authorised person or the Administering Authority on request.
- (A4) A copy of this environmental authority must be kept in a location readily accessible to personnel carrying out the activity.
- (A5) All complaints received by the holder of this environmental authority relating to operations at the licensed place must be recorded.
- (A6) As soon as practicable after becoming aware of any emergency or incident which results in emissions not in accordance with the conditions of this environmental authority, the holder of this environmental authority must notify the administering authority of the release by telephone or facsimile and in writing within 14 days following the initial notification.
- (A7) The holder of this environmental authority must notify the administering authority in the relevant region in writing of any monitoring result which indicates an exceedance of any licence limit within 28 days of completion of analysis.
- (A8) The environmental authority holder will also have in place and comply with an environmental management system, with relevant control strategies and standards. The administering authority will be kept informed of assessments against this system.
- (A9) This environmental authority is granted on the condition that breach of the terms of this environmental authority in respect of one Environmentally Relevant Activity at a location will not affect this licence in relation to any other ERA at the same or any other location.
- (A10) The boundary of activities for which this environmental authority is issued is coincident with the outer boundary of the Authority to Prospect or Petroleum Lease on which that activity is carried out.
- (A11) Only rehabilitation activities associated with the resource activities can occur on PL293, PL294 and PL298 in accordance with the requirements of conditions (F13) to (F20).

SCHEDULE B — Air

(B1) The environmental authority holder will comply with the release limits in Table 1.

Schedule B – Table 1

Release Point Number	Release point	Source Description	Minimum Release Height (metres)	Minimum Efflux Velocity (metres/second)
A1	Wallumbilla LPG Plant	Electric Generator Engines	4	8
A2	Wallumbilla LPG Plant	Gas Compressor Engines	9.9	8
A3	Wallumbilla LPG Plant	Process Heaters	3.5	8
A4	Ballera Gas Facility	Electric Generator and Gas Compression Engines (6)	4	8
A4	Ballera Gas Facility	Power Generation Turbines (10)	10.9	26
A4	Ballera Gas Facility	Glycol Regeneration Reboiler (3) a) Reboiler Vent b) Stack	a) 10.5 b) 5.5	a) 1.6 b) 2.4
A4	Ballera Gas Facility	Hot Oil Heater (2) Reboiler	17.8	2.4
A4	Ballera Gas Facility	CO ₂ Tower (2)	53.8	15.7
A4	Ballera Gas Facility	LP Flare	11.5	2.3
A4	Ballera Gas Facility	HP Flare	3.5	7
A4	Ballera Gas Facility	Fire Pump Diesel Engines	2.4	4
A5	Stokes Field	Gas Field Compressor Engines	5	52
A6	Challum Field	Gas Field Compressor Engines	5	52
A7	Ballera Field	Gas Field Compressor Engines	5	52
A8	Scotia Field	Cold Vent	-	5
A9	Epsilon Field	Gas Field Compressor Engines	5	35
A10	Munkah – Wackett Field	Gas Field Compressor Engines (2)	10	52.9

(B2) There is to be no obstruction to the upward vertical discharge from the chimney (*Wallumbilla LPG Processing Plant* – electric generator, gas compressor engines, process heaters, *Ballera* – electric generator & gas compression engine, Power Generation Turbines, Glycol Regeneration Reboilers, Hot Oil Heaters, CO₂ Towers, LP Flare, Fire Pump Diesel Engines).

(B3) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas associated with the activities on PL35 must be flared in a manner that complies with all of (B3)(a) and (B3)(b) and (B3)(c), or (B3)(d):

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

(B4) An automatic monitoring device is to be in operation to warn of flame failure whenever the flame is in use at the *Wallumbilla LPG Processing Plant ground flare*.

(B5) Only fuels to be used at:

- *Wallumbilla LPG Processing Plant* (electric generator, gas compressor engines, process heaters) – natural gas and LPG
- *Ballera* – natural gas

(B6) Quantities and destination of carbon dioxide produced from oil and gas extraction operations and processing operations must be determined and reported in the annual environment report.

(B7) Quantities of methane produced from oil and gas extraction operations and processing operations that are discharged to the atmosphere must be determined and reported in the annual environment report.

(B8) The sulphur content of fuel burned at *Jackson Oil Field* is not to exceed 0.5 per cent by weight.

SCHEDULE C — Water

- (C1) Water emissions that may cause material or serious environmental harm must not be released directly or indirectly from the boundary of this activity to any waters or the bed and banks of any waters or into the general environment beyond the boundary of this activity except as permitted under this Schedule.
- (C2) Water emissions must not be released directly or indirectly from locations on the boundary of this activity other than at locations listed in the following –
- Release point W1 (PL 23 Jackson Production Facility): Water emission at the overflow of the last evaporation pond at the Jackson Production Facility.
- Release point W2 (PL 25 Naccowlah Production Facility): Water emission from the fourth pond approximately 3.5km downstream from the Naccowlah Production Facility at the overflow point.
- (C3) The total quantity of water emission released from release point number W1 during any day must not exceed 75000 BWPD (approximately 12000 cubic metres).
- Water emissions released from release point number W2 during any day must not exceed 63000 BWPD (approximately 10000 cubic metres).
- (C4) The water emissions must comply, at the sampling and in-situ measurement point/s specified in this Schedule, with each of the limits specified in Table 2 of this Schedule for each quality characteristics.
- (C5) Notwithstanding the quality characteristic limits specified in Table 2 of this Schedule, the release of water emissions to waters must not produce any slick or other visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter, or other objectionable matter.
- For other quality characteristics not listed in Table 2, the water emissions shall not have any properties, nor contain any matter or organism in concentrations, which in the opinion of the administering authority are likely to make the receiving environment less fit for other water uses, when account is taken of any effective dilution and quality of the water.
- (C6) The holder of this environmental authority is responsible for the making of determinations of the quality of the water emissions for the release points, quality characteristics, and at the frequency specified in Table 2 of this Schedule.
- (C7) Determinations of the quality of contaminants released to waters to check conformity with the emission quality characteristics specified in this Schedule must be undertaken at the sampling and in-situ measurement point(s) described in the following.
- (C8) The environmental authority holder shall monitor and watercourse receiving the discharge waters at the 6 nominated locations for the Jackson discharge and at the 4 nominated locations (W1 and W2), shall also be monitored where possible. Monitoring shall include the quality characteristics listed in Table 2.
- (C9) All determinations of the quality of water emissions to waters must be made in accordance with methods prescribed in the Environmental Protection Agency *Water Quality Sampling Manual*, current edition. Soil sampling must be in accordance with the *Guidelines for the Assessment of Contaminated Land in Queensland* (current edition).
- (C10) All required determinations of the quality of water emissions, as defined by this environmental authority, must be made by a person or body deemed appropriate by the Administering Authority.
- (C11) The quality of water emissions must be determined by a method acceptable to the Administering Authority.
- (C12) Evaporation ponds located in areas frequented by livestock shall be securely fenced.

Erosion Protection Measures and Sediment Controls

- (C13) Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment from all disturbed areas.
- (C14) Prevent any build-up of sediment in any stormwater drain.

Stormwater Management Measures

- (C15) The holder must implement and maintain measures to minimise the likelihood of the release of contaminated stormwater from the place where the activities are carried out to any stormwater drain or any waters.
- (C16) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants are unlikely to be released into any waters, roadside gutter or stormwater drainage system.
- (C17) Any spillage of wastes, or contaminants that may cause environmental harm, must be effectively contained and/or cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, or otherwise releasing such waste or contaminants to any stormwater drainage system, roadside gutter or waters.

Schedule C – Table 2: Water Release Quality Characteristic Limits

Quality Characteristics	Release Point Number	Release Limit	Limit Type	Frequency
pH (pH Units)	W1, W2	6.5 – 9.5	Range	Quarterly
Sodium Bicarbonate (mg/L)	W1, W2	3500	maximum	Quarterly
Total Dissolved Solids (mg/L)	W1, W2	4000	maximum	Quarterly
Total Petroleum Hydrocarbons (mg/L)	W1, W2	10 (or no visible film)	maximum	Quarterly
Naphthalene (ug/L)	W1, W2	2.5	maximum	Bi-annually
Phenolic Compounds (ug/L)	W1, W2	85	maximum	Bi-annually
Dissolved Fluoride (as F) (mg/L)	W1, W2	9	maximum	Quarterly
Dissolved Oxygen	W1, W2	-	-	Quarterly

SCHEDULE D — Noise and Vibration

Noise Nuisance

- (D1) Noise from activities must not cause any environmental nuisance at any noise sensitive place.
- (D2) The method of measurement and reporting of noise levels must comply with the latest edition of the Environment Protection Agency's Noise Measurement Manual.

SCHEDULE E — Waste

- (E1) End Point Criteria: Acceptable concentrations of contaminants allowed in soil to be disposed of as fill material by the licensee are as follows:

Contaminant	Maximum Concentration (total) mg/kg dry weight
Total Petroleum Hydrocarbons (C ₆ to C ₉)	100
Total Petroleum Hydrocarbons (C ₁₀ to C ₁₄)	100
Total Petroleum Hydrocarbons (> C ₁₄)	1000
Total Petroleum Hydrocarbons	1000

Or as determined by the Administering Authority.

- (E2) The holder of this environmental authority is responsible for the making of determinations of the quality characteristics and the frequency of sampling of the soil.
- (E3) Progress Reports on land farming operations (including sampling analysis) to be provided to the Administering Authority on an annual basis. Monitoring will include at least the following characteristics:
- Total Petroleum Hydrocarbons (> C₉)
 - Total Petroleum Hydrocarbons (C₆ – C₉)
- (E4) The environmental authority holder will comply with the document *A Management Strategy for the Remediation of Hydrocarbon-contaminated Soil*.
- (E5) Where regulated waste is removed from within the boundary of the environmental authority, other than by a release as permitted under another schedule of this environmental authority, the holder of this environmental authority must monitor and record the following:
- (a) the date, quantity and type of waste removed; and
 - (b) name of the waste transporter and/or disposal operator that removed the waste.

SCHEDULE F — Land

Preventing Contaminant Release to Land

- (F1) Contaminants must not be released to land other than as specified in Schedule E.

Sewage

- (F2) No sewage contaminants are permitted to be discharged to land. All sewage contaminants are to be contained in relevant evaporation ponds or removed from septic tanks by licensed operators.

Pond Conditions

- (F7) The evaporation pond used for the storage of contaminants must be constructed, installed and maintained:
- so as to prevent any release of contaminants through the bed or banks of the pond to any waters (including ground water);
 - so that an acceptable freeboard is maintained at all times; and
 - so as to ensure the stability of the ponds' construction.
- (F8) Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from entering the evaporation pond or other structures used for the storage or treatment of contaminants or wastes.
- (F9) Decommissioning the evaporation pond must include:
- the management of salt contaminated soil so that it does not cause environmental harm to surface waters or groundwater; and
 - the rehabilitation of the land so as to provide a stable landform and to prevent any environmental harm to the surrounding environment.
- (F10) Investigation and testing of the sites is to be undertaken to determine if the soils are contaminated.
- (F11) Any contaminated soil must be managed in accordance with the procedures and processes set out in the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land – May 1998*.

Land Rehabilitation

- (F12) Rehabilitation of disturbed areas must take place progressively as works are staged and new areas are disturbed.
- (F13) Conditions (F14) to (F18) only apply to PL293, PL294 and PL298.

Rehabilitation Planning

- (F14) 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 (F14) to (F17), inclusive; and
 - ii. provide for appropriate monitoring and maintenance.

Transitional Rehabilitation

- (F15) 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:
 - iii. non-polluting
 - iv. a stable landform
 - v. 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.

Final Rehabilitation Acceptance Criteria

- (F16) All significantly disturbed areas caused by petroleum activities which are not being or intended to be utilised by the landholder or overlapping tenure holder, must be rehabilitated to meet the following final acceptance criteria measured either against the highest ecological value adjacent land use or the pre-disturbed land use:
- (a) greater than or equal to 70% of native ground cover species richness
 - (b) greater than or equal to the total per cent of ground cover
 - (c) less than or equal to the per cent species richness of declared plant pest species; and
 - (d) where the adjacent land use contains, or the pre-clearing land use contained, one or more regional ecosystem(s), then at least one regional ecosystem(s) from the same broad vegetation group, and with the equivalent biodiversity status or a biodiversity status with a higher conservation value as any of the regional ecosystem(s) in either the adjacent land or pre-disturbed land, must be present.
- (F17) Where, due to extreme climatic conditions, final acceptance criteria under condition (F16) cannot be met before surrendering this environmental authority, a statement of compliance must be submitted in writing to the administering authority that:
- (a) is certified by a suitably qualified person
 - (b) states that significantly disturbed areas that have been rehabilitated will meet final acceptance criteria under condition (F16) without any further maintenance
 - (c) states when (in years) the final acceptance criteria under condition (F16) is likely to be met; and
 - (d) identifies any residual risks associated with the rehabilitation of the significantly disturbed land.
- (F18) The statement of compliance required by condition (F17) must be given to the administering authority in writing as part of the surrender application for this environmental authority.

Continuing Conditions

- (F19) Conditions (F14), (F15), (F16), (F17) and (F18) continue to apply after this environmental authority has ended or ceased to have effect.

Remaining Dams

- (F20) 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 G — Community

Complaint Response

- (G1) All complaints received must be recorded including investigations undertaken, conclusions formed and action taken. This information must be made available to the administering authority on request.

SCHEDULE H — Definitions

Words and phrases used throughout this authority are defined below:

Where a definition for a term used in this authority is sought and the term is not defined within this authority the definitions provided in the *Environmental Protection Act 1994*, its regulations, and the Environmental Protection Policies shall be used.

“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 the Department of Natural Resources, Mines and Energy or its successor.

“annual return” means the return required by the annual notice (under section 316 of the *Environment Protection Act 1994*) for the section 86(2) licence that applied to the development approval.

“authorised place” means the place authorised under this authority for the carrying out of the specified environmentally relevant activities.

“authority” means level 1 licence (without development approval), or level 1 (without development approval), or level 2 approval (without development approval) under the *Environment Protection Act 1994*.

“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.

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

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

“contaminant” can be –

- (a) a gas, liquid or solid; or
- (b) an odour; or
- (c) an organism (whether alive or dead), including a virus; or
- (d) energy including noise, heat radioactivity and electromagnetic radiation; or
- (e) a combination of contaminants.

“contaminated land” means land contaminated by a hazardous contaminant.

“commercial place” means a place used for business or commercial purposes.

“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.

“dust sensitive place” means:

- a dwelling, mobile home or caravan park, residential marina or other residential place;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens;
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“dwelling” means any of the following structures or vehicles that is principally used as a residence:

- a house, unit, motel, nursing home or other building or part of a building;
- a caravan, mobile home or other vehicle or structure on land;
- a water craft in a marina

“mg/L” means milligrams per litre

“noise sensitive place” means:

- a dwelling, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- a kindergarten, school, university or other educational institution; or
- a medical centre or hospital; or
- a protected area; or
- a park or gardens; or
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“noxious” means harmful or injurious to health or physical wellbeing.

“nuisance sensitive place” includes:

- a dwelling, mobile home or caravan park, residential marina or other residential premises;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens; or
- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

“odour sensitive place” has the same meaning as a “dust sensitive place”.

“offensive” means causing offence or displeasure; is disagreeable to the sense, disgusting, nauseous or repulsive.

“pre-disturbed land use” 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.

“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.

“regulated waste” means non-domestic waste mentioned in Schedule 7 of the Environment Protection Regulation 1998 (whether or not it has been treated or immobilised), and includes:

- for any element – any chemical compound containing the element; and
- anything that has contained the waste.

“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.

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“significantly disturbed” or **“significant disturbance”** or **“significant disturbance to land or areas”** has the 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.

“site” means the place to which this authority relates.

“species richness” means the number of different species in a given area.

“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.

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

“waters” includes river, stream, lake, lagoon, pond, swamp, wetland , unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

ATTACHMENT A — Santos Group Operated Tenures with Environmentally Relevant Activities in Queensland.

ERA	Description of Activity	ATP	PI	Location Name
ERA 8 (3)	Chemical Storage - storing more than 500m3 of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)—	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
			61	Ballera
			68	Genoa
			75	Patroclus
			97	Cook
		299P	29	Tintaburra
			39	Talgeberry
			52	Tarbat
			57	Endeavour
		Moonie	1	Moonie
2	Alton			
Lytton 1RP104475		Lytton terminal		
		Lytton Whyte Island NBP		
ERA 63 (1)(b)	Sewage Treatment-operating sewage treatment works, other than no-release works, with a total daily peak design capacity of— (a) more than 100 to 1500EP—	259P	23	Jackson
			61	Ballera
ERA 15	Fuel Burning - Fuel burning consists of using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour.	259	23	Jackson
			25	Naccowlah
			61	Ballera
		Moonie	1	Moonie
		Scotia	176	Scotia
ERA 60 (2)(a)	Waste Disposal - 2 operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(b)— (a) 50t to 2000t	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
		299P	52	Tarbat
ERA 60 (2)(c)	Waste Disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(b)— (c) more than 5000t but no more than 10000t	259P	61	Ballera

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ERA 60(1)(a)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (a) less than 50000t	259P	23	Gunna
				Tinpilla
			25	Pitchery
				Naccowlah
			26	Bogala
			63	Epsilon
			76	Bolan
				Echuburra
			78	Bowen
			97	Cook
			145	Toby
		299P	39	Talgeberry
			57	Endeavour
			95	Monler
			169	Gimboola
			170	Koorroopa North
			170	Takyah
			10	Bony Creek
				Tanawonga
			13	Grafton Range
				Mooga
		Moonie	2	Alton
		Lytton 1RP104475		Lytton terminal
ERA60(1)(b)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (b) 50000t to 100000t	259P	35	Watson
			36	Watson Smith
			77	Cooroo
		299P	52	Tarbat
		Scotia	176	Scotia
ERA60(1)(c)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (c) more than 100000t to 200000t	259	55	Munro
			75	Patroclus
ERA60(1)(d)	Waste disposal - operating a facility for disposing of, in a year, the following quantity of waste under subsection (1)(a)— (d) more than 200000t	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			61	Ballera
		299P	29	Tintaburra
		Moonie	1	Moonie
ERA 61 (1)	Waste incineration and thermal treatment -	259P	23	Jackson
			25	Naccowlah
			34	Tickalara

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	incinerating waste vegetation, clean paper or cardboard		35	Watson
			61	Ballera
		299P	52	Tarbat
ERA 61 (1)	Waste incineration and thermal treatment - incinerating waste vegetation, clean paper or cardboard	259P	23	Jackson
			25	Naccowlah
			34	Tickalara
			35	Watson
			61	Ballera
		299P	52	Tarbat
ERA 61 (3)(a)	Waste incineration and thermal treatment - incinerating or thermally treating— (a) clinical waste or quarantine waste	259P	23	Jackson
			61	Ballera
ERA 61 (3)(b)	Waste incineration and thermal treatment - incinerating or thermally treating— (b) other regulated waste	259P	23	Jackson
			61	Ballera
		299P	52	Tarbat
ERA 57 (2)(a)	Regulated waste transport - transporting regulated waste, other than tyres, in— (a) 1 to 5 vehicles	259P		Within all of the ATP and PL's
		299P		Within all of the ATP and PL's
		Moonie		Within all of the ATP and PL's
ERA 57 (2)(b)	Regulated waste transport - transporting regulated waste, other than tyres, in— (b) 6 to 35 vehicles	PPL1 & PPL6		Along PPL corridors
ERA 56	Regulated waste storage - receiving and storing regulated waste.	259P	23	Jackson
			61	Ballera
		299P	52	Tarbat
		Lytton 1RP104475		Lytton terminal
ERA 58	Regulated waste treatment - Regulated waste treatment consists of operating a facility for receiving and treating regulated waste	259P	23	Jackson
			25	Naccowlah
			35	Watson
			34	Tickalara
			61	Ballera
		299P	29	Tintaburra
			52	Tarbat / Ipundu
		Moonie	1	Moonie

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	or contaminated soil to render the waste or soil non- hazardous or less hazardous.		2	Alton
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MAH

This environmental authority is issued by the administering authority under section 215 of the *Environmental Protection Act 1994*.

Permit¹ number: EPPG00662213

Santos Reference: PEN103814911

Project Name: Roma Shallow Gas Project Area East (RSGPAE)

Environmental authority takes effect: 20 August 2014

The anniversary date of this environmental authority is **14 December**.

An annual return and the payment of the annual fee will be due each year on this day.

The environmental authority is subject to the attached schedules of conditions.

Environmental authority holders

Principal Holder:	Bronco Energy Pty Ltd ACN: 121 979 664	Registered Address: Ground Floor - Santos Centre 60 Flinders Street ADELAIDE SA 5000
Joint Holders:	Santos CSG Pty Ltd PAPL (Upstream II) Pty Limited Total E&P Australia III KGLNG E&P II Pty Ltd	

Environmentally Relevant Activity	Relevant Resource Authorities
Non-mining resource activities	Authority to Prospect (ATP): 631 Petroleum Lease (PL): 281 and 282



Signature

Kimberley Smith

Delegate of the administering authority
Environmental Protection Act 1994



Date

Enquiries:

Energy Assessment
Level 7, 400 George Street
BRISBANE QLD 4000
GPO Box 2454
BRISBANE QLD 4001
Phone: (07) 3330 5715
Fax: (07) 3330 5634

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Heritage Protection.



Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land and Notifiable activities

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

Responsibilities under the *Environmental Protection Act 1994*

Separate to the requirements of standard conditions, the holder of the environmental authority must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act. For example, the holder must be aware of the following provisions of the *Environmental Protection Act 1994*.

General environmental duty

Section 319 of the *Environmental Protection Act 1994* states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of the successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty, however maintaining your general environmental duty is a defence against the following acts:

- (a) an act that causes serious or material environmental harm or an environmental nuisance
- (b) an act that contravenes a noise standard
- (c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Heritage Protection website www.ehp.qld.gov.au.

Duty to notify

Section 320 of the *Environmental Protection Act 1994* explains the duty to notify. The duty to notify applies to all persons and requires a person or company to give notice where serious or material environmental harm is caused or threatened. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

The duty to notify arises where:

- a person carries out activities or becomes aware of an act of another person arising from or connected to those activities which causes or threatens serious or material environmental harm
- while carrying out activities a person becomes aware of the happening of one or both of the following events:
 - the activity negatively affects (or is reasonably likely to negatively affect) the water quality of an aquifer
 - the activity has caused the unauthorised connection of 2 or more aquifers.

For more information on the duty to notify requirements refer to the guideline *Duty to notify of environmental harm (EM467)*.

Some relevant offences under the *Environmental Protection Act 1994*

Non-compliance with a condition of an environmental authority (section 430)

Section 430 of the *Environmental Protection Act 1994* requires that a person who is the holder of, or is acting under, an environmental authority must not wilfully contravene, or contravene a condition of the authority.

Environmental authority holder responsible for ensuring conditions complied with (section 431)

Section 431 of the *Environmental Protection Act 1994* requires that the holder of an environmental authority must ensure everyone acting under the authority complies with the conditions of the authority. If another person acting under the authority commits an offence against section 430, the holder also commits an offence, namely, the offence of failing to ensure the other person complies with the conditions.

Causing serious or material environmental harm (sections 437–39)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the *Environmental Protection Act 1994*.

It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some relevant offences under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200L or more) at a place. Illegal dumping can also include abandoned vehicles.

Responsibilities under other legislation

An environmental authority pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for the activity that might be required by other State and/or Commonwealth legislation. Other legislation for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Sustainable Planning Act 2009*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Act 2000*

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

An environmental authority for petroleum activities is not an authority to impact on water levels or pressure heads in groundwater aquifers in or surrounding formations. There are obligations to minimise or mitigate any such impact under other Queensland Government and Commonwealth Government legislation.

Environmental Authority Conditions

This environmental authority consists of the following Schedules

Schedule A	General Conditions
Schedule B	Water
Schedule BB	Groundwater
Schedule BE	Fluid Injection
Schedule C	Regulated Structures
Schedule D	Land
Schedule E	Disturbance to Land
Schedule F	Environmental Nuisance
Schedule G	Air
Schedule H	Waste
Schedule I	Rehabilitation
Schedule J	Well Construction, Maintenance and Stimulation Activities
Schedule K	Community Issues
Schedule L	Notification Procedures
Schedule M	Definition

SCHEDULE A – GENERAL CONDITIONS

- (A1) This environmental authority authorises the carrying out of the following **resource activity(ies)**:
- (a) The petroleum activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities* to the extent they are carried out in accordance with the activity's corresponding scale and intensity; and
 - (b) The following **specified relevant activities**:
 - (i) **Regulated waste storage** – operating a facility for receiving and storing regulated waste for more than 24 hours;
 - (ii) **Regulated waste treatment** – operating a facility for receiving and treating regulated waste or contaminated soil to render the waste or soil non-hazardous or less hazardous;
 - (iii) **Waste disposal** – operating a facility for disposing of, in a year, more than 200,000 t of waste;
 - (iv) **Sewage treatment** – operating sewage treatment works, other than no-release works;
 - (v) **Water Treatment** - treating 10ML or more of raw water in a day;
 - (vi) Another activity where, for the specified relevant activities listed in (i) – (v) above, Schedule 2 of the *Environmental Protection Regulation 2008* (the Regulation) provides exemption for the activity, but only to the extent of the circumstances stated in Schedule 2 of the Regulation;
 - (i) Stimulation activities;
 - (ii) Extracting, other than by dredging; and
 - (c) **Incidental activities** that are not otherwise specified relevant activities.

Schedule A, Table 1 – Scale and Intensity for the Activities

Tenure number/s	Petroleum activities and infrastructure	Scale (number of activities)	Intensity (Maximum size in total)
ATP 631 PLs 281, 282	Coal seam gas exploration, appraisal and development wells	278 wells	298 ha
	Compressor Station(s)	1 R-HCS-01	50 ha
	Regulated Dam(s) <400 megalitres	3	36 ha
	Non-Regulated Dam(s)	898	225 ha
	Water treatment facilities	3	≤17 ML/day
	Sewage treatment works that discharge treated effluent to an infiltration trench or through an irrigation scheme, or to land for dust suppression, construction or operational purposes.	1 8	≤450 equivalent person (EP) ≤100 EP

- (A2) The resource activities in condition (A1) are authorised subject to the conditions of this environmental authority.

- (A3) This environmental authority does not authorise a relevant act¹ to occur in carrying out an authorised resource activity unless a condition expressly authorises the relevant act to occur.² Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Prevent or Minimise Likelihood of Environmental Harm

- (A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of Measures, Plant and Equipment

- (A5) All measures, plant and equipment must be:
- (a) installed to ensure compliance with the conditions of this environmental authority;
 - (b) maintained in their proper and effective condition; and
 - (c) operated in a proper and effective manner.
- (A6) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration materially increases, or is likely to increase, the environmental harm caused by the petroleum activities.

Financial Assurance

- (A7) The holder of this authority must provide a financial assurance from time to time, in the amount and form required by the administering authority for the authorised petroleum activities.
- (A8) The financial assurance is to remain in force until the administering authority is satisfied that no claim is likely to be made on the assurance.
- (A9) The calculation of financial assurance must be in accordance with the most recent version of the administering authority's Guideline "Financial Assurance under the Environmental Protection Act 1994".
- (A10) Prior to any changes in petroleum activities which would result in an increase to the maximum disturbance since the last financial assurance calculation was submitted, the holder of the environmental authority must submit, and the administering authority must have approved, an application to amend the financial assurance.

Third Party Audit

- (A11) A **third party auditor**, nominated by the holder of this 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 (3) years.
- (A12) Notwithstanding condition (A11) and prior to undertaking the third party audit, the scope and content of the third party audit can be negotiated with the administering authority.
- (A13) An audit report must be prepared and certified by the third party auditor presenting the findings of each audit carried out.
- (A14) Any recommendations arising from the audit report must be acted upon by:
- (a) investigating any non-compliance issues identified; and

¹ See section 493A of the Act.

² Section 493A(2) of the Act provides that a relevant act is unlawful unless it is authorised to be done under, among other things, an environmental authority.

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- (b) as soon as reasonably practicable, implementing measures or taking necessary action to ensure compliance with the requirements of this environmental authority.
- (A15) A written response must be attached to the audit report detailing the actions taken or to be taken on stated dates:
- (a) to ensure compliance with this environmental authority; and
 - (b) to prevent a recurrence of any non-compliance issues identified.

Contingency Plan for Emergency Environmental Incidents

- (A16) Responses to environmental emergency incidents must be undertaken in accordance with the *GLNG Upstream – Contingency Plan for Emergency Environmental Incidents* dated June 2011, or any subsequent revised versions of this plan.
- (A17) The Contingency Plan for Emergency Environmental Incidents must include, but not necessarily be limited to:
- (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (b) identification of the types of environmental incidents that may occur, relevant to the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (c) response procedures to minimise the extent and duration of environmental harm caused by environmental emergency incidents;
 - (d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;
 - (e) communication procedures and lines of communication within and beyond the organisation (including Local Government) to be employed in responding to environmental emergency incidents;
 - (f) the resources to be used in response to environmental emergency incidents;
 - (g) procedures to investigate the cause of any incidents (including releases) or near misses and where necessary, the remedial actions to be implemented to reduce the likelihood of recurrence of similar events;
 - (h) procedures for responding to incidents resulting from stimulation activities, including specific rectification measures in the event of non-routine stimulation events.
 - (i) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;
 - (j) procedures to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of a dam;
 - (k) procedures to respond to a regulated dam reaching mandatory reporting level;
 - (l) procedures to respond to a regulated dam reaching exceeding its design storage allowance;
 - (m) a receiving environment monitoring program, to be specifically implemented in the event of a release to waters or land to examine / assess environmental impacts. For monitoring of waters, this program must include upstream, downstream and impact site monitoring. For soils monitoring, three replicate samples must be taken at depth intervals of 0-10 cm, 20-30 cm and 50-60 cm at both an analogue and the impact site as a minimum;
 - (n) the provision and availability of documented procedures to staff attending any emergency environmental incident to enable them to effectively respond;
 - (o) training of staff that will be called upon to respond to emergency environmental incidents to enable them to effectively respond;
 - (p) timely and accurate reporting of the circumstance and nature of emergency environmental incidents to the administering authority and any affected landholder, occupier and / or their nominated representative in accordance with conditions of this environmental authority; and
 - (q) procedures for accessing monitoring points during emergency environmental incidents.

Infrastructure

(A18) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

- (a) regulated dams and low hazard dams;
- (b) exploration, appraisal and development wells;
- (c) water treatment facilities;
- (d) sewage treatment facilities;
- (e) authorised discharge points to air and waters;
- (f) any chemical storage facility associated with the environmentally relevant activity of chemical storage; and
- (g) compressor stations.

Monitoring

(A19) All monitoring required under this environmental authority must be undertaken by a suitably qualified person.

(A20) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests, unless NATA accredited tests are not available.

(A21) Any management or monitoring plans, systems, programs or procedures required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three (3) years in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.

(A22) An annual report must be prepared each year and submitted to the administering authority in the form requested by the administering authority. This report must include but not necessarily be limited to:

- (a) the results of the Seepage Monitoring Program that is required by the conditions of this environmental authority;
- (b) a summary of:
 - (i) any investigations required for the Seepage Monitoring Program prescribed under this environmental authority;
 - (ii) the regulated dam register in the approved format that is required by the conditions of this environmental authority;
 - (iii) the results of annual regulated dam water quality monitoring that is required by the conditions of this environmental authority;
 - (iv) the results of vibration and blast monitoring required by the conditions of this environmental authority;
 - (v) any well closure reports that are required by the conditions of this environmental authority, where applicable;
 - (vi) the results of any baseline or stimulation impact monitoring program that is required by this environmental authority, where applicable;
 - (vii) non **NATA accredited** laboratory testing methods, where applicable;
- (c) the management criteria report required by section 126 of the *Environmental Protection Act 1994*;
- (d) if prepared for the subject annual return period, any third audit report and written response to said report that is required by this environmental authority;
- (e) a comparison of the previous 12 **months** monitoring results to both the limits set in this environmental authority and to relevant prior results including data analyses and interpretation to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination and the environmentally relevant activity(ies); and
- (f) details of any exceedances with the conditions of this environmental authority and the dates and times these exceedances were reported to the administering authority;

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- (g) an outline of actions taken to minimise the risk of environmental harm from any circumstance, condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A20).

Surface Water Sampling Methodology

- (A23) The methods of water sampling required by this environmental authority must comply with that set out in the latest edition of the *Queensland Monitoring and Sampling Manual* as amended from time to time.

Groundwater Sampling Methodology

- (A24) The methods of groundwater sampling required by this environmental authority must comply with the latest edition of the *Queensland Monitoring and Sampling Manual*, AS/NZS 5667:11 1998 *Water Sampling Guidelines – Part 11 Guidance on sampling groundwater*, and the Australian Government's *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1) as relevant and as amended from time to time.

Noise Sampling Methodology

- (A25) Noise must be measured in accordance with the prescribed standards in the *Environmental Protection Regulation 2008*.

Documentation and Records Management

- (A26) A record of all documents required by this environmental authority must be kept for a minimum of five (5) years.
- (A27) All plans and monitoring programs required by this environmental authority must be certified by a suitably qualified person.
- (A28) All plans and monitoring programs required under this environmental authority must be implemented.

SCHEDULE B – WATER

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

Erosion and Sediment Control

- (B2) For activities involving significant disturbance to land, **control measures** that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:
- (a) preferentially divert stormwater around significantly disturbed land, or 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).

Works in watercourses, wetlands, lakes and springs

- (B3) Petroleum activity(ies) that require earthworks, vegetation clearing, placing fill and/or that will result in significant disturbance other than that associated with the construction and/or maintenance of **linear infrastructure**, is not permitted in or within:
- (a) 200 metres of any lake or spring; or
 - (b) 100 metres of the high bank of any other watercourse;
- (B4) All reasonable alternative locations must be considered prior to the construction of any linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in (B3)(b).
- (B5) The construction and/or maintenance of linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in (B3)(a) and (B3)(b) must be conducted in accordance with the following order of preference:
- (a) conducting works in times when there is no water present;
 - (b) conducting works in times of no flow;
 - (c) conducting works in times of flow but in a way that does not impede low flow.
- (B6) The construction and maintenance of linear infrastructure authorised under condition (B3) and (B10) must comply with the water quality limits specified in **Schedule B, Table 1 – Release limits for construction or maintenance of linear infrastructure**.

Schedule B, Table 1 – Release limits for construction or maintenance of linear infrastructure.

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

- (B7) Monitoring must be undertaken at a reasonable frequency that is appropriate to demonstrate compliance with condition (B6).
- (B8) Written notification detailing the location (GPS coordinates) of any significant disturbance to be undertaken in or on the **bed and banks** of a watercourse, or within the areas specified in condition (B3)(b), must be provided to the administering authority at least 24 hours prior to the commencement of the significant disturbance.
- (B9) Petroleum activities must occur outside a **wetland of high ecological significance**.
- (B10) Petroleum activities, other than linear infrastructure must occur outside a **general ecologically significant wetland**.
- (B11) Petroleum activities must not negatively impact a **wetland of high ecological significance**.
- (B12) Linear infrastructure activities, other than linear infrastructure construction and/or maintenance activities, must not change the existing surface water hydrological regime of any **general ecologically significant wetland**.
- (B13) The construction and/or maintenance of linear infrastructure in any **general ecologically significant wetland** must not:
- (a) prohibit the flow of surface water in or out of the wetland;
 - (b) impact surface water quality in the wetland unless specifically authorised by this environmental authority;
 - (c) drain the wetland;
 - (d) fill the wetland;
 - (e) impact bank stability; or
 - (f) result in the clearing of riparian vegetation outside of the required footprint.

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Floodplains

- (B14) Where the petroleum activity(ies) is carried out on **floodplains** petroleum activity(ies) must be carried out in a way that does 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.

Well Testing

- (B15) Subject to Conditions (B16) and (B17) the injection of CSG water or better quality groundwater is authorised in wells that are not exploration, appraisal or development wells, for the purposes of **hydraulic testing**, where such hydraulic tests are undertaken for no more than two (2) consecutive days.
- (B16) The maximum volume of CSG water or better quality groundwater injected for the purposes of **hydraulic testing** identified in Condition (B15) must not exceed 1ML per hydraulic test.
- (B17) Written notification detailing the type and location (GPS coordinates) of any **hydraulic testing** undertaken in accordance with condition (B15) must be provided to the administering authority at least 10 business days prior to the commencement of the hydraulic test.

SCHEDULE BB – GROUNDWATER

- (BB1) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to any **watercourse, lake, wetland or spring**.

Seepage Monitoring Program

- (BB2) A Seepage Monitoring Program must be developed to detect any seepage to groundwater as a result of storing contaminants in a regulated structure(s) (e.g. surface dams, monocells).

- (BB3) The Seepage Monitoring Program, must include, but not necessarily be limited to:

- (a) procedures to detect any seepage to groundwater and surrounding soils from regulated structure(s) and its possible effect on groundwater and soils;
- (b) identification of seepage monitoring bores and their locations including:
 - (i) baseline / hydraulically up-gradient seepage monitoring bores (i.e. bores where groundwater quality will not have been affected by petroleum activities;
 - (ii) seepage monitoring bores that are within aquifers potentially affected by the regulated structure(s) authorised under this environmental authority;
 - (iii) a geodetic survey of all seepage monitoring bores; a geodetic survey showing groundwater potentiometric surface;
- (c) the Seepage Monitoring Program has been designed consistent with relevant Guidelines and Standards such that the Program design has:
 - (i) a sufficient number seepage monitoring points and / or wells to obtain representative groundwater samples from the uppermost aquifer up-gradient and down-gradient of the potential influence;
 - (ii) if a salt monocell is authorised under this environmental authority, a sufficient number of seepage monitoring bores located not more than 150 m from the monocell or the boundary of the monocell facility, whichever is the closer;
 - (iii) sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the presence or absence of contaminants;
 - (iv) procedures to determine the quality of groundwater down gradient of any potential sources of contaminants including groundwater passing the relevant seepage monitoring bore(s);
 - (v) procedures to allow an assessment of whether there has been any statistically significant adverse change in groundwater quality at locations hydraulically down gradient of the containment activity(ies).
- (d) procedures to determine groundwater flow direction, groundwater flow rate and hydraulic conductivity beneath the relevant regulated structure(s);
- (e) sampling of all baseline or hydraulically up-gradient monitoring bores for the minimum groundwater parameters levels listed below quarterly over the 12 month period immediately prior to the commencement of any new containment activities;
- (f) identification of the trigger parameter(s) associated with the potential contaminants of concern identified in (e);
- (g) a sampling program of all seepage monitoring bores:
 - (i) to measure and record standing groundwater levels in metres accurate to 0.01 metres to be plotted as function of time (hydrograph) to identify seasonal patterns;
 - (ii) quarterly monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) whilst activities are being carried out;
 - (iii) annual monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) for a minimum of three (3) years after the containment activity(ies) ceases;
- (h) a Seepage Trigger Action Response Procedure which must include but not be limited to the following:
 - (i) trigger levels for the relevant trigger parameter(s) identified in (f);
 - (ii) trigger and action response measures at which investigations will be undertaken;

- (iii) action levels for the relevant possible contaminants of concern at which the holder of this environmental authority will undertake additional investigation into the potential for environmental harm, including the validation and verification of the source, cause and extent of contamination;
 - (i) identification of monitoring equipment to be used; and
 - (j) a rationale containing details on the Programs purpose, conceptualisation and verification of the procedures, determinations, analysis and assumptions undertaken.
- (BB4) Seepage monitoring bores identified in (BB3) must be monitored quarterly for the trigger parameter(s) specified in *Schedule BB – Table 1 (Seepage Monitoring Trigger Parameters)*.

Schedule BB, Table 1 – Seepage Monitoring Trigger Parameters

Parameter	Units	Untreated Coal Seam Water	Permeate	Brine
Static Water Level	m	monitor	monitor	monitor
pH	pH unit	monitor	monitor	monitor
EC	µS/cm	monitor	monitor	monitor
Major Anions (sulphate, chloride)	mg/L	monitor	-	-
Major Cations (calcium, magnesium, sodium and potassium)	mg/L	monitor	-	-

Monitoring bores

- (BB5) The following information concerning each newly constructed groundwater monitoring bore must be submitted to the administering authority with each annual return:
- (a) bore ID and location presented on a plan;
 - (b) design of the monitoring bores installed;
 - (c) specific construction information including but not limited to geographical coordinate (including the geophysical coordinate system utilised) depth of bore, depth and length of casing, depth and length of screening, presence of any measuring probe;
 - (d) identification of any aquifers intercepted by the monitoring bores;
 - (e) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible contaminants of concern; and
 - (f) a lithological log and preferably a stratigraphic interpretation to identify the important features.

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SCHEDULE BE – FLUID INJECTION

Injection of treated coal seam gas water, treated water or brine

- (BE1) The injection of treated coal seam gas water, treated water or brine into a groundwater aquifer is not authorised under this environmental authority.

Well Integrity

- (BE2) Unless otherwise stated in the conditions of this environmental authority, injection wells must be constructed according to the current standards applicable to water bore drilling activities under the *Water Act 2000*. (i.e. Minimum Construction Requirements for Water Bores in Australia [National Water Commission, 2012 or subsequent revisions]).
- (BE3) Fluid injection 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.
- (BE4) Wells used for untreated coal seam water or brine fluid injection must have:
- (a) an annulus packer at the junction of the aquitard and the target formation within the production casing;
 - (b) injection tubing installed which extends through the packer into the target formation;
 - (c) an inert fluid in the annulus between the injection tubing and the production casing; and
 - (d) a system installed to record any loss of containment of the inert fluid.
- (BE5) For fluid injection:
- (a) where injection tubing is required by Condition (BE4(b)), injection must only occur through injection tubing;
 - (b) the injection pressure must not exceed the dry overburden pressure of the base of the overlying aquitard for injection at depth less than 100m or 90% of the formation fracture pressure for injection at depth greater than 100m.

Injection Management Plan

- (BE6) An Injection Management Plan, prepared by a suitable qualified person, must be submitted to the administering authority prior to the carrying out of the fluid injection activity(ies).
- (BE7) The Injection Management Plan required by Condition (BE6) must include but not necessarily be limited to:
- (a) estimated volumes and rates of fluid to be produced and injected;
 - (b) a description of the physical, chemical and biological components and their concentrations of the fluid to be produced;
 - (c) details of how and where the fluid will be produced, aggregated, stored and kept separate from waters until it is, treated and injected into the source aquifer;
 - (d) details of where the fluid is proposed to be treated including a description of the treatment process;
 - (e) a demonstration that the injection fluid has inconsequential reactivity with the target formation and native groundwater it will come into contact with;
 - (f) the characteristics of the receiving environment;
 - (g) identification of the water quality impact zone and the hydraulic impact zone;
 - (h) identification of all existing bores, springs, lakes, wetlands, 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) identification of proposed fluid injection wells;
 - (j) 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 Act 1994*, *Environmental Protection Regulation 2008*, *Environmental Protection (Water) Policy 1997* and the *Queensland Water Quality Guidelines 2006*;
 - (k) an assessment of the potential impacts on the environmental values of the receiving environment including migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourses, faults or other geologic features likely to impact on other aquifers;
 - (l) 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;
 - (m) verification methods to assess performance of the injection activities;
 - (n) 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;
 - (o) the indicators or other criteria against which the performance of fluid injection will be assessed;
 - (p) 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;
 - (q) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;
 - (r) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and
 - (s) a program to monitor impacts on the environmental values of the receiving environment identified by Condition (BE7)(k).

SCHEDULE C – REGULATED STRUCTURES

Assessment of Hazard Category

- (C1) The **hazard category** of any **structure** must be assessed by a **suitably qualified and experienced person** in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C2) The **hazard assessment** required under condition (C1) must occur in any of the following situations:
- (a) prior to the design and construction of the structure;
 - (b) prior to any change in its purpose or its stored contents;
 - (c) for a structure assessed and certified as a high or significant hazard structure, at least biennially after its construction;
 - (d) for an **existing low hazard dam**, within 120 business days of 28 February 2013.
- (C3) A hazard assessment report and **certification** must be prepared by a **suitably qualified and experienced person** for any **structure** assessed

Note: The hazard assessment report may include a hazard assessment for more than one structure.

- (C4) Where an existing structure is for the first time assessed as significant or high, the structure must meet the conditions required for regulated structures under this environmental authority within 12 months of that assessment.

Construction of Low Hazard Dam to Contain Wetting Front

- (C5) Where a dam is assessed as low hazard, it must be
- (a) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the dam is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation.
- (C6) In the event of early signs of loss of structural or hydrological integrity of a low hazard dam:
- (a) immediate action to prevent or minimise any actual or potential environmental harm must be taken; and
 - (b) any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Hazard Dams

- (C7) The condition of all low hazard dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.

Design and Construction of a Regulated Structure

- (C8) **Construction** of any dam determined to be a **regulated structure** is prohibited until:
- (a) a **hazard category** assessment report and certification has been submitted to the administering authority;
 - (b) a **design plan** for the regulated structure has been prepared by a **suitably qualified and experienced person**; and

- (c) certification from a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant conditions of this environmental authority has been received.
- (C9) The design plan must contain the information prescribed in the *Guideline – Structures which are dams or levees constructed as part of environmentally relevant activities*.
- (C10) 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 Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C11) All regulated structures must be constructed in accordance with a design plan that has been certified by a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C12) Certification by a suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:
 - (a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - (b) construction of the regulated structure is in accordance with the design plan.
- (C13) All **regulated structures** must be designed and constructed to prevent:
 - (a) floodwaters from entering the regulated structure from a watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time; and
 - (b) wall failure due to erosion by floodwaters arising from the watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time; and
 - (c) overtopping as a result of a flood event of the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.

Operation of a Regulated Structure

- (C14) Operation of a regulated structure is prohibited unless:
 - (a) one paper copy and one electronic copy of the design plan and certification, and a set of 'as constructed' drawings and specifications has been submitted to the administering authority, together with certification that the structure:
 - (i) has been constructed in accordance with the design plan;
 - (ii) is capable of delivering the performance stated in the design plan; and
 - (iii) is compliant with the relevant conditions of this environmental authority;
 - (b) the conditions of this environmental authority relating to the construction of the structure have been met; and
 - (c) for regulated dams, the details required under this environmental authority have been entered into a Register of Regulated Dams.

Regulated Dam Register

- (C15) A register of regulated dams must be established in accordance with the administering authority's *Regulated Dam Register* template, as amended from time to time.

- (C16) The information contained in the register of regulated dams must always be current and complete on any given day.

Mandatory Reporting Level

- (C17) The **mandatory reporting level** must be marked on a **regulated structure** in such a way that it is clearly visible.
- (C18) On becoming aware that the mandatory reporting level has been reached, action must be taken to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Design Storage Allowance

- (C19) On 1 November of each year, storage must be available in each **regulated structure** to meet the **design storage allowance** estimated for the dam in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C20) On becoming aware that the **regulated structure** will not have the available storage to meet the design storage allowance on 1 November of any year, action must be taken to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Monitoring

- (C21) The condition of all containment structures must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.
- (C22) Each regulated structure must be monitored for the water quality characteristics and at the monitoring location and frequency specified in *Schedule C – Table 1 Regulated Structure Contaminant Monitoring* as follows:

Schedule C – Table 1 Regulated Structure Contaminant Monitoring

Quality Characteristic	Monitoring Location	Frequency of Monitoring
pH (pH unit)	At least three (3) different structure profile depths for each sampling event and be taken as far as practicable from the edge of the regulated structure	During the month of October every year
Electrical Conductivity (µS/m)		
Turbidity (NTU)		
Temperature		
Dissolved Oxygen (mg/L)		
Sodium adsorption ratio (SAR)		
Aluminium (µg/L)		
Arsenic (µg/L)		
Barium (µg/L)		
Boron (µg/L)		
Cadmium (µg/L)		
Chromium (CrVI) (µg/L)		
Copper (µg/L)		
Iron (µg/L)		
Fluoride (µg/L)		
Lead (µg/L)		
Manganese (µg/L)		
Mercury (µg/L)		
Nickel (µg/L)		
Selenium (µg/L)		
Silver (µg/L)		
Strontium (µg/L)		

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Quality Characteristic	Monitoring Location	Frequency of Monitoring
Tin (µg/L)		
Zinc (µg/L)		
Total phosphorus (mg/L)		
Total Nitrogen (mg/L)		
Total petroleum hydrocarbons (µg/L)		
BTEX (µg/L)		
Polycyclic aromatic hydrocarbons (µg/L)		
Gross alpha + gross beta or radionuclides by gamma spectroscopy (Bq/L)		

Annual Inspection and Report

(C23) Each **regulated structure** must:

- (a) be inspected annually by a **suitably qualified and experienced person**.
- (b) be assessed for the condition and adequacy of each regulated structure for dam safety and against the necessary structural, geotechnical and hydraulic performance criteria in each annual inspection.

(C24) A **suitably qualified and experienced person** must:

- (a) prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the structure.
- (b) certify the annual inspection report in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.

(C25) The recommendations contained within the annual inspection report must be considered and actions taken to ensure that the **regulated structure** will safely perform its intended function.

(C26) Within 20 business days of receipt of the annual inspection report, the administering authority must be notified in writing, of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each regulated structure.

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SCHEDULE D — LAND

General

- (D1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.
- (D2) The release of contaminants to land must be carried out in a manner such that:
- (a) vegetation is not damaged;
 - (b) soil quality is not adversely impacted;
 - (c) there is no surface ponding or runoff to waters;
 - (d) there is no aerosols or odours;
 - (e) deep drainage below the root zone of any vegetation is minimised;
 - (f) the quality of shallow aquifers is not adversely affected.

Chemical Storage

- (D3) All chemical storages must:
- (a) be stored in, or serviced by, an effective containment system that is impervious to the materials stored therein; and
 - (b) be stored and handled in accordance with the relevant Australian Standard where such Standard is available; and
 - (c) be managed to prevent the release of substances to waters or land.

Hydrostatic Test Water and Low Point Drains

- (D4) Contaminants that are hydrostatic test water from pipelines and contaminants from low point drains may be released to land in accordance with condition (D2).

Use of Coal Seam Gas Water

- (D5) Coal seam gas water produced from the authorised petroleum activity(ies) which is used for:
- (a) domestic or stock purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for stock and domestic purposes, as amended from time to time;
 - (b) irrigation purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for irrigation purposes, as amended from time to time.
- (D6) Coal seam gas water produced from the authorised petroleum activity(ies) may be used for:
- (a) dust suppression on roads; and
 - (b) for construction and operational purposes for the petroleum activity(ies) authorised by this environmental authority.
- (D7) Coal seam gas water may be transferred to a third party to be used for the following purposes subject to compliance with conditions (D8) and (D9):
- (a) dust suppression;
 - (b) construction and operational purposes;
 - (c) livestock watering purposes.
- (D8) Any coal seam gas water supplied to a third party for livestock watering purposes in accordance with condition (D7)(c) must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for livestock watering purposes, as amended from time to time.
- (D9) If the responsibility of coal seam gas water is given or transferred to a third party in accordance with condition (D7), the holder of the environmental authority must ensure that:

- (a) the responsibility of the coal seam gas water is given or transferred in accordance with a written agreement (the 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*.

Sewage Treatment Works

- (D10) Treated sewage effluent may only:
- (a) be released to land by sub-surface or spray irrigation at designated, fenced contaminant release area(s);
 - (b) be used for dust suppression, construction and operational purposes in accordance with conditions (D21) and (D23).

Conditions (D11) to (D14) apply to temporary and permanent sewage treatment plant operations

- (D11) Treated sewage effluent may only be released to land by large droplet or by subsurface irrigation at designated, fenced and signed contaminant release areas.
- (D12) A buffer distance of 50 meters must be applied from the location of the effluent irrigation area to any watercourse, wetland or protected area and 100m from any potable water supply (bore or a catchment) or stock drinking water supply.
- (D13) When circumstances prevent the irrigation of treated sewage effluent to land, the contaminants must be directed to on-site storage or lawfully disposed of off-site.
- (D14) The quantity of treated sewage effluent used in accordance with condition (D10) must be determined by an appropriate method, for example, a flow meter.

Conditions (D15) to (D16) apply to temporary and permanent sewage treatment plant operations with a design capacity of greater than 21 to 100 equivalent persons.

- (D15) Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land for each quality characteristic*.
- (D16) Treated sewage effluent released to land must be monitored at the frequency and for the parameters specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land for each quality characteristic*.

Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land

Quality Characteristic	Sampling and <i>in situ</i> measurement point location	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment works	Maximum	20 mg/L	Quarterly
E. coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100 mL	
		Maximum	10000 cfu per 100 mL	
pH		Range	6.0-8.5	Monthly
Dissolved Oxygen		Minimum	2mg/L	
Electrical Conductivity		Monitor only		

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Conditions (D17) through (D20) apply only to permanent sewage treatment plant operations with a design capacity of greater than 100 to 450 equivalent persons.

- (D17) Prior to construction of a sewage treatment facility, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated.
- (D18) All nominated locations and minimum areas of land in condition (D17) must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.
- (D19) A copy of results of the determinations required in condition (D18) must be submitted to the administering authority.
- (D20) If, within 20 business days following the submission of the results required by condition (D16) the administering authority provides comments on the submission, the holder of this environmental authority must:
 - (a) have due regard to that comment in the finalisation of the amended results; and
 - (b) submit the finalised amended results within 40 business days after the administering authority provided comments; and
 - (c) implement the amended results.

Conditions (D21) through (D23) apply only to treated sewage effluent use for the purposes of dust suppression, construction and operational purposes.

- (D21) Treated sewage effluent produced from the authorised petroleum activity(ies) may only be used for dust suppression, construction and operational purposes provided that:
 - (a) the treated sewage effluent has not been stored in a dam or tank prior to use and;
 - (b) the treated sewage effluent quality meets the release limits specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each of the water quality characteristics; and
 - (c) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority.
- (D22) Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each quality characteristic.
- (D23) Treated sewage effluent released to land must be monitored at the frequency and for the quality characteristics specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each quality characteristic.

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Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes

Quality Characteristic	Sampling and in-situ measurement point location	Limit type	Release Limit	Frequency
pH	e.g. treated sewage effluent storage	Range	6.0 to 8.5	Weekly ¹
5 – day Biochemical Oxygen Demand (BOD)		Median	20 mg/L	
E.Coli		Median	<10 cfu per 100 mL	
Electrical Conductivity		Maximum	1600 uS/cm	
Turbidity		95%ile (max)	2 (5) NTU	
Total Suspended Solids		Median	5 mg/L	

¹ Monitoring is to be conducted on a weekly basis until 12 months of monitoring demonstrates no exceedances of the release limits. Monthly monitoring can occur thereafter, excluding E.Coli.

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SCHEDULE E – DISTURBANCE TO LAND

Soil Management Plan

- (E1) The identification of management of soil must be undertaken in accordance with the Soils Management Plan as amended from time to time.
- (E2) A copy of the Soils Management Plan must be made available to any potentially affected landholder upon request by that landholder.

Fauna Management

- (E3) Measures must be employed to prevent fauna entrapment:
 - (a) during the construction of pipelines in pipe sections and pipeline trenches; or
 - (b) during the construction and operation of well infrastructure and dams.

Confirming environmentally sensitive areas, wetlands and springs

- (E4) Prior to undertaking petroleum activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground environmentally sensitive areas, wetlands and springs at that location must be undertaken by a suitably qualified person.
- (E5) A suitably qualified person must develop and certify a methodology so that condition (E4) can be complied with and which is appropriate to confirm on-the-ground environmentally sensitive areas, wetlands and springs by 8 December 2014.
- (E6) Where areas mapped as environmentally sensitive areas, wetlands and springs differ from those confirmed under conditions (E4) and (E5), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground values.
- (E7) All documentation survey information photographs, field data or any material associated with the field validation requirements in (E4) must be maintained for the life of the environmental authority to demonstrate to the administering authority that surveys were conducted in a manner consistent with requirements contained in (E5).

Planning for land disturbance

- (E8) The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles:
 - (a) maximise the use of areas of pre-existing disturbance;
 - (b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative; impacts, on areas of native vegetation or other areas of ecological value;
 - (c) minimise disturbance to land that may otherwise result in **land degradation**;
 - (d) minimise isolation, fragmentation or dissection of tracts of native vegetation; and
 - (e) minimise clearing of native mature trees.

Disturbance to Land – Environmentally Sensitive Areas

- (E9) Petroleum activities must be carried out in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas* and any other relevant conditions of this environmental authority.

Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category A ESAs	No petroleum activities permitted	Only low impact petroleum activities permitted.	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are Nature Refuges, Koala Habitat and/or Declared Catchment Areas	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E10) and (E11)	N/A
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are Essential Habitat, Essential Regrowth Habitat and/or 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E10) and (E11)	N/A
Category C ESAs that are Resource Reserves	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A

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Category C ESAs that are State Forests and/or Timber Reserves	Only limited petroleum activities permitted subject to condition (E12) Limited impact camps permitted	N/A	N/A
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Note: Approvals may be required under the *Forestry Act 1959* where the petroleum activity(ies) is proposed to be carried out in ESAs that are State Forests or Timber Reserves.

- (E10) **Limited impact camps** must not be located within a primary protection zone of Category C ESA (Essential Habitat) or Category C ESA (Nature Refuges).
- (E11) Limited petroleum activities or limited impact camps located within a primary protection zone or secondary protection zone of an environmentally sensitive area must not negatively affect the adjacent environmentally sensitive area.
- (E12) Prior to carrying out limited petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, it must demonstrated, in the following order of preference that:
1. no reasonable or practicable alternative exists for carrying out the limited petroleum activities within the **environmentally sensitive area**;
 2. the **limited petroleum activities** are preferentially located in pre-existing areas of clearing or significant disturbance;
 3. clearance widths for linear infrastructure is minimised to the maximum extent possible, taking into account the following matters:
 - (a) safe vehicle movement;
 - (b) drainage devices installed are of a type that is appropriate for the track type and location;
 - (c) erosion and sediment control measures installed are in accordance with the Erosion and Sediment Control Plan required by conditions (B2) and (B3); and
 - (d) power line stays have been preferentially located within the pipeline right of way where possible.
 4. the maximum clearance widths specified in *Schedule E, Table 2 – Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule E, Table 2 – Authorised Disturbance for Linear Infrastructure

Type of Linear Infrastructure	Clearance Width (m)
(A) Access track(s) not associated with a pipeline(s), communication lines(s) or power line(s):	
(a) single carriage access tracks	18
(b) dual carriage access tracks	21
(c) single or dual carriage access track and associated turnaround bay	35
(B) Access track(s) associated with a pipeline(s), communication line(s) or power line(s):	
(a) single carriage access tracks with a single pipeline, communication line or power line	24
(b) dual carriage access track with a single pipeline, communication line or power line.	27
(c) single or dual carriage access track and associated turnaround bay with a single pipeline, communication line or power line.	41
(d) additional clearing for any additional parallel pipeline, communication line or power line associated with (B)(a), (b) or (c)	7 ¹
(C) Additional clearing for take-off drains, power line stays or turnaround bays or other work areas:	
(a) Additional clearing for power line stays associated with (B)	10
(b) additional clearing for take-off drains associated with (A) or (B)	10

¹ Maximum total disturbance for (B) is 62m.

SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, dust and other airborne contaminants

- (F1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activity(ies) must not cause an environmental nuisance at any sensitive place.

Nuisance monitoring

- (F2) When the administering authority advises of a complaint alleging nuisance, the complaint must be investigated as soon as practicable. The investigation is to include monitoring of environmental nuisance at any sensitive place within a reasonable and practical timeframe as specified by the administering authority.
- (F3) The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the complaint within five (5) business days of completing the complaint investigation, unless a longer time is agreed to in writing by the administering authority.
- (F4) If the investigation or monitoring in accordance with condition (F2) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then:
- (a) the complaint must be addressed including the use of alternative dispute resolution services if required; and / or
 - (b) abatement or attenuation measures must be implemented so that the authorised petroleum activity(ies) does not result in further environmental nuisance.
- (F5) Noise monitoring and recording required under this environmental authority must include, but not necessarily be limited to:
- (a) LAN,T (where N equals the statistical levels of 1, 10 and 90 and T=15);
 - (b) $L_{Aeq\ adj, 15\ mins}$;
 - (c) background noise level as $L_{A\ 90, 15\ mins}$;
 - (d) $Max\ L_{pA, 15\ mins}$;
 - (e) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to measured noise levels levels;
 - (f) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (g) effects due to any extraneous factors such as traffic noise;
 - (h) location, date and time of monitoring;
 - (i) if the complaint concerns low frequency noise, $Max\ L_{pZ, 15\ mins}$; and
 - (j) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range for both the noise source and the background noise in the absence of the noise source.

Noise

- (F6) Noise planning must be undertaken in accordance with the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area* dated 29 June 2011 or any subsequent version.
- (F7) Any subsequent revision of the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area*, must include, but not necessarily be limited to:
- (a) a commitment by the Chief Executive Officer for the holder of this environmental authority, or their delegate, to ensure adequate allocation of staff and resources to the establishment and operation of the Noise Management Plan;
 - (b) definition of roles, responsibilities and authorities within the staffing of the Noise Management

- Plan;
- (c) delivery of training to staff and contractors and maintenance of competencies;
 - (d) risk / constraint analysis methods to be undertaken prior to any new operation (e.g. drill site) or installation of new equipment that has the potential to create noise nuisance;
 - (e) procedures and methods to undertake assessments to determine compliance with the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** being received and when there are no **alternative arrangements** in place, taking in to account any tonal or **impulsive noise** impacts;
 - (f) procedures for handling noise complaints;
 - (g) community liaison and consultation procedures including but not limited to consultation for when night time petroleum activities are likely to exceed the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (h) procedures for managing records associated with all aspects of the Noise Management Plan including standardised forms for recording monitoring results and complaints;
 - (i) details of petroleum activities and measured and / or predicted noise levels of noise sources associated with those activities;
 - (j) reasonable and practicable control or abatement measures (including relocating the activity, altering the hours of operation, or having an alternate arrangement in place with any potentially affected person) that can be undertaken to ensure compliance with the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (k) the level of noise at **sensitive receptors** that would be achieved from implementing the measures detailed under condition (F7)(j); and
 - (l) mediation processes to be used in the event that noise complaints are not able to be resolved.
- (F8) Prior to undertaking petroleum activities that will result in **short-term, medium-term or long term noise events** that are likely to impact on a sensitive receptor, and where there are no alternative arrangements in place, any potential noise emissions from the relevant petroleum activity(ies) must be modelled or calculated to demonstrate that noise emissions will not exceed the noise levels specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*.
- (F9) The emission of noise from the petroleum activities authorised under this environmental authority must not result in levels greater than those specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	$L_{Aeq,adj,15\ min}$	45dBA	43dBA	40dBA
6:00 pm – 10:00 pm	$L_{Aeq,adj,15\ min}$	40dBA	38dBA	35dBA
10:00 pm – 6:00 am	$L_{Aeq,adj,15\ min}$	28dBA	28dBA	28dBA
	Max $L_{pA, 15\ mins}$	55dBA	55dBA	55dBA
6:00 am – 7:00 am	$L_{Aeq,adj,15\ min}$	40dBA	38dBA	35dBA

Note – The noise limits in Table 1 have been set based on the following deemed background noise levels (L_{ABG}):

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

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- (F10) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in *Schedule F, 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 F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

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

- (F11) Where alternative arrangements are in place with an affected person(s) at a sensitive receptor as referred to by condition (F7)(j), the noise limits in *Schedule F, Table 1 – Noise limits at Sensitive Receptors* do not apply at that sensitive receptor for the duration for which the alternative arrangements are in place.

Low Frequency Noise

- (F12) Notwithstanding condition (F9), emission of any low frequency noise must not exceed the following limits in the event of a valid complaint about low frequency noise being made to the administering authority:
- (a) 60 dB(C) measured outside the sensitive receptor; and
 - (b) the difference between external A-weighted and C-weighted noise levels is no greater than 20 dB; or
 - (c) 50 dB(Z) measured inside the sensitive receptor; and
 - (d) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Vibration and Blasting

- (F13) A Blast Management Plan must be developed for each blasting activity in accordance with **Australian Standard 2187**.
- (F14) Noise from blasting operations must not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive receptor.
- (F15) Ground-borne vibration peak particle velocity caused by blasting operations must not exceed 10 mm/s at any time, when measured at or extrapolated to any sensitive receptor.

Blast and Vibration Monitoring

- (F16) Monitoring and recording of the air blast overpressure and ground borne vibration of every blast must be undertaken.
- (F17) Blast and vibration monitoring must include but not necessarily be limited to:
- (a) maximum instantaneous charge;
 - (b) location of the blast within the site (including any bench level);
 - (c) airblast overpressure level (dB Linear Peak);
 - (d) peak particle velocity (mm / s);
 - (e) location, date and time of recording;
 - (f) measurement instrumentation and procedure;
 - (g) meteorological conditions for blast monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction); and
 - (h) distances from the blast site to potentially noise-affected buildings or structures.

SCHEDULE G – AIR

- (G1) This environmental authority does not authorise emissions from fuel burning or combustion equipment consisting of using fuel burning equipment that is cumulatively capable of burning at least 500 kg of fuel in an hour.
- (G2) If compressor station R-HCS-01 meets the definition of a **fuel burning or combustion facility**, the design of the facility must be capable of achieving air quality objectives for each environmental value stated in the *Environmental Protection (Air) Policy 2008*.
- (G3) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas from compression station R-HCS-01 must be flared in a manner that complies with all of (G3)(a) and (G3)(b) and (G3)(c) or with (G3)(d):
- a) an automatic ignition system is used, and
 - b) a flame is visible at all times while the waste gas is being flared, and
 - c) there is no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours, or
 - d) it uses an **enclosed flare**.

SCHEDULE H – WASTE

General

- (H1) All general and regulated waste removed from the site must be sent to a facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994* except as permitted under another condition of this environmental authority.
- (H2) All regulated waste removed from the site must be undertaken by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- (H3) Waste must not be burned on the site, unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

Coal Seam Gas Water Management Plan

- (H4) Amendments to a Coal Seam Gas Water Management Plan must be submitted to the administering authority prior to its implementation.
- (H5) If, within 20 business days following the submission of the amended Coal Seam Gas Water Management Plan, the administering authority provides comments on the amended Coal Seam Gas Water Management Plan, then:
 - (a) due regard must be had to those comments in the finalisation of the amended Coal Seam Gas Water Management Plan; and
 - (b) the finalised amended Coal Seam Gas Water Management Plan must be submitted within 40 business days after the administering authority provided comments.

Brine and Salt Management

- (H6) Following the completion of the petroleum activity(ies), any residual brine and / or solid salt present in any dam must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994*.

SCHEDULE I – REHABILITATION

Rehabilitation Planning

- (11) 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 (12 to 17), inclusive; and
 - (ii) provide for appropriate monitoring and maintenance.

Transitional rehabilitation

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

Final rehabilitation acceptance criteria

- (13) 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 per cent 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) where the adjacent land use contains, or the pre-clearing land use contained, one or more **regional ecosystem(s)**, then:
 - i. at least one regional ecosystem(s) from the same broad vegetation group, as demonstrated by the predominant species in the ecologically dominant layer, must be present; and,
 - ii. the regional ecosystem present in (13)(d)(i) must possess an equivalent or higher conservation value (biodiversity status) than the regional ecosystem(s) in either the adjacent land or pre-disturbed land.

Final rehabilitation acceptance criteria in environmentally sensitive areas

- (14) 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 (E4) and (E6)) must be met:
- (a) greater than or equal to 70 per cent 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 per cent of organic litter cover
 - (e) greater than or equal to 50 per cent of **total density of coarse woody material**; and
 - (f) all **predominant species** in the **ecologically dominant layer**, that define the pre-disturbance regional ecosystem(s) are present.

Continuing conditions

- (15) Conditions (12), (13) and (14) continue to apply after this environmental authority has ended or ceased to have effect.

Remaining dams

- (16) Where there is a dam, (including a low consequence dam) that is being or intended to be used 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.

Pipeline activities

- (17) Land that has been significantly disturbed by the pipeline activities must be managed to ensure that gully erosion or subsidence do not occur on that land.

SCHEDULE J – WELL CONSTRUCTION, MAINTENANCE AND STIMULATION ACTIVITIES

Drilling Activities

- (J1) **Oil based or synthetic based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J2) Drilling activities must not result in the connection of the target gas producing formation and another aquifer.
- (J3) Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target formation and another aquifer as a result of drilling activities.

Stimulation Activities

- (J4) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.
- (J5) Stimulation activities must not negatively affect water quality, other than that within the **stimulation impact zone** of the target gas producing formation.
- (J6) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.
- (J7) The internal and external mechanical integrity of the well system prior to and during stimulation must be ensured 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.
- (J8) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

Stimulation Risk Assessment

- (J9) Prior to undertaking stimulation activities, a risk assessment must be developed to ensure that stimulation activities are managed to prevent environmental harm.
- (J10) The stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well and address issues at a relevant geospatial scale such that changes to features and attributes are adequately described and must include, but not necessarily be limited to:
 - (a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice;
 - (b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority;
 - (c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s);
 - (d) naturally occurring geological faults;
 - (e) seismic history of the region (e.g. earth tremors, earthquakes);
 - (f) proximity of overlying and underlying aquifers;
 - (g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation.
 - (h) identification and proximity of **landholders' active groundwater bores** in the area where stimulation activities are to be carried out;
 - (i) the environmental values of groundwater in the area;

- (j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to stimulation monitoring in order to accurately assess the risks to environmental values of groundwater;
- (k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
- (l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
- (m) a description of the well mechanical integrity testing program;
- (n) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc.);
- (o) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation;
- (p) groundwater **transmissivity**, flow rate, hydraulic conductivity and direction(s) of flow;
- (q) a description of the 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;
- (r) a mass balance estimating the concentrations and absolute masses of chemicals that will be reacted, returned to the surface or left in the target gas producing formation subsequent to stimulation;
- (s) an environmental hazard assessment of the chemicals used including their mixtures and the resultant chemicals that are formed after stimulation including:
 - (i) toxicological and ecotoxicological information of chemical compounds used;
 - (ii) information on the persistence and bioaccumulation potential of the chemical compounds used;
 - (iii) identification of the chemicals of potential concern derived from the risk assessment;
- (t) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities;
- (u) if used, identification and an environmental hazard assessment of using radioactive tracer beads in stimulation activities;
- (v) an environmental hazard assessment of leaving chemical compounds in stimulation fluids in the target gas producing formation for extended periods subsequent to stimulation;
- (w) human health exposure pathways to operators and the regional population;
- (x) risk characterisation of environmental impacts based on the environmental hazard assessment;
- (y) potential impacts to landholder bores as a result of stimulation activities;
- (z) the determination of the likelihood of causing interconnectivity and/or negative water quality as a result of stimulation activities undertaken in close proximity or each other; and
- (aa) potential environmental or health impacts which may result from stimulation activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

- (J11) Prior to undertaking any stimulation activity, a baseline bore assessment must be undertaken of the water quality of:
- (a) all landholders' active groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two (2) kilometre horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and
 - (b) all landholders' active groundwater bores (subject to access being permitted by the landholder) in any aquifer that is within 200 metres above or below the target gas producing formation and is spatially located with a two (2) kilometre radius from the location 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 (J9) and (J10).

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- (J12) Prior to undertaking stimulation activities at a well, there must be 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 (J13).
- (J13) Stimulation baseline bore assessments required in Condition (J11) must include the minimum water quality analytes and physico-chemical parameters identified in the *Baseline Assessment Guideline* (EHP) and any restricted stimulation fluids as defined in the *Environmental Protection Act 1994*, as amended from time to time, in order to establish baseline water quality.

Stimulation Impact Monitoring Program

- (J14) A Stimulation Impact Monitoring Program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (J9) and (J10) that relate to hydraulic fracturing activities and must include, as a minimum, monitoring of:
- (a) the stimulation fluid(s) 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 water(s) from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and
 - (c) flow-back water(s) 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; and
 - (d) all bores identified in condition (J11) at the following minimum frequency:
 - (i) monthly for the first six (6) months subsequent to stimulation activities being undertaken; and
 - (ii) annually for the first five (5) years subsequent to stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (J13) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.
- (J15) 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 (J13); 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.
- (J16) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE K – COMMUNITY ISSUES

- (K1) A record of all valid complaints and actions taken in response to the valid complaint must be maintained and kept.
- (K2) The following details for all valid complaints received must be recorded:
- (a) name, address and contact number for complainant;
 - (b) time and date of complaint;
 - (c) reasons for the complaint as stated by the complainant;
 - (d) investigations undertaken in response to the complaint;
 - (e) conclusions formed;
 - (f) actions taken to resolve the complaint;
 - (g) any abatement measures implemented to mitigate the cause of the complaint; and
 - (h) name and contact details of the person responsible for resolving the complaint.



SCHEDULE L – NOTIFICATION PROCEDURES

- (L1) The Department of Environment and Heritage Protection Pollution Hotline must be notified as soon as reasonably practicable, but within 48 hours after becoming aware of:
- (a) any unauthorised significant disturbance to land; or
 - (b) any unauthorised release of contaminants greater than:
 - (i) 200 L of hydrocarbons; or
 - (ii) 200 L of **stimulation additives**; or
 - (iii) 500 L of **stimulation fluids**; or
 - (iv) 1 000 L of brine; or
 - (v) 5 000 L of coal seam gas water; or
 - (vi) 10 000 L of sewage effluent.
 - (vii) 100,000 L of irrigation quality coal seam gas water, in accordance with condition D5(b), inside designated irrigation area
 - (c) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (d) when the level of the contents of any regulated dam reaches the mandatory reporting level; or
 - (e) when a regulated dam will not have available storage to meet the design storage allowance on the 1 November of any year;
 - (f) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during stimulation increases by more than 3.5 MPa from the pressure immediately preceding stimulation); or
 - (g) any detection of restricted stimulation fluids from stimulation fluid monitoring; or
 - (h) any analysis result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource; or
 - (i) any analysis result from groundwater monitoring that exceeds trigger action investigation levels, if provided in this environmental authority.
- (L2) The notification of emergencies or incidents as required by condition (L1) must include but not be limited to the following information:
- (a) the environmental authority number and name of the holder;
 - (b) the tenure type and number where the emergency or incident occurred;
 - (c) the name and telephone number of the designated contact person;
 - (d) the location of the emergency or incident (GDA94);
 - (e) the date and time that the emergency or incident occurred;
 - (f) the date and time the holder of this environmental authority became aware of the emergency or incident;
 - (g) details of the nature of the event and the circumstances in which it occurred;
 - (h) the estimated quantity and type of any contaminants involved in the incident;
 - (i) the actual or potential suspected cause of the emergency or incident;
 - (j) a description of the land use at the site of the emergency or incident (eg. grazing, pasture, forest etc.) and/or the name of any relevant waters and other environmentally sensitive features;
 - (k) a description of the possible impacts from the emergency or incident;
 - (l) a description of whether stock and/or wildlife were exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
 - (m) any sampling conducted or proposed, relevant to the emergency or incident;
 - (n) landholder details and details of landholder consultation;
 - (o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
 - (p) whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.

- (L3) Within 10 business days following the initial notification under conditions (L1) and (L2) unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):
- (a) the root cause of the emergency or incident;
 - (b) the confirmed quantities and types of any contaminants involved in the incident;
 - (c) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
 - (d) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
 - (e) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
 - (f) results and current status of landholder consultation, including commitment to resolve any outstanding issues / concerns; and
 - (g) actions and / or procedural changes to prevent a recurrence of the emergency or incident.

SCHEDULE M – DEFINITIONS

“accepted engineering standards”, in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the *Australian National Committee on Large Dams* (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.

“adjacent land use” 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 Heritage Protection; 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 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, vegetation community attributes 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.

“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.

“appraisal well” means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum.
For clarity, an appraisal well does not include an exploration well.

“areas of pre-disturbance” means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term ‘areas of pre-disturbance’ does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.

“associated works” in relation to a dam, means:

- any kind and all things associated with the construction and operation of a dam; and
- any land used for those operations.

“Australian Standard 1055” means Australian Standard 1055.1:1997 *Description and Measurement of Environmental Noise – General procedures*.

“Australian Standard 2187” means Australian Standard 2187.0:1998 *Explosives—Storage, transport and use, Part 0*, Australian Standard 2187.1:1998 *Explosives—Storage, transport and use Part 1* and Australian Standard 2187.2:2006 *Explosives—Storage and use, Part 2* or any updated versions that becomes available from time to time.

“Australian Standard 2885” means Australian Standard 2885.0:2008 *Pipelines – Gas and Liquid Petroleum General Requirements*, Australian Standard 2885.1:2007 *Pipelines – Gas and Liquid Petroleum Design and Construction* and Australian Standard 2885.3:2001 *Pipelines – Gas and Liquid Petroleum Operation and Maintenance*, or any updated versions that becomes available from time to time.

“Australian Standard 4323” means Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*.

“Australian / New Zealand Standard 5667.11” means Australian / New Zealand Standard 5667.11: 1998 *Water Quality – Sampling – Guidance on sampling at Groundwaters*.

“Australian / New Zealand Standard 5667.12” means Australian / New Zealand Standard 5667.12:1999 *Guidance on Sampling of Bottom Sediments for permanent, semi-permanent water holes and water storages*.

“authorised person” means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive or chief executive officer of a local government.

“authorised resource activities” for this environmental authority means the resource activities authorised to be carried out under condition (A1).

“background noise level” means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

“bed and banks” for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

“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 environmental authority holder 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.

“beneficial use” means

- with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:

- of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Waste Reduction and Recycling Act 2011*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - the transfer and use have been approved or authorised under any relevant legislation. Or
- with respect to coal seam gas water, refer to the Department of Environment and Heritage Protection's *Guideline – Approval of Coal Seam Gas Water for Beneficial Use*.

“bore” means a water observation bore or a water supply bore that is either sub-artesian or artesian.

“brine” means saline water with a total dissolved solid concentration greater than 40 000 mg/l.

“brine dam” means a regulated dam that is designed to receive, contain or evaporate brine.

“bund or banded” in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

“BTEX” means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.

“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.
- a business day that occurs during the period starting on 20 December in a year and ending on 5 January in the following year.

“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 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*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*
- An area identified as “Essential Habitat” or “Essential Regrowth Habitat” under the *Vegetation Management Act 1999* for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*;
- Of Concern Regional Ecosystems identified in the database maintained by the Department of Environment and Heritage Protection called ‘RE description database’ containing Regional Ecosystem numbers and descriptions.

“certification or certified by a suitably qualified and experienced person” in relation to a design plan, ‘as constructed’ drawings or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- exactly what is being certified and the precise nature of that certification.
- the relevant legislative, regulatory and technical criteria on which the certification has been based;
- the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and

- o the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

“certify” or “certification” or “certified” in relation to any matter other than a design plan, ‘as constructed’ drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that:

- a) all relevant material has been considered in the written document; and
- b) that the content of the written document is accurate and true; and
- c) that the written document meets the requirements of the relevant conditions of the environmental authority.

“clearing” for vegetation means removing, cutting down, ringbarking, pushing over, poisoning or destroying in any way including by burning, flooding or draining; but does not include destroying standing vegetation by stock, or **lopping** a tree.

“coal seam gas water” means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. Coal seam gas water is a waste defined under section 13 of the *Environmental Protection Act 1994*.

“coal seam gas water concentrate” means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.

“coal seam gas water dams” include any type of dam (storage or evaporation) used to contain groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production.

“coal seam gas evaporation dam” is defined as a impoundment, enclosure or structure that is designed to be used to hold coal seam gas water for evaporation.

“construction” in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.

“control measure” has the meaning in section 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.

“declared plant pest species” has the meaning in the Land Protection (Pest and Stock Route Management) Regulation 2003 and is a 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 plant.

“design plan” is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and **certifications**,

together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.

"design storage allowance or DSA" means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.

"development well" means a petroleum well which produces or stores petroleum.
For clarity, a development well does not include an appraisal well.

"discharge area" means:

- that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- identified by an assessment process consistent with the document *Salinity Management Handbook* Queensland Department of Natural Resources, 1997, as amended from time to time; or
- identified by an approved salinity hazard map held by the Department of Environment and Heritage Protection.

"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 Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) 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 or ecosystem function" means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.

"enclosed flare" means a device where the residual gas is burned in a cylindrical or rectangular enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.

"end" means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related petroleum activities such as rehabilitation. In other words, it does not refer to the 'completion' of the petroleum activities, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.

"equivalent person or EP" means an equivalent person under volume 1, section 2 of the *Guidelines for Planning and Design of Sewerage Schemes*, October 1991, published by the Water Resources Commission, Department of Primary Industries, Fisheries and Forestry.

"evaporation dam" means an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.

"existing dam" means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on 14 December 2012.

"existing low hazard dam" means a low hazard dam that was constructed and/or whose construction had substantially commenced on 28 February 2013.

"exploration well" means a petroleum well that is drilled to:

- explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or
 - obtain stratigraphic information for the purpose of exploring for petroleum.
- For clarity, an exploration well does not include an appraisal or development well.

“exploring for petroleum” means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the *Petroleum and Gas (Production and Safety) Act 2004* for example including:

- conducting a geochemical, geological or geophysical survey;
- drilling a well;
- carrying out testing in relation to a well;
- taking a sample for chemical or other analysis.

“field validation surveys” means vegetation assessments undertaken in accordance with the most current version of the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*.

“fill” means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.

“floodplain” has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that—

- is covered from time to time by floodwater overflowing from the watercourse; and
- does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.

“flowable substance” means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

“foreseeable future” means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.

“fuel burning or combustion equipment” means a permanent fuel burning or combustion equipment which is in isolation, or combined in operation, or which are interconnected, is, or is capable of burning more than 500 kg of fuel in an hour.

“general ecologically significant wetland” otherwise known as “wetlands of other environmental value”, is a wetland that meets the definition of a wetland and that is shown as a general ecologically significant wetland or “wetlands of other environmental value” on the map of referable wetlands

“geophysical survey” means a systematic collection of geophysical data.

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

“hazard category” means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in *Manual for Assessing Hazard Categories and*

Hydraulic Performance of Dams, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“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.

“high value regrowth” vegetation means

- any of the following:
 - an endangered regional ecosystem;
 - an of concern regional ecosystem;
 - a least concern regional ecosystem; and
- have not been cleared since 31 December 1989; and
- is shown on a regrowth vegetation map.

“hydraulic fracturing” means a technique used to create cracks in underground coal seams to increase the flow and recovery of gas or oil out of a well. It involves pumping a fluid, comprised largely of water and sand, under pressure, into a coal seam. This action fractures the coal seam which provides a pathway that increases the ability for gas to flow through the coal.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“hydraulic testing” means the testing of a geological formation to evaluate the hydrogeological characteristics of the formation.

“impulsive noise” means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.

“incidental activity” for this environmental authority means an activity that is not a specified relevant activity and is necessary to carry out the activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities*.

“infrastructure” means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activities) 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.

“land degradation” has the meaning in the *Vegetation Management Act 1999* and means the following:

- soil erosion

- rising water tables
- the expression of salinity
- mass movement by gravity of soil or rock
- stream bank instability
- a process that results in declining water quality.

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

“landholders’ active groundwater bores” for the purposes of stimulation baseline and impact monitoring in this environmental authority means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *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 a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.

“limited impact camps” mean accommodation camps that:

- are temporary (no more than 6 months);
- are located within pre-existing areas of clearing or significant disturbance;
- are up to 2 ha or located within well sites; and
- may involve sewage treatment works that are no release works or release works that involve an irrigation release within pre-existing areas of clearing or significant disturbance.

“limit of reporting” means the lowest amount of an analyte in a sample that can be quantifiably determined with stated, acceptable precision and accuracy under stated analytical conditions (i.e. the lower limit of quantification).

“limited petroleum activities” mean any low impact petroleum activity, and:

- single well sites (includes observation, pilot, injection and production wells) up to 1 ha and associated infrastructure (water pumps and generators, sumps, flare pits or dams) located on the well site or up to 1.25 ha if the well pad includes the use of a tank (minimum 1ML) for above ground fluid storage,
- multi-well sites up to an additional (in addition to single well site above) 0.25 ha per additional well and associated infrastructure (water pumps and generators, sumps, flare pits, dams or tanks) located on the well site to a maximum of 3 ha,
- construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone
- upgrading or maintenance of existing roads or tracks,
- power and communication lines,
- gas gathering lines from a well site to the initial compression facility,
- water gathering lines from a well site to the initial water storage or dam,
- camps within well site that may involve sewage treatment works that are a no release works.

“linear infrastructure” means powerlines, communication, pipelines, roads and access tracks.

“long term noise event” is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (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 —

- removing its trunk; and
- cutting or pruning its branches so severely that it is likely to die.

“low flow” means flow up to the one month average recurrence interval.

“low hazard dam” means any dam in the low hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“low impact petroleum activities” means petroleum activities which do not result in the clearing of native vegetation, earthworks or excavation work that cause either, a significant disruption to the soil profile or permanent damage to vegetation that cannot be easily rehabilitated immediately after the activity is completed. Examples of such activities include but are not necessarily limited to:

- chipholes
- coreholes
- geophysical surveys
- seismic surveys
- soil surveys
- topographic surveys
- cadastral surveys
- ecological surveys
- installation of environmental monitoring equipment (including surface water)

“Max $L_{pZ, 15 \text{ min}}$ ” means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.

“Max $L_{pA, 15 \text{ min}}$ ” 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 Hazard Categories and Hydraulic Performance of Dams”* prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“medium term noise event” is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.

“meter” means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe.”

“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 (1) 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.

“overburden pressure” means the pressure or stress imposed on a layer of soil or rock by the weight of overlying material. The overburden pressure at a depth z is given by $p(z) = p_0 + g \int_0^z p(z) dz$ where $p(z)$ is the density of the overlying rock at depth z and g is the acceleration due to gravity. p_0 is the datum pressure, like the pressure at the surface.

“permanent sewage treatment plant operations” means sewage treatment plant operations with a design capacity of greater than 21 but less than 450 equivalent persons carried out at one location for of a period of greater than six months in a calendar year.

“pest” means species:

- declared under the *Land Protection (Pest and Stock route Management) Act 2002*;
- declared under Local Government model local laws; and
- which may become invasive in the future.

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

“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.

“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.

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

“regional ecosystem(s)” 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 geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystems Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.

“regrowth vegetation map” means a map certified by the chief executive as the regrowth vegetation map for the State and showing for the State:

- areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - have not been cleared since 31 December 1989; and
- particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- areas the chief executive decides under section 20AI of the *Vegetation Management Act 1999* to show on the map as high value regrowth vegetation.

“regulated dam” means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, as amended from time to time.

“regulated structure” means any dam or levee in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection , 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 the 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).

“remnant unit” means a continuous polygon of remnant vegetation (as defined by the QLD Herbarium) representative of a single RE type or a single heterogeneous unit.

“remnant vegetation” means vegetation, part of which forms the predominant canopy of the vegetation—

- covering more than 50% of the undisturbed predominant canopy; and
- averaging more than 70% of the vegetation’s undisturbed height; and
- composed of species characteristic of the vegetation’s undisturbed predominant canopy cover.

“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.

“resource activity(ies)” has the meaning in section 107(d) of the *Environmental Protection Act 1994*.

“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 rehabilitations after pipeline decommissioning.

“restricted stimulation fluids” means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 81B of the *Environmental Protection Regulation 2008*:

- petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene; or
- chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.

The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.

“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, B or C Environmentally Sensitive Area means an area within an 100 metre buffer from the boundary of a **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 (7) 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 a particular conditions – to the condition it was in immediately before the disturbance

“site” means the relevant petroleum activity(ies) to which the environmental authority relates.

“species diversity” means the diversity within an ecological community that incorporates both species richness and the evenness of species' abundances.

“species richness” means the number of different species in a given area.

“specified relevant activities” for this environmental activity means an activity that:

- a) but for being carried out as a resource activity, would otherwise be an activity prescribed under section 19 of the Environmental Protection Act 1994 as an environmentally relevant activity; or
- b) stimulation activities; or
- c) extracting material other than by dredging.

“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.

“stimulation” means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing / hydrofracking, 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. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.

“stimulation impact zone” means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.

“structure” for the purposes of Schedule C 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 a hazard 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 at any time:

- exactly what has been assessed and the precise nature of that assessment;
- the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- 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
- the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

“suitably qualified and experienced person” in relation to regulated structures means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, 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.

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.

“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.

“temporary sewage treatment plant operations” means sewage treatment plant operations with a design capacity of equal to or less than 100 equivalent persons carried out at one location for a period of no greater than six months in a calendar year.

“third party auditor” means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.

“threatening processes” means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).

“tolerable limits” means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).

“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” means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 *Risk Management* or any updated version that becomes available from time to time.

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

“visible salt” means where salt crystals accumulate on the soil surface.

“void” means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

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

“well site” means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.

“wetland” for the purpose of this environmental authority means:

- areas shown on the *Map of Referable Wetlands* which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the *Environmental Protection Regulation 2008*; and
- are wetlands as defined under the Queensland Wetlands Program as areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) 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.

“Wetland of high ecological significance” otherwise known as a “high conservation value wetland”, is a wetland that meets the definition of a wetland and that is shown as a wetland of high ecological significance or high conservation value wetland on the map of referable wetlands

“year” means a period of 12 months.

"80th percentile" in relation to release limits means that not more than one (1) of the measured values is to exceed the stated release limit for any five (5) consecutive samples where:

- the consecutive samples are taken over a five (5) month period; and
- the consecutive samples are taken at approximately equal periods.

End of Conditions

Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

Environmental authority

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

Permit¹ number: EPPG00808713

Environmental authority takes effect on 18-SEP-2014.

The anniversary date of this environmental authority is 1 November. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name	Registered address
Bronco Energy Pty Ltd	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
PAPL (Upstream II) Pty Limited	Level 12 60 Carrington Street SYDNEY NSW 2000
Total E & P Australia III	Level 13 BGC Centre 28 The Esplanade PERTH WA 6000
KGLNG E & P II Pty Ltd	Level 11 28 the Esplanade PERTH WA 6000

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum - ATP	ATP708

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority is issued is a restatement of the ERA as defined by legislation at the time the approval is issued. Where there is any

inconsistency between that description of an ERA and the conditions stated by an environmental authority as to the scale, intensity or manner of carrying out an ERA, then the conditions prevail to the extent of the inconsistency.

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

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

Contaminated land

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



Signature

Jodie Brackenbury
Department of Environment and Heritage Protection
Delegate of the administering authority
Environmental Protection Act 1994

18/09/2014

Date

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

Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Location: ATP708

Relevant activity/ies: Petroleum - ATP

The environmentally relevant activity(ies) conducted at the location as described above must be conducted in accordance with the following site specific conditions of approval.

Conditions of environmental authority

Condition 1 – Significant disturbance

The holder of the environmental authority must ensure that petroleum activities do not cause more than 4 ha of any land to be significantly disturbed at a petroleum works site at any one time.

Condition 2 – Work program

The holder of the environmental authority must submit to the administering authority a copy of the original or any amended **work program** for the relevant petroleum authority 8 business days before commencing activities or additional or varied activities covered by the program or plan.

Condition 3 – Financial assurance

The holder of the environmental authority must:

- (a) calculate a financial assurance in accordance with the Schedule of Rehabilitation Costs (in Appendix C of this code) and Schedule of Disturbance (in Appendix D);
- (b) attach the Schedule of Disturbance to the original or any amended Work Program or Development Plan;
- (c) provide to the administering authority the financial assurance in the amount and form required by the administering authority at the time of submission of the original or any amended work program or development plan; and
- (d) maintain the financial assurance until the administering authority is satisfied that no claim is likely to be made on the assurance.

Condition 4 – Environmentally sensitive areas

The holder of the environmental authority must ensure that:

- (a) petroleum activities are not conducted within a category A or B **environmentally sensitive area**; and
- (b) petroleum activities do not cause a significant disturbance within 1km of a category A environmentally sensitive area or within 500m of a category B environmentally sensitive area;
- (c) petroleum activities are not conducted in a category C environmentally sensitive area unless there is a written agreement to enter the area for those activities from the relevant administering authority;
- (d) if the relevant administering authority gives written permission to conduct petroleum activities in a category C environmentally sensitive area with conditions that are in conflict with the standard environmental conditions of this code – the holder must as a minimum comply with the standard environmental conditions (except for condition 4(c)); and
- (e) staff, contractors or agents carrying out petroleum activities on a petroleum authority are aware of the location of any relevant category A, B or C environmentally sensitive areas within the authority.

Condition 5 – Declared Wild Rivers Areas

If the petroleum authority is in or partly within a declared Wild Rivers Area or an area covered by a moratorium under the *Wild Rivers Act 2005*, the holder of the environmental authority must ensure that petroleum activities within the (proposed) Wild Rivers Area are conducted in accordance with the conditions in the wild river declaration for the area that state they are for petroleum activities.

Condition 6 – Land management

The holder of the environmental authority must:

- (a) minimise disturbance to land in order to prevent **land degradation**; and
- (b) ensure that for land that is to be **significantly disturbed** by petroleum activities, the **top layer** of the soil profile is removed and
 - i. stockpiled in a manner that will preserve its biological and chemical properties; and
 - ii. used for rehabilitation purposes (refer condition 19).

Condition 7 – Vegetation management

The holder of the environment authority must:

- (a) prevent or minimise disturbance to vegetation by petroleum activities;
- (b) manage the effects of clearing to prevent the loss of biodiversity, reduction of ecological processes and land degradation;
- (c) consider whether it is feasible to avoid clearing, and where viable alternatives exist, must not clear vegetation:
 - i. in, or within 50 metres of, the **high bank** of a watercourse;
 - ii. in, or within 50 metres of the **static high water mark** of, wetlands, lakes or springs;
 - iii. in a way that isolates clumps or **dissects corridors of vegetation**;
 - iv. on slopes greater than 5%;
 - v. on **dispersible soils**; and
 - vi. in existing or potential **discharge areas**.

- (d) when clearing in areas with a high probability of acid sulfate soils, comply with an acid sulfate soil environmental management plan prepared in accordance with the State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils and the relevant Guideline.

Condition 8 – Protection of riverine areas

The holder of the environmental authority must:

- (a) ensure that there is no significant disturbance in **riverine areas** containing permanent water, except where necessary for the construction and/or maintenance of roads, tracks and pipelines that are essential for carrying out the authorised petroleum activities and no reasonable alternative location is feasible; and
- (b) minimise disturbance of all other riverine areas.

Condition 9 – Erosion and sedimentation control

The holder of the environmental authority must prevent or minimise:

- (a) erosion of areas disturbed by petroleum activities; and
- (b) sedimentation of any **waters** as a result of petroleum activities.

Condition 10 – Dust Management

The holder of the environmental authority (petroleum activities) must ensure that dust or particulate matter or both resulting from a petroleum activity does not cause an environmental nuisance at any **sensitive place or commercial place**.

Condition 11 - Noise management

- (a) Noise emitted from any aspect of petroleum activities must not exceed the noise levels, specified in the table below, at any sensitive place or commercial place.

Time period	Noise level at a sensitive place measured as the Adjusted Maximum Sound Pressure Level $L_{A, \max \text{ adj } T}$
7am – 6pm	Background noise level plus 5 dB(A)
6pm – 10pm	Background noise level plus 5 dB(A)
10pm – 7am	Background noise level plus 3 dB(A)
Time period	Noise level at a commercial place measured as the Adjusted Maximum Sound Pressure Level $L_{A, \max \text{ adj } T}$
7am – 6pm	Background noise level plus 10 dB(A)
6pm – 10pm	Background noise level plus 10 dB(A)
10pm – 7am	Background noise level plus 8 dB(A)

General note: In no case is the background noise level, $L_{A90, 15 \text{ mins}}$ to be less than 25 dB(A). In the event that measured background noise level is less than 25 dB(A), then 25 dB(A) is to be used.

- (b) When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring, analysis and interpretation of results.
- (c) The method of measurement and reporting of noise levels must be in accordance with most recent edition of the Environmental Protection Agency (EPA) Noise Measurement Manual.

Condition 12 – Waste Management

The holder of the environmental authority must:

- (a) ensure that petroleum activities do not result in the release or likely release of a contaminant to land or waters that results in material or serious environmental harm, unless the release is explicitly authorised under the *EP Act*; and
- (b) as soon as practicable, remove and dispose of all regulated waste to a **licensed waste disposal facility** or recycling facility.

Condition 13 – Sewage treatment and disposal for temporary camps

The holder of this environmental authority must ensure that:

- (a) plant and equipment used for sewage treatment or disposal is installed, maintained and operated in a proper and efficient manner;
- (b) untreated sewage effluent is not released to waters;
- (c) the disposal of sewage effluent does not cause the contamination of any water used for drinking or domestic purposes or manufacturing purposes or for consumption by animals;
- (d) where sewage sludge is buried on land the sludge is covered with at least 250mm of soil and where practicable located above known flood levels;
- (e) irrigation of sewage effluent on land must be in accordance with National Water Quality Guidelines – Use of Reclaimed Water;
- (f) surface ponding of effluent on land disposal area(s) shall be minimised and managed in a way that does not cause nuisance;
- (g) public access to any sewage effluent land disposal area must be denied during the release of contaminants to the land and until the irrigation/disposal area has dried.

Condition 14 – Storage of hazardous substances, fuel and oil

Fuel and oil

The holder of the environmental authority must ensure that storage facilities for all hazardous, flammable and combustible liquids:

- (a) are within an on-site containment system;
- (b) are controlled in a manner that prevents material or serious environmental harm;
- (c) are maintained in accordance with Section 2.3 for minor storages and Section 5.8 for storages above 10 000 L of AS 1940:2004 Storage and Handling of Flammable and Combustible Liquids; and
- (d) are equipped with measures, appropriate to the risks to the surrounding environment, to minimise the risk of spills and ensure early detection of spills.

Condition 15 – Spills and clean up action

Notwithstanding the other conditions of this code, if a hazardous contaminant is released to waters or land, the holder of the environmental authority must:

- (a) take immediate action to stop any further release;
- (b) take immediate action to contain the hazardous contaminant to the affected area, taking particular care to protect environmentally sensitive areas;
- (c) restore or rehabilitate the environment to its condition before the release occurred; and
- (d) take necessary action to prevent a recurrence of the release

Condition 16 – Associated water

- (a) The holder of the environmental authority must ensure that associated water that, at the time it is produced is a hazardous waste, as determined from Table 1 of Appendix B of this Code, is not released to land or waters, other than to an evaporation pond constructed and managed in accordance with Appendix B.
- (b) The holder of the environmental authority must ensure that associated water that, at the time it is produced, is not a hazardous waste, is not released to land or waters other than to an appropriate evaporation pond.
- (c) Despite (a) and (b) the holder of the environmental authority may apply to the administering authority to amend this environmental authority to allow associated water to be released to a containment for domestic or stock purposes managed by the land owner/occupier, provided the owner/occupier has:
 - i. given written permission to the holder for discharge to the containment;
 - ii. given written advice to the administering authority about the proposed storage and use; and
 - iii. given an assurance to the administering authority that the associated water will not be released to land or waters in a way that has the potential to cause material or serious environmental harm.
- (d) Despite (a) and (b) the holder of the environmental authority may apply to the administering authority to amend this environmental authority to allow associated water that meets a nominated set of water quality standards (after treatment if necessary) to:
 - i. be released to land or waters; or
 - ii. be used for a specified purpose, provided the potential user has given written advice about the proposed use and environmental safeguards that will be implemented to prevent material or serious environmental harm.
- (e) If the associated water complies with a *Notice of decision to approve a resource for beneficial use* under section 66L of the *Environmental Protection (Waste Management) Regulation 2000* it can be used in accordance with the Notice for the stated type of use(s).

Condition 17 – Dams and evaporation ponds

The holder of the environmental authority must ensure all dams and evaporation ponds are:

- (a) designed, constructed, operated, maintained and decommissioned in accordance with the criteria outlined in Appendix B; and
- (b) not located within 100 m of any natural drainage feature (i.e. watercourse, waterway, wetland or lake).

Condition 18

For dams, ponds and other excavations which are constructed as part of the petroleum activities, the holder of the environmental authority must where relevant either:

- (a) provide safe access for livestock and wildlife where contained water has appropriate quality; or
- (b) construct and maintain bunds and/or fences sufficient to exclude livestock.

Condition 19 - Rehabilitation

As soon as practicable but no later than 6 months (or longer period agreed in writing by the administering authority) after the **end** of petroleum activities causing significant disturbance to land, the holder of the environmental authority must:

- (a) remediate contaminated land (e.g. evaporation ponds containing hazardous waste) in accordance with *EP Act* requirements;
- (b) reshape all significantly disturbed land to a stable landform similar to that of surrounding undisturbed areas; and
- (c) on all significantly disturbed land, take all reasonable and practicable measures to:
 - i. re-establish surface drainage lines;
 - ii. reinstate the top layer of the soil profile; and
 - iii. promote establishment of vegetation of the same species and density of cover to that of the surrounding undisturbed areas.

Condition 20 – Pipeline activities

The holder of the environmental authority must design, construct, operate and decommission petroleum pipelines on the relevant petroleum authority in accordance with AS 2885.

Condition 21 – Infrastructure

All infrastructure, constructed by or for the holder of the environmental authority, including water storage structures, must be removed by the holder from the site and the site rehabilitated according to condition 19, prior to surrender of the petroleum authority, except where it is to remain with the **written agreement** of the administering authority and post petroleum authority landowner/holder.

Condition 22 – Monitoring and complaints

The holder of the environmental authority must:

- (a) develop and implement a monitoring program that will demonstrate compliance with this code;
- (b) document the monitoring and inspections carried out under the program and any actions taken;
- (c) when the administering authority advises the holder of a complaint alleging nuisance (e.g. caused by dust or noise), investigate the complaint and advise the administering authority of the action proposed or undertaken in relation to the complaint;
- (d) if the administering authority is not satisfied with the proposed or completed action, undertake monitoring or other action requested by the administering authority;
- (e) maintain a record of complaints and incidents causing environmental harm, and actions taken in response to the complaint or incident; and
- (f) retain the record of complaints required by this condition for 5 years.

Condition 23 - Notification

The holder of the environmental authority must record and initially notify the administering authority as soon as practicable of any emergency or incident that causes non-compliance with the standard environmental conditions.

Schedule B: Definitions

Note: If a word or phrase is not defined it must be given the meaning it has under the EP Act or its subordinate legislation, as amended from time to time. If a word or phrase is not defined in this code or the EP Act or its subordinate legislation, it has its ordinary meaning.

APPEA Code means the current APPEA, Code of Environmental Practice.

AS 2885 Australian Standard Pipelines – Gas and Liquid Petroleum

Associated water for this code is underground water produced from a petroleum well during the course of or resulting from carrying out petroleum activities. Associated water may be potable, suitable for stock purposes, saline, high in fluoride, contaminated by hydrocarbons, and/or otherwise contaminated by a hazardous contaminant. It may be classified as a **hazardous waste** (See Appendix B).

Commercial place means a place used as an office or for business or commercial purposes.

Development plan - Under the P & G Act holders of petroleum authorities must submit a development plan for a petroleum lease or proposed petroleum lease. The plan gives detailed information about the nature and extent of activities to be carried out under the relevant lease.

Discharge area is:

- (a) that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- (b) identified by an assessment process consistent with the document: Salinity Management Handbook, Queensland Department of Natural Resources, 1997; or
- (c) identified by an approved salinity hazard map held by the Department of Natural Resources, Mines and Water.

Dissects corridors of vegetation means clearing vegetation that results in a break more than 50 metres wide across a corridor.

Dispersible soils are soils in which clay material disintegrates into particles less than 2 microns across. This can be observed within 24 hours when soil crumbs are submerged in distilled water.

End means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related *activities such as rehabilitation*. In other words, it does not refer to: the “completion” of the particular activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority. Under the *APPEA Code* “completion” refers to the point at which the particular survey, program or operation has been rehabilitated and abandoned.

Environmental nuisance is unreasonable interference or likely interference with an environmental value caused by:

- (a) noise, dust, odour, light; or
- (b) an unhealthy, offensive or unsightly condition because of contamination; or
- (c) another way prescribed by regulation.

Environmentally sensitive area (as determined from the EPA GIS data base) means a location, however large or small, that has environmental values that contribute to maintaining biological diversity and integrity, have intrinsic or attributed scientific, historical or cultural heritage value, or are important in providing amenity, harmony or sense of community.

Essential habitat means an area identified as essential habitat for a species of wildlife listed as endangered, vulnerable, rare, or near threatened under the *Nature Conservation Act 1992* on a map prepared by the chief executive officer of the Environmental Protection Agency and certified by the chief

executive officer of the Department of Natural Resources, Mines and Water for the purposes of the *Vegetation Management Act 1999*.

Evaporation pond means a dam or interceptor pond constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the pond.

Financial assurance means a security deposit, either cash or a bank guarantee, held by the administering authority to cover the potential costs of rehabilitating areas significantly disturbed by the petroleum activities.

Flow line is a small diameter pipeline through which fluids move on a petroleum lease before being sold.

Gathering line is a pipeline to convey crude oil or gas from a production facility to a processing plant, compressor station, flow line or transmission pipeline.

Hazardous contaminant means a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm because of—

- (a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability; or
- (b) its physical, chemical or infectious characteristics.

High bank - The defining bank is the terrace or bank or, if no bank is present, the point on the active floodplain, which confines the average annual peak flows.

Land degradation includes the following:

- (a) soil erosion;
- (b) rising water tables;
- (c) the expression of salinity;
- (d) mass movement by gravity of soil or rock;
- (e) stream bank instability; and
- (f) a process that results in declining water quality.

LA_{max, adj, T} is the adjusted average maximum A-weighted sound pressure level measured over a time period T. The maxima must be measured on a sound level meter with a frequency-weighting that corresponds to perceived loudness ("A" weighting) and the meter must be set to the "fast" response time-weighting. The measured values are to be adjusted upwards by 2 dB(A) to 5 dB(A) if the noise source has tonal characteristics.

The measuring period must be in excess of five minutes. The arithmetic average of the adjusted maxima, after eliminating any extraneous noise peaks, is the measure used to characterise the noise environment. (This measure will generally be similar to a percent exceedance of 10% or less. Refer to Australian Standard AS1055.)

Licensed waste disposal facility is a facility approved under a development approval and operated by a holder of a registration certificate for environmentally relevant activity item number 75 under Schedule 1 of the *Environmental Protection Regulation 1998*.

Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc), which is to be left by agreement with the landowner.

Petroleum activity is defined in the EP Act as an activity:

- (a) authorised on a petroleum tenure granted under the *Petroleum Act 1923*; or
- (b) authorised on a petroleum authority granted under the *Petroleum and Gas (Production and Safety) Act 2004*; or

- (c) exploring for or mining minerals under a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*; or
- (d) rehabilitating or remediating environmental harm because of an activity mentioned in paragraphs (a) to (c); or
- (e) action taken to prevent environmental harm because of an activity mentioned in paragraphs (a) to (d); or
- (f) required under a condition of an environmental authority (petroleum activities); or
- (g) required under a condition of an environmental authority (petroleum activities) that has ended or ceased to have effect, if the condition:
 - i continues to apply after the authority has ended or ceased to have effect; and
 - ii has not been complied with.
 - iii

Petroleum authority includes Authority to Prospect, Petroleum Lease, Data Acquisition Authority, Water Monitoring Authority, Petroleum Facility Licence, Survey Licence and Pipeline Licence issued or granted under the *Petroleum Act 1923* or *Petroleum and Gas (Production and Safety) Act 2004*.

Petroleum project is all petroleum activities conducted on one or more petroleum authorities as a single integrated operation. To be a single integrated operation, the activities must be:

- carried out under the day to day management of a single responsible person, for example, a site or
- operations manager;
- operationally interrelated;
- operated in a way that leads to a lower risk of environmental harm being caused by the activities; and
- carried out at two or more places at or about the same time, and the places where they are carried out are separated by distances short enough to make feasible the integrated day to day management of the activities.

Petroleum works site is a separate location on the area subject to a petroleum authority where certain petroleum activities are undertaken including a well site, production facilities, evaporation pond, compressor site and campsite. The following petroleum activities are excluded from the definition of *petroleum works site*: roads and tracks, seismic survey lines, and non-licensed gathering systems.

Potential discharge area - Low lying parts of the landscape (relative to adjacent terrain) where groundwater movements are within 2-5m of the land surface and the landscape may be subject to upward movement of groundwater in the future.

Release of a contaminant into the environment, includes –

- (a) to deposit, discharge, emit or disturb the contaminant; and
- (b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- (c) to fail to prevent the contaminant from being deposited, discharged, emitted or disturbed; and
- (d) to allow the contaminant to escape; and
- (e) to fail to prevent the contaminant from escaping.

Riverine area refers to the land confined to the flood flow channel of a watercourse.

Sediment pond means a bunded or excavated structure used to contain and settle waterborne sediment running off significantly disturbed areas.

Sediment trap means a device used to filter waterborne sediment running off significantly disturbed areas. This may include silt fences, hay bales or grassed strips.

Sensitive place means

- (a) a dwelling, mobile home or caravan park, residential marina or other residential place;
- (b) a motel, hotel or hostel;
- (c) a kindergarten, school, university or other educational institution;
- (d) a medical centre or hospital;
- (e) a protected area;
- (f) a park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organized entertainment.

Significantly disturbed land and **significant disturbance** means land that is:

- (a) contaminated land; or
- (b) disturbed and human intervention is needed to rehabilitate it:
 - i. to a state required under the relevant environmental authority; or
 - ii. if the environmental authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Stable means geo-technical stability of the rehabilitated landform where instability related to the excessive settlement and subsidence caused by consolidation / settlement of the wastes deposited, and sliding / slumping instability has ceased.

State wildlife corridor means an area identified as State wildlife corridor on a map prepared by the chief executive officer of the Environmental Protection Agency and certified by the chief executive officer of the Department of Natural Resources, Mines and Water for the purposes of the *Vegetation Management Act 1999*. The map showing areas of State wildlife corridor is available in digital form from NRMW. Areas of State wildlife corridor are also depicted on regional ecosystem maps available from NRMW or the EPA's website at <http://www.epa.qld.gov.au/REMAPS>.

Static high water mark means the settled ordinary water level that occurs under average meteorological conditions. It is less than extreme levels that can be caused by storm surges.

Turkey's nest dam - A dam constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the dam.

Waters includes river, stream, lake, wetland, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

Work program - Under the P & G Act holders of petroleum authorities are required to submit a work program for an authority to prospect. The program gives detailed information about the nature and extent of activities to be carried out under the authority.

APPENDIX A Environmentally sensitive areas

Category A - Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
• National Parks (Scientific); • National Parks; • National Parks (Aboriginal Land); • National Parks (Torres Strait Islander Land); • National Parks (Recovery); • Conservation Parks; and • Forest Reserves.	<i>Nature Conservation Act 1992</i>	Department of Environment and Resource Management (DERM)
• Restricted Areas that include Constructed Water Reservoirs	<i>Mineral Resources Act 1989</i>	DERM
• Marine Parks (other than general use zones)	<i>Marine Parks Act 1982</i>	DERM
• Wet Tropics Area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Wet Tropics Management Authority (WTMA)
• Great Barrier Reef Marine Park Region	<i>Great Barrier Reef Marine Park Act 1975 (Cth)</i>	Great Barrier Reef Marine Park Authority (GBRMPA)

Category B – Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
• Coordinated Conservation Areas; • Wilderness Areas; • World Heritage Management Areas; • International Agreement Areas; • An area of Critical Habitat or Major Interest identified under a Conservation Plan; and • Areas subject to an Interim Conservation Order	<i>Nature Conservation Act 1992</i>	DERM
An area subject to following conventions: • Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 23 June 1979); • Convention on Wetlands of International Importance, especially as Waterfowl Habitat (RAMSAR, 2 February 1971); and • Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 16 November 1972).	<i>International Conventions</i>	DERM
• General Use Zones of a Marine Park	<i>Marine Parks Act 1982</i>	DERM
• An Area to the Seaward Side of the Highest Astronomical Tide	Nil	DERM
• Place of cultural heritage significance; • Protected area; • Registered place; and • Restricted zone	<i>Queensland Heritage Act 1992</i>	DERM
• Designated Landscape Area (other than the area known as the 'Stanbroke Pastoral Holding').	<i>Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987</i>	DERM
• Feature Protection Area; • State Forest Park; and • Scientific Area.	<i>Forestry Act 1959</i>	DERM
• Fish Habitat Area; and • A place in which a marine plant is situated.	<i>Fisheries Act 1994</i>	Department of Employment, Economic Development and Innovation (DEEDI)
• Endangered Regional Ecosystems (ERE) *	Nil	DERM

* **Important Note:** Regional ecosystem classification is determined according to the Queensland Herbarium **Biodiversity Status** Classification. Information on ERE's is maintained by DERM on the Regional Ecosystem Description Database.

Category C – Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
• Nature Refuges and Resource Reserves	<i>Nature Conservation Act 1992</i>	DERM
• Declared Catchment Areas; • Declared Irrigation and Irrigation Undertaking Areas; • Water Reservoirs and Drainage Areas.	<i>Water Act 2000 and various Water Board Acts</i>	DERM and/ or Relevant Storage Operator or Board
• River Improvement Areas	<i>River Improvement Trust Act 1940</i>	DERM and the Relevant River Trust
• The Designated Landscape Area - Stanbrooke Pastoral Holding	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
Areas under Part 5 Division 2 of the Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
• State Forest or Timber Reserves	<i>Forestry Act 1959</i>	DERM
• DPI Research Sites	<i>Nil</i>	DEEDI
• Areas of land occupied by the Bureau of Sugar Experiment Stations.	<i>Sugar Industry Act 1999</i>	DEEDI
• Critical Areas and Public Purpose Reserves	<i>Land Act 1994</i>	DERM
• An area subject to a State Planning Policy that the policy declares is in need of environmental protection.	<i>Integrated Planning Act 1997</i>	DERM
• Erosion Prone Areas under Coastal Management Plans and Coastal Management Control Districts	<i>Coastal Protection and Management Act 1995</i>	DERM
• “Declared Areas”	<i>Vegetation Management Act 1999</i>	DERM
• An area identified as “Essential Habitat” for a species of wildlife listed as endangered, vulnerable, rare, or near threatened under the <i>Nature Conservation Act 1992</i>	<i>Nature Conservation Act 1992</i>	DERM
• State Wildlife corridor	<i>Vegetation Management Act 1999</i>	DERM

Important Note: Regional ecosystem classification is determined according to the Queensland Herbarium Biodiversity Status Classification. Information on ERE's is maintained by the DERM on the Regional Ecosystem Description Database.

APPENDIX B Criteria for dams and evaporation ponds

Containments built on land subject to a Petroleum Authority as level 2 petroleum activities can be used for raw water storage, storage and evaporation of contaminated waters, containment of **associated water** that is saline or contains hydrocarbons, storage of process waters, or the containment of contaminated solids formed from such waters.

They are classified as:

- Hazardous dams containing hazardous waste; or
- Low hazard dams.

Hazardous dams containing hazardous waste are those, which cannot comply with the assessment criteria presented in Tables 1 and 2. High hazard dams containing hazardous waste, or dams which could impact on life or property on collapse or failure, are not permitted under this code and will require either site-specific conditions or will be conditioned under a level 1 environmental authority.

Determination if dam contains hazardous waste.

The assessment process for the determination if a dam contains a hazardous waste is dependent on whether the dam contents, including liquor and total solids can comply with the hazardous contaminant limits listed in Table 1 below. If the content of the dam cannot comply with the limits in Table 1, then the dam contains a hazardous waste.

Table 1 – Determination if content of dam is hazardous waste

Contaminant ¹	Liquor ²	Total solids ^{3,4}
Arsenic	0.5 mg/l	250 mg/kg
Boron	5.0 mg/l	15,000 mg/kg
Cadmium	10µg/l	100mg/kg
Cobalt	1.0 mg/l	500 mg/kg
Copper	1.0 mg/l	5,000 mg/kg
Lead	0.1 mg/l	300 mg/kg
Mercury	2µg/l	75 mg/kg
Nickel	1.0 mg/l	3,000 mg/kg
Zinc	20 mg/l	35,000 mg/kg
Chloride	2,500 mg/l	-
Fluoride	2.0 mg/l	-
Selenium	0.02 mg/l	-
Sulphate	1,000 mg/l	-
Cyanide	10 mg/l	2,500 mg/kg
pH	Between 5.5 and 9.0	Net acid generation of pH <4
Nitrite	30 mg/l	-
Nitrate	400 mg/l	-
TDS	4000 mg/l	-
Aromatic Hydrocarbons	600 µg/l	-
Polycyclic Aromatic Hydrocarbons Naphthalene	16µg/l	-

Benzo (a) pyrene	0.2 µg/l	
Phenol	320 µg/l	-
Polychlorinated Biphenyls		-
Aroclor 1242	0.3 µg /l	
Aro 1254	0.1 µg /l	
TPH	10 mg/l (or no visible film)	
Blue green Algae (Microcystis)	11,000 cells/ml	-

1. Metals should be analysed in accordance with recognised test methods by a NATA certified laboratory.
2. Applies to the liquid contents in a dam generally available to the environment (for example, water available to birds and animals)
3. Total solids include suspended and colloidal solids.
4. Applies to the solids in the dam.

Determining the hazard category of dam containing hazardous waste

If any proposed dam containing a hazardous waste cannot comply with the acceptance criteria listed in Table 1 but can comply with the size and location criteria listed in Table 2, then the dam will be a hazardous dam containing hazardous waste. Similarly if the dam contains hazardous waste and exceeds the criteria in Table 2 then the dam will be a high hazard dam containing hazardous waste.

Table 2 – Determination if dam containing hazardous waste is high hazard

	Hazardous dam activity
Criterion 1	In the event of dam collapse, failure or overflow, flow from the dam would have one or more of the following actions; it would or could • impact on occupied premises to a depth of more than 300 mm; or • flow to a sensitive or commercial place; or • flow to a riverine area containing permanent water; or • contaminate a water supply for human consumption; or • contaminate a water supply used for livestock.
Criterion 2	The dam is located within a: • declared catchment or sub-artesian area; or • watercourse and the dam's surface area of water exceeds 1ha.
Criterion 3	The dam has a surface area of water greater than 4 ha; or the dam has a volume of water greater than 20 mega litres.

Table 3 summarises the process for the determination of what is the hazard category of dams on a site.

Table 3 – Determination of dam hazard category

Dam liquor and total solid hazardous contaminant concentration	Dam location and size	Type of dam
Dam contents do not exceed limits in Table 1	Dam location and size do not trigger criterion 1 listed in Table 2	The dam is a low hazard dam
Dam contents exceed limits in Table 1	Dam location and size are below the criteria listed in Table 2	The dam is a medium hazard dam containing hazardous waste.
Dam contents exceed limits in Table 1	Dam location and size are above the criteria listed in Table 2	The dam is a high hazard dam (containing hazardous waste).

Design, construction, operation, maintenance and decommissioning criteria

Dams are engineering structures and must be designed by professional engineer(s) who would normally apply the criteria defined below. A professional engineer should also be consulted in the development of the decommissioning plan.

In order to comply with the conditions of this Code design, construction, operation, maintenance and decommissioning of dams containing hazardous waste must be in accordance with the following criteria and other requirements, as applicable, of the Queensland Small Dams Guideline 2005.

Criteria for the design, construction, operation, maintenance and decommissioning of dams containing hazardous waste

Design:

- (a) Dams with a capacity up to 3000m³ are best constructed as ***Turkey's Nest*** dams;
- (b) Dams should be located to have the smallest practical catchment area;
- (c) Dams must have a spillway capable of passing a design flood, defined as the peak discharge from a critical duration storm with an annual exceedence probability of 1% (i.e. 1 in 100 yr event) or lower;
- (d) The spillway should be located where practicable in the abutment of the dam or in the minimum height section of the dam;

- (e) Any spillway discharge should be contained within stable defined channels until it enters any natural watercourse or waterway;
- (f) For embankments built on stable foundations, not subject to draw down and out of uniform soil material, the batters shall be no steeper than those shown in the table below, unless otherwise shown to be stable:

Embankment Soil Classification (Universal soil classification)	Upstream Batter	Downstream Batter
GC, SC	2.5:1	2.0:1
CL, ML	3.5:1	2.5:1
CH, MH	3.5:1	2.5:1
GW, GP, GM, SW, SP, SM	Not suitable	Not suitable

Note: The codes for the Universal Soil Classification (e.g. GC) are detailed in the Australian Standard AS 1726 1993 Geotechnical Site Investigation, Appendix A.

- (g) Where foundation material differs from the embankment fill material, the batters shall be chosen conservatively to be consistent with the weaker material classification.

Construction:

- (a) Embankments must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures, flow velocities, material strength, stability and durability.
- (b) Fine grained soils used in embankment construction should be mechanically compacted when they are near or at the optimum moisture content (i.e. slightly plastic) to improve soil strength, minimise seepage and reduce the risk of piping failure
- (c) Where geo-membranes are used, ensure that they are placed, anchored and joined in accordance with the manufacturer's specification.
- (d) Where geo-membranes are used ensure that they are suitable to prevent leakage of the hazardous contaminants, which are contained within the dam.
- (e) Where geo-membranes are used for liners, filters or drains, ensure that the geo-membrane is in contact only with fine-grained soils to prevent punching or tearing of the membrane.
- (f) Embankments built out of pervious material must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures and flow velocities.
- (g) Where foundation material differs from embankment fill material, the embankment should be constructed out of the material, which gives the flatter batter.
- (h) Prior to construction of an embankment, the foundation should be cleared of all:
 - vegetation (grass, shrubs and trees);
 - soils containing organic matter (roots);
 - cracked soils (stiff plastic soils);
 - pervious soils (sand, gravel)
 - pervious material in rock faults, joints or the rock foundation itself.
- (i) Prior to construction of an embankment, all transverse trenches, holes and other irregularities should be plugged or backfilled to create a generally undulating foundation for placement of the embankment.

- (j) Fine-grained soils used in embankment construction should have a consistent texture and be free from foreign matter such as branches, logs, gravels or boulders etc.
- (k) Fine-grained soils including dispersive soils should be placed in the centre of or towards the upstream faces of embankment dams.
- (l) Coarser grained soils and rock materials are to be placed to wards and on the outer faces of embankment dams to minimise erosion and breaching potential.
- (m) Dispersive and easily erodible soils should not be used on the outer faces of embankment dams.
- (n) Provide adequate measures to control seepage through the dam wall and the transmission of contaminants through underlying soil layers or rock stratum.
- (o) Embankment dams should be constructed with stable earth materials that will not decay or generate leachate or hazardous contaminants.

Operation:

- (a) The dam should be operated to maintain a minimum freeboard of 0.5m below the spillway level.
- (b) To ensure that there is no leakage of hazardous wastes from any dam or evaporation pond associated with the petroleum activity a field based groundwater monitoring program must be established to ensure there is no contamination of any unsaturated perched systems or existing groundwater aquifers in the vicinity of the works. Three or more monitoring bores specifically designed for this purpose should be located in a cluster between the contaminant source and any environmentally sensitive place. The monitoring program should regularly record:
 - (a) water levels;
 - (b) water quality;
 - (c) flow rates; and
 - (d) direction of flow.
- (c) As far as practicable minimise seepage and return any contaminated seepage to the dam.

Maintenance:

- (a) Maintain the erosion resistance of the downstream face of the dam to avoid surface scour, which may lead to failure of the wall;
- (b) Maintain the erosion resistance of the spillway to avoid scouring during the design flood;
- (c) Prevent the establishment of trees or shrubs on water containing embankments (roots initiate seepage paths);
- (d) Control of burrowing insects and animals (initiation of piping paths);
- (e) Repair active erosion and piping processes; and
- (f) During initial filling or commissioning, the dam should be monitored for leaks, seepages, embankment deformation or other signs of embankment distress.

Decommissioning:

- (a) Removing (where possible) all remaining liquids in the dam (e.g. it is generally acceptable to evaporate the liquid if the dam is not to be left to the land owner / holder).
- (b) Remove (where possible) all contaminated solids from the dam and encapsulate in a purpose built storage facility, or
- (c) Encapsulate any residual contaminated solids in situ by capping with an appropriate capillary break and with one metre of clay or similar impermeable material;
- (d) Design, install and maintain adequate diversion drains or similar structures to protect or minimise the erosion of any exposed surfaces by stormwater runoff;
- (e) Design, install and maintain adequate surface drainage to prevent water ponding and infiltration into any contaminated materials;
- (f) Address contaminated site issues by referring to Condition 19 of this code;
- (g) Establish a monitoring program to determine the success of the decommissioning plan.
- (h) If required, remove the wall and rehabilitate the disturbed area in accordance with the rehabilitation conditions of this code; and
- (i) Rehabilitate the disturbed areas in accordance with the rehabilitation conditions of this code.

APPENDIX C Schedule of rehabilitation costs

GAS ACTIVITIES (Including Coal Seam Gas wells >350m)	
Activity Type	Unit Cost
First well	\$10,000
Subsequent wells	\$5,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Buried flow line construction	\$20,000 per gathering system project
Buried flow line in operation	\$500 per line
Flow lines – surface	\$200 per km
Borrow pit	\$1,000 each
Containment pond (water)	Site specific estimation
Contaminated land survey	\$20,000 per facility
Processing facility (small)	\$10,000 each
Processing facility (large)	Site specific estimation
Compressor only	\$5,000 each
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

GAS ACTIVITIES (Coal Seam Gas wells <350m)	
Activity Type	Unit Cost
First well	\$10,000
Subsequent wells	\$1,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Flow lines – buried	\$500 per line
Flow lines – surface	\$200 per line
Borrow pit	\$1,000 each
Containment pond (water)	Site specific estimation

Contaminated land survey	\$20,000 per facility
Processing facility (small)	\$10,000 each
Processing facility (large)	Site specific estimation
Compressor only	\$5,000 each
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

Note: Rehabilitation cost estimates must be based on third party costs for rehabilitation of land that has been “*significantly disturbed*” and may be reviewed annually by the administering authority.

Permit¹

Environmental Protection Act 1994

Environmental authority

APPENDIX D – Schedule of disturbance

This form is required to be lodged with the **Initial Work Program** or **Development Plan**. Where there is a change to the initial significant disturbance and rehabilitation liability advice submitted with a program/plan, this form is required to be updated and to accompany a submission of the relevant **later Work Program** or **Development Plan**

Project name / ID

Plan / Program

Commencement
date:

End date:

Activity category / Disturbance type	Unit rehabilitation cost (GST Included) (from Schedule of Rehabilitation Costs) (A)	Existing significant disturbance at commencement of this Work Program/Development Plan (e.g. number of wells/ pits/ ponds) (B)	Maximum additional significant disturbance proposed during term of Work Program ¹ or Development Plan ¹ (C)	Rehabilitation of significant disturbance proposed during term of Program/Plan (D)	Maximum rehabilitation cost (B+C–D) x (A)

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



Total rehabilitation liability for the term of the work program or development plan					
Maintenance and monitoring costs (20% of rehab costs to a maximum amount of \$20,000)					
CPI (3% of total rehabilitation costs (compounded)) (This example is calculated for maximum disturbance in year 2)					
GST (10% of above costs if not already included)					
Financial assurance (Pay the difference between this amount and any financial assurance currently submitted for this project)					

¹Or as advised and attached with a submitted latter Work Program or Development Plan where there is a change to the initial significant disturbance and rehabilitation liability advice submitted with the Initial Work Program/Development Plan.

Certification

I/We (the current Environmental Authority holder) certify that: *(select each to certify)*

- ☐ The determination of this financial assurance is correct. ☐ The information I/we have provided on this form is accurate, complete and not misleading ¹.

Permit
Environmental authority

HOLDER NAME / COMPANY

Please note:

Where there is more than one holder, this certification may be signed by the holder authorized (in writing by all other holders) to sign on behalf of and to commit in all matters relevant to this environmental authority. Where the holder is a company, this form is to be signed by a person authorized (in writing) to sign for that company.

¹ It is an offence, under the *Environmental Protection Act 1994*, to give the administering authority information that is false, misleading or incomplete in any material particular. The maximum penalty for such action is 165 penalty units for an individual, or 825 penalty units where the applicant is a corporation (section 181B(3) of the *Penalties and Sentences Act 1992*).

The current penalty unit value is \$75.00.

END OF PERMIT

Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

Environmental authority

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

Permit¹ number: EPPG00811113

Environmental authority takes effect on 19-SEP-2014.

The anniversary date of this environmental authority is 1 November. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name	Registered address
Bronco Energy Pty Ltd	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
PAPL (Upstream II) Pty Limited	Level 12 60 Carrington Street SYDNEY NSW 2000
Total E & P Australia III	Level 13 BGC Centre 28 The Esplanade PERTH WA 6000
KGLNG E & P II Pty Ltd	Level 11 28 the Esplanade PERTH WA 6000

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum - other than site specific	ATP665

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority is issued is a restatement of the ERA as defined by legislation at the time the approval is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an environmental authority as to

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

the scale, intensity or manner of carrying out an ERA, then the conditions prevail to the extent of the inconsistency.

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

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

Contaminated land

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



Signature

19 September 2014

Date

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

Enquiries:

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

Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Location: ATP665

Relevant activity/ies: Petroleum - other than site specific

The environmentally relevant activity(ies) conducted at the location as described above must be conducted in accordance with the following site specific conditions of approval.

Conditions of environmental authority

Standard Environmental Conditions
Condition 1 – Significant disturbance The holder of the environmental authority must ensure that petroleum activities do not cause more than 4 ha of any land to be significantly disturbed at a petroleum works site at any one time.
Condition 2 – Work program The holder of the environmental authority must submit to the administering authority a copy of the original or any amended work program for the relevant petroleum authority 8 business days before commencing activities or additional or varied activities covered by the program or plan.
Condition 3 – Financial assurance The holder of the environmental authority must: (a) calculate a financial assurance in accordance with the Schedule of Rehabilitation Costs (in Appendix C of this code) and Schedule of Disturbance (in Appendix D); (b) attach the Schedule of Disturbance to the original or any amended Work Program or Development Plan; (c) provide to the administering authority the financial assurance in the amount and form required by the administering authority at the time of submission of the original or any amended work program or development plan; and (d) maintain the financial assurance until the administering authority is satisfied that no claim is likely to be made on the assurance.
Condition 4 – Environmentally sensitive areas The holder of the environmental authority must ensure that: (a) petroleum activities are not conducted within a category A or B environmentally sensitive area; and (b) petroleum activities do not cause a significant disturbance within 1km of a category A environmentally sensitive area or within 500m of a category B environmentally sensitive area; (c) petroleum activities are not conducted in a category C environmentally sensitive area unless there is a written agreement to enter the area for those activities from the relevant administering authority; (d) if the relevant administering authority gives written permission to conduct petroleum activities in a category C environmentally sensitive area with conditions that are in conflict with the standard environmental conditions of this code – the holder must as a minimum comply with the standard environmental conditions (except for condition 4(c)); and (e) staff, contractors or agents carrying out petroleum activities on a petroleum authority are aware of the location of any relevant category A, B or C environmentally sensitive areas within the authority.
Condition 5 – Declared Wild Rivers Areas

Standard Environmental Conditions

If the petroleum authority is in or partly within a declared Wild Rivers Area or an area covered by a moratorium under the *Wild Rivers Act 2005*, the holder of the environmental authority must ensure that petroleum activities within the (proposed) Wild Rivers Area are conducted in accordance with the conditions in the wild river declaration for the area that state they are for petroleum activities.

Condition 6 – Land management

The holder of the environmental authority must:

- (a) minimise disturbance to land in order to prevent **land degradation**; and
- (b) ensure that for land that is to be **significantly disturbed** by petroleum activities, the **top layer** of the soil profile is removed and
 - i. stockpiled in a manner that will preserve its biological and chemical properties; and
 - ii. used for rehabilitation purposes (refer condition 19).

Condition 7 – Vegetation management

The holder of the environment authority must:

- (a) prevent or minimise disturbance to vegetation by petroleum activities;
- (b) manage the effects of clearing to prevent the loss of biodiversity, reduction of ecological processes and land degradation;
- (c) consider whether it is feasible to avoid clearing, and where viable alternatives exist, must not clear vegetation:
 - i. in, or within 50 metres of, the **high bank** of a watercourse;
 - ii. in, or within 50 metres of the **static high water mark** of, wetlands, lakes or springs;
 - iii. in a way that isolates clumps or **dissects corridors of vegetation**;
 - iv. on slopes greater than 5%;
 - v. on **dispersible soils**; and
 - vi. in existing or potential **discharge areas**.
- (d) when clearing in areas with a high probability of acid sulfate soils, comply with an acid sulfate soil environmental management plan prepared in accordance with the State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils and the relevant Guideline.

Condition 8 – Protection of riverine areas

The holder of the environmental authority must:

- (a) ensure that there is no significant disturbance in **riverine areas** containing permanent water, except where necessary for the construction and/or maintenance of roads, tracks and pipelines that are essential for carrying out the authorised petroleum activities and no reasonable alternative location is feasible; and
- (b) minimise disturbance of all other riverine areas.

Condition 9 – Erosion and sedimentation control

Standard Environmental Conditions

The holder of the environmental authority must prevent or minimise:

- (a) erosion of areas disturbed by petroleum activities; and
- (b) sedimentation of any **waters** as a result of petroleum activities.

Condition 10 – Dust Management

The holder of the environmental authority (petroleum activities) must ensure that dust or particulate matter or both resulting from a petroleum activity does not cause an environmental nuisance at any **sensitive place or commercial place**.

Condition 11 - Noise management

- (a) Noise emitted from any aspect of petroleum activities must not exceed the noise levels, specified in the table below, at any sensitive place or commercial place.

Time period	Noise level at a sensitive place measured as the Adjusted Maximum Sound Pressure Level $L_{A, \max \text{ adjT}}$
7am – 6pm	Background noise level plus 5 dB(A)
6pm – 10pm	Background noise level plus 5 dB(A)
10pm – 7am	Background noise level plus 3 dB(A)
Time period	Noise level at a commercial place measured as the Adjusted Maximum Sound Pressure Level $L_{A, \max \text{ adjT}}$
7am – 6pm	Background noise level plus 10 dB(A)
6pm – 10pm	Background noise level plus 10 dB(A)
10pm – 7am	Background noise level plus 8 dB(A)

General note: In no case is the background noise level, $L_{A90, 15 \text{ mins}}$ to be less than 25 dB(A). In the event that measured background noise level is less than 25 dB(A), then 25 dB(A) is to be used.

- (b) When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring, analysis and interpretation of results.
- (c) The method of measurement and reporting of noise levels must be in accordance with most recent edition of the Environmental Protection Agency (EPA) Noise Measurement Manual.

Standard Environmental Conditions

Condition 12 – Waste Management

The holder of the environmental authority must:

- (a) ensure that petroleum activities do not result in the release or likely release of a contaminant to land or waters that results in material or serious environmental harm, unless the release is explicitly authorised under the *EP Act*; and
- (b) as soon as practicable, remove and dispose of all regulated waste to a **licensed waste disposal facility** or recycling facility.

Condition 13 – Sewage treatment and disposal for temporary camps

The holder of this environmental authority must ensure that:

- (a) plant and equipment used for sewage treatment or disposal is installed, maintained and operated in a proper and efficient manner;
- (b) untreated sewage effluent is not released to waters;
- (c) the disposal of sewage effluent does not cause the contamination of any water used for drinking or domestic purposes or manufacturing purposes or for consumption by animals;
- (d) where sewage sludge is buried on land the sludge is covered with at least 250mm of soil and where practicable located above known flood levels;
- (e) irrigation of sewage effluent on land must be in accordance with National Water Quality Guidelines – Use of Reclaimed Water;
- (f) surface ponding of effluent on land disposal area(s) shall be minimised and managed in a way that does not cause nuisance;
- (g) public access to any sewage effluent land disposal area must be denied during the release of contaminants to the land and until the irrigation/disposal area has dried.

Condition 14 – Storage of hazardous substances, fuel and oil

Fuel and oil

The holder of the environmental authority must ensure that storage facilities for all hazardous, flammable and combustible liquids:

- (a) are within an on-site containment system;
- (b) are controlled in a manner that prevents material or serious environmental harm;
- (c) are maintained in accordance with Section 2.3 for minor storages and Section 5.8 for storages above 10 000 L of AS 1940:2004 Storage and Handling of Flammable and Combustible Liquids; and
- (d) are equipped with measures, appropriate to the risks to the surrounding environment, to minimise the risk of spills and ensure early detection of spills.

Condition 15 – Spills and clean up action

Notwithstanding the other conditions of this code, if a hazardous contaminant is released to waters or

Standard Environmental Conditions

land, the holder of the environmental authority must:

- (a) take immediate action to stop any further release;
- (b) take immediate action to contain the hazardous contaminant to the affected area, taking particular care to protect environmentally sensitive areas;
- (c) restore or rehabilitate the environment to its condition before the release occurred; and
- (d) take necessary action to prevent a recurrence of the release

Condition 16 – Associated water

- (a) The holder of the environmental authority must ensure that associated water that, at the time it is produced is a hazardous waste, as determined from Table 1 of Appendix B of this Code, is not released to land or waters, other than to an evaporation pond constructed and managed in accordance with Appendix B.
- (b) The holder of the environmental authority must ensure that associated water that, at the time it is produced, is not a hazardous waste, is not released to land or waters other than to an appropriate evaporation pond.
- (c) Despite (a) and (b) the holder of the environmental authority may apply to the administering authority to amend this environmental authority to allow associated water to be released to a containment for domestic or stock purposes managed by the land owner/occupier, provided the owner/occupier has:
 - i. given written permission to the holder for discharge to the containment;
 - ii. given written advice to the administering authority about the proposed storage and use; and
 - iii. given an assurance to the administering authority that the associated water will not be released to land or waters in a way that has the potential to cause material or serious environmental harm.
- (d) Despite (a) and (b) the holder of the environmental authority may apply to the administering authority to amend this environmental authority to allow associated water that meets a nominated set of water quality standards (after treatment if necessary) to:
 - i. be released to land or waters; or
 - ii. be used for a specified purpose, provided the potential user has given written advice about the proposed use and environmental safeguards that will be implemented to prevent material or serious environmental harm.
- (e) If the associated water complies with a *Notice of decision to approve a resource for beneficial use* under section 66L of the *Environmental Protection (Waste Management) Regulation 2000* it can be used in accordance with the Notice for the stated type of use(s).

Condition 17 – Dams and evaporation ponds

The holder of the environmental authority must ensure all dams and evaporation ponds are:

- (a) designed, constructed, operated, maintained and decommissioned in accordance with the criteria outlined in Appendix B; and
- (b) not located within 100 m of any natural drainage feature (i.e. watercourse, waterway, wetland or lake).

Standard Environmental Conditions

Condition 18

For dams, ponds and other excavations which are constructed as part of the petroleum activities, the holder of the environmental authority must where relevant either:

- (a) provide safe access for livestock and wildlife where contained water has appropriate quality; or
- (b) construct and maintain bunds and/or fences sufficient to exclude livestock.

Condition 19 - Rehabilitation

As soon as practicable but no later than 6 months (or longer period agreed in writing by the administering authority) after the **end** of petroleum activities causing significant disturbance to land, the holder of the environmental authority must:

- (a) remediate contaminated land (e.g. evaporation ponds containing hazardous waste) in accordance with *EP Act* requirements;
- (b) reshape all significantly disturbed land to a stable landform similar to that of surrounding undisturbed areas; and
- (c) on all significantly disturbed land, take all reasonable and practicable measures to:
 - i. re-establish surface drainage lines;
 - ii. reinstate the top layer of the soil profile; and
 - iii. promote establishment of vegetation of the same species and density of cover to that of the surrounding undisturbed areas.

Condition 20 – Pipeline activities

The holder of the environmental authority must design, construct, operate and decommission petroleum pipelines on the relevant petroleum authority in accordance with AS 2885.

Condition 21 – Infrastructure

All infrastructure, constructed by or for the holder of the environmental authority, including water storage structures, must be removed by the holder from the site and the site rehabilitated according to condition 19, prior to surrender of the petroleum authority, except where it is to remain with the **written agreement** of the administering authority and post petroleum authority landowner/holder.

Condition 22 – Monitoring and complaints

The holder of the environmental authority must:

- (a) develop and implement a monitoring program that will demonstrate compliance with this code;
- (b) document the monitoring and inspections carried out under the program and any actions taken;
- (c) when the administering authority advises the holder of a complaint alleging nuisance (e.g.

Standard Environmental Conditions
caused by dust or noise), investigate the complaint and advise the administering authority of the action proposed or undertaken in relation to the complaint; (d) if the administering authority is not satisfied with the proposed or completed action, undertake monitoring or other action requested by the administering authority; (e) maintain a record of complaints and incidents causing environmental harm, and actions taken in response to the complaint or incident; and (f) retain the record of complaints required by this condition for 5 years.
Condition 23 - Notification The holder of the environmental authority must record and initially notify the administering authority as soon as practicable of any emergency or incident that causes non-compliance with the standard environmental conditions.

Schedule B - Definitions

Note: If a word or phrase is not defined it must be given the meaning it has under the EP Act or its subordinate legislation, as amended from time to time. If a word or phrase is not defined in this code or the EP Act or its subordinate legislation, it has its ordinary meaning.

APPEA Code means the current APPEA, Code of Environmental Practice.

AS 2885 Australian Standard Pipelines – Gas and Liquid Petroleum

Associated water for this code is underground water produced from a petroleum well during the course of or resulting from carrying out petroleum activities. Associated water may be potable, suitable for stock purposes, saline, high in fluoride, contaminated by hydrocarbons, and/or otherwise contaminated by a hazardous contaminant. It may be classified as a **hazardous waste** (See Appendix B).

Commercial place means a place used as an office or for business or commercial purposes.

Development plan - Under the P & G Act holders of petroleum authorities must submit a development plan for a petroleum lease or proposed petroleum lease. The plan gives detailed information about the nature and extent of activities to be carried out under the relevant lease.

Discharge area is:

- (a) that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- (b) identified by an assessment process consistent with the document: Salinity Management Handbook, Queensland Department of Natural Resources, 1997; or
- (c) identified by an approved salinity hazard map held by the Department of Natural Resources, Mines and Water.

Dissects corridors of vegetation means clearing vegetation that results in a break more than 50 metres wide across a corridor.

Dispersible soils are soils in which clay material disintegrates into particles less than 2 microns across. This can be observed within 24 hours when soil crumbs are submerged in distilled water.

End means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related *activities such as rehabilitation*. In other words, it does not refer to: the "completion" of the particular activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority. Under the *APPEA Code* "completion" refers to the point at which the particular survey, program or operation has been rehabilitated and abandoned.

Environmental nuisance is unreasonable interference or likely interference with an environmental value caused by:

- (a) noise, dust, odour, light; or
- (b) an unhealthy, offensive or unsightly condition because of contamination; or
- (c) another way prescribed by regulation.

Environmentally sensitive area (as determined from the EPA GIS data base) means a location, however large or small, that has environmental values that contribute to maintaining biological diversity and integrity, have intrinsic or attributed scientific, historical or cultural heritage value, or are important in providing amenity, harmony or sense of community.

Essential habitat means an area identified as essential habitat for a species of wildlife listed as endangered, vulnerable, rare, or near threatened under the *Nature Conservation Act 1992* on a map prepared by the chief executive officer of the Environmental Protection Agency and certified by the chief

executive officer of the Department of Natural Resources, Mines and Water for the purposes of the *Vegetation Management Act 1999*.

Evaporation pond means a dam or interceptor pond constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the pond.

Financial assurance means a security deposit, either cash or a bank guarantee, held by the administering authority to cover the potential costs of rehabilitating areas significantly disturbed by the petroleum activities.

Flow line is a small diameter pipeline through which fluids move on a petroleum lease before being sold.

Gathering line is a pipeline to convey crude oil or gas from a production facility to a processing plant, compressor station, flow line or transmission pipeline.

Hazardous contaminant means a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm because of—

- (a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability; or
- (b) its physical, chemical or infectious characteristics.

High bank - The defining bank is the terrace or bank or, if no bank is present, the point on the active floodplain, which confines the average annual peak flows.

Land degradation includes the following:

- (a) soil erosion;
- (b) rising water tables;
- (c) the expression of salinity;
- (d) mass movement by gravity of soil or rock;
- (e) stream bank instability; and
- (f) a process that results in declining water quality.

LA_{max, adj, T} is the adjusted average maximum A-weighted sound pressure level measured over a time period T. The maxima must be measured on a sound level meter with a frequency-weighting that corresponds to perceived loudness ("A" weighting) and the meter must be set to the "fast" response time-weighting. The measured values are to be adjusted upwards by 2 dB(A) to 5 dB(A) if the noise source has tonal characteristics.

The measuring period must be in excess of five minutes. The arithmetic average of the adjusted maxima, after eliminating any extraneous noise peaks, is the measure used to characterise the noise environment. (This measure will generally be similar to a percent exceedance of 10% or less. Refer to Australian Standard AS1055.)

Licensed waste disposal facility is a facility approved under a development approval and operated by a holder of a registration certificate for environmentally relevant activity item number 75 under Schedule 1 of the *Environmental Protection Regulation 1998*.

Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc), which is to be left by *agreement* with the landowner.

Petroleum activity is defined in the EP Act as an activity:

- (a) authorised on a petroleum tenure granted under the *Petroleum Act 1923*; or
- (b) authorised on a petroleum authority granted under the *Petroleum and Gas (Production and Safety) Act 2004*; or

- (c) exploring for or mining minerals under a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*; or
- (d) rehabilitating or remediating environmental harm because of an activity mentioned in paragraphs (a) to (c); or
- (e) action taken to prevent environmental harm because of an activity mentioned in paragraphs (a) to (d); or
- (f) required under a condition of an environmental authority (petroleum activities); or
- (g) required under a condition of an environmental authority (petroleum activities) that has ended or ceased to have effect, if the condition:
 - i continues to apply after the authority has ended or ceased to have effect; and
 - ii has not been complied with.
 - iii

Petroleum authority includes Authority to Prospect, Petroleum Lease, Data Acquisition Authority, Water Monitoring Authority, Petroleum Facility Licence, Survey Licence and Pipeline Licence issued or granted under the *Petroleum Act 1923* or *Petroleum and Gas (Production and Safety) Act 2004*.

Petroleum project is all petroleum activities conducted on one or more petroleum authorities as a single integrated operation. To be a single integrated operation, the activities must be:

- carried out under the day to day management of a single responsible person, for example, a site or
- operations manager;
- operationally interrelated;
- operated in a way that leads to a lower risk of environmental harm being caused by the activities; and
- carried out at two or more places at or about the same time, and the places where they are carried out are separated by distances short enough to make feasible the integrated day to day management of the activities.

Petroleum works site is a separate location on the area subject to a petroleum authority where certain petroleum activities are undertaken including a well site, production facilities, evaporation pond, compressor site and campsite. The following petroleum activities are excluded from the definition of *petroleum works site*: roads and tracks, seismic survey lines, and non-licensed gathering systems.

Potential discharge area - Low lying parts of the landscape (relative to adjacent terrain) where groundwater movements are within 2-5m of the land surface and the landscape may be subject to upward movement of groundwater in the future.

Release of a contaminant into the environment, includes –

- (a) to deposit, discharge, emit or disturb the contaminant; and
- (b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- (c) to fail to prevent the contaminant from being deposited, discharged, emitted or disturbed; and
- (d) to allow the contaminant to escape; and
- (e) to fail to prevent the contaminant from escaping.

Riverine area refers to the land confined to the flood flow channel of a watercourse.

Sediment pond means a bunded or excavated structure used to contain and settle waterborne sediment running off significantly disturbed areas.

Sediment trap means a device used to filter waterborne sediment running off significantly disturbed areas. This may include silt fences, hay bales or grassed strips.

Sensitive place means

- (a) a dwelling, mobile home or caravan park, residential marina or other residential place;
- (b) a motel, hotel or hostel;
- (c) a kindergarten, school, university or other educational institution;

- (d) a medical centre or hospital;
- (e) a protected area;
- (f) a park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organized entertainment.

Significantly disturbed land and significant disturbance means land that is:

- (a) contaminated land; or
- (b) disturbed and human intervention is needed to rehabilitate it:
 - i. to a state required under the relevant environmental authority; or
 - ii. if the environmental authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Stable means geo-technical stability of the rehabilitated landform where instability related to the excessive settlement and subsidence caused by consolidation / settlement of the wastes deposited, and sliding / slumping instability has ceased.

State wildlife corridor means an area identified as State wildlife corridor on a map prepared by the chief executive officer of the Environmental Protection Agency and certified by the chief executive officer of the Department of Natural Resources, Mines and Water for the purposes of the *Vegetation Management Act 1999*. The map showing areas of State wildlife corridor is available in digital form from NRMW. Areas of State wildlife corridor are also depicted on regional ecosystem maps available from NRMW or the EPA's website at <http://www.epa.qld.gov.au/REMAPS>.

Static high water mark means the settled ordinary water level that occurs under average meteorological conditions. It is less than extreme levels that can be caused by storm surges.

Turkey's nest dam - A dam constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the dam.

Waters includes river, stream, lake, wetland, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

Work program - Under the P & G Act holders of petroleum authorities are required to submit a work program for an authority to prospect. The program gives detailed information about the nature and extent of activities to be carried out under the authority.

APPENDIX A Environmentally sensitive areas

Category A - Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
• National Parks (Scientific); • National Parks; • National Parks (Aboriginal Land); • National Parks (Torres Strait Islander Land); • National Parks (Recovery); • Conservation Parks; and • Forest Reserves.	<i>Nature Conservation Act 1992</i>	Department of Environment and Resource Management (DERM)
• Restricted Areas that include Constructed Water Reservoirs	<i>Mineral Resources Act 1989</i>	DERM
• Marine Parks (other than general use zones)	<i>Marine Parks Act 1982</i>	DERM
• Wet Tropics Area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Wet Tropics Management Authority (WTMA)
• Great Barrier Reef Marine Park Region	<i>Great Barrier Reef Marine Park Act 1975 (Cth)</i>	Great Barrier Reef Marine Park Authority (GBRMPA)

Category B – Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
• Coordinated Conservation Areas; • Wilderness Areas; • World Heritage Management Areas; • International Agreement Areas; • An area of Critical Habitat or Major Interest identified under a Conservation Plan; and • Areas subject to an Interim Conservation Order	<i>Nature Conservation Act 1992</i>	DERM
An area subject to following conventions: • Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 23 June 1979); • Convention on Wetlands of International Importance, especially as Waterfowl Habitat (RAMSAR, 2 February 1971); and • Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 16 November 1972).	<i>International Conventions</i>	DERM
• General Use Zones of a Marine Park	<i>Marine Parks Act 1982</i>	DERM
• An Area to the Seaward Side of the Highest Astronomical Tide	Nil	DERM
• Place of cultural heritage significance; • Protected area; • Registered place; and • Restricted zone	<i>Queensland Heritage Act 1992</i>	DERM
• Designated Landscape Area (other than the area known as the 'Stanbroke Pastoral Holding').	<i>Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987</i>	DERM
• Feature Protection Area; • State Forest Park; and • Scientific Area.	<i>Forestry Act 1959</i>	DERM
• Fish Habitat Area; and • A place in which a marine plant is situated.	<i>Fisheries Act 1994</i>	Department of Employment, Economic Development and Innovation (DEEDI)
• Endangered Regional Ecosystems (ERE) *	Nil	DERM

* **Important Note:** Regional ecosystem classification is determined according to the Queensland Herbarium **Biodiversity Status** Classification. Information on ERE's is maintained by DERM on the Regional Ecosystem Description Database.

Category C – Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
• Nature Refuges and Resource Reserves	<i>Nature Conservation Act 1992</i>	DERM
• Declared Catchment Areas; • Declared Irrigation and Irrigation Undertaking Areas; • Water Reservoirs and Drainage Areas.	<i>Water Act 2000 and various Water Board Acts</i>	DERM and/ or Relevant Storage Operator or Board
• River Improvement Areas	<i>River Improvement Trust Act 1940</i>	DERM and the Relevant River Trust
• The Designated Landscape Area - Stanbroke Pastoral Holding	<i>Aboriginal Cultural Heritage Act 2003 Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
Areas under Part 5 Division 2 of the Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003	<i>Aboriginal Cultural Heritage Act 2003 Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
• State Forest or Timber Reserves	<i>Forestry Act 1959</i>	DERM
• DPI Research Sites	<i>Nil</i>	DEEDI
• Areas of land occupied by the Bureau of Sugar Experiment Stations.	<i>Sugar Industry Act 1999</i>	DEEDI
• Critical Areas and Public Purpose Reserves	<i>Land Act 1994</i>	DERM
• An area subject to a State Planning Policy that the policy declares is in need of environmental protection.	<i>Integrated Planning Act 1997</i>	DERM
• Erosion Prone Areas under Coastal Management Plans and Coastal Management Control Districts	<i>Coastal Protection and Management Act 1995</i>	DERM
• “Declared Areas”	<i>Vegetation Management Act 1999</i>	DERM
• An area identified as “Essential Habitat” for a species of wildlife listed as endangered, vulnerable, rare, or near threatened under the <i>Nature Conservation Act 1992</i>	<i>Nature Conservation Act 1992</i>	DERM
• State Wildlife corridor	<i>Vegetation Management Act 1999</i>	DERM

Important Note: Regional ecosystem classification is determined according to the Queensland Herbarium Biodiversity Status Classification. Information on ERE's is maintained by DERM on the Regional Ecosystem Description Database.

APPENDIX B Criteria for dams and evaporation ponds

Containments built on land subject to a Petroleum Authority as level 2 petroleum activities can be used for raw water storage, storage and evaporation of contaminated waters, containment of **associated water** that is saline or contains hydrocarbons, storage of process waters, or the containment of contaminated solids formed from such waters.

They are classified as:

- Hazardous dams containing hazardous waste; or
- Low hazard dams.

Hazardous dams containing hazardous waste are those, which cannot comply with the assessment criteria presented in Tables 1 and 2. High hazard dams containing hazardous waste, or dams which could impact on life or property on collapse or failure, are not permitted under this code and will require either site-specific conditions or will be conditioned under a level 1 environmental authority.

Determination if dam contains hazardous waste.

The assessment process for the determination if a dam contains a hazardous waste is dependent on whether the dam contents, including liquor and total solids can comply with the hazardous contaminant limits listed in Table 1 below. If the content of the dam cannot comply with the limits in Table 1, then the dam contains a hazardous waste.

Table 1 – Determination if content of dam is hazardous waste

Contaminant ¹	Liquor ²	Total solids ^{3,4}
Arsenic	0.5 mg/l	250 mg/kg
Boron	5.0 mg/l	15,000 mg/kg
Cadmium	10µg/l	100mg/kg
Cobalt	1.0 mg/l	500 mg/kg
Copper	1.0 mg/l	5,000 mg/kg
Lead	0.1 mg/l	300 mg/kg
Mercury	2µg/l	75 mg/kg
Nickel	1.0 mg/l	3,000 mg/kg
Zinc	20 mg/l	35,000 mg/kg
Chloride	2,500 mg/l	-
Fluoride	2.0 mg/l	-
Selenium	0.02 mg/l	-
Sulphate	1,000 mg/l	-
Cyanide	10 mg/l	2,500 mg/kg
pH	Between 5.5 and 9.0	Net acid generation of pH <4
Nitrite	30 mg/l	-
Nitrate	400 mg/l	-
TDS	4000 mg/l	-
Aromatic Hydrocarbons	600 µg/l	-
Polycyclic Aromatic Hydrocarbons		-
Naphthalene	16µg/l	
Benzo (a) pyrene	0.2 µg/l	

Phenol	320 µg/l	-
Polychlorinated Biphenyls		-
Aroclor 1242	0.3 µg /l	
Aro 1254	0.1 µg /l	
TPH	10 mg/l (or no visible film)	
Blue green Algae (Microcystis)	11,000 cells/ml	-

1. Metals should be analysed in accordance with recognised test methods by a NATA certified laboratory.
2. Applies to the liquid contents in a dam generally available to the environment (for example, water available to birds and animals)
3. Total solids include suspended and colloidal solids.
4. Applies to the solids in the dam.

Determining the hazard category of dam containing hazardous waste

If any proposed dam containing a hazardous waste cannot comply with the acceptance criteria listed in Table 1 but can comply with the size and location criteria listed in Table 2, then the dam will be a hazardous dam containing hazardous waste. Similarly if the dam contains hazardous waste and exceeds the criteria in Table 2 then the dam will be a high hazard dam containing hazardous waste.

Table 2 – Determination if dam containing hazardous waste is high hazard

	Hazardous dam activity
Criterion 1	In the event of dam collapse, failure or overflow, flow from the dam would have one or more of the following actions; it would or could • impact on occupied premises to a depth of more than 300 mm; or • flow to a sensitive or commercial place; or • flow to a riverine area containing permanent water; or • contaminate a water supply for human consumption; or • contaminate a water supply used for livestock.
Criterion 2	The dam is located within a: • declared catchment or sub-artesian area; or • watercourse and the dam's surface area of water exceeds 1ha.
Criterion 3	The dam has a surface area of water greater than 4 ha; or the dam has a volume of water greater than 20 mega litres.

Table 3 summarises the process for the determination of what is the hazard category of dams on a site.

Table 3 – Determination of dam hazard category

Dam liquor and total solid hazardous contaminant concentration	Dam location and size	Type of dam
Dam contents do not exceed limits in Table 1	Dam location and size do not trigger criterion 1 listed in Table 2	The dam is a low hazard dam
Dam contents exceed limits in Table 1	Dam location and size are below the criteria listed in Table 2	The dam is a medium hazard dam containing hazardous waste.
Dam contents exceed limits in Table 1	Dam location and size are above the criteria listed in Table 2	The dam is a high hazard dam (containing hazardous waste).

Design, construction, operation, maintenance and decommissioning criteria

Dams are engineering structures and must be designed by professional engineer(s) who would normally apply the criteria defined below. A professional engineer should also be consulted in the development of the decommissioning plan.

In order to comply with the conditions of this Code design, construction, operation, maintenance and decommissioning of dams containing hazardous waste must be in accordance with the following criteria and other requirements, as applicable, of the Queensland Small Dams Guideline 2005.

Criteria for the design, construction, operation, maintenance and decommissioning of dams containing hazardous waste

Design:

- (a) Dams with a capacity up to 3000m³ are best constructed as ***Turkey's Nest*** dams;
- (b) Dams should be located to have the smallest practical catchment area;
- (c) Dams must have a spillway capable of passing a design flood, defined as the peak discharge from a critical duration storm with an annual exceedence probability of 1% (i.e. 1 in 100 yr event) or lower;
- (d) The spillway should be located where practicable in the abutment of the dam or in the minimum height section of the dam;
- (e) Any spillway discharge should be contained within stable defined channels until it enters any natural watercourse or waterway;
- (f) For embankments built on stable foundations, not subject to draw down and out of uniform soil material, the batters shall be no steeper than those shown in the table below, unless otherwise shown to be stable:

Embankment Soil	Upstream Batter	Downstream Batter
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Classification (Universal soil classification)		
GC, SC	2.5:1	2.0:1
CL, ML	3.5:1	2.5:1
CH, MH	3.5:1	2.5:1
GW, GP, GM, SW, SP, SM	Not suitable	Not suitable

Note: The codes for the Universal Soil Classification (e.g. GC) are detailed in the Australian Standard AS 1726 1993 Geotechnical Site Investigation, Appendix A.

- (g) Where foundation material differs from the embankment fill material, the batters shall be chosen conservatively to be consistent with the weaker material classification.

Construction:

- (a) Embankments must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures, flow velocities, material strength, stability and durability.
- (b) Fine grained soils used in embankment construction should be mechanically compacted when they are near or at the optimum moisture content (i.e. slightly plastic) to improve soil strength, minimise seepage and reduce the risk of piping failure
- (c) Where geo-membranes are used, ensure that they are placed, anchored and joined in accordance with the manufacturer's specification.
- (d) Where geo-membranes are used ensure that they are suitable to prevent leakage of the hazardous contaminants, which are contained within the dam.
- (e) Where geo-membranes are used for liners, filters or drains, ensure that the geo-membrane is in contact only with fine-grained soils to prevent punching or tearing of the membrane.
- (f) Embankments built out of pervious material must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures and flow velocities.
- (g) Where foundation material differs from embankment fill material, the embankment should be constructed out of the material, which gives the flatter batter.
- (h) Prior to construction of an embankment, the foundation should be cleared of all:
 - vegetation (grass, shrubs and trees);
 - soils containing organic matter (roots);
 - cracked soils (stiff plastic soils);
 - pervious soils (sand, gravel)
 - pervious material in rock faults, joints or the rock foundation itself.
- (i) Prior to construction of an embankment, all transverse trenches, holes and other irregularities should be plugged or backfilled to create a generally undulating foundation for placement of the embankment.
- (j) Fine-grained soils used in embankment construction should have a consistent texture and be free from foreign matter such as branches, logs, gravels or boulders etc.
- (k) Fine-grained soils including dispersive soils should be placed in the centre of or towards the upstream faces of embankment dams.
- (l) Coarser grained soils and rock materials are to be placed to wards and on the outer faces of embankment dams to minimise erosion and breaching potential.

- (m) Dispersive and easily erodible soils should not be used on the outer faces of embankment dams.
- (n) Provide adequate measures to control seepage through the dam wall and the transmission of contaminants through underlying soil layers or rock stratum.
- (o) Embankment dams should be constructed with stable earth materials that will not decay or generate leachate or hazardous contaminants.

Operation:

- (a) The dam should be operated to maintain a minimum freeboard of 0.5m below the spillway level.
- (b) To ensure that there is no leakage of hazardous wastes from any dam or evaporation pond associated with the petroleum activity a field based groundwater monitoring program must be established to ensure there is no contamination of any unsaturated perched systems or existing groundwater aquifers in the vicinity of the works. Three or more monitoring bores specifically designed for this purpose should be located in a cluster between the contaminant source and any environmentally sensitive place. The monitoring program should regularly record:
 - (a) water levels;
 - (b) water quality;
 - (c) flow rates; and
 - (d) direction of flow.
- (c) As far as practicable minimise seepage and return any contaminated seepage to the dam.

Maintenance:

- (a) Maintain the erosion resistance of the downstream face of the dam to avoid surface scour, which may lead to failure of the wall;
- (b) Maintain the erosion resistance of the spillway to avoid scouring during the design flood;
- (c) Prevent the establishment of trees or shrubs on water containing embankments (roots initiate seepage paths);
- (d) Control of burrowing insects and animals (initiation of piping paths);
- (e) Repair active erosion and piping processes; and
- (f) During initial filling or commissioning, the dam should be monitored for leaks, seepages, embankment deformation or other signs of embankment distress.

Decommissioning:

- (a) Removing (where possible) all remaining liquids in the dam (e.g. it is generally acceptable to evaporate the liquid if the dam is not to be left to the land owner / holder).
- (b) Remove (where possible) all contaminated solids from the dam and encapsulate in a purpose built storage facility, or
- (c) Encapsulate any residual contaminated solids in situ by capping with an appropriate capillary break and with one metre of clay or similar impermeable material;
- (d) Design, install and maintain adequate diversion drains or similar structures to protect or minimise the erosion of any exposed surfaces by stormwater runoff;
- (e) Design, install and maintain adequate surface drainage to prevent water ponding and infiltration into any contaminated materials;

- (f) Address contaminated site issues by referring to Condition 19 of this code;
- (g) Establish a monitoring program to determine the success of the decommissioning plan.
- (h) If required, remove the wall and rehabilitate the disturbed area in accordance with the rehabilitation conditions of this code; and
- (i) Rehabilitate the disturbed areas in accordance with the rehabilitation conditions of this code.

APPENDIX C Schedule of rehabilitation costs

GAS ACTIVITIES (Including Coal Seam Gas wells >350m)	
Activity Type	Unit Cost
First well	\$10,000
Subsequent wells	\$5,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Buried flow line construction	\$20,000 per gathering system project
Buried flow line in operation	\$500 per line
Flow lines – surface	\$200 per km
Borrow pit	\$1,000 each
Containment pond (water)	Site specific estimation
Contaminated land survey	\$20,000 per facility
Processing facility (small)	\$10,000 each
Processing facility (large)	Site specific estimation
Compressor only	\$5,000 each
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

GAS ACTIVITIES (Coal Seam Gas wells <350m)	
Activity Type	Unit Cost
First well	\$10,000
Subsequent wells	\$1,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Flow lines – buried	\$500 per line
Flow lines – surface	\$200 per line
Borrow pit	\$1,000 each
Containment pond (water)	Site specific estimation
Contaminated land survey	\$20,000 per facility

Processing facility (small)	\$10,000 each
Processing facility (large)	Site specific estimation
Compressor only	\$5,000 each
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

Note: Rehabilitation cost estimates must be based on third party costs for rehabilitation of land that has been "significantly disturbed" and may be reviewed annually by the administering authority.

Environmental authority

APPENDIX D – Schedule of disturbance

This form is required to be lodged with the **Initial Work Program** or **Development Plan**.
Where there is a change to the initial
significant disturbance and rehabilitation liability advice submitted with a program/plan, this
form is required to be updated and to

Project
name / ID

Plan /
Program

Commencement
date:

End
date:

Activity category / Disturbance type	Unit rehabilitation cost (GST Included) (from Schedule of Rehabilitation Costs) (A)	Existing significant disturbance at commencement of this Work Program/Development Plan (e.g. number of wells/ pits/ ponds) (B)	Maximum additional significant disturbance proposed during term of Work Program ¹ or Development Plan ¹ (C)	Rehabilitation of significant disturbance proposed during term of Program/Plan (D)	Maximum rehabilitation cost (B+C-D) x (A)
Total rehabilitation liability for the term of the work program or development plan					
Maintenance and monitoring costs (20% of rehab costs to a maximum amount of \$20,000)					

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



CPI (3% of total rehabilitation costs (compounded)) (This example is calculated for maximum disturbance in year 2)	
GST (10% of above costs if not already included)	
Financial assurance (Pay the difference between this amount and any financial assurance currently submitted for this project)	

¹Or as advised and attached with a submitted latter Work Program or Development Plan where there is a change to the initial significant disturbance and rehabilitation liability advice submitted with the Initial Work Program/Development Plan.

Certification

I/We (the current Environmental Authority holder) certify that: (select each to certify)

- ☐ The determination of this financial assurance is correct. ☐ The information I/we have provided on this form is accurate, complete and not misleading ¹.

HOLDER NAME / COMPANY	Please note: Where there is more than one holder, this certification may be signed by the holder authorized (in writing by all other holders) to sign on behalf of and to commit in all matters relevant to this environmental authority. Where the holder is a company, this form is to be signed by a person authorized (in writing) to sign for that company. ¹ It is an offence, under the <i>Environmental Protection Act 1994</i>, to give the administering authority information that is false, misleading or incomplete in any material particular. The maximum penalty for such action is 165 penalty units for an individual, or 825 penalty units where the applicant is a corporation (section 181B(3) of the <i>Penalties and Sentences Act 1992</i>). The current penalty unit value is \$75.00.
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END OF PERMIT

Permit¹

Environmental Protection Act 1994

Environmental authority

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

Permit¹ number: EPPG00832113

Environmental authority takes effect on 18-SEP-2014.

The anniversary date of this environmental authority is 1st November. An annual return and the payment of the annual fee will be due each year on this day.

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



Environmental authority holders

Name	Registered address
Santos Toga Pty Ltd	Santos Centre, Ground Floor 60 Flinders Street ADELAIDE BC SA 5000
Santos TPY CSG Corp	Santos Centre Level 14 60 Flinders Street ADELAIDE SA 5000
Santos TPY Corp	
Santos Queensland Corp	Santos Centre 60 Flinders Street ADELAIDE SA 5000
Bronco Energy Pty Ltd	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
PAPL (Upstream II) Pty Limited	Level 12 60 Carrington Street SYDNEY NSW 2000
Total E&P Australia	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
Total E&P Australia II	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
KGLNG E&P Pty Ltd	BGC Centre Level 11, 28 The Esplanade PERTH WA 6000
Santos QNT Pty Ltd	Santos Centre Ground Floor, 60 Flinders Street ADELAIDE SA 5000
Santos TOG Corp	Santos Centre Floor 14 60 Flinders Street ADELAIDE SA 5000

Environmentally relevant activity and location details

Environmentally relevant activity	Location
Petroleum	ATP745

Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

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



Signature

19/9/2014

Date

Jodie Brackenbury
Department of Environment and Heritage Protection
Delegate of the administering authority
Environmental Protection Act 1994

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

Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Location: ATP745

Relevant activity: Petroleum

The environmentally relevant activity(ies) conducted at the location as described above must be conducted in accordance with the following site specific conditions of approval.

SCHEDULE OF CONDITIONS

This environmental authority incorporates the following schedule of conditions relevant to various issues:

Schedule A - General Conditions

APPENDIX A - Definitions

APPENDIX B - Map of ATP745P

APPENDIX C - Environmentally Sensitive Areas

SCHEDULE A GENERAL CONDITIONS

Condition 1 – Significant disturbance

Petroleum activities must not cause more than 0.1% of the total land area on the relevant petroleum authorities (excluding pipeline licences) that constitute the petroleum project to be significantly disturbed any one time.

Condition 2 - Work program and development plan

The holder of the environmental authority must submit to the administering authority:

- (a) a copy of the initial work program, later work programs and any amendments to work programs when submitted to the Department of Employment, Economic Development and Innovation (DEEDI) under the *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act) for authorities to prospect; or
- (b) a copy of the initial development plan, later development plans and any amendments to development plans when submitted to the DEEDI under the P&G Act for petroleum leases.

Condition 3 – Financial assurance

The holder or proposed holder of the environmental authority must:

- (a) calculate a **financial assurance** as required by the administering authority ; and
- (b) attach a completed Schedule of Disturbance to the original and any amended work program or development plan; and
- (c) provide to the administering authority the financial assurance in the amount and form required by the administering authority at the time of submission of any original, later or amended work program or development plan; and
- (d) maintain the financial assurance until the administering authority is satisfied that no claim is likely to be made on the assurance.

Condition 4 – Environmentally sensitive areas

The holder of the environmental authority must not:

- (a) conduct petroleum activities within a category A or B environmentally sensitive area;
- (b) cause any significant disturbance to land within 1km of a category A environmentally sensitive area or within 500m of a category B environmentally sensitive area; or
- (c) conduct petroleum activities in a category C environmentally sensitive area unless there is a written agreement to enter the area for those activities from the relevant administering authority.

Condition 5

If the relevant administering authority imposes any conditions on undertaking petroleum activities within a Category C environmentally sensitive area, the holder must comply with those conditions.

Condition 6 – Heritage places and archaeological artefacts

The holder of the environmental authority must take all reasonable and practicable measures to avoid impacting upon places of known or potential cultural heritage significance whilst carrying out petroleum activities.

Condition 7 – Wild river areas

The holder of the environmental authority must ensure that any petroleum activities carried out within a wild river area comply with the conditions in the relevant **wild river declaration** for the area that state they are for petroleum activities.

Condition 8 – Clearing vegetation

Clearing vegetation must be minimised and only be undertaken where necessary to carry out the authorised petroleum activities. Where viable alternatives exist, clearing vegetation must not be undertaken:

- (a) in, or within 50 metres of, the **high bank** of a **watercourse**;
- (b) in, or within 100 metres of a **wetland** or **spring**;
- (c) in a way that dissects large tracts of vegetation resulting in a reduction in the current level of **ecosystem functioning**, an increase in **threatening processes**, or dissection of corridors of vegetation that provide connection between contiguous tracts of vegetation;
- (d) in a way that damages adjacent live vegetation;
- (e) in an **'of concern' regional ecosystem**;
- (f) on slopes greater than 6° (~10%);
- (g) on **dispersible soils** or **highly erodible soils**; or
- (h) in **discharge areas**.

Condition 9

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

Condition 10 – Topsoil management

Except in areas of highly erodible soils, topsoil must be:

- (a) removed from an area prior to other significant disturbance commencing in the area;
- (b) stockpiled in a manner that will minimise erosion and preserve its biological and chemical integrity; and
- (c) used only for on-site rehabilitation purposes.

Condition 11 – Acid sulfate soils

When carrying out petroleum activities in areas with a high probability of acid sulfate soils, the holder of the environmental authority must comply with an acid sulfate soil environmental management plan prepared in accordance with the *State Planning Policy 2/02 Guideline: Planning and Managing Development Involving Acid Sulfate Soils* and the relevant Guidelines.

Condition 12 – Drilling operations

All waste fluids and muds resulting from drilling and exploration activities must be contained in an appropriately constructed dam or containment structure for disposal, remediation or reuse where applicable.

Condition 13

Oil and synthetic based drilling muds are not authorised to be used under the authority.

Condition 14 – Pipeline construction

The pipeline construction corridor must not exceed 30 metres in width. Turn arounds and work areas must not exceed 50 metres in width.

Condition 15

During construction, pipe must be strung with gaps to allow for fauna movement across the line of the pipe.

Condition 16

Measures must be employed to prevent fauna entrapment in pipe sections or within the pipeline trench.

Condition 17

Open trenches and pipes must be checked for fauna prior to backfill and any trapped animals removed.

Condition 18

Hydrostatic test water must be contained in dams on site, tested and either:

- (a) directly reused where appropriate for petroleum activities;
- (b) treated so that it meets water quality criteria for the intended reuse; or

- (c) disposed of via evaporation.

Condition 19

The pipeline construction corridor must be rehabilitated on completion of laying the pipe, with the exception of the width of an access track, if necessary, to enable vehicular movement along the corridor for pipeline inspection and maintenance.

Condition 20 – Spill response

A spill response plan must be developed for all pipelines and other plant or equipment under this authority carrying liquids that have the potential to cause environmental harm. The plan must address the following:

- (a) monitoring and detection systems;
- (b) notification and reporting procedures (internal and external);
- (c) call-out procedures and contact lists;
- (d) measures required to halt the spill (i.e. control of pumps, valves etc);
- (e) spill containment procedures;
- (f) procedures to safely recover the spilt material;
- (g) clean up and rehabilitation procedures;
- (h) requirements for the remediation or disposal of contaminated soil;
- (i) personnel responsibilities;
- (j) equipment requirements, location, storage, maintenance and transport;
- (k) communications and logistics; and
- (l) incident investigation procedures.

Condition 21

Workforce training must be conducted in spill response and recovery procedures.

Condition 22 – Contaminant release

Contaminants that are likely to cause environmental nuisance, or serious or material environmental harm, must not be released directly or indirectly to land or **waters** unless explicitly authorised in the environmental authority.

Condition 23

As soon as the environmental authority holder is aware of any release to the environment specified in the preceding condition that is causing or threatening to cause environmental nuisance, or serious or material environmental harm, the release must be stopped, promptly rectified using appropriate equipment and remediation methods and all reasonable actions taken to prevent a recurrence of the release. Report in writing to the administering authority any findings and actions taken within 20 business days of that event.

Condition 24 – Bunding

Any container such as a tank or drum that contains material that has the potential to cause material or serious environmental harm if **released** to the environment must be appropriately labelled and be contained in a **bunded** area. Volumes of liquid less than 1000L may be stored without bunding if:

- (a) recovery of any spilt material is possible;
- (b) containers or drums are stored undercover on an impervious base;
- (c) the storage is occurring at least 50m from any waters; and
- (d) absorbent material is readily available for clean up if necessary.

Individual drums may be temporarily stored on spill containment pallets.

Condition 25

The net capacity of a bunded compound in a storage facility must be at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas.

Condition 26

If an automatic fire sprinkler system is installed in or over any bunded tank or drum storage compound, the capacity of the on-site containment must be increased to include the output from the sprinkler system over a 20 minute period.

Condition 27

If the material to be bunded is contained in drums (or other small containers) the bunded area must contain at least 25% of the total volume of the stored product.

Condition 28

The bund floor and wall must be built of materials impervious to the contents of any tank or container within the bund and be capable of preventing the migration of any spillage or leakage outside the bund wall to the environment.

Condition 29

Wall type bunds at tank storage facilities must be at least 0.5 metres high and not exceed 1.5 metres high. The distance between a tank and the bund wall must be at least 1 metre.

Condition 30

A collection sump must be provided in the bund floor and the floor must be graded in such a way that liquids collect in the sump. The sump must not be connected to a sewer drainage system or any waters.

Condition 31

The bund must be designed to minimise rainwater collection. Removal of accumulated rainwater must be done with a manually operated pump, baling from the sump or via a locked valve. Rainwater from the bund must meet water quality criteria for the intended use or receiving environment prior to release.

Condition 32

All pipework must be sited above ground and go over the bund walls where possible. Pumps must still be able to operate when the bund is full of liquid.

Condition 33

Piping and pumping facilities must be arranged so that the potential for leaks to escape the confines of the bund is minimised.

Condition 34 – Flammable and combustible liquids

Flammable and combustible liquids, including petroleum products, must be stored and handled in accordance with the latest edition of Australian Standard 1940 – The storage and handling of flammable and combustible liquids.

Condition 35 – Notification

The holder of this authority must:

- a) telephone the DERM's Pollution Hotline (1300 130 372) or local office as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of this authority or any event where environmental harm has been caused or threatened; and
- b) notify the administering authority in writing within 14 days of the initial notification.

Condition 36 – Erosion and sediment control

Erosion protection and sediment control measures must be designed, implemented and maintained to minimise erosion and the release of sediment resulting from carrying out the petroleum activities.

Condition 37 – Protection of watercourses, wetlands and springs

Unless otherwise approved under relevant legislation, the holder of the environmental authority must not:

- (a) excavate or place **fill** in a way that 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;
- (b) undertake activities that take water from a watercourse, wetland or spring; or
- (c) undertake activities that take **overland flow water** using works that are mentioned as assessable development in a water resource plan under the *Water Act 2000*.

Condition 38 – Activities in a watercourse, wetland or spring

Significant disturbance to the **bed or banks** of a watercourse or wetland, or to a spring must:

- (a) only be caused where necessary for the construction, operation and/or maintenance of roads, tracks and pipelines that are essential for carrying out other authorised petroleum activities and no reasonable alternative location is feasible; and
- (b) be no larger than the minimum area necessary for the purpose; and
- (c) be designed by an appropriately qualified person; and
- (d) be undertaken and maintained by a person with appropriate skills who has been informed of the design and is appropriately supervised; and
- (e) have rehabilitation commence as soon as reasonably practicable upon cessation of the relevant authorised petroleum activities.

Condition 39

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 in a spring.

Condition 40

Routine visual monitoring must be undertaken while carrying out petroleum activities in a watercourse, wetland or spring. If, due to the petroleum activities, water turbidity increases in the watercourse, wetland or spring outside contained areas, works must cease and the sediment control measures must be rectified before activities recommence.

Condition 41 – Management of dams

Only low hazard dams are authorised under this authority.

Condition 42

All **dams** must be designed, constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which they are intended.

Condition 43

The **hazard category** of each dam must be determined by a **suitably qualified and experienced person** prior to its construction and at least once per year, based on documented evidence sufficient to define or confirm the current nature and extent of environmental consequences from potential failure of that dam.

Condition 44

Where the hazard category of a dam is for the first time assessed as significant or high, the holder of the environmental authority must:

- (a) as soon as reasonably possible, advise the administering authority of the current details of that dam, including:
 - i. the assessed hazard category of that dam,
 - ii. sufficient points of latitude and longitude in the current Australian geodetic datum to form a perimeter around that dam and its associated works,
 - iii. the maximum surface area, maximum volume, maximum depth of that dam; and
- (b) apply to amend the environmental authority to a level 1 environmental authority; and
- (c) ensure that the dam meets the **hydraulic performance** required of the assessed hazard category within 12 months of that assessment.

Condition 45

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

Condition 46

In the event of early signs of loss of structural or hydraulic integrity, the holder of the environmental authority must immediately take action to prevent or minimise any actual or potential environmental harm, and report in writing any findings and actions taken to the administering authority within 20 business days of that event.

Condition 47 – Decommissioning dams

Each dam must be decommissioned such that it either:

- (a) becomes a **stable** landform that no longer contains **flowable substances**; or
- (b) is approved or authorised under relevant legislation for a **beneficial use**; or
- (c) is a void authorised by the administering authority to remain after decommissioning, or
- (d) is compliant with the rehabilitation requirements of the authority; and
- (e) is agreed by the post petroleum authority landowner/holder to remain after surrender of the environmental authority and meets water quality criteria for the intended use.

Condition 48 – Access to dams

Any dam constructed as part of the petroleum activities must be managed so that either:

- (a) where the quality of the water is likely to result in adverse health affects if contacted or consumed, adequate barriers are provided to limit access to the water by humans, livestock and native fauna; or
- (b) where the quality of the water will not result in any adverse health affects if contacted or consumed, safe access to the water is provided for livestock and native fauna.

Condition 49 – Associated water

Associated water may be temporarily contained in a dam or other containment vessel on site prior to:

- (a) reuse on site for petroleum activities; or
- (b) use under the provisions of the *Petroleum and Gas (Production and Safety) Act 2004*; or
- (c) use for an approved beneficial use; or
- (d) removal from site for treatment or disposal at an appropriately authorised facility.

Condition 50

If the use of associated water for a purpose other than a petroleum activity has been authorised by grant of a Notice of decision to approve a resource for beneficial use under Part 6A of the *Environmental Protection (Waste Management) Regulation 2000* it can be used in accordance with the Notice for the stated type of use(s).

Condition 51 – Release of contaminants to the atmosphere

The release of **noxious** or **offensive** odour, dust, particulate matter or any other airborne contaminant resulting from the petroleum activities must not cause environmental nuisance at any sensitive place or commercial place.

Condition 52 – Noise management

If the environmental authority holder receives a complaint as defined in Condition 63 about noise from the petroleum activities at a **sensitive place** or **commercial place**, the holder must conduct an appropriate investigation and must implement remedial action if the noise from the petroleum activities exceeds the noise limits at the sensitive place or commercial place in Table 1 – Noise Limits.

Table 1 – Noise limits

Sensitive place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
LA90, adj, 15 mins	lesser of bg+3 or 48	bg+0	bg+0	bg+0	bg+0	bg+0
LA10, adj, 15 mins	lesser of bg+5 or 50	lesser of bg+5 or 45	bg+0	lesser of bg+5 or 45	lesser of bg+5 or 40	bg+0
LA1, adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
Commercial place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
LA90, adj, 15 mins	lesser of bg+5 or 50	bg+0	bg+0	lesser of bg+3 or 43	bg+0	bg+0
LA10, adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
LA1, adj, 15 mins	lesser of bg+15 or 60	lesser of bg+15 or 55	lesser of bg+10 or 50	lesser of bg+15 or 55	lesser of bg+15 or 50	lesser of bg+10 or 45

- bg = **background noise level**
- In the event that measured bg is less than 25 dB(A), then 25 dB(A) is to be substituted for the measured level.
- If the background is higher than the number shown on the second line in any box, the limit is to be background plus 0.

Condition 53

The method of measurement and reporting of noise levels must comply with the latest edition of the Department of Environment and Resource Management's (Environmental Protection Agency's) Noise Measurement Manual or the most recent version of AS1055 Acoustics – Description and measurement of environmental noise.

Condition 54 – General waste management

Where practicable, general waste generated in carrying out the petroleum activities must be reused, recycled or removed to a facility that can lawfully accept the waste under the *Environmental Protection Act 1994*.

Condition 55

If no viable alternative exists, solid general waste may be disposed of on site at a facility designed to receive waste at a rate of less than 50t per year only if it is:

- (a) disposed of into a waste disposal trench;
- (b) consolidated, compacted and covered with a layer of inert material following placement of the waste into the trench;
- (c) managed in a way that prevents scavenging and access by vermin;
- (d) managed in a way that prevents or contains wind blown litter; and
- (e) managed in a way that prevents or controls **leachate** generated from the activity.

Condition 56

Waste, including vegetation, must not be burnt.

Condition 57 – Regulated waste

Regulated waste must be removed and transported from the site by a person who holds a current authority to transport such wastes to a facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994*.

Condition 58

Regulated waste generated in carrying out the petroleum activities can be temporarily stored on the site awaiting removal provided:

- (a) it is stored in a place and circumstance in which there is minimal risk of causing contamination to land or waters or a fire hazard; and
- (b) each container of regulated waste stored awaiting movement off site is clearly marked to identify the contents.

Condition 59

A record of all regulated waste (excluding trackable waste) must be kept detailing the following information:

- (a) date of pickup of waste;
- (b) description of waste;
- (c) quantity of waste;
- (d) origin of waste; and
- (e) destination of waste.

Condition 60 – Sewage

Disposal of sewage effluent must not cause environmental nuisance or material or serious environmental harm.

Condition 61

Sewage treatment works on the site must not exceed a combined peak design capacity to treat sewage of more than 21 **equivalent persons**.

Condition 62 – Monitoring

The holder of the environmental authority must:

- (a) develop a monitoring program that will demonstrate compliance with the conditions of the environmental authority;
- (b) document monitoring and inspections carried out under the monitoring program and any actions taken; and
- (c) record, compile and keep for a minimum of seven (7) years all monitoring results and data.

Condition 63 - Complaints

The holder of the environmental authority must:

- (a) when the administering authority advises the holder of a complaint that the administering authority does not consider to be frivolous, vexatious or based on a mistaken belief alleging nuisance (e.g. caused by dust or noise), investigate the complaint and advise the administering authority of the action proposed or undertaken in relation to the complaint;
- (b) if the administering authority is not satisfied with the proposed or completed action, undertake monitoring or other action requested by the administering authority; and
- (c) maintain a record of complaints and incidents causing environmental harm and actions taken in response to the complaints or incidents for a minimum of seven (7) years.

Condition 64 - Rehabilitation

As soon as practicable after the **end** of petroleum activities that have caused significant disturbance to land, the holder of the environmental authority must:

- (a) remediate contaminated land caused by petroleum activities in accordance with EP Act requirements and this authority; and
- (b) undertake works to establish a safe, **stable**, non polluting landform similar to that of surrounding undisturbed areas, including where relevant:
 - i. backfilling any **voids** and trenches;
 - ii. neutralising and /or encapsulating any acid producing or potentially acid producing material;
 - iii. removing or encapsulating in low permeability material saline residues from evaporation ponds;

- iv. re-establishing surface drainage lines;
- v. minimising the potential for slumping, subsidence or erosion;
- vi. reinstating the top layer of the soil profile;
- vii. resspreading any cleared vegetation; and
- viii. promoting establishment of vegetation of similar species composition and density of cover to the surrounding undisturbed land;

unless the holder has the written consent of the landowner/holder and the administering authority.

Condition 65 – Maintenance of land rehabilitation

Monitoring and maintenance of rehabilitated areas must take place to ensure and demonstrate:

- (a) stability of landforms;
- (b) erosion control measures remain effective;
- (c) stormwater runoff and seepage from rehabilitated areas does not negatively affect the environmental values of any waters;
- (d) plants show healthy growth and recruitment is occurring; and
- (e) rehabilitated areas are free of any **declared pest plants**.

Condition 66 – Rehabilitation Success

Rehabilitation can be considered successful when the site can be managed for its designated land-use (either similar to that of surrounding undisturbed areas or as otherwise agreed in a written document with the landowner/holder and administering authority) without any greater management input than for other land in the area being used for a similar purpose and there is evidence that the rehabilitation has been successful for at least three (3) years.

Condition 67 – Decommissioning pipelines

Decommission inactive buried pipelines by in-situ decommissioning (abandonment in place).

Condition 68

Prior to pipelines and equipment being disconnected they must be drained or vented and cleaned via purging or flushing.

Condition 69

Any water used for purging or flushing pipelines must be contained in dams on site, tested and either:

- (a) directly reused where suitable for petroleum activities;
- (b) treated so that it meets water quality criteria for the intended reuse; or

- (c) removed from the site for disposal or treatment at an appropriately authorised facility;
or
- (d) disposed of via evaporation in a suitably lined pond.

Condition 70 – Infrastructure

All above ground **infrastructure** used for the petroleum activities must be removed prior to surrender of the environmental authority, except where it is to remain under the authority of the *Petroleum and Gas (Production and Safety) Act 2004*, or with the written agreement of the administering authority and the post petroleum authority landowner/holder.

Condition 71 – Transition of petroleum authority

The holder of the environmental authority must take responsibility for the rehabilitation of any disturbance to land undertaken as part of a petroleum activity on a petroleum authority that has been transitioned (all or in part) due to the grant of a new petroleum authority over that land which now forms part of the current project.

APPENDIX A – Definitions

Note: Where a term is not defined in this Authority, the definition in the *Environmental Protection Act 1994*, its regulations and Environmental Protection Policies or the *Petroleum and Gas (Production and Safety) Act 2004* and its regulations must be used in that order.

Accepted engineering standards, in relation to dams, means those standards of design, **construction**, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the Australian National Committee on Large Dams (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.

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

Appropriately 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.

Archaeological artefact means:

- (a) any artefact that is evidence of an aspect of Queensland's history, whether it is located in, on or below the surface of land, and not
- (b) a thing that is Aboriginal cultural heritage under the *Aboriginal Cultural Heritage Act 2003* or Torres Strait Islander cultural heritage under the *Torres Strait Islander Cultural Heritage Act 2003*.

Archaeological investigation means a physical investigation of the place carried out by a person or persons with recognised qualifications, experience or standing in historical archaeology, mining history, cultural heritage management, or related discipline for the purpose of investigating, recording or conserving archaeological artefacts on the place.

Archaeological place means a place entered in the Queensland heritage register under Part 5 of the *Queensland Heritage Act 1992*.

Assessed or assess by a suitably qualified and experienced person in relation to a hazard 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 at any time:

- (a) what has been assessed and the precise nature of that assessment;
- (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 activity authorised under a petroleum authority, such as producing petroleum from a well, and includes water also known as produced formation water. The term includes all contaminants suspended or dissolved in the water.

Associated works in relation to a dam means:

- (a) operations of any kind and all things constructed, erected or installed for that dam; and
- (b) any land used for those operations.

Background noise level means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90, T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

Bed and banks for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

Beneficial use means:

1. with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - (a) of benefit to that owner in that it adds real value to their business or to the general community,
 - (b) in accordance with relevant provisions of the *Environmental Protection Act 1994*,
 - (c) sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - (d) the transfer and use have been approved or authorised under any relevant legislation; or
2. with respect to associated water, see Environmental Protection Agency's Operational Policy *Management of water produced in association with petroleum activities (associated water)* and *Notice of decision to approve a resource for beneficial use – associated water* which can be accessed on Department of Environment and Resource Management's website at www.derm.qld.gov.au.

Bund or banded in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks

from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

Certification or certified by a suitably qualified and experienced person in relation to a **design plan** or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- (a) exactly what is being certified and the precise nature of that certification;
- (b) the relevant legislative, regulatory and technical criteria on which the certification has been based;
- (c) the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- (d) the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

Clearing means:

- (a) in relation to grass, scrub or bush - the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include—
 - i the flattening or compaction of vegetation by vehicles if the vegetation remains living; or
 - ii the slashing or mowing of vegetation to facilitate access tracks; or
 - iii the clearing of noxious or introduced plant species; and
- (b) in relation to trees - cutting down, ringbarking, pushing over, poisoning or destroying in any way.

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.

Construction in relation to a dam includes building a new dam and modifying or lifting an existing dam.

Cultural heritage significance means aesthetic, architectural, historical, scientific, social or other significance, to the present generation or past or future generations, as assessed against the following criteria:

- (a) the place is important in demonstrating the evolution or pattern of Queensland's history;
- (b) the place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage;
- (c) the place has potential to yield information that will contribute to an understanding of Queensland's history;

- (d) the place is important in demonstrating the principal characteristics of a particular class of cultural places;
- (e) the place is important because of its aesthetic significance;
- (f) the place is important in demonstrating a high degree of creative or technical achievement at a particular period;
- (g) the place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- (h) the place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

Dam means a land-based structure (including a **levee**, dyke or bund) or a void that is intended or used to contain, divert or control **flowable substances**, and includes any substances that are thereby contained or controlled by that land-based structure or void and **associated works**. However; a dam does *not* mean a fabricated or manufactured tank or container designed to a recognised standard, nor does a dam mean a land-based structure where that structure is designed to an Australian Standard such as a bund designed for spill containment to AS1940.

Declared pest plants are listed in Schedule 2 of the *Land Protection (Pest and Stock Route Management) Regulation 2003*.

Design plan is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.

Discharge area is an area in the landscape where the net movement of groundwater is out of the aquifer. This may be expressed by waterlogging where groundwater discharges at the soil surface because of seepage or salting because of evaporation.

Dispersible soils are structurally unstable soils that readily breakdown into their constituent particles in water (e.g. the clay material disintegrates into particles less than 2 microns across within 24 hours when soil crumbs are submerged in distilled water). These soils are also known as sodic soils and have a high percentage of sodium ions (in soluble or exchangeable form).

Ecosystem functioning means the interactions between and within living and non-living components of an ecosystem and generally correlates with the size, shape and location of an area of vegetation.

End means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related activities such as rehabilitation. In other words, it does not refer to the 'completion' of the petroleum activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.

Equivalent person means an equivalent person as defined in Item 63 of Schedule 2 in the *Environmental Protection Regulation 2008*.

Evaporation pond means a dam specifically designed for the purpose of disposing of a liquid via evaporation.

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.

Financial assurance means a security deposit, either cash or a bank guarantee, held by the administering authority to cover the potential costs of preventing or minimising environmental harm from, or rehabilitating areas significantly disturbed by, the petroleum activities.

Flowable substance means matter or a mixture of materials which can flow under conditions potentially affecting that substance. Constituents of a flowable substance can include water, other fluids or solids, or a mixture that includes water and any other fluids or solids either in solution or suspension.

Foreseeable future is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.

Hazard in relation to a dam as defined means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

Hazard category means the level of hazard (low, significant or high) assigned to a dam as a result of an assessment against tables and other criteria in *the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (Version 1.0, 2008)* published by the Environmental Protection Agency (Department of Environment and Resource Management) on its website.

Heritage place means any place that may be of **cultural heritage significance**, or any place with potential to contain **archaeological artefacts** that are an important source of information about Queensland's history.

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.

Highly erodible soils means very unstable soils that are generally described as Sodosols with hard-setting, fine sandy loam to silty clay loam surfaces (solodics, solodised solonetz and solonetz) or soils with a dispersible layer located less than 25cm deep or soils less than 25cm deep.

Hydraulic performance means the capacity of a **regulated dam** to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (Version 1.0, 2008)* published by the Department of Environment and Resource Management on its website.

Infrastructure means water storage dams, roads and tracks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activities, but does not include other facilities required for the long term management of the impact of those activities or the protection of potential resources. Such other facilities include dams other

than water storage dams (e.g. evaporation ponds), pipelines and assets that have been decommissioned, rehabilitated and lawfully recognised as being subject to subsequent transfer with ownership of the land.

L_{A90}, adj, 15 mins means the A-weighted sound pressure level exceeded for 90 percent of the measurement time period of 15 minutes, adjusted for noise characteristics including tonality and impulsiveness and measured in the presence of the noise under investigation, using Fast Response.

L_{A10}, adj, 15 mins means the A-weighted sound pressure level exceeded for 10 percent of the measurement time period of 15 minutes, adjusted for noise character including tonality and impulsiveness and measured in the presence of the noise under investigation, using Fast Response.

L_{A1}, adj, 15 mins means the A-weighted sound pressure level exceeded for 1 percent of the measurement time period of 15 minutes, adjusted for noise character including tonality and impulsiveness and measured in the presence of the noise under investigation, using Fast Response.

Leachate means a liquid that contains soluble, suspended or miscible contaminants likely to have been derived from material which is stored, processed or disposed of on site and which the liquid has passed through or emerged from, or is likely to have passed through or emerged from.

Levee means a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.

Limited regulated waste means any of the following regulated wastes, asbestos, clinical waste or quarantine waste that has been rendered non-infectious, fish processing waste, food processing waste, poultry processing waste, tyres or treatment tank sludge or residue produced in the carrying out of an activity in relation to sewage treatment and water supply activities.

Noxious means harmful or injurious to health or physical well being.

'Of concern' regional ecosystem means an 'of concern' regional ecosystem identified in the database maintained by the Department of Environment and Resource Management called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions. The database is available for inspection on the Department of Environment and Resource Management's website at www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/.

Offensive means causing unreasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

Overland flow water means water, including floodwater, flowing over land, otherwise than in a watercourse or lake:

- (a) after having fallen as rain or in any other way; or
- (b) after rising to the surface naturally from underground.

Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc) which is to be left by agreement with the landowner.

Petroleum authority is:

- (a) a 1923 Act petroleum tenure granted under the *Petroleum Act 1923*; or
- (b) a petroleum authority granted under the *Petroleum and Gas (Production and Safety) Act 2004*; or
- (c) a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*.

Regulated dam means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (Version 1.0, 2008)* published by the Department of Environment and Resource Management on its website.

Regulated waste means non-domestic waste mentioned in Schedule 7 of the *Environmental Protection Regulation 2008* (whether or not it has been treated or immobilised), and includes—

- (a) for an element – any chemical compound containing the element; and
- (b) anything that has contained the waste.

Release of a contaminant into the environment includes:

- (a) to deposit, discharge, emit or disturb the contaminant; and
- (b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- (c) to allow the contaminant to escape; and
- (d) to fail to prevent the contaminant from escaping.

Sensitive place means:

- (a) a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel;
- (b) a library, childcare centre, kindergarten, school, university or other educational institution;
- (c) a medical centre, surgery or hospital;
- (d) a protected area;
- (e) 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.

Significantly disturbed land or **significant disturbance to land** means land that is:

- (a) contaminated land; or
- (b) disturbed and human intervention is needed to rehabilitate it:
 - i to a state required under this authority; or

- ii if the authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Examples of a significant disturbance to land:

- (a) areas where soil has been compacted, removed, covered, exposed or stockpiled;
- (b) areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion;
- (c) areas where land use suitability or capability has been diminished;
- (d) areas within a watercourse, wetland, or spring where petroleum activities have occurred causing the loss of habitat or a decline in ecological processes and requiring human intervention to restore or stabilise the disturbed area and/or protect the quality of the water downstream of the disturbance;
- (e) areas submerged by waste or water;
- (f) areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after petroleum activities have ceased; or
- (g) areas where land has become contaminated land and a suitability statement has not been issued.

However, for the purpose of this authority the following areas are not significantly disturbed:

- (a) areas off the petroleum authority (e.g. roads or tracks which provide access to the petroleum authority);
- (b) areas previously significantly disturbed which have been rehabilitated to the administering authority's satisfaction;
- (c) areas under permanent infrastructure (e.g. roads, bridges, buildings) as agreed by the administering authority and landholder;
- (d) areas that were significantly disturbed prior to the grant of the petroleum authority, unless those areas are re-disturbed by the petroleum authority holder during the course of carrying out the petroleum activities or were conducted on a petroleum authority that was replaced by the current authority (e.g. through conditional surrender or the transition from an authority to prospect to a petroleum lease).

Site means the area within the petroleum authority or authorities to which the environmental authority relates.

Spring means the land to which water rises naturally from below the ground and the land over which the water then flows.

Stable in relation to land means landform dimensions are or will be stable within **tolerable limits** now and in the **foreseeable future**. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

State heritage place means a place entered in the Queensland heritage register under Part 4 of the *Queensland Heritage Act 1992*.

Suitably qualified and experienced person in relation to dams means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, OR registered as a National Professional Engineer (NPER) with the Institution of Engineers Australia, OR holds equivalent professional qualifications to the satisfaction of the administering authority for the Act; AND the administering authority for the Act is satisfied that person has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

- (a) knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- (b) a total of five (5) years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry; and
- (c) a total of five (5) years of suitable experience and demonstrated expertise each, in three (3) of the following categories:
 - i investigation and design of dams;
 - ii construction, operation and maintenance of dams;
 - iii hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology;
 - iv hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes;
 - v hydrogeology with particular reference to seepage, groundwater;
 - vi solute transport processes and monitoring thereof;
 - vii dam safety.

Thing means a material object without life or consciousness or some entity, object or creature which is not or cannot be specifically designated or precisely described.

Threatening processes are processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation. For example, altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation.

Tolerable limits means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values. For example, a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing pondage and limiting infiltration and percolation.

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 300mm in depth from the natural surface.

Void means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

Waters includes all or any part of a creek, river, stream, lake, lagoon, pond, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed

and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.

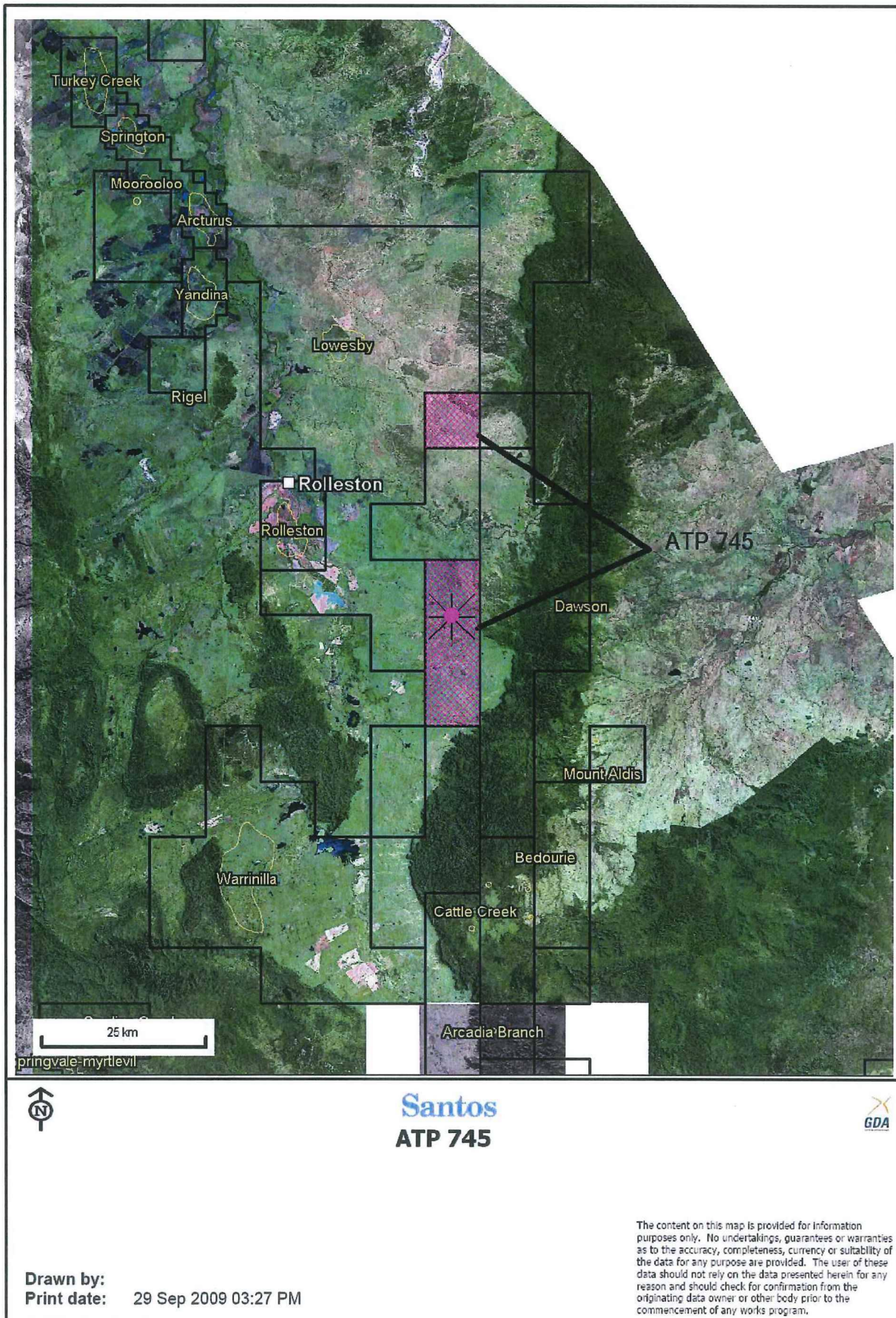
Watercourse is a creek, river or stream

- (a) in which water flows intermittently or permanently in a visibly defined channel, whether artificial, artificially improved or natural; and
- (b) that has evidence of biological dependence on any water that flows in the creek, river or stream or on the banks or bed.

Wetland means an area shown as a wetland on a 'Map of referable wetlands', a document approved by the chief executive (environment). A map of referable wetlands can be viewed at www.derm.qld.gov.au.

Wild river declaration is a statutory instrument under the *Wild Rivers Act 2005*. A declaration lists the relevant natural values to be preserved and delineates certain parts of the wild river area and the different constraints that may apply in these areas. With reference to environmental authorities for petroleum, each declaration also specifies conditions to be included in a new authority if the activity is to be located within the wild river area.

APPENDIX B – Map of ATP745P



APPENDIX C – Environmentally Sensitive Areas

Category A and B environmentally sensitive areas

Category A and B environmentally sensitive areas are listed in Section 25 and 26 respectively of the *Environmental Protection Regulation 2008*.

Category C environmentally sensitive areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
Nature Refuges and Resource Reserves	<i>Nature Conservation Act 1992</i>	Department of Environment and Resource Management
Koala Habitat Area	<i>Nature Conservation (Koala) Conservation Plan 2006</i>	Department of Environment and Resource Management
An area identified as essential habitat by the EPA for a species of wildlife listed as endangered, vulnerable, near threatened or rare under the Nature Conservation Act 1992	<i>Nature Conservation Act 1992</i>	Department of Environment and Resource Management
Declared Catchment Areas	<i>Water Act 2000</i>	Department of Environment and Resource Management and/or Relevant Storage Operator or Board
River Improvement Areas	<i>River Improvement Trust Act 1940</i>	Department of Environment and Resource Management and the Relevant River Trust
Former Designated Landscape Area - Stanbroke Pastoral Holding	<i>Aboriginal Cultural Heritage Act 2003</i>	Department of Environment and Resource Management
Areas under Part 5 Division 2 of the Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Environment and Resource Management
State Forest or Timber Reserves	<i>Forestry Act 1959</i>	Department of Environment and Resource Management
DPI Research Sites	<i>Nil</i>	Department of Employment, Economic Development and

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
		Innovation
Areas of land occupied by the Bureau of Sugar Experiment Stations.	<i>Sugar Industry Act 1999</i>	Department of Employment, Economic Development and Innovation
Coastal Management Districts	<i>Coastal Protection and Management Act 1995</i>	Department of Environment and Resource Management
Declared Areas	<i>Sections 17, 18 and 19a of the Vegetation Management Act 1999</i>	Department of Environment and Resource Management
An area shown as a wetland on a 'map of referable wetlands'	<i>Environmental Protection Act 1994</i>	Department of Environment and Resource Management
Reserves under the Land Act 1994	<i>Land Act 1994</i>	Department of Environment and Resource Management
An 'of concern' regional ecosystem identified in the database maintained by the Department of Environment and Resource Management called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions.	<i>Nil</i>	Department of Environment and Resource Management

Important Note: Regional ecosystem classification is determined according to the Queensland Herbarium *Biodiversity Status Classification*. Information on ERE's is maintained by the DERM on the Regional Ecosystem Description Database.

END OF PERMIT

Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

Environmental authority

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

Permit¹ number: EPPG00832313

Environmental authority takes effect on 18-SEP-2014.

The anniversary date of this environmental authority is the 1ST November. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name	Registered address
Santos CSG Pty Limited	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
PAPL (Upstream II) Pty Limited	Level 12 60 Carrington Street SYDNEY NSW 2000
Total E&P Australia	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
Total E&P Australia II	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
KGLNG E&P Pty Ltd	BGC Centre Level 11, 28 The Esplanade PERTH WA 6000
Vamgas Pty Ltd	GF Santos House 91 King William Street ADELAIDE SA 5000

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum	ATP868

Additional information for applicants

Environmentally relevant activities

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

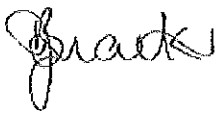
The description of any environmentally relevant activity (ERA) for which an environmental authority is issued is a restatement of the ERA as defined by legislation at the time the approval is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an environmental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

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

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

Contaminated land

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



Signature

Jodie Brackenbury
Department of Environment and Heritage Protection
Delegate of the administering authority
Environmental Protection Act 1994

19/9/2014

Date

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

Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Location: ATP868

Relevant activity: Petroleum

The environmentally relevant activity conducted at the location as described above must be conducted in accordance with the following site specific conditions of approval.

SCHEDULE OF CONDITIONS

This environmental authority incorporates the following schedule of conditions relevant to various issues:

Schedule A - General Conditions

APPENDIX A - Definitions

APPENDIX B - Map of ATP868

APPENDIX C - Environmentally Sensitive Areas

SCHEDULE A GENERAL CONDITIONS

Condition 1 – Significant disturbance

Petroleum activities must not cause more than 0.1% of the total land area on the relevant petroleum authorities (excluding pipeline licences) that constitute the petroleum project to be significantly disturbed any one time.

Condition 2 - Work program and development plan

The holder of the environmental authority must submit to the administering authority:

- (a) a copy of the initial work program, later work programs and any amendments to work programs when submitted to the Department of Employment, Economic Development and Innovation (DEEDI) under the *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act) for authorities to prospect; or
- (b) a copy of the initial development plan, later development plans and any amendments to development plans when submitted to the DEEDI under the P&G Act for petroleum leases.

Condition 3 – Financial assurance

The holder or proposed holder of the environmental authority must:

- (a) calculate a **financial assurance** as required by the administering authority ; and
- (b) attach a completed Schedule of Disturbance to the original and any amended work program or development plan; and
- (c) provide to the administering authority the financial assurance in the amount and form required by the administering authority at the time of submission of any original, later or amended work program or development plan; and
- (d) maintain the financial assurance until the administering authority is satisfied that no claim is likely to be made on the assurance.

Condition 4 – Environmentally sensitive areas

The holder of the environmental authority must not:

- (a) conduct petroleum activities within a category A or B environmentally sensitive area;
- (b) cause any significant disturbance to land within 1km of a category A environmentally sensitive area or within 500m of a category B environmentally sensitive area; or
- (c) conduct petroleum activities in a category C environmentally sensitive area unless there is a written agreement to enter the area for those activities from the relevant administering authority.

Condition 5

If the relevant administering authority imposes any conditions on undertaking petroleum activities within a Category C environmentally sensitive area, the holder must comply with those conditions.

Condition 6 – Heritage places and archaeological artefacts

The holder of the environmental authority must take all reasonable and practicable measures to avoid impacting upon places of known or potential cultural heritage significance whilst carrying out petroleum activities.

Condition 7 – Wild river areas

The holder of the environmental authority must ensure that any petroleum activities carried out within a wild river area comply with the conditions in the relevant **wild river declaration** for the area that state they are for petroleum activities.

Condition 8 – Clearing vegetation

Clearing vegetation must be minimised and only be undertaken where necessary to carry out the authorised petroleum activities. Where viable alternatives exist, clearing vegetation must not be undertaken:

- (a) in, or within 50 metres of, the **high bank** of a **watercourse**;
- (b) in, or within 100 metres of a **wetland** or **spring**;
- (c) in a way that dissects large tracts of vegetation resulting in a reduction in the current level of **ecosystem functioning**, an increase in **threatening processes**, or dissection of corridors of vegetation that provide connection between contiguous tracts of vegetation;
- (d) in a way that damages adjacent live vegetation;
- (e) in an '**of concern**' **regional ecosystem**;
- (f) on slopes greater than 6° (~10%);
- (g) on **dispersible soils** or **highly erodible soils**; or
- (h) in **discharge areas**.

Condition 9

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

Condition 10 – Topsoil management

Except in areas of highly erodible soils, topsoil must be:

- (a) removed from an area prior to other significant disturbance commencing in the area;
- (b) stockpiled in a manner that will minimise erosion and preserve its biological and chemical integrity; and
- (c) used only for on-site rehabilitation purposes.

Condition 11 – Acid sulfate soils

When carrying out petroleum activities in areas with a high probability of acid sulfate soils, the holder of the environmental authority must comply with an acid sulfate soil environmental management plan prepared in accordance with the *State Planning Policy 2/02 Guideline: Planning and Managing Development Involving Acid Sulfate Soils* and the relevant Guidelines.

Condition 12 – Drilling operations

All waste fluids and muds resulting from drilling and exploration activities must be contained in an appropriately constructed dam or containment structure for disposal, remediation or reuse where applicable.

Condition 13

Oil and synthetic based drilling muds are not authorised to be used under the authority.

Condition 14 – Pipeline construction

The pipeline construction corridor must not exceed 30 metres in width. Turn arounds and work areas must not exceed 50 metres in width.

Condition 15

During construction, pipe must be strung with gaps to allow for fauna movement across the line of the pipe.

Condition 16

Measures must be employed to prevent fauna entrapment in pipe sections or within the pipeline trench.

Condition 17

Open trenches and pipes must be checked for fauna prior to backfill and any trapped animals removed.

Condition 18

Hydrostatic test water must be contained in dams on site, tested and either:

- (a) directly reused where appropriate for petroleum activities;
- (b) treated so that it meets water quality criteria for the intended reuse; or

(c) disposed of via evaporation.

Condition 19

The pipeline construction corridor must be rehabilitated on completion of laying the pipe, with the exception of the width of an access track, if necessary, to enable vehicular movement along the corridor for pipeline inspection and maintenance.

Condition 20 – Spill response

A spill response plan must be developed for all pipelines and other plant or equipment under this authority carrying liquids that have the potential to cause environmental harm. The plan must address the following:

- (a) monitoring and detection systems;
- (b) notification and reporting procedures (internal and external);
- (c) call-out procedures and contact lists;
- (d) measures required to halt the spill (i.e. control of pumps, valves etc);
- (e) spill containment procedures;
- (f) procedures to safely recover the spilt material;
- (g) clean up and rehabilitation procedures;
- (h) requirements for the remediation or disposal of contaminated soil;
- (i) personnel responsibilities;
- (j) equipment requirements, location, storage, maintenance and transport;
- (k) communications and logistics; and
- (l) incident investigation procedures.

Condition 21

Workforce training must be conducted in spill response and recovery procedures.

Condition 22 – Contaminant release

Contaminants that are likely to cause environmental nuisance, or serious or material environmental harm, must not be released directly or indirectly to land or **waters** unless explicitly authorised in the environmental authority.

Condition 23

As soon as the environmental authority holder is aware of any release to the environment specified in the preceding condition that is causing or threatening to cause environmental nuisance, or serious or material environmental harm, the release must be stopped, promptly rectified using appropriate equipment and remediation methods and all reasonable actions taken to prevent a recurrence of the release. Report in writing to the administering authority any findings and actions taken within 20 business days of that event.

Condition 24 – Bunding

Any container such as a tank or drum that contains material that has the potential to cause material or serious environmental harm if **released** to the environment must be appropriately labelled and be contained in a **bunded** area. Volumes of liquid less than 1000L may be stored without bunding if:

- (a) recovery of any spilt material is possible;
- (b) containers or drums are stored undercover on an impervious base;
- (c) the storage is occurring at least 50m from any waters; and
- (d) absorbent material is readily available for clean up if necessary.

Individual drums may be temporarily stored on spill containment pallets.

Condition 25

The net capacity of a bunded compound in a storage facility must be at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas.

Condition 26

If an automatic fire sprinkler system is installed in or over any bunded tank or drum storage compound, the capacity of the on-site containment must be increased to include the output from the sprinkler system over a 20 minute period.

Condition 27

If the material to be bunded is contained in drums (or other small containers) the bunded area must contain at least 25% of the total volume of the stored product.

Condition 28

The bund floor and wall must be built of materials impervious to the contents of any tank or container within the bund and be capable of preventing the migration of any spillage or leakage outside the bund wall to the environment.

Condition 29

Wall type bunds at tank storage facilities must be at least 0.5 metres high and not exceed 1.5 metres high. The distance between a tank and the bund wall must be at least 1 metre.

Condition 30

A collection sump must be provided in the bund floor and the floor must be graded in such a way that liquids collect in the sump. The sump must not be connected to a sewer drainage system or any waters.

Condition 31

The bund must be designed to minimise rainwater collection. Removal of accumulated rainwater must be done with a manually operated pump, baling from the sump or via a locked valve. Rainwater from the bund must meet water quality criteria for the intended use or receiving environment prior to release.

Condition 32

All pipework must be sited above ground and go over the bund walls where possible. Pumps must still be able to operate when the bund is full of liquid.

Condition 33

Piping and pumping facilities must be arranged so that the potential for leaks to escape the confines of the bund is minimised.

Condition 34 – Flammable and combustible liquids

Flammable and combustible liquids, including petroleum products, must be stored and handled in accordance with the latest edition of Australian Standard 1940 – The storage and handling of flammable and combustible liquids.

Condition 35 – Notification

The holder of the environmental authority must notify the administering authority as soon as practicable after becoming aware of any act occurring as a result of carrying out a relevant petroleum activity, causing or threatening unlawful serious or material environmental harm.

Condition 36 – Erosion and sediment control

Erosion protection and sediment control measures must be designed, implemented and maintained to minimise erosion and the release of sediment resulting from carrying out the petroleum activities.

Condition 37 – Protection of watercourses, wetlands and springs

Unless otherwise approved under relevant legislation, the holder of the environmental authority must not:

- (a) excavate or place **fill** in a way that 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;
- (b) undertake activities that take water from a watercourse, wetland or spring; or
- (c) undertake activities that take **overland flow water** using works that are mentioned as assessable development in a water resource plan under the *Water Act 2000*.

Condition 38 – Activities in a watercourse, wetland or spring

Significant disturbance to the **bed or banks** of a watercourse or wetland, or to a spring must:

- (a) only be caused where necessary for the construction, operation and/or maintenance of roads, tracks and pipelines that are essential for carrying out other authorised petroleum activities and no reasonable alternative location is feasible; and
- (b) be no larger than the minimum area necessary for the purpose; and
- (c) be designed by an appropriately qualified person; and
- (d) be undertaken and maintained by a person with appropriate skills who has been informed of the design and is appropriately supervised; and
- (e) have rehabilitation commence as soon as reasonably practicable upon cessation of the relevant authorised petroleum activities.

Condition 39

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 in a spring.

Condition 40

Routine visual monitoring must be undertaken while carrying out petroleum activities in a watercourse, wetland or spring. If, due to the petroleum activities, water turbidity increases in the watercourse, wetland or spring outside contained areas, works must cease and the sediment control measures must be rectified before activities recommence.

Condition 41 – Management of dams

Only low hazard dams are authorised under this authority.

Condition 42

All **dams** must be designed, constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which they are intended.

Condition 43

The **hazard category** of each dam must be determined by a **suitably qualified and experienced person** prior to its construction and at least once per year, based on documented evidence sufficient to define or confirm the current nature and extent of environmental consequences from potential failure of that dam.

Condition 44

Where the hazard category of a dam is for the first time assessed as significant or high, the holder of the environmental authority must:

- (a) as soon as reasonably possible, advise the administering authority of the current details of that dam, including:
 - i. the assessed hazard category of that dam,
 - ii. sufficient points of latitude and longitude in the current Australian geodetic datum to form a perimeter around that dam and its associated works,
 - iii. the maximum surface area, maximum volume, maximum depth of that dam; and
- (b) apply to amend the environmental authority to a level 1 environmental authority; and
- (c) ensure that the dam meets the **hydraulic performance** required of the assessed hazard category within twelve months of that assessment.

Condition 45

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

Condition 46

In the event of early signs of loss of structural or hydraulic integrity, the holder of the environmental authority must immediately take action to prevent or minimise any actual or potential environmental harm, and report in writing any findings and actions taken to the administering authority within 20 business days of that event.

Condition 47 – Decommissioning dams

Each dam must be decommissioned such that it either:

- (a) becomes a **stable** landform that no longer contains **flowable substances**; or
- (b) is approved or authorised under relevant legislation for a **beneficial use**; or
- (c) is a void authorised by the administering authority to remain after decommissioning, or
- (d) is compliant with the rehabilitation requirements of the authority; and
- (e) is agreed by the post petroleum authority landowner/holder to remain after surrender of the environmental authority and meets water quality criteria for the intended use.

Condition 48 – Access to dams

Any dam constructed as part of the petroleum activities must be managed so that either:

- (a) where the quality of the water is likely to result in adverse health affects if contacted or consumed, adequate barriers are provided to limit access to the water by humans, livestock and native fauna; or
- (b) where the quality of the water will not result in any adverse health affects if contacted or consumed, safe access to the water is provided for livestock and native fauna.

Condition 49 – Associated water

Associated water may be temporarily contained in a dam or other containment vessel on site prior to:

- (a) reuse on site for petroleum activities; or
- (b) use under the provisions of the *Petroleum and Gas (Production and Safety) Act 2004*; or
- (c) use for an approved beneficial use; or
- (d) removal from site for treatment or disposal at an appropriately authorised facility.

Condition 50

If the use of associated water for a purpose other than a petroleum activity has been authorised by grant of a Notice of decision to approve a resource for beneficial use under Part 6A of the *Environmental Protection (Waste Management) Regulation 2000* it can be used in accordance with the Notice for the stated type of use(s).

Condition 51 – Release of contaminants to the atmosphere

The release of **noxious** or **offensive** odour, dust, particulate matter or any other airborne contaminant resulting from the petroleum activities must not cause environmental nuisance at any sensitive place or commercial place.

Condition 52 – Noise management

If the environmental authority holder receives a complaint as defined in Condition 63 about noise from the petroleum activities at a **sensitive place** or **commercial place**, the holder must conduct an appropriate investigation and must implement remedial action if the noise from the petroleum activities exceeds the noise limits at the sensitive place or commercial place in Table 1 – Noise Limits.

Table 1 – Noise limits

Sensitive place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L _{A90} , adj, 15 mins	lesser of bg+3 or 48	bg+0	bg+0	bg+0	bg+0	bg+0
L _{A10} , adj, 15 mins	lesser of bg+5 or 50	lesser of bg+5 or 45	bg+0	lesser of bg+5 or 45	lesser of bg+5 or 40	bg+0
L _{A1} , adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
Commercial place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L _{A90} , adj, 15 mins	lesser of bg+5 or 50	bg+0	bg+0	lesser of bg+3 or 43	bg+0	bg+0
L _{A10} , adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
L _{A1} , adj, 15 mins	lesser of bg+15 or 60	lesser of bg+15 or 55	lesser of bg+10 or 50	lesser of bg+15 or 55	lesser of bg+15 or 50	lesser of bg+10 or 45

- **bg = background noise level**
- In the event that measured bg is less than 25 dB(A), then 25 dB(A) is to be substituted for the measured level.
- If the background is higher than the number shown on the second line in any box, the limit is to be background plus 0.

Condition 53

The method of measurement and reporting of noise levels must comply with the latest edition of the Department of Environment and Resource Management's (Environmental Protection Agency's) Noise Measurement Manual or the most recent version of AS1055 Acoustics – Description and measurement of environmental noise.

Condition 54 – General waste management

Where practicable, general waste generated in carrying out the petroleum activities must be reused, recycled or removed to a facility that can lawfully accept the waste under the *Environmental Protection Act 1994*.

Condition 55

If no viable alternative exists, solid general waste may be disposed of on site at a facility designed to receive waste at a rate of less than 50t per year only if it is:

- (a) disposed of into a waste disposal trench;
- (b) consolidated, compacted and covered with a layer of inert material following placement of the waste into the trench;
- (c) managed in a way that prevents scavenging and access by vermin;
- (d) managed in a way that prevents or contains wind blown litter; and
- (e) managed in a way that prevents or controls **leachate** generated from the activity.

Condition 56

Waste, including vegetation, must not be burnt.

Condition 57 – Regulated waste

Regulated waste must be removed and transported from the site by a person who holds a current authority to transport such wastes to a facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994*.

Condition 58

Regulated waste generated in carrying out the petroleum activities can be temporarily stored on the site awaiting removal provided:

- (a) it is stored in a place and circumstance in which there is minimal risk of causing contamination to land or waters or a fire hazard; and
- (b) each container of regulated waste stored awaiting movement off site is clearly marked to identify the contents.

Condition 59

A record of all regulated waste (excluding trackable waste) must be kept detailing the following information:

- (a) date of pickup of waste;
- (b) description of waste;
- (c) quantity of waste;
- (d) origin of waste; and
- (e) destination of waste.

Condition 60 – Sewage

Disposal of sewage effluent must not cause environmental nuisance or material or serious environmental harm.

Condition 61

Sewage treatment works on the site must not exceed a combined peak design capacity to treat sewage of more than 21 **equivalent persons**.

Condition 62 – Monitoring

The holder of the environmental authority must:

- (a) develop a monitoring program that will demonstrate compliance with the conditions of the environmental authority;
- (b) document monitoring and inspections carried out under the monitoring program and any actions taken; and
- (c) record, compile and keep for a minimum of seven years all monitoring results and data.

Condition 63 - Complaints

The holder of the environmental authority must:

- (a) when the administering authority advises the holder of a complaint that the administering authority does not consider to be frivolous, vexatious or based on a mistaken belief alleging nuisance (e.g. caused by dust or noise), investigate the complaint and advise the administering authority of the action proposed or undertaken in relation to the complaint;
- (b) if the administering authority is not satisfied with the proposed or completed action, undertake monitoring or other action requested by the administering authority; and
- (c) maintain a record of complaints and incidents causing environmental harm and actions taken in response to the complaints or incidents for a minimum of seven years.

Condition 64 - Rehabilitation

As soon as practicable after the **end** of petroleum activities that have caused significant disturbance to land, the holder of the environmental authority must:

- (a) remediate contaminated land caused by petroleum activities in accordance with EP Act requirements and this code; and
- (b) undertake works to establish a safe, **stable**, non polluting landform similar to that of surrounding undisturbed areas, including where relevant:
 - i. backfilling any **voids** and trenches;
 - ii. neutralising and /or encapsulating any acid producing or potentially acid producing material;
 - iii. removing or encapsulating in low permeability material saline residues from evaporation ponds;
 - iv. re-establishing surface drainage lines;
 - v. minimising the potential for slumping, subsidence or erosion;
 - vi. reinstating the top layer of the soil profile;
 - vii. respraying any cleared vegetation; and

- viii. promoting establishment of vegetation of similar species composition and density of cover to the surrounding undisturbed land;

unless the holder has the written consent of the landowner/holder and the administering authority.

Condition 65 – Maintenance of land rehabilitation

Monitoring and maintenance of rehabilitated areas must take place to ensure and demonstrate:

- (a) stability of landforms;
- (b) erosion control measures remain effective;
- (c) stormwater runoff and seepage from rehabilitated areas does not negatively affect the environmental values of any waters;
- (d) plants show healthy growth and recruitment is occurring; and
- (e) rehabilitated areas are free of any **declared pest plants**.

Condition 66 – Rehabilitation Success

Rehabilitation can be considered successful when the site can be managed for its designated land-use (either similar to that of surrounding undisturbed areas or as otherwise agreed in a written document with the landowner/holder and administering authority) without any greater management input than for other land in the area being used for a similar purpose and there is evidence that the rehabilitation has been successful for at least 3 years.

Condition 67 – Decommissioning pipelines

Decommission inactive buried pipelines by in-situ decommissioning (abandonment in place).

Condition 68

Prior to pipelines and equipment being disconnected they must be drained or vented and cleaned via purging or flushing.

Condition 69

Any water used for purging or flushing pipelines must be contained in dams on site, tested and either:

- (a) directly reused where suitable for petroleum activities;
- (b) treated so that it meets water quality criteria for the intended reuse; or
- (c) removed from the site for disposal or treatment at an appropriately authorised facility;
or
- (d) disposed of via evaporation in a suitably lined pond.

Condition 70 – Infrastructure

All above ground **infrastructure** used for the petroleum activities must be removed prior to surrender of the environmental authority, except where it is to remain under the authority of the *Petroleum and Gas (Production and Safety) Act 2004*;, or with the written agreement of the administering authority and the post petroleum authority landowner/holder.

Condition 71 – Transition of petroleum authority

The holder of the environmental authority must take responsibility for the rehabilitation of any disturbance to land undertaken as part of a petroleum activity on a petroleum authority that has been transitioned (all or in part) due to the grant of a new petroleum authority over that land which now forms part of the current project.

APPENDIX A – Definitions

Note: Where a term is not defined in this Code, the definition in the *Environmental Protection Act 1994*, its regulations and Environmental Protection Policies or the *Petroleum and Gas (Production and Safety) Act 2004* and its regulations must be used in that order.

Accepted engineering standards, in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the Australian National Committee on Large Dams (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.

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

Appropriately 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.

Archaeological artefact means:

- (a) any artefact that is evidence of an aspect of Queensland's history, whether it is located in, on or below the surface of land, and not
- (b) a thing that is Aboriginal cultural heritage under the *Aboriginal Cultural Heritage Act 2003* or Torres Strait Islander cultural heritage under the *Torres Strait Islander Cultural Heritage Act 2003*.

Archaeological investigation means a physical investigation of the place carried out by a person or persons with recognised qualifications, experience or standing in historical archaeology, mining history, cultural heritage management, or related discipline for the purpose of investigating, recording or conserving archaeological artefacts on the place.

Archaeological place means a place entered in the Queensland heritage register under Part 5 of the *Queensland Heritage Act 1992*.

Assessed or assess by a suitably qualified and experienced person in relation to a hazard 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 at any time:

- (a) what has been assessed and the precise nature of that assessment;
- (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 activity authorised under a petroleum authority, such as producing petroleum from a well, and includes water also known as produced formation water. The term includes all contaminants suspended or dissolved in the water.

Associated works in relation to a dam means:

- (a) operations of any kind and all things constructed, erected or installed for that dam; and
- (b) any land used for those operations.

Background noise level means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90, T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

Bed and banks for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

Beneficial use means:

1. with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - (a) of benefit to that owner in that it adds real value to their business or to the general community,
 - (b) in accordance with relevant provisions of the *Environmental Protection Act 1994*,
 - (c) sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - (d) the transfer and use have been approved or authorised under any relevant legislation; or
2. with respect to associated water, see Environmental Protection Agency's Operational Policy *Management of water produced in association with petroleum activities (associated water)* and *Notice of decision to approve a resource for beneficial use – associated water* which can be accessed on Department of Environment and Resource Management's website at www.derm.qld.gov.au.

Bund or bunded in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or bunded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks

from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

Certification or **certified** by a suitably qualified and experienced person in relation to a **design plan** or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- (a) exactly what is being certified and the precise nature of that certification;
- (b) the relevant legislative, regulatory and technical criteria on which the certification has been based;
- (c) the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- (d) the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

Clearing means:

- (a) in relation to grass, scrub or bush - the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include—
 - i the flattening or compaction of vegetation by vehicles if the vegetation remains living; or
 - ii the slashing or mowing of vegetation to facilitate access tracks; or
 - iii the clearing of noxious or introduced plant species; and
- (b) in relation to trees - cutting down, ringbarking, pushing over, poisoning or destroying in any way.

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.

Construction in relation to a dam includes building a new dam and modifying or lifting an existing dam.

Cultural heritage significance means aesthetic, architectural, historical, scientific, social or other significance, to the present generation or past or future generations, as assessed against the following criteria:

- (a) the place is important in demonstrating the evolution or pattern of Queensland's history;
- (b) the place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage;
- (c) the place has potential to yield information that will contribute to an understanding of Queensland's history;
- (d) the place is important in demonstrating the principal characteristics of a particular class of cultural places;

- (e) the place is important because of its aesthetic significance;
- (f) the place is important in demonstrating a high degree of creative or technical achievement at a particular period;
- (g) the place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- (h) the place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

Dam means a land-based structure (including a **levee**, dyke or bund) or a void that is intended or used to contain, divert or control **flowable substances**, and includes any substances that are thereby contained or controlled by that land-based structure or void and **associated works**. However; a dam does *not* mean a fabricated or manufactured tank or container designed to a recognised standard, nor does a dam mean a land-based structure where that structure is designed to an Australian Standard such as a bund designed for spill containment to AS1940.

Declared pest plants are listed in Schedule 2 of the *Land Protection (Pest and Stock Route Management) Regulation 2003*.

Design plan is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.

Discharge area is an area in the landscape where the net movement of groundwater is out of the aquifer. This may be expressed by waterlogging where groundwater discharges at the soil surface because of seepage or salting because of evaporation.

Dispersible soils are structurally unstable soils that readily breakdown into their constituent particles in water (e.g. the clay material disintegrates into particles less than 2 microns across within 24 hours when soil crumbs are submerged in distilled water). These soils are also known as sodic soils and have a high percentage of sodium ions (in soluble or exchangeable form).

Ecosystem functioning means the interactions between and within living and non-living components of an ecosystem and generally correlates with the size, shape and location of an area of vegetation.

End means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related activities such as rehabilitation. In other words, it does not refer to the 'completion' of the petroleum activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.

Equivalent person means an equivalent person as defined in Item 63 of Schedule 2 in the *Environmental Protection Regulation 2008*.

Evaporation pond means a dam specifically designed for the purpose of disposing of a liquid via evaporation.

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.

Financial assurance means a security deposit, either cash or a bank guarantee, held by the administering authority to cover the potential costs of preventing or minimising environmental harm from, or rehabilitating areas significantly disturbed by, the petroleum activities.

Flowable substance means matter or a mixture of materials which can flow under conditions potentially affecting that substance. Constituents of a flowable substance can include water, other fluids or solids, or a mixture that includes water and any other fluids or solids either in solution or suspension.

Foreseeable future is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.

Hazard in relation to a dam as defined means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

Hazard category means the level of hazard (low, significant or high) assigned to a dam as a result of an assessment against tables and other criteria in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (Version 1.0, 2008)* published by the Environmental Protection Agency (Department of Environment and Resource Management) on its website.

Heritage place means any place that may be of **cultural heritage significance**, or any place with potential to contain **archaeological artefacts** that are an important source of information about Queensland's history.

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.

Highly erodible soils means very unstable soils that are generally described as Sodosols with hard-setting, fine sandy loam to silty clay loam surfaces (solodics, solodised solonetz and solonetz) or soils with a dispersible layer located less than 25cm deep or soils less than 25cm deep.

Hydraulic performance means the capacity of a **regulated dam** to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (Version 1.0, 2008)* published by the Department of Environment and Resource Management on its website.

Infrastructure means water storage dams, roads and tracks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activities, but does not include other facilities required for the long term management of the impact of those activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation ponds), pipelines and assets that have been decommissioned, rehabilitated and lawfully recognised as being subject to subsequent transfer with ownership of the land.

L_{A90, adj, 15 mins} means the A-weighted sound pressure level exceeded for 90 percent of the measurement time period of 15 minutes, adjusted for noise characteristics including tonality and impulsiveness and measured in the presence of the noise under investigation, using Fast Response.

L_{A10, adj, 15 mins} means the A-weighted sound pressure level exceeded for 10 percent of the measurement time period of 15 minutes, adjusted for noise character including tonality and impulsiveness and measured in the presence of the noise under investigation, using Fast Response.

L_{A1, adj, 15 mins} means the A-weighted sound pressure level exceeded for 1 percent of the measurement time period of 15 minutes, adjusted for noise character including tonality and impulsiveness and measured in the presence of the noise under investigation, using Fast Response.

Leachate means a liquid that contains soluble, suspended or miscible contaminants likely to have been derived from material which is stored, processed or disposed of on site and which the liquid has passed through or emerged from, or is likely to have passed through or emerged from.

Levee means a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.

Limited regulated waste means any of the following regulated wastes, asbestos, clinical waste or quarantine waste that has been rendered non-infectious, fish processing waste, food processing waste, poultry processing waste, tyres or treatment tank sludge or residue produced in the carrying out of an activity in relation to sewage treatment and water supply activities.

Noxious means harmful or injurious to health or physical well being.

'Of concern' regional ecosystem means an 'of concern' regional ecosystem identified in the database maintained by the Department of Environment and Resource Management called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions. The database is available for inspection on the Department of Environment and Resource Management's website at www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/.

Offensive means causing unreasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

Overland flow water means water, including floodwater, flowing over land, otherwise than in a watercourse or lake:

- (a) after having fallen as rain or in any other way; or
- (b) after rising to the surface naturally from underground.

Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc) which is to be left by agreement with the landowner.

Petroleum authority is:

- (a) a 1923 Act petroleum tenure granted under the *Petroleum Act 1923*; or
- (b) a petroleum authority granted under the *Petroleum and Gas (Production and Safety) Act 2004*; or
- (c) a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*.

Regulated dam means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (Version 1.0, 2008)* published by the Department of Environment and Resource Management on its website.

Regulated waste means non-domestic waste mentioned in Schedule 7 of the *Environmental Protection Regulation 2008* (whether or not it has been treated or immobilised), and includes—

- (a) for an element – any chemical compound containing the element; and
- (b) anything that has contained the waste.

Release of a contaminant into the environment includes:

- (a) to deposit, discharge, emit or disturb the contaminant; and
- (b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- (c) to allow the contaminant to escape; and
- (d) to fail to prevent the contaminant from escaping.

Sensitive place means:

- (a) a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel;
- (b) a library, childcare centre, kindergarten, school, university or other educational institution;
- (c) a medical centre, surgery or hospital;
- (d) a protected area;
- (e) 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.

Significantly disturbed land or significant disturbance to land means land that is:

- (a) contaminated land; or
- (b) disturbed and human intervention is needed to rehabilitate it:
 - i to a state required under this code; or
 - ii if the code does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Examples of a significant disturbance to land:

- (a) areas where soil has been compacted, removed, covered, exposed or stockpiled;
- (b) areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion;
- (c) areas where land use suitability or capability has been diminished;
- (d) areas within a watercourse, wetland, or spring where petroleum activities have occurred causing the loss of habitat or a decline in ecological processes and requiring human intervention to restore or stabilise the disturbed area and/or protect the quality of the water downstream of the disturbance;
- (e) areas submerged by waste or water;
- (f) areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after petroleum activities have ceased; or
- (g) areas where land has become contaminated land and a suitability statement has not been issued.

However, for the purpose of this code the following areas are not significantly disturbed:

- (a) areas off the petroleum authority (e.g. roads or tracks which provide access to the petroleum authority);
- (b) areas previously significantly disturbed which have been rehabilitated to the administering authority's satisfaction;
- (c) areas under permanent infrastructure (e.g. roads, bridges, buildings) as agreed by the administering authority and landholder;
- (d) areas that were significantly disturbed prior to the grant of the petroleum authority, unless those areas are re-disturbed by the petroleum authority holder during the course of carrying out the petroleum activities or were conducted on a petroleum authority that was replaced by the current authority (e.g. through conditional surrender or the transition from an authority to prospect to a petroleum lease).

Site means the area within the petroleum authority or authorities to which the environmental authority relates.

Spring means the land to which water rises naturally from below the ground and the land over which the water then flows.

Stable in relation to land means landform dimensions are or will be stable within **tolerable limits** now and in the **foreseeable future**. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

State heritage place means a place entered in the Queensland heritage register under Part 4 of the *Queensland Heritage Act 1992*.

Suitably qualified and experienced person in relation to dams means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, OR registered as a National Professional Engineer (NPER)

with the Institution of Engineers Australia, OR holds equivalent professional qualifications to the satisfaction of the administering authority for the Act; AND the administering authority for the Act is satisfied that person has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

- (a) knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- (b) a total of five years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry; and
- (c) a total of five years of suitable experience and demonstrated expertise each, in three of the following categories:
 - i investigation and design of dams;
 - ii construction, operation and maintenance of dams;
 - iii hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology;
 - iv hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes;
 - v hydrogeology with particular reference to seepage, groundwater;
 - vi solute transport processes and monitoring thereof;
 - vii dam safety.

Thing means a material object without life or consciousness or some entity, object or creature which is not or cannot be specifically designated or precisely described.

Threatening processes are processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation. For example, altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation.

Tolerable limits means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values. For example, a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing pondage and limiting infiltration and percolation.

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 300mm in depth from the natural surface.

Void means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

Waters includes all or any part of a creek, river, stream, lake, lagoon, pond, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.

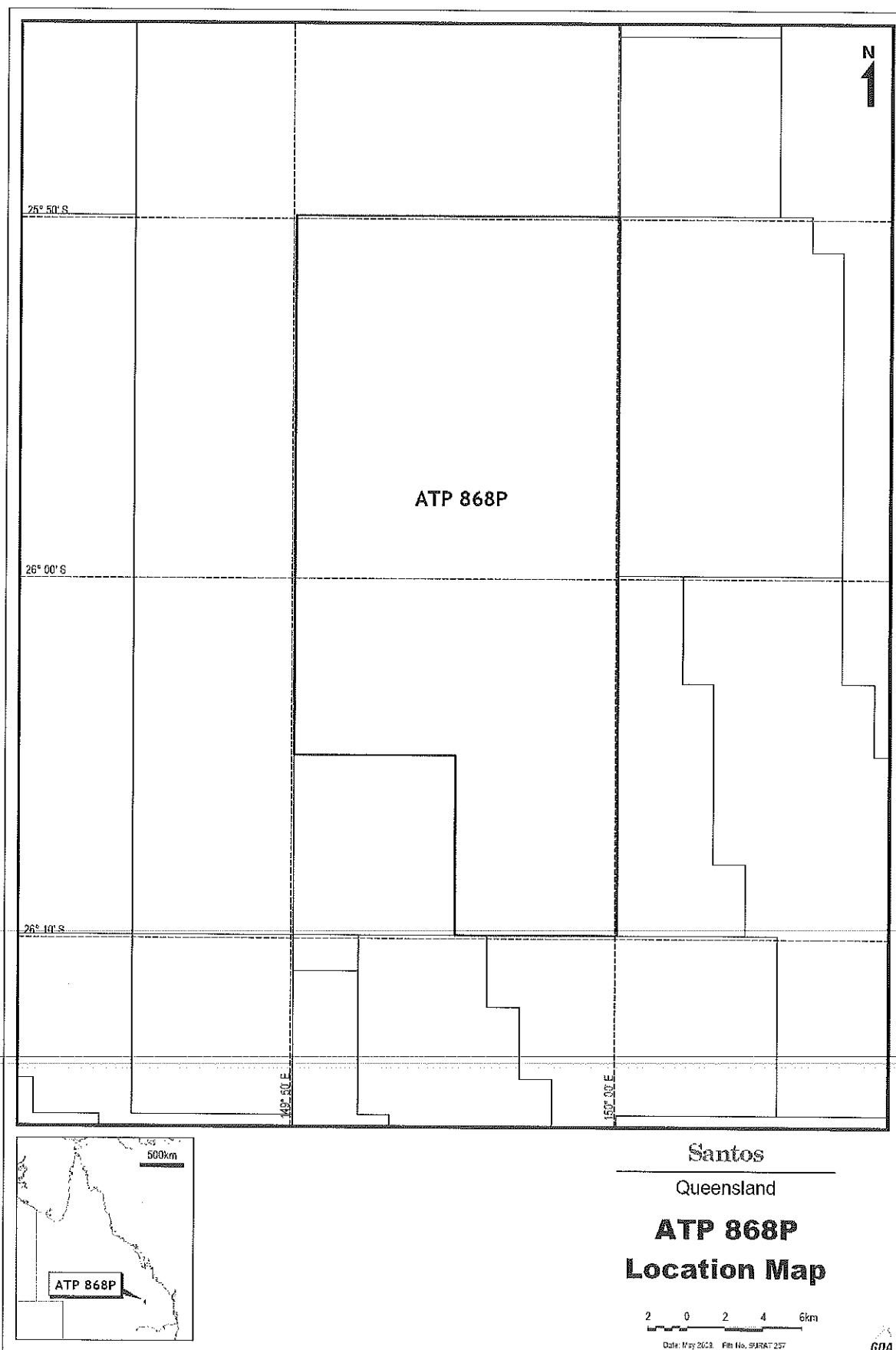
Watercourse is a creek, river or stream

- (a) in which water flows intermittently or permanently in a visibly defined channel, whether artificial, artificially improved or natural; and
- (b) that has evidence of biological dependence on any water that flows in the creek, river or stream or on the banks or bed.

Wetland means an area shown as a wetland on a 'Map of referable wetlands', a document approved by the chief executive (environment). A map of referable wetlands can be viewed at www.derm.qld.gov.au.

Wild river declaration is a statutory instrument under the *Wild Rivers Act 2005*. A declaration lists the relevant natural values to be preserved and delineates certain parts of the wild river area and the different constraints that may apply in these areas. With reference to environmental authorities for petroleum, each declaration also specifies conditions to be included in a new authority if the activity is to be located within the wild river area.

APPENDIX B - Map of ATP868P



APPENDIX C – Environmentally Sensitive Areas

Category A and B environmentally sensitive areas

Category A and B environmentally sensitive areas are listed in Section 25 and 26 respectively of the *Environmental Protection Regulation 2008*.

Category C environmentally sensitive areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
Nature Refuges and Resource Reserves	<i>Nature Conservation Act 1992</i>	Department of Environment and Resource Management
Koala Habitat Area	<i>Nature Conservation (Koala) Conservation Plan 2006</i>	Department of Environment and Resource Management
An area identified as essential habitat by the EPA for a species of wildlife listed as endangered, vulnerable, near threatened or rare under the Nature Conservation Act 1992	<i>Nature Conservation Act 1992</i>	Department of Environment and Resource Management
Declared Catchment Areas	<i>Water Act 2000</i>	Department of Environment and Resource Management and/or Relevant Storage Operator or Board
River Improvement Areas	<i>River Improvement Trust Act 1940</i>	Department of Environment and Resource Management and the Relevant River Trust
Former Designated Landscape Area - Stanbroke Pastoral Holding	<i>Aboriginal Cultural Heritage Act 2003</i>	Department of Environment and Resource Management
Areas under Part 5 Division 2 of the Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Environment and Resource Management
State Forest or Timber Reserves	<i>Forestry Act 1959</i>	Department of Environment and Resource Management
DPI Research Sites	<i>Nil</i>	Department of Employment, Economic Development and

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
		Innovation
Areas of land occupied by the Bureau of Sugar Experiment Stations.	<i>Sugar Industry Act 1999</i>	Department of Employment, Economic Development and Innovation
Coastal Management Districts	<i>Coastal Protection and Management Act 1995</i>	Department of Environment and Resource Management
Declared Areas	<i>Vegetation Management Act 1999</i>	Department of Environment and Resource Management
An area shown as a wetland on a 'map of referable wetlands'	<i>Environmental Protection Act 1994</i>	Department of Environment and Resource Management
Reserves under the Land Act 1994	<i>Land Act 1994</i>	Department of Environment and Resource Management
An 'of concern' regional ecosystem identified in the database maintained by the EPA called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions.	<i>Nil</i>	Department of Environment and Resource Management

END OF PERMIT

Permit¹

Environmental Protection Act 1994

Environmental authority

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

Permit¹ number: EPPG00860813

Environmental authority takes effect on 18-SEP-2014.

The anniversary date of this environmental authority is 1 November. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name	Registered address
Bronco Energy Pty Ltd	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
PAPL (Upstream II) Pty Limited	Level 12 60 Carrington Street SYDNEY NSW 2000
Total E & P Australia III	Level 13 BGC Centre 28 The Esplanade PERTH WA 6000
KGLNG E & P II Pty Ltd	Level 11 28 the Esplanade PERTH WA 6000

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum – DAA Petroleum - ATP	DAA25 ATP804

Additional information for applicants

Environmentally relevant activities

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

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



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

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

Contaminated land

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



Signature

18/09/2014

Date

Jodie Brackenbury
Department of Environment and Heritage Protection
Delegate of the administering authority
Environmental Protection Act 1994

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

Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Location: ATP804, DAA25

Relevant activities: Petroleum - ATP
Petroleum - DAA

The environmentally relevant activities conducted at the location as described above must be conducted in accordance with the following site specific conditions of approval.

Additional advice about the approval

1. This approval pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for this activity which might be required by other State and/or Commonwealth legislation. Other legislation administered by DERM for which a permit may be required includes but is not limited to the:
 - *Aboriginal Cultural Heritage Act 2003*;
 - The contaminated land provisions of the *Environmental Protection Act 1994*;
 - *Nature Conservation Act 1992*;
 - *Forestry Act 1959*;
 - *Water Supply (Safety and Reliability) Act 2008*; and
 - *Water Act 2000*.

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

2. This environmental authority, issued under the *Environmental Protection Act 1994*, for the carrying out of a non-code compliant level 2 petroleum activity(ies) is not an authority to impact on water levels or pressure heads in groundwater aquifers in, or surrounding, coal seams. The holder of this environmental authority will have obligations to minimise or mitigate any such impact under other Queensland Government and Australian Government legislation.
3. 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.
4. This environmental authority does not authorise the taking of protected animals or the tampering with an animal breeding place as defined under the *Nature Conservation Act 1992* and its regulations.

5. Terms defined in Schedule L of this environmental authority are **bolded** as they appear in this document. 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.
6. This environmental authority consists of the following schedules
 - Schedule A Schedule of Conditions
 - Schedule B Definitions
 - Appendix A Environmentally Sensitive Areas
 - Appendix B Criteria for Environmentally Relevant Containment Facilities
 - Appendix C Schedule of Rehabilitation Costs

Schedule A: Schedule of Conditions

Condition 1 – Significant Disturbance

The holder of the environmental authority must ensure that petroleum activities do not cause more than **4 ha** of any land to be significantly disturbed at a petroleum works site at any one time.

Condition 2– Work Program, Development Plan

The applicant for or holder of the environmental authority must submit to the administering authority a copy of the original or any amended work program or development plan for the relevant application for or granted petroleum authority.

Condition 3 – Financial Assurance

The holder of the environmental authority must:

- (a) calculate a financial assurance in accordance with the Schedule of Rehabilitation Costs and Schedule of Disturbance in Appendix C of this Authority;
- (b) attach the Schedule of Disturbance to the original or any amended Work Program or Development Plan; and
- (c) provide to the administering authority the financial assurance in the amount and form required by the administering authority at the time of submission of the original or any amended work program or development plan
- (d) maintain the financial assurance until the administering authority is satisfied that no claim is likely to be made on the assurance.

Condition 4 – Environmentally Sensitive Areas

The holder of the environmental authority must ensure that petroleum activities:

- (a) are not conducted within a category A or B environmentally sensitive area; and
- (b) do not cause a significant disturbance within **1km** of a category A environmentally sensitive area or within **500m** of a category B environmentally sensitive area.
- (c) are not conducted in a category C environmentally sensitive area unless there is a written agreement to enter the area for those activities from the relevant administering authority.

Condition 5 – Land Management

The holder of the environmental authority must:

- (a) take all reasonable and practicable measures to minimise disturbance to land in order to prevent land degradation; and
- (b) ensure that for land that is to be significantly disturbed by petroleum activities, the top layer of the soil profile is removed and
 - i. stockpiled in a manner that will preserve its biological and chemical properties; and
 - ii. used for rehabilitation purposes (refer condition 18).

Condition 6 – Vegetation

The holder of the environmental authority must:

- (a) take all reasonable and practicable measures to prevent or minimise disturbance to vegetation by petroleum activities; and
- (b) manage the effects of clearing to prevent the loss of biodiversity, reduction of ecological processes and land degradation.

Condition 7 – Protection of Riverine Areas

The holder of the environmental authority must:

- (a) ensure that there is no significant disturbance in riverine areas containing permanent water, except for the necessary construction and/or maintenance of roads, tracks and pipelines; and
- (b) minimise disturbance of all other riverine areas.

Condition 8 – Erosion and Sedimentation Control

The holder of the environmental authority must take all reasonable and practicable measures to prevent or minimise:

- (a) erosion of areas disturbed by petroleum activities; and
- (b) sedimentation of any waters as a result of petroleum activities.

Condition 9 – Dust Management

The holder of the environmental authority (petroleum activities) must ensure that:

- (a) Dust or particulate matter or both resulting from a petroleum activity must not cause an environmental nuisance at any sensitive place or commercial place.
- (b) When requested by the administering authority, dust and particulate monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place or commercial place, and the results must be notified within **14 days** to the administering authority following completion of monitoring, analysis and interpretation of results.

Condition 10 - Noise Management

- (a) Noise emitted from the temporary petroleum activities must not exceed the noise acoustic quality objective of 55 dB(A) at any sensitive or commercial place.
- (b) Noise emitted from the permanent petroleum activities must not exceed the noise levels, specified in the table below, at any sensitive place or commercial place.

Time period	Noise level at a sensitive place measured as the Adjusted Maximum Sound Pressure Level $L_{A, max, adj, T}$
7am–6 pm	Background noise level plus 5 dB(A)
6pm–10pm	Background noise level plus 5 dB(A)
10pm–7am	Background noise level plus 3 dB(A)
Time period	Noise level at a commercial place measured as the Adjusted Maximum Sound Pressure Level $L_{A, max, adj, T}$
7am–6 pm	Background noise level plus 10 dB(A)
6pm–10pm	Background noise level plus 10 dB(A)
10pm–7am	Background noise level plus 8 dB(A)

General note: In no case is the background noise level, $L_{A90, 15 mins}$ to be less than 25 dB(A). In the event that measured background noise level is less than 25 dB(A), then 25 dB(A) is to be used.

- (c) When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place or commercial place, and the results must be notified within **14 days** to the administering authority following completion of monitoring, analysis and interpretation of results.
- (d) The method of measurement and reporting of noise levels must be in accordance with most recent edition of the EPA's *Noise Measurement Manual*.

Condition 11 – Waste Management

The holder of the environmental authority must:

- (a) ensure that petroleum activities do not result in the release or likely release of a contaminants to land or waters that results in unlawful environmental harm; and
- (b) as soon as practicable, remove and dispose of all regulated waste to a licensed waste disposal facility or recycling facility.

Condition 12 - Sewage Management and Disposal

The holder of this environmental authority must ensure that:

- (a) plant and equipment used in the carrying out of the activity is installed, maintained and operated in a proper and efficient manner;
- (b) sewage effluent is not released to waters (including groundwater);
- (c) the disposal of sewage effluent does not cause the contamination of any water used for drinking or domestic purposes or manufacturing purposes or for consumption by animals;
- (d) any area(s) used for the disposal of sewage wastes (liquids or solids) is securely fenced to prevent animals entering such area(s);
- (e) where sewage sludge is buried on land the sludge is covered with at least **250mm** of top soil and where practicable located above known flood levels;
- (f) where sewage effluent is irrigated on land it is carried out in accordance with the *National Water Quality Guidelines for Sewage Systems – Use of Reclaimed Water*;
- (g) there is no surface pond of effluent on land disposal area(s);
- (h) any noxious offence odours or any other noxious or offensive contaminant resulting from the activity do not cause a nuisance at any odour sensitive place; and
- (i) public access to any sewage effluent land disposal area must be denied during the release of contaminants to the land and until the irrigation/disposal area has dried.

Condition 13 – Storage of Hazardous Substances, Fuel and Oil

The holder of the environmental authority must ensure that the storage of all flammable and combustible liquids are:

- (a) contained within an on-site containment system; and
- (b) controlled in a manner that prevents environmental harm; and
- (c) maintained in accordance with Section 2.3 for minor storages and Section 5.8 for storages above 10,000 L of AS 1940 –2004 *Storage and Handling of Flammable and Combustible Liquids*.

Condition 14 – Spills and clean up action

Notwithstanding the other conditions of this Authority, if a hazardous contaminant is released to waters or land, the holder of the environmental authority must:

- (a) take immediate action to stop any further release;
- (b) take immediate action to contain the hazardous contaminant to the affected area, taking particular care to protect environmentally sensitive areas;
- (c) restore or rehabilitate the environment to its condition before the release occurred; and
- (d) take necessary action to prevent a recurrence of the release.

Condition 15 – Associated Water

- (a) The holder of the environmental authority must ensure that associated water is not released to land or waters, other than to an appropriate containment facility except as provided for:

- (i) Under section 186 of the *Petroleum and Gas (Production and Safety) Act 2004*; and
 - (ii) Condition 16 (c).

- (b) Despite 16 (a) (i), the holder of the environmental authority must ensure that associated water to be used for domestic or stock purposes meets the accepted ANZECC 2000 Water Quality Guidelines for stock and domestic purposes.
- (c) Despite 16 (a), the holder of the environmental authority may apply to the administrative authority to allow associated water that meets a nominated set of water quality standards to:
 - (i) be released to land or waters; or
 - (ii) be used for a specific purpose, provided the potential user has given written advice about the proposed use and environmental safeguards that will be implemented to prevent material or serious environmental harm.

Condition 16 – Containment Facilities

- (a) The holder of the environmental authority must ensure all environmentally relevant containment facilities are:
 - (i) Designed, constructed, operated, maintained and decommissioned in accordance with the criteria outlined in Appendix B; and
 - (ii) Not located within 100 m of any natural drainage feature (i.e. watercourses, waterway, wetland or lank).
- (b) The holder of the environmental authority must ensure all drill sumps are installed and maintained to prevent any discharge through the bed or banks of the sumps from causing environmental harm or environmental nuisance in any waters.

Condition 17 – Containment Facilities and Other Excavations

For all environmentally relevant activities and other excavations which are constructed as part of the petroleum activities, the holder of the environmental authority must where relevant either:

- (a) provide safe access for livestock where contained water quality is adequate for live stock; or
- (b) construct and maintain bunds and/or fences sufficient to exclude livestock.

Condition 18 – Rehabilitation

As soon as practicable and within 6 months (or longer period agreed in writing with the administering authority) of the completion of petroleum activities causing significant disturbance to land, the holder of the environmental authority must:

- (a) remediate contaminated land (e.g. evaporation ponds containing hazardous waste) in accordance with *EP Act* requirements;
- (b) reshape all significantly disturbed land to a stable landform similar to that of surrounding undisturbed areas; and
- (c) on all significantly disturbed land, take all reasonable and practicable measures to:
 - i. re-establish surface drainage lines;
 - ii. reinstate the top layer of the soil profile; and
 - iii. promote establishment of vegetation of the same species and density of cover to that of the surrounding undisturbed areas.

Condition 19 – Infrastructure

All Infrastructure, constructed by or for the holder of the environmental authority, including water storage structures, must be removed by the holder from the site and the sites rehabilitated according to condition 18, prior to surrender of the petroleum authority, except where it is to remain with the written agreement of the administering authority and post petroleum authority landowner / holder.

Condition 20 – Monitoring and Complaints

The holder of the environmental authority must:

- (a) develop and implement a monitoring program that will demonstrate compliance with this Authority;
- (b) document the monitoring and inspections carried out under the program and any actions taken.
- (c) maintain a record of complaints and incidents causing environmental harm, and actions taken in response to the complaint or incident; and
- (d) retain the record of complaints required by this condition for **5 years**.

Condition 21 - Notification

The holder of the environmental authority must:

- (a) record and initially notify the administering authority as soon as practicable, but within **24 hours**, of any emergency or incident that demonstrates non-compliance to the standard environmental conditions, and
- (b) notify the administering authority in writing within **14 days** of the initial notification.

End of Conditions

Schedule B - Definitions

APPEA Code means the current APPEA, Code of Environmental Practice.

AS 2885 Australian Standard Pipelines – Gas and Liquid Petroleum

Associated water is underground water taken from or interfered with from a petroleum well during the course of or resulting from carrying out petroleum activities. Associated water may be potable or suitable for stock purposes, or saline, high in fluoride, contain hydrocarbons, and/or is otherwise contaminated by a hazardous contaminant and become a **hazardous waste**.

Commercial place means a place used as an office or for business or commercial purposes.

End means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related *activities such as rehabilitation*. In other words, it does not refer to: the “completion” of the particular activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority. Under the *APPEA Code* “completion” refers to the point at which the particular survey, program or operation has been rehabilitated and abandoned.

Environmental nuisance is unreasonable interference or likely interference with an environmental value caused by:

- (a) noise, dust, odour, light; or
- (b) an unhealthy, offensive or unsightly condition because of contamination; or
- (c) another way prescribed by regulation.

Evaporation pond means a dam or interceptor pond constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the pond.

Environmentally sensitive area (as determined from the EPA GIS data base) means a location, however large or small, that has environmental values that contribute to maintaining biological diversity and integrity, have intrinsic or attributed scientific, historical or cultural heritage value, or are important in providing amenity, harmony or sense of community.

Financial assurance means a security deposit, either cash or a bank guarantee, held by the administering authority to cover the potential costs of rehabilitating areas significantly disturbed by the petroleum activities.

Hazardous contaminant means a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm because of—

- (a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability; or
- (b) its physical, chemical or infectious characteristics.

Land degradation includes the following:

- (a) soil erosion;
- (b) rising water tables;
- (c) the expression of salinity;
- (d) mass movement by gravity of soil or rock;
- (e) stream bank instability; and
- (f) a process that results in declining water quality.

Licensed waste disposal facility is a facility approved under a development approval and operated by a holder of a registration certificate for environmentally relevant activity item number 75 under Schedule 1 of the *Environmental Protection Regulation 1998*.

Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc), which is to be left by *agreement* with the landowner.

Petroleum activity is defined in the *EP Act* as an activity:

- a) authorised on a petroleum tenure granted under the *Petroleum Act 1923*; or
- b) authorised on a petroleum authority granted under the *P&G Act*; or
- c) exploring for or mining minerals under a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*; or
- d) rehabilitating or remediating environmental harm because of an activity mentioned in paragraphs (a) to (c); or
- e) action taken to prevent environmental harm because of an activity mentioned in paragraphs (a) to (d); or
- f) required under a condition of an environmental authority (petroleum activities); or
- g) required under a condition of an environmental authority (petroleum activities) that has ended or ceased to have effect, if the condition:
 - i. continues to apply after the authority has ended or ceased to have effect; and
 - ii. has not been complied with.

Petroleum Authority includes Authority to Prospect, Petroleum Lease, Data Acquisition Authority Water Monitoring Authority, Petroleum Facility Licence, Survey Licence and Pipeline Licence issued or granted under the *Petroleum Act 1923* or *Petroleum and Gas (Production and Safety) Act 2004*.

Petroleum works site is a separate location on the area subject to a petroleum authority where certain petroleum activities are undertaken; including a well site, production facilities, evaporation pond, compressor site and campsite. The following petroleum activities are excluded from the definition of *petroleum works site*: roads and tracks, seismic survey lines, and non-licensed gathering systems.

Release of a contaminant into the environment, includes –

- (a) to deposit, discharge, emit or disturb the contaminant; and
- (b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- (c) to fail to prevent the contaminant from being deposited, discharged, emitted or disturbed; and
- (d) to allow the contaminant to escape; and
- (e) to fail to prevent the contaminant from escaping.

Riverine area refers to the land confined to the flood flow channel of a watercourse.

Sediment pond means a bunded or excavated structure used to contain and settle waterborne sediment running off significantly disturbed areas.

Sediment trap means a device used to filter waterborne sediment running off significantly disturbed areas. This may include silt fences, hay bales or grassed strips.

Sensitive place means

- (a) a dwelling, mobile home or caravan park, residential marina or other residential place;
- (b) a motel, hotel or hostel;
- (c) a kindergarten, school, university or other educational institution;
- (d) a medical centre or hospital;
- (e) a protected area;
- (f) a park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organized entertainment.

Significantly disturbed land and **significant disturbance** means land if:

- (a) it is contaminated land; or
- (b) it has been disturbed and human intervention is needed to rehabilitate it:

- i. to a state required under the relevant environmental authority; or
- ii. if the environmental authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance

Examples of a disturbance to land:

- (a) areas where soil has been compacted, removed, covered, exposed or stockpiled;
- (b) areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion;
- (c) areas where land use suitability or capability has been diminished;
- (d) areas within a watercourse, waterway, wetland or lake where petroleum activities occur and human intervention is necessary to restore or stabilise the disturbed area;
- (e) areas submerged by hazardous waste storage and dam walls in all cases;
- (f) areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after petroleum activities have ceased; or
- (g) areas where land has become contaminated land and a suitability statement has not been issued.

However, for the purpose of this Authority the following areas **are not** significantly disturbed:

- (a) areas off the petroleum authority (e.g. roads or tracks which provide access to the petroleum authority).
- (b) areas previously significantly disturbed which have been rehabilitated to the administering authority's satisfaction.
- (c) areas under permanent infrastructure.
- (d) areas that were significantly disturbed prior to the grant of the environmental authority, unless those areas are re-disturbed by the holder of the environmental authority during the term of the authority.
- (e) minor disturbances such as drill sumps and minor respreading of soil on GPS located seismic lines.

Stable means geo-technical stability of the rehabilitated landform i.e. settlement and subsidence caused by consolidation / settlement of the wastes deposited, and sliding / slumping are unlikely to cause instability.

Temporary petroleum activities means drilling

Permanent petroleum activities means compressors, wells

Top layer of soil means soil, alluvium, weathered rock or other suitable plant growth medium. Top layer material should be non-crusting and low in salinity.

Turkey's nest dam - A dam constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the dam.

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

APPENDIX A Environmentally Sensitive Areas

Category A - Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
- National Parks (Scientific) - National Parks - National Parks (Aboriginal Land) - National Parks (Torres Strait Islander Land) - National Parks (Recovery) - Conservation Parks - Forest Reserves	<i>Nature Conservation Act 1992</i>	DERM
Restricted Areas that include Constructed Water Reservoirs	<i>Mineral Resources Act 1989</i>	DERM
Marine Parks (other than general use zones)	<i>Marine Parks Act 1982</i>	DERM
Wet Tropics Area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Wet Tropics Management Authority (WTMA)
Great Barrier Reef Marine Park Region	<i>Great Barrier Reef Marine Park Act 1975 (Cth)</i>	Great Barrier Reef Marine Park Authority (GBRMPA)

Category B – Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
- Coordinated Conservation Areas; - Wilderness Areas; - World Heritage Management Areas; - International Agreement Areas; - An area of Critical Habitat or Major Interest identified under a Conservation Plan; - Areas subject to an Interim Conservation Order;	<i>Nature Conservation Act 1992</i>	DERM
An area subject to following conventions: - Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 23 June 1979); - Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 2 February 1971); - Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 16 November 1972).	<i>International Conventions</i>	DERM
General Use Zones of a Marine Park	<i>Marine Parks Act 1982</i>	DERM
An Area to the Seaward Side of the Highest Astronomical Tide	Nil	DERM
- Registered Places; - Area of Cultural Heritage Significance; - Protected Area;	<i>Queensland Heritage Act 1992</i> <i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
Designated Landscape Area (other than the area known as the 'Stanbroke Pastoral Holding')	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
- Feature Protection Area; - State Forest Park; - Scientific Area	<i>Forestry Act 1959</i>	DERM
- Fish Habitat Area; - A place in which a Marine Plant is situated	<i>Fisheries Act 1994</i>	Department of Employment, Economic Development and Innovation (DEEDI)
- Endangered Regional Ecosystems (ERE);* - An area of High Nature Conservation Value	Nil	DERM
Essential habitat of Endangered, Vulnerable and Rare Species for the purposes of a Regional Vegetation Management Code	<i>Vegetation Management Act 1999</i>	DERM

Important Note: Regional ecosystem classification is determined according to the Queensland Herbarium **Biodiversity Status** Classification. Information on ERE's is maintained by DERM on the Regional Ecosystem Description Database.

Category C – Environmentally Sensitive Areas		
LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTERING AUTHORITY
Nature Refuges and Resource Reserves	<i>Nature Conservation Act 1992</i>	DERM
- Declared Catchment Areas; - Declared Irrigation and Irrigation Undertaking Areas; - Water Reservoirs and Drainage Areas.	<i>Water Act 2000 and various Water Board Acts</i>	DERM and/ or Relevant Storage Operator or Board
River Improvement Areas	<i>River Improvement Trust Act 1940</i>	DERM and the Relevant River Trust
The Designated Landscape Area - Stanbroke Pastoral Holding	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
Areas under Part 5 Division 2 of the Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	DERM
State Forest or Timber Reserves	<i>Forestry Act 1959</i>	DERM
DPI Research Sites	<i>Nil</i>	DEEDI
Areas of land occupied by the Bureau of Sugar Experiment Stations.	<i>Sugar Industry Act 1999</i>	DEEDI
Critical Areas and Public Purpose Reserves	<i>Land Act 1994</i>	DERM
An area subject to a State Planning Policy that the policy declares is in need of environmental protection.	<i>Integrated Planning Act 1997</i>	DERM
Erosion Prone Areas under Coastal Management Plans and Coastal Management Control Districts	<i>Coastal Protection and Management Act 1995</i>	DERM

APPENDIX B Criteria for environmentally relevant containment facilities

The holder of the environmental authority (petroleum activities) may require environmentally relevant containment facilities to be constructed within the petroleum authority for raw water storage, storage and evaporation of **associated water** or for the containment of contaminated solids formed from such waters. Environmentally relevant containment facilities are defined as “structures that may or could contain flowable substances that, in the event of collapse of the structure, failure to contain or discharge of either liquor, solids or gas, could or would adversely impact on the environment.”

Associated water may be saline, contain hydrocarbons or other substances at certain concentrations that when released to land or waters may cause material or serious environmental harm. This does not prevent or limit the holder of the environmental authority from treating the associated water to a specified standard for subsequent discharge to land or waters, or on-supplied to a third party for beneficial reuse, providing it is authorised by the relevant environmental authority.

Appendix B provides for the environmental regulation of such containment facilities. The regulation of such facilities is based on both a hazard and risk assessment, which includes an assessment of the contents of the containment facility.

The assessment criteria presented in Tables 1 and 2 allow these structures to be classified as:

- High hazard containment facility;
- Medium hazard containment facility; or
- Low hazard containment facility.

High hazard containment facilities that could impact on life or property on collapse or failure are not permitted under this environmental authority and will require either site-specific conditions or will be conditioned under a level 1 environmental authority.

Step 1 - Assessing the contents of the relevant containment facility

The first step in the assessment process is to determine whether the facility contains substances that may be classed as hazardous if released to the environment. If the contents of the relevant containment facility, including either liquor and/or total solids, exceed the limits in Table 1, then the containment facility contains hazardous substances.

Table 1 – Criteria for determining the contents of the containment facility

Contaminant ¹	Liquor ²	Total solids ^{3,4}
Arsenic	0.5 mg/l	250 mg/kg
Boron	5.0 mg/l	15,000 mg/kg
Cadmium	10 µg /	100 mg/kg
Cobalt	1.0 mg/l	500 mg/kg
Copper	1.0 mg/l	5,000 mg/kg
Lead	0.1 mg/l	300 mg/kg
Mercury	2µg/l	75 mg/kg

Nickel	1.0 mg/l	3,000 mg/kg
Zinc	20 mg/l	35,000 mg/kg
Chloride	2,500 mg/l	-
Fluoride	2.0 mg/l	-
Selenium	0.02 mg/l	
Sulphate	1,000 mg/l	-
Cyanide	10 mg/l	2,500 mg/kg
pH	Between 5.5 and 9.0	Net acid generation of pH <4
Nitrite	30 mg/l	-
Nitrate	400 mg/l	-
Total Dissolved Solids	4000 mg/l	
Aromatic Hydrocarbons	600 µg/l	-
Polycyclic Aromatic Hydrocarbons		-
Naphthalene	16µg/l	
Benzo (a) pyrene	0.2 C	
Phenol	320 µg/l	-
Polychlorinated Biphenyls		-
Aroclor 1242	0.3 µg /l	
Aro 1254	0.1 µg /l	
Total Petroleum Hydrocarbons	10 mg/l (or no visible film)	
Blue green Algae (Microcystis)	11,000 cells/ml	-

1. Metals should be analysed in accordance with recognised test methods by a NATA certified laboratory.
2. Applies to the liquid contents in the containment facility readily available to the environment (e.g. water available to birds and animals).
3. Total solids include suspended and colloidal solids.
4. Applies to the solids in the containment facility.

Step 2 - Determining other risk factors

The second step in the assessment process is to consider other factors that may increase the hazard category of the containment facility including its size, location and environmental setting. If a proposed containment facility exceeds any of the size and location criteria listed in Table 2, then the structure will be a high hazard containment facility.

Table 2 – Determination of other risk factors

	Threshold criteria for a high hazard containment facilities
Criterion 1 Location with respect to habitation or water infrastructure	In the event of collapse, failure or overflow from the containment facility, would result in one or more of the following actions, it would or could: • impact on occupied premises to a depth of more than 300 mm; or • flow to a sensitive or commercial place; or • flow to a riverine area containing permanent water; or • contaminate a water supply for human consumption; or • contaminate a water supply used for livestock.

Criterion 2 Location in catchments	The containment facility is located within a: - declared catchment or sub-artesian area; or - watercourse and the containment facilities surface area of water exceeds 1ha.
Criterion 3 Size	The containment facility has a surface area of water greater than 4 ha; or the containment facility has a volume of water greater than 20 mega litres.

Step 3 - Determining the hazard category

Table 3 summarises the process for determining the hazard category of containment facilities on a petroleum authority.

If any proposed containment facility cannot comply with the acceptance criteria listed in Table 1 but can comply with the size and location criteria listed in Table 2, then the structure will be a medium hazard containment facility. Similarly if the structure contains substances that may be hazardous and exceeds the criteria in Table 2 then the structure will be a high hazard containment facility.

Table 3 – Determination of hazard category

Concentration of liquor and total solids	Location and size	Hazard Category
Contents of the containment facility do not exceed limits in Table 1	Containment facility location and size do not trigger criterion 1 listed in table 2	The structure is a low hazard containment facility
Contents of the containment facility exceed limits in Table 1	Containment facility location and size are below the criteria listed in table 2	The structure is a medium hazard containment facility.
Contents of the containment facility exceed limits in Table 1	Containment facility location and size are above the criteria listed in table 2	The structure is a high hazard containment facility.

Design, construction, operation, maintenance and decommissioning criteria

Containment facilities are engineering structures and must be designed by professional engineer(s) who would normally apply the criteria defined below. A professional engineer should also be consulted in the development of the decommissioning plan.

Criteria for Low Hazard Containment Facilities

Low hazard containment facilities should be designed, constructed, operated and decommissioned in accordance with the "Queensland Small Embankment Dam Guideline".

Criteria for Medium Hazard Containment Facilities

In order to comply with the conditions of this environmental authority, design, construction, operation, maintenance and decommissioning of medium hazard containment facilities, must be in accordance with the following.

Design:

- (a) Containment facilities with a capacity up to 3 mega litres are best constructed as *Turkey's Nest* structures;
- (b) Containment facilities should be located to have the smallest practical catchment area;
- (c) Containment facilities must have a spillway capable of passing a design flood, defined as the peak discharge from a critical duration storm with an annual exceedence probability of 1% (i.e. 1 in 100 yr event) or lower;
- (d) The spillway should be located where practicable in the abutment of the containment facility or in the minimum height section of the containment facility;
- (e) Any spillway discharge should be contained within stable defined channels until it enters any natural watercourse or waterway;
- (f) For embankments built on stable foundations, not subject to draw down and out of uniform soil material, the batters shall be no steeper than those shown in the table below, unless otherwise shown to be stable:

Embankment Soil Classification (Universal soil classification)	Upstream Batter	Downstream Batter
GC, SC	2.5:1	2.0:1
CL, ML	3.5:1	2.5:1
CH, MH	3.5:1	2.5:1
GW, GP, GM, SW, SP, SM	Not suitable	Not suitable

Note: The codes for the Universal Soil Classification (e.g. GC) are detailed in the Australian Standard AS 1726 1993 Geotechnical Site Investigation, Appendix A.

- (g) Where foundation material differs from the embankment fill material, the batters shall be chosen conservatively to be consistent with the weaker material classification.

Construction:

- (a) Embankments must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures, flow velocities, material strength, stability and durability.
- (b) Fine grained soils used in embankment construction should be mechanically compacted when they are near or at the optimum moisture content (i.e. slightly plastic) to improve soil strength, minimise seepage and reduce the risk of piping failure
- (c) Where geo-membranes are used, ensure that they are placed, anchored and joined in accordance with the manufacturer's specification.
- (d) Where geo-membranes are used ensure that they are suitable to prevent leakage of the hazardous contaminants, which are contained within the containment facility.
- (e) Where geo-membranes are used for liners, filters or drains, ensure that the geo-membrane is in contact only with fine-grained soils to prevent punching or tearing of the membrane.
- (f) Embankments built out of pervious material must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures and flow velocities.
- (g) Where foundation material differs from embankment fill material, the embankment should be constructed out of the material, which gives the flatter batter.
- (h) Prior to construction of an embankment, the foundation should be cleared of all:
 - vegetation (grass, shrubs and trees);
 - soils containing organic matter (roots);
 - cracked soils (stiff plastic soils);
 - pervious soils (sand, gravel)
 - pervious material in rock faults, joints or the rock foundation itself.
- (i) Prior to construction of an embankment, all transverse trenches, holes and other irregularities should be plugged or backfilled to create a generally undulating foundation for placement of the embankment.
- (j) Fine-grained soils used in embankment construction should have a consistent texture and be free from foreign matter such as branches, logs, gravels or boulders etc.
- (k) Fine-grained soils including dispersible soils should be placed in the centre of or towards the upstream faces of embankment containment facilities.
- (l) Coarser grained soils and rock materials are to be placed towards and on the outer faces of embankment containment facility to minimise erosion and breaching potential.
- (m) Dispersible and easily erodible soils should not be used on the outer faces of embankment containment facility.
- (n) Provide adequate measures to control seepage through the containment facility wall and the transmission of contaminants through underlying soil layers or rock stratum.
- (o) Embankment containment facility should be constructed with stable earth materials that will not decay or generate leachate or hazardous contaminants.

Operation:

- (a) The containment facility should be operated to maintain a minimum freeboard of 0.5m below the spillway level.
- (b) To ensure that there is no leakage of hazardous wastes from any containment facility associated with the petroleum activity a field based groundwater monitoring program must be established to ensure there is no contamination of any unsaturated perched systems or existing groundwater aquifers in the

vicinity of the works. Three or more monitoring bores specifically designed for this purpose should be located in a cluster between the contaminant source and any environmentally sensitive place. The monitoring program should regularly record:

- i. water levels;
 - ii. water quality;
 - iii. flow rates; and
 - iv. direction of flow.
- (c) As far as practicable minimise seepage and return any contaminated seepage to the containment facility.

Maintenance:

- (a) Maintain the erosion resistance of the downstream face of the containment facility to avoid surface scour, which may lead to failure of the wall;
- (b) Maintain the erosion resistance of the spillway to avoid scouring during the design flood;
- (c) Prevent the establishment of trees or shrubs on water containing embankments (roots initiate seepage paths);
- (d) Control of burrowing insects and animals (initiation of piping paths);
- (e) Repair active erosion and piping processes; and
- (f) During initial filling or commissioning, the containment facility should be monitored for leaks, seepages, embankment deformation or other signs of embankment distress.

Decommissioning:

- (a) Removing (where possible) all remaining liquids in the containment facility (e.g. it is generally acceptable to evaporate the liquid if the containment facility is not to be left to the land owner / holder).
- (b) Remove (where possible) all contaminated solids from the containment facility and encapsulate in a purpose built storage facility, or encapsulate any residual contaminated solids in situ by capping with an appropriate capillary break and with one metre of clay or similar impermeable material;
- (c) Design, install and maintain adequate diversion drains or similar structures to protect or minimise the erosion of any exposed surfaces by stormwater runoff;
- (d) Design, install and maintain adequate surface drainage to prevent water ponding and infiltration into any contaminated materials;
- (e) Address contaminated site issues by referring to Notes 11.2 and 11.3 of this environmental authority;
- (f) Establish a monitoring program to determine the success of the decommissioning plan;
- (g) If required, remove the wall of the containment facility; and
- (h) Rehabilitate the disturbed areas in accordance with the rehabilitation conditions of this environmental authority.

APPENDIX C Schedule of Rehabilitation Costs

OIL ACTIVITIES	
<i>Activity Type</i>	<i>Unit Cost</i>
First well	\$10,000
Subsequent wells	\$10,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Buried flow line construction	\$20,000 per gathering system project
Buried flow line in operation	\$500 per line
Flow lines – surface	\$500 per line, plus \$200 per km
Borrow pit	\$1,000 each
Evaporation pond	Site-specific estimation
Storage tank	\$5,000 per tank
Contaminated land survey	\$20,000 per facility
Sampling	\$5,000 per facility
Bioremediation land farm	\$5,000 per facility
Infrastructure	Site specific estimation
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

GAS ACTIVITIES (Including Coal Seam Gas wells >350m)	
<i>Activity Type</i>	<i>Unit Cost</i>
First well	\$10,000
Subsequent wells	\$5,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Buried flow line construction	\$20,000 per gathering system project
Buried flow line in operation	\$500 per line
Flow lines – surface	\$200 per km
Borrow pit	\$1,000 each

GAS ACTIVITIES (Including Coal Seam Gas wells >350m)	
Activity Type	Unit Cost
Containment pond (water)	Site specific estimation
Contaminated land survey	\$20,000 per facility
Processing facility (small)	\$10,000 each
Processing facility (large)	Site specific estimation
Compressor only	\$5,000 each
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

GAS ACTIVITIES (Coal Seam Gas wells <350m)	
Activity Type	Unit Cost
First well	\$10,000
Subsequent wells	\$1,000
Activity in environmentally sensitive area *	Site specific estimation
Roads	\$400 per km
Flow lines - buried	\$500 per line
Flow lines - surface	\$200 per line
Borrow pit	\$1,000 each
Containment pond (water)	Site specific estimation
Contaminated land survey	\$20,000 per facility
Processing facility (small)	\$10,000 each
Processing facility (large)	Site specific estimation
Compressor only	\$5,000 each
Seismic lines	\$5,000 per seismic line survey
Management fee	20% (maximum \$20,000)
* Including but not limited to exploration, appraisal, development activities and infrastructure developments	

Note: Rehabilitation cost estimates must be based on third party costs for rehabilitation of land that has been “*significantly disturbed*” and may be reviewed annually by the administering authority.

Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

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

Permit¹ number: EPPG00898213

Santos Reference: PEN101578910

Project Name: Roma Shallow Gas Project Area

Environmental authority takes effect: 20 August 2014

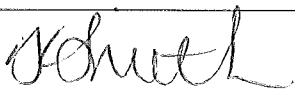
The anniversary date of this environmental authority is **7 April**.

An annual return and the payment of the annual fee will be due each year on this day.

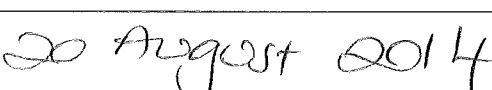
The environmental authority is subject to the attached schedules of conditions.

Environmental authority holders		
Principal Holder:	Santos CSG Pty Limited ACN: 121 188 654	Registered Address: Ground Floor - Santos Centre 60 Flinders Street ADELAIDE SA 5000
Joint Holders:	PAPL (Upstream) Pty Ltd Total E&P Australia Total E&P Australia II KGLNG E&P Pty Ltd	

Environmentally Relevant Activity	Location
Non-mining resource activities	Authority to Prospect (ATP): 336 Petroleum Lease (PL): 309, 310, 3/313, 314, 315, 6/316, 7/317, 8/318, 9/319, 13/322 and 93/323



Signature



Date

Kimberley Smith

Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:

Energy Assessment
Level 7, 400 George Street
BRISBANE QLD 4000
GPO Box 2454
BRISBANE QLD 4001
Phone: (07) 3330 5715
Fax: (07) 3330 5634

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Heritage Protection.



Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land and notifiable Activities

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

Responsibilities under the *Environmental Protection Act 1994*

Separate to the requirements of standard conditions, the holder of the environmental authority must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act. For example, the holder must be aware of the following provisions of the *Environmental Protection Act 1994*.

General environmental duty

Section 319 of the *Environmental Protection Act 1994* states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of the successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty, however maintaining your general environmental duty is a defence against the following acts:

- (a) an act that causes serious or material environmental harm or an environmental nuisance
- (b) an act that contravenes a noise standard
- (c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Heritage Protection website www.ehp.qld.gov.au.

Duty to notify

Section 320 of the *Environmental Protection Act 1994* explains the duty to notify. The duty to notify applies to all persons and requires a person or company to give notice where serious or material environmental harm is caused or threatened. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

The duty to notify arises where:

- a person carries out activities or becomes aware of an act of another person arising from or connected to those activities which causes or threatens serious or material environmental harm
- while carrying out activities a person becomes aware of the happening of one or both of the following events:
 - the activity negatively affects (or is reasonably likely to negatively affect) the water quality of an aquifer
 - the activity has caused the unauthorised connection of 2 or more aquifers.

For more information on the duty to notify requirements refer to the guideline *Duty to notify of environmental harm (EM467)*.

Some relevant offences under the *Environmental Protection Act 1994*

Non-compliance with a condition of an environmental authority (section 430)

Section 430 of the *Environmental Protection Act 1994* requires that a person who is the holder of, or is acting under, an environmental authority must not wilfully contravene, or contravene a condition of the authority.

Environmental authority holder responsible for ensuring conditions complied with (section 431)

Section 431 of the *Environmental Protection Act 1994* requires that the holder of an environmental authority must ensure everyone acting under the authority complies with the conditions of the authority. If another person acting under the authority commits an offence against section 430, the holder also commits an offence, namely, the offence of failing to ensure the other person complies with the conditions.

Causing serious or material environmental harm (sections 437–39)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the *Environmental Protection Act 1994*.

It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some relevant offences under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes

cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200L or more) at a place. Illegal dumping can also include abandoned vehicles.

Responsibilities under other legislation

An environmental authority pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for the activity that might be required by other State and/or Commonwealth legislation. Other legislation for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Sustainable Planning Act 2009*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Act 2000*

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

An environmental authority for petroleum activities is not an authority to impact on water levels or pressure heads in groundwater aquifers in or surrounding formations. There are obligations to minimise or mitigate any such impact under other Queensland Government and Commonwealth Government legislation.

Environmental Authority Conditions

This environmental authority consists of the following Schedules:

- Schedule A General Conditions
- Schedule AA Underground Gas Storage
- Schedule B Water
- Schedule BB Groundwater
- Schedule BE Fluid Injection
- Schedule C Regulated Structures
- Schedule D Land
- Schedule E Disturbance to Land
- Schedule F Environmental Nuisance
- Schedule G Air
- Schedule H Waste
- Schedule I Rehabilitation
- Schedule J Well Construction, Maintenance and Stimulation Activities
- Schedule K Community Issues
- Schedule L Notification Procedures
- Schedule M Definitions
- Appendix 1 Roma Underground Gas Storage Map

SCHEDULE A – GENERAL CONDITIONS

- (A1) This environmental authority authorises the carrying out of the following **resource activity(ies)**:
- (a) the petroleum activities listed in *Schedule A, Table 1 - Scale and Intensity for the Activities* to the extent they are carried out in accordance with the activity's corresponding scale and intensity; and
 - (b) the following **specified relevant activities**:
 - (i) Hydrocarbon Gas Refining – consists of refining 200,000,000m³ or more of natural gas;
 - (ii) Gas Producing – consists of manufacturing, processing or reforming 200t or more of hydrocarbon gas in a year;
 - (iii) Electricity Generation – generating electricity by using gas at a rated capacity of 10MW electrical or more;
 - (iv) Fuel Burning – consists of using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour;
 - (v) Waste Disposal – operating a facility for disposing of, in a year, more than 200000t of any combination of regulated waste, general waste and limited regulated waste and <5t of untreated clinical waste (if in a scheduled area);
 - (vi) Sewage Treatment - Operating sewage treatment works, other than no release works;
 - (vii) Water Treatment - treating 10ML or more of raw water in a day;
 - (viii) Another activity where, for the specified relevant activities listed in (i) – (vii) above, Schedule 2 of the *Environmental Protection Regulation 2008* (the Regulation) provides exemption for the activity, but only to the extent of the circumstances stated in Schedule 2 of the Regulation;
 - (ix) Stimulation activities;
 - (x) Extracting, other than by dredging; and
 - (c) incidental activities that are not otherwise specified relevant activities.

Schedule A, Table 1 – Scale and Intensity for the Activities

Tenure number/s	Petroleum Activity	Scale (number of activities)	Intensity (Maximum size in total)
ATP 336 PLs 309, 310, 3/313, 314, 315, 6/316, 7/317, 8/318, 9/319, 13/322 93/323	Coal seam gas exploration, appraisal and development wells	1460 wells	2190 ha
	Gas Injection	49 wells	73.5 ha
	Water Injection	13 wells	19.5 ha
	Compressor Station(s)	3 R-HCS-02 R-NCS-02-01 R-NCS-02-01	50 ha 2 X 30 ha
	LPG Plant	1	7 ha
	Regulated Dam(s) ≥400 megalitres	2	90 ha
	Regulated Dam(s) <400 megalitres	28	305 ha
	Non-Regulated Dam(s)	3161	790 ha

Tenure number/s	Petroleum Activity	Scale (number of activities)	Intensity (Maximum size in total)
	Water treatment facilities that allows treated water to be released to waters other than seawater	13	≤48 ML/day
	Sewage Treatment Plant(s) that discharge treated effluent to an infiltration trench or through an irrigation scheme, or to land for dust suppression, construction or operational purposes.	5	>100 equivalent persons (EP) ≤ 450 EP
		9	>21 EP ≤ 100 EP

- (A2) The resource activities in condition (A1) are authorised subject to the conditions of this environmental authority.
- (A3) This environmental authority does not authorise a relevant act¹ to occur in carrying out an authorised resource activity unless a condition expressly authorises the relevant act to occur². Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Prevent or Minimise Likelihood of Environmental Harm

- (A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of Measures, Plant and Equipment

- (A5) The holder of the environmental authority must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;
 - (b) maintain such measures, plant and equipment in their proper and effective condition; and
 - (c) operate such measures, plant and equipment in a proper and effective manner.
- (A6) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration materially increases, or is likely to increase, the environmental harm caused by the petroleum activities.

Financial Assurance

- (A7) Prior to any changes in petroleum activities which would result in an increase to the maximum disturbance since the last financial assurance calculation was submitted, the holder of the environmental authority must submit, and the administering authority must have approved, an application to amend the financial assurance.

¹ See section 493A of the Act.

² Section 493A(2) of the Act provides that a relevant act is unlawful unless it is authorised to be done under, among other things, an environmental authority.

Third Party Audit

- (A8) A **third party auditor**, nominated by the holder of this 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 (3) years.
- (A9) Notwithstanding condition (A9), and prior to undertaking the third party audit, the scope and content of the third party audit can be negotiated with the administering authority.
- (A10) An audit report must be prepared and certified by the third party auditor presenting the findings of each audit carried out.
- (A11) Any recommendations arising from the audit report must be acted upon 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.
- (A12) A written response must be attached to the audit report detailing the actions taken or to be taken on stated dates:
 - (a) to ensure compliance with this environmental authority; and
 - (b) to prevent a recurrence of any non-compliance issues identified.

Contingency Plan for Emergency Environmental Incidents

- (A13) Responses to environmental emergency incidents must be undertaken in accordance with the *GLNG Upstream – Contingency Plan for Emergency Environmental Incidents* dated June 2011, or any subsequent revised versions of this plan.
- (A14) The Contingency Plan for Emergency Environmental Incidents must include, but not necessarily be limited to:
 - (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (b) identification of the types of environmental incidents that may occur, relevant to the petroleum activities authorised to be carried out under this environmental authority;
 - (c) response procedures to minimise the extent and duration of environmental harm caused by environmental emergency incidents;
 - (d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;
 - (e) communication procedures and lines of communication within and beyond the organisation, including but not limited to Local Government, to be employed in responding to environmental emergency incidents;
 - (f) the resources to be used in response to environmental emergency incidents;
 - (g) procedures to investigate the cause of any incidents including releases or near misses, and where necessary, the remedial actions to be implemented to reduce the likelihood of recurrence of similar events;
 - (h) procedures for responding to incidents resulting from **stimulation** activities, including specific rectification measures in the event of non-routine stimulation events;
 - (i) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;
 - (j) procedures to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of a **dam**;
 - (k) procedures to respond to a **regulated dam** reaching its **mandatory reporting level**;
 - (l) procedures to respond to a regulated dam reaching its **design storage allowance**.
 - (m) a receiving environment monitoring program, to be specifically implemented in the event of a release to waters or land to examine / assess environmental impacts. For monitoring

- of waters, this program must include upstream, downstream and impact site monitoring procedures. For soils monitoring, three replicate samples must be taken at depth intervals of 0-10 cm, 20-30 cm and 50-60 cm at both an analogue and the impact site as a minimum;
- (n) the provision and availability of documented procedures to staff attending any emergency environmental incident to enable them to effectively respond;
 - (o) training of staff that will be called upon to respond to emergency environmental incidents to enable them to effectively respond;
 - (p) timely and accurate reporting of the circumstance and nature of emergency environmental incidents to the administering authority and any affected landholder, occupier and / or their nominated representative in accordance with conditions of this environmental authority; and
 - (q) procedures for accessing monitoring locations during emergency environmental incidents.

Infrastructure

- (A15) The following **infrastructure** must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:
- (a) **regulated dams and low hazard dams;**
 - (b) **exploration, appraisal and development wells;**
 - (c) water treatment plants;
 - (d) sewage treatment facilities;
 - (e) authorised discharge points to air and waters;
 - (f) any chemical storage facility associated with the environmentally relevant activity of chemical storage; and
 - (g) compressor stations.

Monitoring

- (A16) All monitoring required under this environmental authority must be undertaken by a suitably qualified person.
- (A17) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests, unless NATA accredited tests are not available.
- (A18) Any management or monitoring plans, systems, programs or procedures required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three (3) years in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.
- (A19) An annual report must be prepared each year and submitted to the administering authority in the form requested by the administering authority. This report must include but not necessarily be limited to:
- (a) the results of the Seepage Monitoring Program that is required by the conditions of this environmental authority;
 - (b) a summary of:
 - (i) any investigations required for the Seepage Monitoring Program prescribed under this environmental authority;
 - (ii) the regulated dam register in the approved format that is required by the conditions of this environmental authority;
 - (iii) the results of annual regulated dam water quality monitoring that is required by the conditions of this environmental authority;

- (iv) the results of vibration and blast monitoring required by the conditions of this environmental authority;
- (v) any well closure reports that are required by the conditions of this environmental authority, where applicable;
- (vi) the results of any baseline or stimulation impact monitoring program that is required by this environmental authority, where applicable;
- (vii) non **NATA accredited** laboratory testing methods, where applicable;
- (c) the management criteria report required by section 316A of the *Environmental Protection Act 1994*;
- (d) if prepared for the subject annual return period, any third party audit report and written response to said report that is required by this environmental authority;
- (e) a comparison of the previous 12 **months** monitoring results to both the limits set in this environmental authority and to relevant prior results including data analyses and interpretation to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination and the environmentally relevant activity(ies); and
- (f) details of any exceedences with the conditions of this environmental authority and the dates and times these exceedences were reported to the administering authority;
- (g) an outline of actions taken to minimise the risk of environmental harm from any circumstance, condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A17).

Surface Water Sampling Methodology

- (A20) The methods of water sampling required by this environmental authority must comply with that set out in the latest edition of the *Queensland Monitoring and Sampling Manual* as amended from time to time.

Groundwater Sampling Methodology

- (A21) The methods of groundwater sampling required by this environmental authority must comply with the latest edition of the *Queensland Monitoring and Sampling Manual*, AS/NZS 5667:11 1998 *Water Sampling Guidelines – Part 11 Guidance on sampling groundwater*, and the Australian Government's *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1) as relevant and as amended from time to time.

Noise Sampling Methodology

- (A22) Noise must be measured in accordance with the prescribed standards in the *Environmental Protection Regulation 2008*.

Documentation and Records Management

- (A23) A record of all documents required by this environmental authority must be kept for a minimum of five (5) years.
- (A24) All plans and monitoring programs required by this environmental authority must be certified by a suitably qualified person.
- (A25) All plans and monitoring programs under this environmental authority must be implemented.

SCHEDULE AA – UNDERGROUND GAS STORAGE

- (AA1) The only gas authorised to be stored underground is coal seam gas and other gas of sales specification quality.
- (AA2) The authorised gas must only be injected at the location(s) and within the formation(s) and impact zones depicted in Appendix 1 and listed in *Schedule AA, Table 1 – Details of Authorised Storage Formation*.

Schedule AA, Table 1 – Details of Authorised Storage Formation

Well Location (latitude and longitude (GDA94) or Map Ref)	Well Number/ Reference	Target Formation	Gas Injection Impact Zone
-26.4110; 149.0179	PH31	Showground Sandstone	Pleasant Hills Sh
-26.3762; 148.9995	PH32	Precipice Sandstone	Pleasant Hills Up
-26.5898; 149.1249	PJ22I	Precipice Sandstone	Pickanjinie #1 Pr
-26.5897; 149.1249	PJ23I	Showground Sandstone	Pickanjinie #3 Sh
-26.4024; 148.9335	GR21	Precipice Sandstone	Grafton Range #3 C Ev
-26.4024; 148.9335	GR32I	Precipice Sandstone	Grafton Range #3 C Ev
-26.4909; 149.0810	RA14IH	Precipice Sandstone	Raslie Pr
-26.3954; 148.9393	GR02I	Precipice Sandstone	Grafton Range Pr
-26.4024; 148.9335	GR21I	Precipice Sandstone	Grafton Range Pr
-26.4909; 149.0810	RA15I	Precipice Sandstone	Raslie Pr
-26.4021; 149.0047	PH36I	Showground Sandstone	Pleasant Hills Sh
-26.3936; 148.9950	PH37I	Showground Sandstone	Pleasant Hills Sh
-26.3954; 148.9393	GR19I	Precipice Sandstone	Grafton Range #3 C Ev
-26.4045; 149.0167	PH08I	Showground Sandstone	Pleasant Hills Sh
-26.4263; 148.8911	GR09I	Precipice Sandstone (Basal Evergreen Sandstone)	Grafton Range #9 D Ev
-26.4263; 148.8911	GR11I	Precipice Sandstone (Basal Evergreen Sandstone)	Grafton Range #11 D Ev
-26.4263; 148.8911	GR1I	Precipice Sandstone (Basal Evergreen Sandstone)	Grafton Range #9 D Ev
-26.4443; 148.8784	GR13I	Precipice Sandstone (Basal Evergreen Sandstone)	Grafton Range #11 D Ev
-26.4443; 148.8784	GR2I	Precipice Sandstone (Basal Evergreen Sandstone)	Grafton Range #11 D Ev
-26.3739; 149.0047	PH14I	Precipice Sandstone	Pleasant Hills Up
-26.6818; 148.8351	RM18	Precipice Sandstone	Richmond Pr
-26.4902; 149.0172	PR1I	Precipice Sandstone	Pine Ridge #1 Pr
-26.4771; 148.9953	PR5I	Precipice Sandstone	Pine Ridge #5 Pr
-26.3861; 148.9764	PH11I	Precipice Sandstone	Pleasant Hills Lpr
-26.7041; 148.8802	RM13I	Precipice Sandstone	Richmond Pr
-26.6820; 148.8550	RM16I	Precipice Sandstone	Richmond Pr
-26.4045; 149.0167	PH23I	Showground Sandstone	Pleasant Hills Sh
-26.6922; 148.8606	RM1I	Precipice Sandstone	Richmond Pr
-26.4045; 149.0167	PH1I	Showground Sandstone	Pleasant Hills Sh
-26.4045; 149.0167	PH2I	Showground Sandstone	Pleasant Hills Sh
-26.3936; 148.9950	PH3I	Showground Sandstone	Pleasant Hills Sh

- (AA3) Gas injection must not result in:
- (a) fracturing the target formation; or
 - (b) surface migration of the injected gas; or
 - (c) loss of containment from within the impact zones; or
 - (d) ingress to buildings and structures; or
 - (e) fugitive emissions.

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- (AA4) If environmental harm is caused or threatened to be caused, as a result of gas injection activities, gas injection must cease immediately.
- (AA5) The maximum injection pressure permitted must not exceed 90% of the formation fracture pressure.
- (AA6) Tracers must not be injected underground.
- (AA7) Despite condition (AA2), prior to gas injection into the Showgrounds Sandstone a risk assessment must be developed to ensure that injection activities are managed to prevent environmental harm and meet the additional requirements within this environmental authority.
- (AA8) The risk assessment required by condition (AA7) for gas injection into the Showgrounds Sandstone must include but not necessarily be limited to:
- (a) establishment of baseline data including but not limited to:
 - (i). identification of the gas injection impact zone;
 - (ii). estimated volume and rates of gas to be injected;
 - (iii). identification of injection wells, all existing bores, springs, environmental assets and watercourses connected to groundwater, faults and other geologic features that occur within the gas injection impact zone;
 - (iv). identification of the environmental values and water quality objectives of the gas injection impact zone in accordance with the *Environmental Protection (Water) Policy 2009*;
 - (v). development of a hydrogeological and/or geological conceptualisation that includes:
 - i. characterisation of formation geometry;
 - ii. physiochemical and hydraulic properties (including groundwater levels / pressure) of the target formation as well as surrounding geological formations;
 - iii. processes that may influence movement and storage of the injected gas;
 - (vi). consideration of any relevant reports prepared by other governmental or professional research organisations that relate to the environment within gas injection impact zone.
 - (b) identification of potential hazards and detailed assessment of their inherent risk. Potential hazards include but are not limited to:
 - (i). impacts on water quality within the gas injection impact zone within the target formation and surrounding aquifers;
 - (ii). impact on physical integrity of the aquifer or geological formation due to reactions between injection gas, aquifer material and native groundwater;
 - (iii). the potential for migration of injected gas or native groundwater out of the target formation during the injection operations;
 - (iv). over-pressurisation of target formation and its impact on surrounding aquifers;
 - (v). impacts on users or resources;
 - (vi). impacts on other aquifers of environmental, economic or social importance; and
 - (vii). impacts on groundwater-dependent ecosystems.
 - (c) Details of preventative measures for the management of potential hazards.
- (AA9) The Risk Assessment required by condition (AA7) must be accepted in writing by the administering authority.

Reporting Requirements for Operational Gas Injection

- (AA10) An operational gas injection report which has been certified by a suitably qualified person must be submitted to the administering authority with each annual return.
- (AA11) The operational gas injection report must summarize the results of the Underground Gas Storage Monitoring Program and provide interpretation and analysis of the information as required by condition (AA14) including but not necessarily being limited to:
- (a) the results of the monitoring program as required by condition (AA14);

- (b) monthly summaries of injection conditions;
- (c) well head injection rates versus formation pressure;
- (d) the effectiveness of aquitards (including the stability of the aquitard) and aquicludes of confining the injected gas within the target formation;
- (e) a detailed interpretation of the logs and other tests conducted during drilling and construction or refurbishment of the well against their specific objectives;
- (f) analysis of monitoring and operational data in terms of:
 - (i). validation of conceptual framework for injection; and
 - (ii). additional hazards that were not identified earlier;
- (g) a revised risk analysis that identifies all potential hazards, likelihood of various risk elements and associated consequences;
- (h) a re-evaluation of the gas injection impact zone; and
- (i) location details of any wells closed and decommissioned (GDA94).

Operational Gas Injection Cessation Report

(AA12) A gas injection cessation report which has been certified by a suitably qualified person must be submitted to the administering authority within two (2) months of completion of gas injection activities.

(AA13) The gas injection cessation report must include, but not necessarily be limited to:

- (a) volumes of gas injected at each well;
- (b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the verification monitoring, preventative measures and the residual risk; and
- (c) a monitoring report outlining the methods and results of verification monitoring undertaken to assess the performance of the operational injection activities and preventative measures for identified hazards.

Gas Injection Impact Monitoring Program

(AA14) An Underground Gas Storage Monitoring Program must include but not necessarily be limited to:

- (a) establishment of baseline data including but not limited to:
 - (i). identification of the gas injection impact zone;
 - (ii). estimated volume and rates of gas to be injected;
 - (iii). development of a hydrogeological and/or geological conceptualisation that includes:
 - i. characterisation of formation geometry;
 - ii. physiochemical and hydraulic properties (including groundwater levels / pressure) of the target formation as well as surrounding geological formations;
 - iii. processes that may influence movement and storage of the injected gas ;
- (b) validation of assumptions, predicted impacts and effectiveness of preventative measures (including details of any control or reference sites, methods for analysis and interpretation including a description of the statistical basis on which conclusions are drawn);
- (c) operational monitoring to manage potential hazards (including details on sampling and analysis methods (including frequency and locations) and quality assurance and control including but not limited to:
 - (i) continuously recording injection pressure, flow rate, cumulative volume of the gas and pressure of the target formation;
 - (ii) daily monitoring and keeping of records of the quantity of gas injected into the formation;
 - (iii) a temperature survey;
 - (iv) a casing integrity assessment technique such as:
 - i. oxygen activation log;
 - ii. cement integrity log; or
 - iii. an equivalent survey technique approved by the administering authority;
 - (v). profiling of the gas plume including rate of movement;
 - (vi). real-time surface gas detectors;

- (vii). monthly groundwater level monitoring of the target formation and other potentially affected aquifers;
- (viii). monthly monitoring of potentially affected landholder bores; and
- (ix). verification to assess the performance of the injection activities and compliance.

SCHEDULE B – WATER

Contaminant Release

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

Erosion and Sediment Control

- (B2) For activities involving significant disturbance to land, **control measures** that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:
- (a) preferentially divert stormwater around significantly disturbed land, or 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).

Works in watercourses, wetlands, lakes and springs

- (B3) Petroleum activity(ies) that require earthworks, vegetation clearing, placing fill and/or that will result in significant disturbance other than that associated with the construction and/or maintenance of **linear infrastructure**, is not permitted in or within:
- (a) 200 metres of any lake or spring; or
 - (b) 100 metres of the high bank of any other watercourse.
- (B4) All reasonable alternative locations must be considered prior to the construction of any linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in (B3)(b).
- (B5) The construction and/or maintenance of linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in (B5)(a) and (b) must be conducted in accordance with the following order of preference:
- (a) conducting works in times when there is no water present;
 - (b) conducting works in times of no flow;
 - (c) conducting works in times of flow but in a way that does not impede low flow.
- (B6) The construction and maintenance of linear infrastructure authorised under condition (B3) and (B10) must comply with the water quality limits specified in **Schedule B, Table 1 – Release limits for construction or maintenance of linear infrastructure**.

Schedule B, Table 1 – Release limits for construction or maintenance of linear infrastructure.

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

- (B7) Monitoring must be undertaken at a reasonable frequency that is appropriate to demonstrate compliance with condition (B6).
- (B8) Written notification detailing the location (GPS coordinates) of any significant disturbance to be undertaken in or on the **bed and banks** of a watercourse, or within the areas specified in condition (B3)(b), must be provided to the administering authority at least 24 hours prior to the commencement of the significant disturbance.
- (B9) Petroleum activities must occur outside a **wetland of high ecological significance**.
- (B10) Petroleum activities, other than linear infrastructure must occur outside a **general ecologically significant wetland**.
- (B11) Petroleum activities must not negatively impact a wetland of high ecological significance.
- (B12) Linear infrastructure activities, other than linear infrastructure construction and/or maintenance activities, must not change the existing surface water hydrological regime of any general ecologically significant wetland.

- (B13) The construction and/or maintenance of linear infrastructure in any general ecologically significant wetland must not:
- (a) prohibit the flow of surface water in or out of the wetland;
 - (b) impact surface water quality in the wetland unless specifically authorised by this environmental authority;
 - (c) drain the wetland;
 - (d) fill the wetland;
 - (e) impact bank stability; or
 - (f) result in the clearing of riparian vegetation outside of the required footprint.

Floodplains

- (B14) Where the petroleum activity(ies) is carried out on **floodplains** petroleum activity(ies) must be carried out in a way that does 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.

Well Testing

- (B15) Subject to Conditions (B16) and (B17) the injection of CSG water or better quality groundwater is authorised in wells that are not exploration, appraisal or development wells, for the purposes of **hydraulic testing**, where such hydraulic tests are undertaken for no more than two (2) consecutive days.
- (B16) The maximum volume of CSG water or better quality groundwater injected for the purposes of **hydraulic testing** identified in Condition (B15) must not exceed 1ML per hydraulic test.
- (B17) Written notification detailing the type and location (GPS coordinates) of any **hydraulic testing** undertaken in accordance with condition (B15) must be provided to the administering authority at least 10 business days prior to the commencement of the hydraulic test.

SCHEDULE BB - GROUNDWATER

- (BB1) 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.

Seepage Monitoring Program

- (BB2) A Seepage Monitoring Program must be developed to detect any seepage to groundwater as a result of storing contaminants in a regulated structure(s) (e.g. surface dams, monocells).
- (BB3) The Seepage Monitoring Program, must include, but not necessarily be limited to:
- (a) procedures to detect any seepage to groundwater and surrounding soils from regulated structure(s) and its possible effect on groundwater and soils;
 - (b) identification of seepage monitoring bores and their locations including:
 - (i) baseline / hydraulically up-gradient seepage monitoring bores (i.e. bores where groundwater quality will not have been affected by petroleum activities;
 - (ii) seepage monitoring bores that are within aquifers potentially affected by the regulated structure(s) authorised under this environmental authority;
 - (iii) a geodetic survey of all seepage monitoring bores; a geodetic survey showing groundwater potentiometric surface;
 - (c) the Seepage Monitoring Program has been designed consistent with relevant Guidelines and Standards such that the Program design has:
 - (i) a sufficient number seepage monitoring points and / or wells to obtain representative groundwater samples from the uppermost aquifer up-gradient and down-gradient of the potential influence;
 - (ii) if a salt monocell is authorised under this environmental authority, a sufficient number of seepage monitoring bores located not more than 150 m from the monocell or the boundary of the monocell facility, whichever is the closer;
 - (iii) sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the presence or absence of contaminants;
 - (iv) procedures to determine the quality of groundwater down gradient of any potential sources of contaminants including groundwater passing the relevant seepage monitoring bore(s);
 - (v) procedures to allow an assessment of whether there has been any statistically significant adverse change in groundwater quality at locations hydraulically down gradient of the containment activity(ies).
 - (d) procedures to determine groundwater flow direction, groundwater flow rate and hydraulic conductivity beneath the relevant regulated structure(s);
 - (e) sampling of all baseline or hydraulically up-gradient monitoring bores for the minimum groundwater parameters levels listed below quarterly over the 12 month period immediately prior to the commencement of any new containment activities;
 - (f) identification of the trigger parameter(s) associated with the potential contaminants of concern identified in (e);
 - (g) a sampling program of all seepage monitoring bores:
 - (i) to measure and record standing groundwater levels in metres accurate to 0.01 metres to be plotted as function of time (hydrograph) to identify seasonal patterns;
 - (ii) quarterly monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) whilst activities are being carried out;
 - (iii) annual monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) for a minimum of three (3) years after the containment activity(ies) ceases;

- (h) a Seepage Trigger Action Response Procedure which must include but not be limited to the following:
- (i) trigger levels for the relevant trigger parameter(s) identified in (f);
 - (ii) trigger and action response measures at which investigations will be undertaken;
 - (iii) action levels for the relevant possible contaminants of concern at which the holder of this environmental authority will undertake additional investigation into the potential for environmental harm, including the validation and verification of the source, cause and extent of contamination;
 - (i) identification monitoring equipment to be used; and
 - (j) a rationale containing details on the Programs purpose, conceptualisation and verification of the procedures, determinations, analysis and assumptions undertaken.
- (BB4) Seepage monitoring bores identified in (BB3) must be monitored quarterly for the trigger parameter(s) specified in *Schedule BB – Table 1 (Seepage Monitoring Trigger Parameters)*.

Schedule BB – Table 1 (Seepage Monitoring Trigger Parameters)

Parameter	Units	Untreated Coal Seam Water	Permeate	Brine
Static Water Level	m	monitor	monitor	monitor
pH	pH unit	monitor	monitor	monitor
EC	µS/cm	monitor	monitor	monitor
Major Anions (sulphate, chloride)	mg/L	monitor	-	-
Major Cations (calcium, magnesium, sodium and potassium)	mg/L	monitor	-	-

Monitoring Bores

- (BB5) The following information concerning each newly constructed groundwater monitoring bore must be submitted to the administering authority with each annual return:
- (a) bore ID and location presented on a plan;
 - (b) design of the monitoring bores installed;
 - (c) specific construction information including but not limited to geographical coordinate (including the geophysical coordinate system utilised) depth of bore, depth and length of casing, depth and length of screening, presence of any measuring probe;
 - (d) identification of any aquifers intercepted by the monitoring bores;
 - (e) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible contaminants of concern; and
 - (f) a lithological log and preferably a stratigraphic interpretation to identify the important features.

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SCHEDULE BE – FLUID INJECTION

(BE1) The only fluids authorised to be injected into an aquifer(s) are those fluid types into the aquifer formations and locations listed in *Schedule BE, Table 1 – Details of Authorised Fluid Injection*.

Schedule BE, Table 1 – Details of Authorised Fluid Injection

Well Location (easting and northing (MGA Z55))	Well Number/ Reference	Target Formation	Fluid Type	Water Quality ^{[1](2)} Impact Zone	Hydraulic Impact Zone ^[2]
7013142, 7071103	TBDIG01	Gubberamunda	Treated CSG water	1,500 metres	15,000 metres
701574, 7071369	TBDIG02	Gubberamunda	Treated CSG water		
702492, 7070264	TBDIG03	Gubberamunda	Treated CSG water		
703342, 7068925	TBDIG04	Gubberamunda	Treated CSG water		
703080, 7069642	TBDIG09	Gubberamunda	Treated CSG water		
703221, 7067882	RTRIG11	Gubberamunda	Treated CSG water		
700030, 7070411	PASIG05	Gubberamunda	Treated CSG water		
698073, 7069729	PASIG07	Gubberamunda	Treated CSG water		
698177, 7068384	CWRIG08	Gubberamunda	Treated CSG water		
699141, 7070866	PASIG12	Gubberamunda	Treated CSG water		
697989, 7067415	CWRIG13	Gubberamunda	Treated CSG water		

^[1] The water quality impact zone area shall be described as a polygon with boundary references specified in grid references to GDA94 and will only be applicable where the injection water quality is poorer than the target aquifer.

^[2] For details on the defining the water quality impact zone and the hydraulic impact zone, refer to chapter 7.3 of the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) Managed Aquifer Recharge.

697528, 7066628	CWRIG14	Gubberamunda	Treated CSG water		
703242, 7083206	Emu Park 1	Timbury Hills	Treated CSG water	200 metres	18,000 metres

(BE2) The treated CSG water injection trial authorised by Condition (BE1) is limited to 180 days for the injection activities at the Emu Park 1 well. The administering authority must be notified prior to the commencement of the treated CSG water injection trial.

(BE3) Treated CSG water injection into the Gubberamunda target formation authorised by Condition (BE1) is limited to a period of twenty (20) years from 09 April 2014.

Well Integrity

(BE4) Unless otherwise stated in a condition of this environmental authority, 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.

(BE5) 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.

(BE6) 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.

Fluid Injection Quality

(BE7) Fluid used for the well injection activities in the Gubberamunda Target Formation, as authorised by Condition (BE1) must comply with the contaminant limits prescribed in *Schedule BE, Table 2 – Specific Contaminant Limits for Injection Fluid (Gubberamunda Target Formation)*.

Schedule BE, Table 2 – Specific Contaminant Limits for Injection Fluid (Gubberamunda Target Formation)

Water Quality Characteristics	Release Limits	Limit Type	Monitoring Frequency
Electrical conductivity ($\mu\text{S}/\text{cm}$)	1000	Maximum	Fortnightly for the first 12 month of operation, then monthly afterwards
pH (pH unit)	6.5 – 8.5	Range	
N-Nitrosodimethylamine ($\mu\text{g}/\text{L}$)	0.1	Maximum	
Dissolved Oxygen (mg/L)	1	Maximum	

NS

Ammonia as N (mg/L)	0.5	Maximum
Total nitrate as N (mg/L)	50	Maximum
Faecal coliforms (cfu/100ml)	1	Maximum
Total chlorine (mg/L)	5	Maximum
Benzene (mg/L)	0.001	Maximum
Toluene (mg/L)	0.8	Maximum
Ethyl benzene (mg/L)	0.3	Maximum
Xylene (mg/L)	0.6	Maximum
Aluminium (mg/L) (total)	0.1	Maximum
Arsenic (mg/L) (total)	0.01	Maximum
Beryllium (mg/L) (total)	0.06	Maximum
Boron (mg/L) (total)	0.4	Maximum
Cadmium (mg/L) (total)	0.002	Maximum
Chromium (mg/L) (total)	0.05	Maximum
Copper (mg/L) (total)	1	Maximum
Iron (mg/L) (total)	0.3	Maximum
Lead (mg/L) (total)	0.01	Maximum
Manganese (mg/L) (total)	0.1	Maximum
Mercury (mg/L) (total)	0.001	Maximum
Selenium (mg/L) (total)	0.01	Maximum
Zinc (mg/L) (total)	3	Maximum

(BE8) Fluid used for the well injection activities in the Emu Park 1 well, as authorised by Condition (BE1), must comply with the contaminant limits prescribed in *Schedule BE, Table 3 – Specific Contaminant Limits for Injection Fluid (Emu Park 1 well)*

Schedule BE, Table 3 – Specific Contaminant Limits for Injection Fluid (Emu Park 1 well)

Water Quality Characteristics	Release Limits	Limit Type	Monitoring Frequency
Electrical conductivity (µS/cm)	300 to 900	Range	Daily
pH (pH Unit)	6.5-8.5	Range	Daily
Dissolved oxygen (mg/L)	0.5	Maximum	Daily

Fluid Injection Quantity

(BE9) The total volume of fluid injected to the Emu Park 1 well must not exceed 180 ML over the duration of the injection trial.

(BE10) The total volume of fluid injected into the Gubberamunda Target Formation, as authorised by Condition (BE1) must not exceed 24ML/day.

Monitoring

(BE11) Monitoring for changes in groundwater pressure resulting from the CSG water injection trial at the Emu Park 1 well must be conducted. The monitoring must involve the following:

- (a) the use of a minimum of three wells, accessing the following formations and locations:
 - (i) Timbury Hills formation within the hydraulic impact zone of the well; and
 - (ii) Precipice Sandstone formation within 1km radius of the well; and
 - (iii) Gubberamunda formation within 1km radius of the well.

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Injection Management Plan

(BE12) An Injection Management Plan must be submitted to the administering authority prior to the carrying out of the fluid injection activities.

(BE13) The Injection Management Plan must include but not necessarily be limited to:

- (a) estimated volumes and rates of fluid to be produced and injected;
- (b) a description of the physical, chemical and biological components and their concentrations of the fluid to be produced;
- (c) details of how and where the fluid will be produced, aggregated, stored and kept separate from other fluid until it is, treated and injected into the source aquifer;
- (d) details of where the fluid is proposed to be treated including a description of the treatment process;
- (e) a demonstration that the injection fluid has inconsequential reactivity with the target formation and native groundwater it will come into contact with;
- (f) the characteristics of the receiving environment;
- (g) identification of the water quality impact zone and the hydraulic impact zone;
- (h) identification of all existing bores, springs, lakes, wetlands, 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) 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 Act 1994*, *Environmental Protection Regulation 2008*, *Environmental Protection (Water) Policy 1997* and the *Queensland Water Quality Guidelines 2009*;
- (j) an assessment of the potential impacts on the environmental values of the receiving environment including migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourses, faults or other geologic features likely to impact on other aquifers;
- (k) a risk assessment consistent with the risk framework specified in the *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;
- (l) verification methods to assess performance of the injection activities,
- (m) 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;
- (n) the indicators or other criteria against which the performance of fluid injection will be assessed;
- (o) 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;
- (p) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;

- (q) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and
- (r) a program to monitor impacts on the environmental values of the receiving environment identified by condition (BE13)(j).

Reporting Requirements for Fluid Injection

- (BE14) For fluid injection activities other than trials at the Emu Park 1 well as authorised under condition (BE1), a fluid injection report must be submitted to the administering authority with each annual report as required by Condition (A20).
- (BE15) The fluid injection report must summarise the results of the Injection Monitoring Program and provide interpretation and analysis of those results including but not necessarily being limited to:
- (a) the results of the monitoring program as required by condition (BE7);
 - (b) monthly summaries of injection conditions;
 - (c) commentary on changes to injection fluid characteristics or sources;
 - (d) annulus performance;
 - (e) packer isolation tests;
 - (f) mechanical integrity tests;
 - (g) pressure of the target formation;
 - (h) stability of overlying aquitard;
 - (i) an updated risk assessment providing details on potential hazards including their inherent risk, preventative measures & monitoring and the residual risk;
 - (j) quantity of fluid injected; and
 - (k) quality parameters of fluid injected.

Well Closure

- (BE16) A Well Closure Plan must be submitted to the administering authority within six (6) months prior to the cessation of fluid injection at a well.
- (BE17) The Well Closure Plan must include, but not necessarily be limited to the following:
- (a) details of when and under what circumstances the injection well will be decommissioned;
 - (b) sealing details including the method, type of material to be used and the location and the depth (metres) from ground surface of the bottom of the seal will be located; and
 - (c) any proposed test or measure to be made.
- (BE18) Actions outlined in the well closure plan must be completed within three (3) months of the cessation of fluid injection at the injection well.
- (BE19) Upon completion of injection activities at a fluid injection well, a well closure report demonstrating compliance with the well closure plan as required by condition (BE16) for that well must be prepared by a suitably qualified person and submitted to the administering authority with the next annual report as required by Condition (A20).

Injection Cessation Report

- (BE20) A fluid injection cessation report must be submitted to the administering authority within four (4) months of completion of fluid injection activities.

(BE21) The fluid injection cessation report must include, but not necessarily be limited to:

- (a) volumes of fluid injected at each well;
- (b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the verification monitoring, preventative measures and the residual risk; and
- (c) a monitoring report outlining the methods and results of verification monitoring as required by condition (BE13)(r) to assess the performance of the injection activities and preventative measures for identified hazards.

SCHEDULE C – REGULATED STRUCTURES

Assessment of Hazard Category

- (C1) The **hazard category** of any **structure** must be assessed by a **suitably qualified and experienced person** in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C2) The **hazard assessment** required under condition (C1) must occur in any of the following situations:
- (a) prior to the design and construction of the structure;
 - (b) prior to any change in its purpose or its stored contents;
 - (c) for a structure assessed and certified as a high or significant hazard structure, at least biennially after its construction;
 - (d) for an **existing low hazard dam**, by 2 January 2014.

- (C3) A hazard assessment report and **certification** must be prepared by a **suitably qualified and experienced person** for any **structure** assessed

Note: The hazard assessment report may include a hazard assessment for more than one structure.

- (C4) Where an existing structure is for the first time assessed as significant or high, the structure must meet the conditions required for regulated structures under this environmental authority within 12 months of that assessment.

Construction of Low Hazard Dam to Contain Wetting Front

- (C5) Where a dam is assessed as low hazard, it must be:
- (a) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the dam is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation.
- (C6) In the event of early signs of loss of structural or hydrological integrity of a low hazard dam:
- (a) immediate action to prevent or minimise any actual or potential environmental harm must be taken; and
 - (b) any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Hazard Dams

- (C7) The condition of all low hazard dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.

Design and Construction of a Regulated Structure

- (C8) **Construction** of any dam determined to be a **regulated structure** is prohibited until :

- (a) a **hazard category** assessment report and certification has been submitted to the administering authority;
 - (b) a **design plan** for the regulated structure has been prepared by a **suitably qualified and experienced person**; and
 - (c) certification from a suitable qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant conditions of this environmental authority has been received.
- (C9) The design plan must contain the information prescribed in the *Guideline – Structures which are dams or levees constructed as part of environmentally relevant activities*.
- (C10) 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 Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C11) All regulated structures must be constructed in accordance with a design plan that has been certified by a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C12) Certification by a suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:
- (a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - (b) construction of the regulated structure is in accordance with the design plan.
- (C13) All **regulated structures** must be designed and constructed to prevent:
- (a) floodwaters from entering the regulated structure from a watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time; and
 - (b) wall failure due to erosion by floodwaters arising from the watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time; and
 - (c) overtopping as a result of a flood event of the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.

Operation of a Regulated Structure

- (C14) Operation of a regulated structure is prohibited unless:
- (a) one paper copy and one electronic copy of the design plan and certification, and a set of 'as constructed' drawings and specifications has been submitted to the administering authority, together with certification that the structure:
 - (i) has been constructed in accordance with the design plan;
 - (ii) is capable of delivering the performance stated in the design plan; and
 - (iii) is compliant with the relevant conditions of this environmental authority;

- (b) the conditions of this environmental authority relating to the construction of the structure have been met; and
- (c) for regulated dams, the details required under this environmental authority have been entered into a Register of Regulated Dams.

Regulated Dam Register

- (C15) A register of regulated dams must be established in accordance with the administering authority's *Regulated Dam Register* template, as amended from time to time.
- (C16) The information contained in the register of regulated dams must always be current and complete on any given day.

Mandatory Reporting Level

- (C17) The **mandatory reporting level** must be marked on each regulated structure in such a way that it is clearly visible during routine inspections of each dam.
- (C18) On becoming aware that the mandatory reporting level has been reached, action must be taken to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.

Design Storage Allowance

- (C19) On 1 November of each year, storage must be available in each **regulated structure** to meet the **design storage allowance** estimated for the dam in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C20) On becoming aware that the **regulated structure** will not have the available storage to meet the design storage allowance on 1 November of any year, action must be taken to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Monitoring

- (C21) The condition of all containment structures must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.
- (C22) Each regulated structure must be monitored for the water quality characteristics and at the monitoring location and frequency specified in *Schedule C – Table 1 Regulated Structure Contaminant Monitoring* as follows:

Schedule C – Table 1 Regulated Structure Contaminant Monitoring

Quality Characteristic	Monitoring Location	Frequency of Monitoring
pH (pH unit)	At least three (3) different structure profile depths for each sampling event and be taken as far as practicable from the edge of the regulated structure	During the month of October every year
Electrical Conductivity (µS/m)		
Turbidity (NTU)		
Temperature		
Dissolved Oxygen (mg/L)		
Sodium adsorption ratio (SAR)		
Aluminium (µg/L)		
Arsenic (µg/L)		

Barium (µg/L)		
Boron (µg/L)		
Cadmium (µg/L)		
Chromium (CrVI) (µg/L)		
Copper (µg/L)		
Iron (µg/L)		
Fluoride (µg/L)		
Lead (µg/L)		
Manganese (µg/L)		
Mercury (µg/L)		
Nickel (µg/L)		
Selenium (µg/L)		
Silver (µg/L)		
Strontium (µg/L)		
Tin (µg/L)		
Zinc (µg/L)		
Total phosphorus (mg/L)		
Total Nitrogen (mg/L)		
Total petroleum hydrocarbons (µg/L)		
BTEX (µg/L)		
Polycyclic aromatic hydrocarbons (µg/L)		
Gross alpha + gross beta or radionuclides by gamma spectroscopy (Bq/L)		

Annual Inspection and Report

(C23) Each regulated structure must:

- (a) be inspected annually by a **suitably qualified and experienced person**.
- (b) be assessed for the condition and adequacy of each regulated structure for dam safety and against the necessary structural, geotechnical and hydraulic performance criteria in each annual inspection.

(C24) A **suitably qualified and experienced person** must:

- (a) prepare an annual inspection report containing details of the assessment and including recommended actions to ensure integrity of the structure.
- (b) certify the annual inspection report in accordance with the *Manual for Assessing Categories and Hydraulic Performance of Dams*, as amended from time to time.

(C25) The recommendations contained within the annual inspection report must be considered and action(s) taken to ensure that the regulated structure will safely perform its intended function.

(C26) Within 20 days of receipt of the annual inspection report, the administering authority must be notified in writing of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each regulated structure.

SCHEDULE D — LAND

General

- (D1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.
- (D2) The release of contaminants to land must be carried out in a manner such that:
- (a) vegetation is not damaged;
 - (b) soil quality is not adversely impacted;
 - (c) there is no surface ponding or runoff to waters;
 - (d) there is no aerosols or odours;
 - (e) deep drainage below the root zone of any vegetation is minimised;
 - (f) the quality of shallow aquifers is not adversely affected.

Chemical Storage

- (D3) All chemical storages must:
- (a) be stored in, or serviced by, an effective containment system that is impervious to the materials stored therein; and
 - (b) be stored and handled in accordance with the relevant Australian Standard where such Standard is available; and
 - (c) be managed to prevent the release of substances to waters or land.

Hydrostatic Test Water and Low Point Drains

- (D4) Contaminants that are hydrostatic test water from pipelines and contaminants from low point drains may be released to land in accordance with condition (D2).

Use of Coal Seam Gas Water

- (D5) Coal seam gas water produced from the authorised petroleum activity(ies) which is used for:
- (a) domestic or stock purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for stock and domestic purposes, as amended from time to time;
 - (b) irrigation purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for irrigation purposes, as amended from time to time.
- (D6) Coal seam gas water produced from the authorised petroleum activity(ies) may be used for:
- (a) dust suppression on roads; and
 - (b) for construction and operational purposes for the petroleum activity(ies) authorised by this environmental authority.
- (D7) Coal seam gas water may be transferred to a third party to be used for the following purposes subject to compliance with conditions (D8) and (D9):
- (a) dust suppression;
 - (b) construction and operational purposes;
 - (c) livestock watering purposes.
- (D8) Any coal seam gas water supplied to a third party for livestock watering purposes in accordance with condition (D7)(c) must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for livestock watering purposes, as amended from time to time.
- (D9) If the responsibility of coal seam gas water is given or transferred to a third party in accordance with condition (D7), the holder of the environmental authority must ensure that:

- (a) the responsibility of the coal seam gas water is given or transferred in accordance with a written agreement (the 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*.

Sewage Treatment Works

(D10) Treated sewage effluent may only:

- (a) be released to land by sub-surface or spray irrigation at designated, fenced contaminant release area(s)
- (b) be used for dust suppression, construction and operational purposes in accordance with condition (D21) to condition (D23).

Conditions (D11) to (D13) apply to temporary and permanent sewage treatment work operations

- (D11) Treated sewage effluent may only be released to land by large droplet or by subsurface irrigation at designated, fenced and signed contaminant release areas.
- (D12) A buffer distance of 50 metres must be applied from the location of the effluent irrigation area to any watercourse, wetland or protected area and 100 metres from any potable water supply (bore or a catchment) or stock drinking water supply.
- (D13) When circumstances prevent the irrigation of treated sewage effluent to land, the contaminants must be directed to on-site storage or lawfully disposed of off-site.
- (D14) The quantity of treated sewage effluent used in accordance with condition (D10) must be determined by an appropriate method, for example, a flow meter.

Conditions (D15) to (D16) apply to temporary and permanent sewage treatment plant operations with a design capacity of greater than 21 to 100 equivalent persons

- (D15) Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land* for each quality characteristic.
- (D16) Treated sewage effluent released to land must be monitored at the frequency and for the quality characteristics specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land* for each quality characteristic.



Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land

Quality Characteristic	Sampling and <i>in situ</i> measurement point location	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment works	Maximum	20 mg/L	Quarterly
E. coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100 mL	
		Maximum	10000 cfu per 100 mL	
pH		Range	6.0-8.5	Monthly
Dissolved Oxygen		Minimum	2mg/L	
Electrical Conductivity		Monitor only		

Conditions (D17) through (D20) apply only to permanent sewage treatment works operations with a design capacity of between 100 and 450 equivalent persons

- (D17) Prior to construction of a sewage treatment works the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated.
- (D18) All nominated locations and minimum areas of land in condition (D17) must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.
- (D19) A copy of results of the determinations required in condition (D18) must be submitted to the administering authority.
- (D20) If, within 20 business days following the submission of the results required by condition (D19) the administering authority provides comments on the submission, the holder of this environmental authority must:
- (a) have due regard to that comment in the finalisation of the amended results; and
 - (b) submit the finalised amended results within 40 business days after the administering authority provided comments; and
 - (c) implement the amended results.

Conditions (D21) through (D23) apply only to treated sewage effluent use for the purposes of dust suppression, construction and operational purposes.

- (D21) Treated sewage effluent produced from the authorised petroleum activity(ies) may only be used for dust suppression, construction and operational purposes provided that:
- (a) the treated sewage effluent has not been stored in a dam or tank prior to use and;
 - (b) the treated sewage effluent quality meets the release limits specified in *Schedule D, Table 2 –Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each of the water quality characteristics; and

- (c) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority.
- (D22) Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 2 –Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each quality characteristic.
- (D23) All sewage effluent released to land must be monitored at the frequency and for the quality characteristics specified in *Schedule D, Table 2 –Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each quality characteristic.

Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes

Quality Characteristic	Sampling and in-situ measurement point location	Limit type	Release Limit	Frequency
pH	e.g. treated sewage effluent storage	Range	6.0 to 8.5	Weekly ¹
5 – day Biochemical Oxygen Demand (BOD)		Median	20 mg/L	
E.Coli		Median	<10 cfu per 100 mL	
Electrical Conductivity		Maximum	1600 uS/cm	
Turbidity		95%ile (max)	2 (5) NTU	
Total Suspended Solids		Median	5 mg/L	

¹ Monitoring is to be conducted on a weekly basis until 12 months of monitoring demonstrates no exceedances of the release limits. Monthly monitoring can occur thereafter, excluding E.Coli.

SCHEDULE E — DISTURBANCE TO LAND

Soil Management Plan

- (E1) The identification of management of soil must be undertaken in accordance with the Soils Management Plan as amended from time to time.
- (E2) A copy of Soil Management Plan must be made available to any potentially affected landholder upon request by that landholder.

Fauna Management

- (E3) Measures must be employed to prevent fauna entrapment:
 - (a) during the construction of pipelines in pipe sections and pipeline trenches; or
 - (b) during the construction and operation of well infrastructure and dams.

Confirming environmentally sensitive areas, wetlands and springs

- (E4) Prior to undertaking petroleum activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground environmentally sensitive areas, wetlands and springs at that location must be undertaken by a suitably qualified person.
- (E5) A suitably qualified person must develop and certify a methodology so that condition (E4) can be complied with and which is appropriate to confirm on-the-ground environmentally sensitive areas, wetlands and springs by 8 December 2014.
- (E6) Where areas mapped as environmentally sensitive areas, wetlands and springs differ from those confirmed under conditions (E4) and (E5), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground values.
- (E7) All documentation survey information photographs, field data or any material associated with the field validation requirements in (E4) must be maintained for the life of the environmental authority to demonstrate to the administering authority that surveys were conducted in a manner consistent with requirements contained in (E5).

Planning for land disturbance

- (E8) The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles:
 - (a) maximise the use of areas of pre-existing disturbance;
 - (b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative; impacts, on areas of native vegetation or other areas of ecological value;
 - (c) minimise disturbance to land that may otherwise result in **land degradation**;
 - (d) minimise isolation, fragmentation or dissection of tracts of native vegetation; and
 - (e) minimise clearing of native mature trees.

Disturbance to Land – Environmentally Sensitive Areas

- (E9) Petroleum activities must be carried out in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, *Schedule E, Table 2 – Authorised Disturbance* and any other relevant conditions of this environmental authority.

Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category A ESAs	No petroleum activities permitted	Only low impact petroleum activities permitted.	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are Nature Refuges, Koala Habitat and/or Declared Catchment Areas	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E10) and (E11)	N/A
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are Essential Habitat, Essential Regrowth Habitat and/or 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E10) and (E11)	N/A

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Category C ESAs that are Resource Reserves	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are State Forests and/or Timber Reserves	Only limited petroleum activities permitted subject to condition (E12). Limited impact camps permitted	N/A	N/A

Note: Approvals may be required under the *Forestry Act 1959* where the petroleum activity(ies) is proposed to be carried out in ESAs that are State Forests or Timber Reserves.

Schedule E, Table 2 - Authorised Petroleum Activities and Disturbances

Schedule E, Table 2 - Authorised Petroleum Activities and Disturbances					
Authorised Activity	Development Name	Location of Development (GDA94)		Size of Disturbance	ESA affected
Pipeline Replacement	Roma Town Gas Supply	Latitude	Longitude	Approximate Length: 27m Maximum Width: 15m Area of disturbance: 0.04 ha	Category C ESA (Of Concern Regional Ecosystem (RE))
		-26.57467239 to -26.57484102	148.81652127 to 148.81678162		
		-26.57484102 to -26.57676487	148.81678162 to 148.81931362	Length: 480m Maximum Width: 15m Area of disturbance: 0.72 ha	Category C (Of Concern RE) Primary Protection Zone
		-26.57852201 to -26.57915321	148.8367684 to 148.84072202	Length: 430m Maximum Width: 15m Area of disturbance: 0.645 ha	Category B (Endangered RE) Secondary Protection Zone
		-26.579152321 to -26.57711036	148.84072202 to 148.840766891	Length: 230m Maximum Width: 15m Area of disturbance: 0.345 ha	Category B (Endangered RE) Primary Protection Zone
Total Area of Disturbance for Pipeline Replacement					1.75 ha
CSG Re-injection Pipeline and Pleasant Hills Dam to Roma Hub 02 Dam water transfer line	Roma Underground Storage and Pleasant Hills Dam to Roma Hub long distance water line	-26.427814 to -26.430236	149.013226 to 149.01254	Length: 276m Width: 20m Area of disturbance: 0.5591 ha	Category C (Of Concern RE) Primary Protection Zone
		-26.430236 to -26.433375	149.01254 to 149.011659	Length:360m Width: 20m Area of disturbance: 0.7110 ha	Category C ESA (Of Concern Regional Ecosystem (RE))
		-26.433375 to -26.435553	149.011659 to 149.011044	Length: 249m Width: 20m Area of disturbance: 0.4935 ha	Category C (Of Concern RE) Primary Protection Zone
		-26.435553 to -26.438237	149.011044 to 149.010292	Length:287m Width: 20m Area of disturbance: 0.4784 ha	Category C ESA (Of Concern Regional Ecosystem (RE))
		-26.438237 to -26.440709	149.010292 to 149.009599	Length: 305m Width: 20m Area of disturbance: 0.7024 ha	Category C (Of Concern RE) Primary Protection Zone
Total Area of Disturbance for CSG Re-injection Pipeline					2.9446 ha
Water Transfer Line	Coxon Creek to Mount Hope Section 2	-26.372292 to -26.375052	149.093267 to 149.097478	Length: 739m Width: 12m Area of disturbance: 0.8868 ha	Category C ESA (Of Concern ecosystem): Primary Protection Zone

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	Coxon Creek to Mount Hope Section 3	-26.374407 to -26.375052	149.097320 to 149.097478	Length: 70m Width: 12m Area of disturbance: 0.084 ha	Category C ESA (Of Concern ecosystem)
	Coxon Creek to Mount Hope Section 4	-26.387917 to -26.378832	149.098679 to 149.098908	Length: 1115m Width: 12m Area of disturbance: 1.338 ha	Category B (Endangered RE) Primary Protection Zone
Total Area of Disturbance for Water Transfer Line					2.3088 ha
Water Transfer Pipeline and Gas Transmission Pipeline	Blyth Creek Crossing	-26.466890 to -26.466915	149.045108 to 149.045231	Length: 140m Width: 30 – 52m Area of disturbance: 0.4901 ha	Category C ESA (Of Concern ecosystem)
		-26.467413 to -26.467290	149.045427 to 149.045297		
		-26.466719 to -26.466393	149.043949 to 149.043937		
		-26.466953 to -26.466979	149.046125 to 149.046129		
		-26.466981 to -26.467267	149.046387 to 149.046396		
		-26.467399 to -26.467403	149.046410 to 149.046138		
		-26.466949 to -26.466960	149.046031 to 149.047503	Length: 430m Width: 30m - 52m Area of disturbance: 1.6265 ha	Category C ESA (Of Concern ecosystem): Primary Protection Zone
		-26.466947 to -26.466843	149.047862 to 149.048592		
		-26.466628 to -26.466929	149.049527 to 149.049510		
		-26.467149 to -26.467149	149.048555 to 149.048555		
Total Area of Disturbance for Water and Gas pipelines					2.116 ha
Water Transfer Pipelines (Crossing 2)	Blyth Creek	-26.467772 (point 2) to -26.468085 (point 5)	149.037975 (point 2) to 149.037266 (point 5)	Length: 125m Width: 24 - 80m Area of disturbance: 0.3275 ha	Category C ESA (Of Concern ecosystem)
		-26.468977 (point 9) to -26.468957 (point 21)	149.037166 (point 9) to 149.037457 (point 21)		
		-26.465679 (point 0) to -26.465749 (point 8)	149.037800 (point 0) to 149.037564 (point 8)	Length: 525m Width: 24 - 98m Area of disturbance: 2.1243 ha	Category C ESA (Of Concern) Primary Protection Zone
		-26.467062 (point 7) to -26.467310 (point 6)	149.038111 (point 7) to 149.037149 (point 6)		
		-26.468085 (point 5) to -26.467984 (point 3)	149.037266 (point 5) to 149.037604 (point 3)		
		-26.467772 (point 2) to -26.467165 (point 1)	149.037975 (point 2) to 149.038440 (point 1)		
		-26.468977 (point 9) to -26.469086 (point 19)	149.037166 (point 9) to 149.037071 (point 19)		
		-26.468978 (point 18) to -26.469633 (point 17)	149.036858 (point 18) to 149.036332 (point 17)		
		-26.469714 (point 16) to -26.469714 (point 16)	149.036520 (point 16) to 149.036520 (point 16)		

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		-26.470491 (point 15) to -26.470951 (point 14) to -26.470873 (point 12) to -26.470568 (point 11) to -26.469039 (point 10) to -26.468957 (point 21)	to 149.035839 (point 15) to 149.035847 (point 14) to 149.036096 (point 12) to 149.036090 (point 11) to 149.037431 (point 10) to 149.037457 (point 21)		
Roma hub 02 to MAR Well the Bend 3 (MAR Well Reinjection water pipeline) (Crossing 3)	Blyth Creek	-26.470737 to -26.470734	149.031174 to 149.031439	Length: 485m Width: 12m Area of disturbance: 0.5835 ha	Category C ESA (Of Concern) Primary Protection Zone
Total Area of Disturbance for Blyth Creek water transfer and reinjection pipelines					3.035 ha

- (E10) **Limited impact camps** must not be located within a primary protection zone of Category C ESA (Essential Habitat) or Category C ESA (Nature Refuges).
- (E11) Limited petroleum activities or limited impact camps located within a primary protection zone or secondary protection zone of an environmentally sensitive area must not negatively affect the adjacent environmentally sensitive area.
- (E12) Prior to carrying out limited petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, it must be demonstrated, in the following order of preference that:
1. no reasonable or practicable alternative exists for carrying out the limited petroleum activities within the **environmentally sensitive area**;
 2. the **limited petroleum activities** are preferentially located in pre-existing areas of clearing or significant disturbance;
 3. clearance widths for linear infrastructure is minimised to the maximum extent possible, taking into account the following matters:
 - (a) safe vehicle movement;
 - (b) drainage devices installed are of a type that is appropriate for the track type and location;
 - (c) erosion and sediment control measures installed are in accordance with the Erosion and Sediment Control Plan required by conditions (B2) and (B3); and
 - (d) power line stays have been preferentially located within the pipeline right of way where possible.
 4. the maximum clearance widths specified in *Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure

Type of Linear Infrastructure	Clearance Width (m)
(A) Access track(s) not associated with a pipeline(s), communication lines(s) or power line(s):	
(a) single carriage access tracks	18
(b) dual carriage access tracks	21
(c) single or dual carriage access track and associated turnaround bay	35
(B) Access track(s) associated with a pipeline(s), communication line(s) or power line(s):	
(a) single carriage access tracks with a single pipeline, communication line or power line	24
(b) dual carriage access track with a single pipeline, communication line or power line.	27
(c) single or dual carriage access track and associated turnaround bay with a single pipeline, communication line or power line.	41
(d) additional clearing for any additional parallel pipeline, communication line or power line associated with (B)(a), (b) or (c)	7 ¹
(C) Additional clearing for take-off drains, power line stays or turnaround bays or other work areas:	
(a) Additional clearing for power line stays associated with (B)	10
(b) additional clearing for take-off drains associated with (A) or (B)	10

¹ Maximum total disturbance for (B) is 62m.

SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, dust and other airborne contaminants

- (F1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activity(ies) must not cause an environmental nuisance at any sensitive place.

Nuisance monitoring

- (F2) When the administering authority advises of a complaint alleging nuisance, the complaint must be investigated as soon as practicable. The investigation is to include monitoring of environmental nuisance at any sensitive place within a reasonable and practical timeframe as specified by the administering authority.
- (F3) The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the complaint within five (5) business days of completing the complaint investigation, unless a longer time is agreed to in writing by the administering authority.
- (F4) If the investigation or monitoring in accordance with condition (F2) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then:
- (a) the complaint must be addressed including the use of alternative dispute resolution services if required; and / or
 - (b) abatement or attenuation measures must be implemented so that the authorised petroleum activity(ies) does not result in further environmental nuisance.
- (F5) Noise monitoring and recording required under this environmental authority must include, but not necessarily be limited to:
- (a) LAN,T (where N equals the statistical levels of 1, 10 and 90 and T=15 mins);
 - (b) LAeq adj, 15 mins;
 - (c) background noise level as LA 90, 15 mins;
 - (d) Max LpA, 15 mins ;
 - (e) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to measured noise levels levels;
 - (f) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (g) effects due to any extraneous factors such as traffic noise;
 - (h) location, date and time of monitoring;
 - (i) if the complaint concerns low frequency noise, Max LpZ, 15 mins; and
 - (j) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range for both the noise source and the background noise in the absence of the noise source.

Noise

- (F6) Noise planning must be undertaken in accordance with the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area* dated 29 June 2011 or any subsequent version.
- (F7) Any subsequent revision of the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area*, must include, but not necessarily be limited to:

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- (a) a commitment by the Chief Executive Officer for the holder of this environmental authority, or their delegate, to ensure adequate allocation of staff and resources to the establishment and operation of the Noise Management Plan;
 - (b) definition of roles, responsibilities and authorities within the staffing of the Noise Management Plan;
 - (c) delivery of training to staff and contractors and maintenance of competencies;
 - (d) risk / constraint analysis methods to be undertaken prior to any new operation (e.g. drill site) or installation of new equipment that has the potential to create noise nuisance;
 - (e) procedures and methods to undertake assessments to determine compliance with the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** being received and when there are no **alternative arrangements** in place, taking in to account any tonal or **impulsive noise** impacts;
 - (f) procedures for handling noise complaints;
 - (g) community liaison and consultation procedures including but not limited to consultation for when night time petroleum activities are likely to exceed the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (h) procedures for managing records associated with all aspects of the Noise Management Plan including standardised forms for recording monitoring results and complaints;
 - (i) details of petroleum activities and measured and / or predicted noise levels of noise sources associated with those activities;
 - (j) reasonable and practicable control or abatement measures (including relocating the activity, altering the hours of operation, or having an alternate arrangement in place with any potentially affected person) that can be undertaken to ensure compliance with the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (k) the level of noise at **sensitive receptors** that would be achieved from implementing the measures detailed under condition (F7)(j); and
 - (l) mediation processes to be used in the event that noise complaints are not able to be resolved.
- (F8) Prior to undertaking petroleum activities that will result in **short-term, medium-term or long term noise events** that are likely to impact on a sensitive receptor, and where there are no alternative arrangements in place, any potential noise emissions from the relevant petroleum activity(ies) must be modelled or calculated to demonstrate that noise emissions will not exceed the noise levels specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*.
- (F9) The emission of noise from the petroleum activities authorised under this environmental authority must not result in levels greater than those specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	$L_{Aeq,adj,15\ min}$	45dBA	43dBA	40dBA
6:00 pm – 10:00 pm	$L_{Aeq,adj,15\ min}$	40dBA	38dBA	35dBA
10:00 pm – 6:00 am	$L_{Aeq,adj,15\ min}$	28dBA	28dBA	28dBA
	Max $L_{pA, 15\ mins}$	55dBA	55dBA	55dBA
6:00 am – 7:00 am	$L_{Aeq,adj,15\ min}$	40dBA	38dBA	35dBA

Note – The noise limits in Table 1 have been set based on the following deemed background noise levels (L_{ABG}):

7:00 am - 6:00 pm: 35 dBA

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6:00 pm – 10:00 pm: 30 dBA
10:00 pm – 6:00 am: 25 dBA
6:00 am – 7:00 am: 30 dBA

- (F10) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in *Schedule F, 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 F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

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

- (F11) Where alternative arrangements are in place with an affected person(s) at a sensitive receptor as referred to by condition (F7)(j), the noise limits in *Schedule F, Table 1 – Noise limits at Sensitive Receptors* do not apply at that sensitive receptor for the duration for which the alternative arrangements are in place.

Low Frequency Noise

- (F12) Notwithstanding condition (F9), emission of any low frequency noise must not exceed the following limits in the event of a valid complaint about low frequency noise being made to the administering authority:
- (a) 60 dB(C) measured outside the sensitive receptor; and
 - (b) the difference between external A-weighted and C-weighted noise levels is no greater than 20 dB; or
 - (c) 50 dB(Z) measured inside the sensitive receptor; and
 - (d) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Vibration and Blasting

- (F13) A Blast Management Plan must be developed for each blasting activity in accordance with **Australian Standard 2187**.
- (F14) Noise from blasting operations must not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive receptor.
- (F15) Ground-borne vibration peak particle velocity caused by blasting operations must not exceed 10 mm/s at any time, when measured at or extrapolated to any sensitive receptor.

Blast and Vibration Monitoring

- (F16) Monitoring and recording of the air blast overpressure and ground borne vibration of every blast must be undertaken.
- (F17) Blast and vibration monitoring must include but not necessarily be limited to:
- (a) maximum instantaneous charge;
 - (b) location of the blast within the site (including any bench level);
 - (c) airblast overpressure level (dB Linear Peak);
 - (d) peak particle velocity (mm / s);
 - (e) location, date and time of recording;
 - (f) measurement instrumentation and procedure;

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- (g) meteorological conditions for blast monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction); and
- (h) distances from the blast site to potentially noise-affected buildings or structures.

SCHEDULE G – AIR

Fuel Burning or Combustion Equipment

- (G1) Contaminants 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.
- (G2) If compressor stations R-NCS-02-01 or R-NCS-02-03 meet the definition of a **fuel burning or combustion facility**, the design of the facility must be capable of achieving air quality objectives for each environmental value stated in the *Environmental Protection (Air) Policy 2008*.

The Release of Contaminants to the Atmosphere

- (G3) A **fuel burning or combustion facility** must not be operated unless it is listed in *Schedule G – Table 1: Contaminant Release Points*.
- (G4) The release of contaminants to the atmosphere from a point source must only occur from those release points identified in *Schedule G - Table 1: Contaminant Release Points* and must be directed vertically upwards without any impedance or hindrance.

Schedule G – Table 1: Contaminant Release Points

Determination Required	Release Point Numbers	Minimum release height (metres)	Minimum velocity (m/sec)
Mass emission rate and concentration of oxides of nitrogen (NOx) in the flue gas at 15% O ₂ , dry, 0°C (237°K), 101.3kPa oxygen reference level.	Roma HCS-02 Compressors 7667-KX-30 7667-KX-31 7667-KX-32 7667-KX-33 7667-KX-34 7667-KX-35 7667-KX-36	15	10
Mass emission rate and concentration of oxides of nitrogen (NOx) in the flue gas at 15% O ₂ , dry, 0°C (237°K), 101.3kPa oxygen reference level.	Roma HCS-02 Gas Turbine Generators 7667-GX-01 7667-GX-02 7667-GX-03 7667-GX-04	15	10

- (G5) Contaminants must be released to the atmosphere from a release point at a height and a flow rate not less than the corresponding height and velocity stated for that release point in *Schedule G, Table 2:- Contaminant Release Limits to Air*.

Schedule G, Table 2: Contaminant Release Limits to Air

Release point number	Contaminant release	Maximum release limit ¹	Frequency
Roma HCS-02 Compressors 7667-KX-30 7667-KX-31 7667-KX-32 7667-KX-33 7667-KX-34 7667-KX-35 7667-KX-36	Oxides of Nitrogen	150 mg/Nm ³ 2g/s	All stacks must be monitored during commissioning (See Note 1) of the facility and once per year thereafter.
Roma HCS-02 Gas Turbine Generators 7667-GX-01 7667-GX-02 7667-GX-03 7667-GX-04	Oxides of Nitrogen	150 mg/Nm ³ 2g/s	All stacks must be monitored during commissioning (See Note 1) of the facility and once per year thereafter.

Note 1: The above NOx release limits are applicable during all timings except start-up, shut-down and calibration of emission monitoring devices. The start-up duration is allowed up to 30 minutes.

- (G6) Contaminants must not be released to the atmosphere from a release point at a mass emission rate/concentration, as measured at a monitoring point, in excess of that stated in *Schedule G, Table 2 - Contaminant Release Limits to Air*.
- (G7) Contaminants must be monitored not less frequently than specified in *Schedule G, Table 2 - Contaminant Release Limits to Air*.
- (G8) Monitoring of any releases to the atmosphere required by a condition of this approval must be carried out in accordance with the following requirements:
- (a) monitoring provisions for the release points listed in *Schedule G, Table 1 - Contaminant Release Points* must comply with the Australian Standard AS 4323.1-1995 'Stationary source emissions, Method 1: Selection of sampling positions' (or more recent editions).
 - (b) The following tests must be performed for each determination specified in *Schedule G, Table 2 - Contaminant Release Limits to Air*:
 - (i) Gas velocity and volume flow rate;
 - (ii) Temperature;
 - (iii) Water vapour concentration (moisture content);
 - (c) Samples must be taken when emissions are expected to be at maximum rates;
 - (d) During the sampling period the following additional information must be gathered:
 - (i) Production rate at the time of sampling;
 - (ii) Raw materials and fuel used;
 - (iii) Number of plant or equipment and operating units operating;
 - (iv) Reference to the actual test methods and accuracy of the methods.
- (G9) All release points referred to in *Schedule G, Table 1 - Contaminant Release Points* must be conspicuously marked with the corresponding release point number.
- (G10) Air emission monitoring must be conducted within three (3) months of commissioning the facility to demonstrate compliance with air emission limits listed in *Schedule G, Table 2 - Contaminant Release Limits to Air* and submit the report to the administering authority.

- (G11) Prior to the installation of any new or additional fuel burning and combustion equipment that is capable of burning at least 500 kg of fuel in an hour, following the issue of this environmental authority, air dispersion modelling must be conducted to calculate the ground level concentrations of emissions from the fuel burning or combustion equipment under maximum operating conditions within the relevant airshed and identify any potential impacts to air quality within the study area.
- (G12) Calculated ground level concentrations required under condition (G11) must not exceed the criteria for each air contaminant in *Schedule G, Table 3 – Maximum Ground Level Concentration Criteria*.

Schedule G, Table 3 – Maximum Ground Level Concentration Criteria

Contaminant	Concentration at 0°Celsius	Units	Averaging time
NOx as Nitrogen Dioxide	250	µg/m ³	1 hour
NOx as Nitrogen Dioxide	33	µg/m ³	1 year
Carbon monoxide	11	mg/m ³	8 hour

- (G13) Verification monitoring of the air dispersion modelling must be undertaken once fuel burning equipment that is capable of burning at least 500 kg of fuel in an hour has been commissioned.
- (G14) Where the verification monitoring required under condition (G13) demonstrates that the air dispersion modelling required under condition (G11) under-predicted actual concentrations:
- (a) details must be provided to the administering authority within 10 business days;
 - (b) modelling based on the new information must be undertaken; and
 - (c) appropriate pollution control measures to bring the emissions into compliance with the limits specified in *Schedule G, Table 3 – Maximum Ground Level Concentration Criteria* must be determined and implemented.
- (G15) A register of fuel burning and combustion equipment that is capable of burning at least 500 kg of fuel in an hour must be maintained and 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/Nm³ @ x %O₂ dry gas at 0°Celsius and 1 atmosphere).
- (G16) Information contained in the register of fuel burning and combustion equipment must always be current and complete.
- (G17) 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.

Air Monitoring (Point Source)

- (G18) A monitoring program must be conducted of contaminants released to the atmosphere at each release point recorded in the register of fuel burning and combustion equipment (condition (G15)) for the contaminants listed in *Schedule G, Table 1 - Contaminant Release Points* and *Schedule G, Table 2 - Contaminant Release Limits to Air* and at the frequencies specified in *Schedule G, Table 4 – Monitoring Frequency for Contaminants*.

Schedule G, Table 4 – Monitoring Frequency for Contaminants

Contaminant	Monitoring frequency
NOx as Nitrogen Dioxide	Annual
Carbon monoxide	Annual

- (G19) The monitoring program must include, but not necessarily be limited to:
- (a) monitoring provisions for the release points which complies with the most recent edition of Australian Standard 4323.
 - (b) tests for each sample taken at each release point specified in the register of fuel burning or combustion equipment (condition (G9)) including:
 - (i). gas velocity, volume and mass flow rate;
 - (ii). temperature; and
 - (iii). 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.
- (G20) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas from compression stations R-NCS-02-01 and R-NCS-02-03 must be flared in a manner that complies with all of (G20)(a) and (G20)(b) and (G20)(c) or with (G20)(d):
- a) an automatic ignition system is used, and
 - b) a flame is visible at all times while the waste gas is being flared, and
 - c) there is no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours, or
 - d) it uses an **enclosed flare**.

SCHEDULE H – WASTE

General

- (H1) All general and regulated waste must only be removed from the site and sent to a facility licensed to accept the waste under the *Environmental Protection Act 1994* except as permitted under another condition of this environmental authority.
- (H2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- (H3) Waste must not be burned unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

Coal Seam Gas Water Management Plan

- (H4) Amendments to a Coal Seam Gas Water Management Plan must be submitted to the administering authority prior to its implementation.
- (H5) If, within 20 business days following the submission of the amended Coal Seam Gas Water Management Plan, the administering authority provides comments on the amended Coal Seam Gas Water Management Plan:
 - (a) due regard must be given to that comment in the finalisation of the amended Coal Seam Gas Water Management Plan; and
 - (b) the finalised amended Coal Seam Gas Water Management Plan must be submitted within 40 business days after the administering authority provided comments.

Brine and Salt Management

- (H6) Following the completion of the petroleum activity(ies), any residual brine and / or solid salt present in any dam must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994*.
- (H7) Evaporation dams may be used for the evaporation of **coal seam gas water concentrate** until 1 January 2019.

Investigation into Alternative CSG Water Management Options

- (H8) If evaporation dams are proposed to be used for evaporation of coal seam gas water concentrate after 1 January 2019, an evaluation of CSG water management must be undertaken, including:
 - (a) best practice environmental management for managing the CSG water; and
 - (b) feasibility of alternative ways for managing the CSG water.
- (H9) The Salt and Brine Management Plan must be developed by December 2019 that has investigated 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 and does or could supply water for potable or agricultural purposes;
 - (c) the outcomes of the investigations and proposed actions forward, and identified methods for the beneficial use and of brine and salt; and
 - (d) procedures for identifying and implementing opportunities to improve the CSG water management practices.

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SCHEDULE I – REHABILITATION

Rehabilitation Planning

- (I1) 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 (I2 to I7), inclusive; and
 - (ii) provide for appropriate monitoring and maintenance.

Transitional rehabilitation

- (I2) **Significantly disturbed areas** that are no longer required for the on-going petroleum activities, must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria:
- (a) contaminated land resulting from petroleum activities is remediated and rehabilitated;
 - (b) the areas are:
 - i. non-polluting;
 - ii. a **stable** landform;
 - iii. re-profiled to contours consistent with the surrounding landform
 - (c) surface drainage lines are re-established;
 - (d) top soil is reinstated; and
 - (e) either:
 - i. groundcover, that is not a **declared pest species**, is **growing**; or
 - ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final rehabilitation acceptance criteria

- (I3) 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 per cent 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) where the adjacent land use contains, or the pre-clearing land use contained, one or more **regional ecosystem(s)**, then:
 - i. at least one regional ecosystem(s) from the same broad vegetation group, as demonstrated by the predominant species in the ecologically dominant layer, must be present; and,
 - ii. the regional ecosystem present in (I3)(d)(i) must possess an equivalent or higher conservation value (biodiversity status) than the regional ecosystem(s) in either the adjacent land or pre-disturbed land.

Final rehabilitation acceptance criteria in environmentally sensitive areas

- (I4) 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 (E4) and (E6)) must be met:
- (a) greater than or equal to 70 per cent 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 per cent of organic litter cover
 - (e) greater than or equal to 50 per cent of **total density of coarse woody material**; and

- (f) all **predominant species** in the **ecologically dominant layer**, that define the pre-disturbance regional ecosystem(s) are present.

Continuing conditions

- (I5) Conditions (I2), (I3) and (I4) continue to apply after this environmental authority has ended or ceased to have effect.

Remaining dams

- (I6) Where there is a dam, (including a low consequence dam) that is being or intended to be used 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.

Pipeline activities

- (I7) Land that has been significantly disturbed by the pipeline activities must be managed to ensure that gully erosion or subsidence do not occur on that land.

SCHEDULE J – WELL CONSTRUCTION, MAINTENANCE AND STIMULATION ACTIVITIES

Drilling Activities

- (J1) **Oil based or synthetic based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J2) Drilling activities must not result in the connection of the target gas producing formation and another aquifer.
- (J3) Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target formation and another aquifer as a result of drilling activities.

Stimulation Activities

- (J4) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.
- (J5) Stimulation activities must not negatively affect water quality, other than that within the **stimulation impact zone** of the target gas producing formation.
- (J6) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.
- (J7) The internal and external mechanical integrity of the well system prior to and during stimulation must be ensured 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.
- (J8) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

Stimulation Risk Assessment

- (J9) Prior to undertaking stimulation activities, a risk assessment must be developed to ensure that stimulation activities are managed to prevent environmental harm.
- (J10) The stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well and address issues at a relevant geospatial scale such that changes to features and attributes are adequately described and must include, but not necessarily be limited to:
 - (a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice;
 - (b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority;
 - (c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s);
 - (d) naturally occurring geological faults;
 - (e) seismic history of the region (e.g. earth tremors, earthquakes);
 - (f) proximity of overlying and underlying aquifers;

- (g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation.
- (h) identification and proximity of **landholders' active groundwater bores** in the area where stimulation activities are to be carried out;
- (i) the environmental values of groundwater in the area;
- (j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to stimulation monitoring in order to accurately assess the risks to environmental values of groundwater;
- (k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
- (l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
- (m) a description of the well mechanical integrity testing program;
- (n) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc.);
- (o) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation;
- (p) groundwater **transmissivity**, flow rate, hydraulic conductivity and direction(s) of flow;
- (q) a description of the chemical compounds used in stimulation activities (including estimated total mass, estimated composition, chemical abstract service numbers and properties), their mixtures and the resultant compounds that are formed after stimulation;
- (r) a mass balance estimating the concentrations and absolute masses of chemical compounds that will be reacted, returned to the surface or left in the target gas producing formation subsequent to stimulation;
- (s) an environmental hazard assessment of the chemicals used including their mixtures and the resultant chemicals that are formed after stimulation including:
 - (i). toxicological and ecotoxicological information of chemical compounds used;
 - (ii). information on the persistence and bioaccumulation potential of the chemical compounds used;
 - (iii). identification of the chemicals of potential concern in stimulation fluids derived from the risk assessment;
- (t) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities;
- (u) if used, identification and an environmental hazard assessment of using radioactive tracer beads in stimulation activities;
- (v) an environmental hazard assessment of leaving chemical compounds in stimulation fluids in the target gas producing formation for extended periods subsequent to stimulation;
- (w) human health exposure pathways to operators and the regional population;
- (x) risk characterisation of environmental impacts based on the environmental hazard assessment;
- (y) potential impacts to landholder bores as a result of stimulation activities;
- (z) the determination of the likelihood of causing interconnectivity and/or negative water quality as a result of stimulation activities undertaken in close proximity or each other; and
- (aa) potential environmental or health impacts which may result from stimulation activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

- (J11) Prior to undertaking any stimulation activity, a baseline bore assessment must be undertaken of the water quality of:

- (a) all landholders' active groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two (2) kilometre horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and
 - (b) all landholders' active groundwater bores (subject to access being permitted by the landholder) in any aquifer that is within 200 metres above or below the target gas producing formation and is spatially located with a two (2) kilometre radius from the location 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 (J9) and (J10).
- (J12) Prior to undertaking stimulation activities at a well, there must be 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 (J13).
- (J13) Stimulation baseline bore assessments required in Condition (J11) must include the minimum water quality analytes and physico-chemical parameters identified in the *Baseline Assessment Guideline* (EHP) and any restricted stimulation fluids as defined in the *Environmental Protection Act 1994*, as amended from time to time, in order to establish baseline water quality.

Stimulation Impact Monitoring Program

- (J14) A Stimulation Impact Monitoring Program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (J9) and (J10) that relate to hydraulic fracturing activities and must include, as a minimum, monitoring of:
- (a) the stimulation fluid(s) 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 water(s) from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and
 - (c) flow-back water(s) 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; and
 - (d) all bores identified in condition (J11) at the following minimum frequency:
 - (i) monthly for the first six (6) months subsequent to stimulation activities being undertaken; and
 - (ii) annually for the first five (5) years subsequent to stimulation activities being undertaken or until analytes and physico-chemical parameters identified in condition (J13) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions, whichever is shorter.
- (J15) 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 (J13); 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, identified in the respective Stimulation Risk Assessment, that are actually or potentially formed by chemical reactions with each other or coal seam materials during stimulation activities.

- (J16) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

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SCHEDULE K – COMMUNITY ISSUES

- (K1) A record of all valid complaints and actions taken in response to the valid complaint must be maintained and kept.
- (K2) The following details for all valid complaints received must be recorded:
- (a) name, address and contact number for complainant;
 - (b) time and date of complaint;
 - (c) reasons for the complaint as stated by the complainant;
 - (d) investigations undertaken in response to the complaint;
 - (e) conclusions formed;
 - (f) actions taken to resolve the complaint;
 - (g) any abatement measures implemented to mitigate the cause of the complaint; and
 - (h) name and contact details of the person responsible for resolving the complaint.

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SCHEDULE L - NOTIFICATION PROCEDURES

- (L1) The Department of Environment and Heritage Protection Pollution Hotline must be notified as soon as reasonably practicable, but within 48 hours after becoming aware of:
- (a) any unauthorised significant disturbance to land; or
 - (b) any unauthorised release of contaminants greater than:
 - (i) 200 L of hydrocarbons; or
 - (ii) 200 L of **stimulation additives**; or
 - (iii) 500 L of **stimulation fluids**; or
 - (iv) 1 000 L of brine; or
 - (v) 5 000 L of coal seam gas water; or
 - (vi) 10 000 L of sewage effluent; or
 - (vii) 100,000 L of irrigation quality coal seam gas water, in accordance with condition D5(b), inside designated irrigation area.
 - (c) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (d) when the level of the contents of any regulated dam reaches the mandatory reporting level; or
 - (e) when a regulated dam will not have available storage to meet the design storage allowance on the 1 November of any year;
 - (f) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during stimulation increases by more than 3.5 MPa from the pressure immediately preceding stimulation); or
 - (g) any detection of restricted stimulation fluids from stimulation fluid monitoring; or
 - (h) any analyses result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource; or
 - (i) any analyses result from groundwater monitoring that exceeds trigger action investigation levels, if provided in this environmental authority.
- (L2) The notification of emergencies or incidents as required by condition (L1) must include but not be limited to the following information:
- (a) the environmental authority number and name of the holder;
 - (b) the tenure type and number where the emergency or incident occurred;
 - (c) the name and telephone number of the designated contact person;
 - (d) the location of the emergency or incident (GDA94);
 - (e) the date and time that the emergency or incident occurred;
 - (f) the date and time the holder of this environmental authority became aware of the emergency or incident;
 - (g) details of the nature of the event and the circumstances in which it occurred;
 - (h) the estimated quantity and type of any contaminants involved in the incident;
 - (i) the actual or potential suspected cause of the emergency or incident;
 - (j) a description of the land use at the site of the emergency or incident (eg. grazing, pasture, forest etc.) and/or the name of any relevant waters and other environmentally sensitive features;
 - (k) a description of the possible impacts from the emergency or incident;
 - (l) a description of whether stock and/or wildlife were exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
 - (m) any sampling conducted or proposed, relevant to the emergency or incident;
 - (n) landholder details and details of landholder consultation;
 - (o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
 - (p) whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.

- (L3) Within 10 business days following the initial notification under conditions (L1) and (L2) unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):
- (a) the root cause of the emergency or incident;
 - (b) the confirmed quantities and types of any contaminants involved in the incident;
 - (c) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
 - (d) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
 - (e) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
 - (f) results and current status of landholder consultation, including commitment to resolve any outstanding issues / concerns; and
 - (g) actions and / or procedural changes to prevent a recurrence of the emergency or incident.

SCHEDULE M - DEFINITIONS

"accepted engineering standards", in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the *Australian National Committee on Large Dams* (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.

"adjacent land use" 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 Heritage Protection; 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 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, vegetation community attributes 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.

"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.

"appraisal well" means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum.

For clarity, an appraisal well does not include an exploration well.

"areas of pre-disturbance" means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term 'areas of pre-disturbance' does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.

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

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- any kind and all things associated with the construction and operation of a dam; and
- any land used for those operations.

“Australian Standard 1055” means Australian Standard 1055.1:1997 *Description and Measurement of Environmental Noise – General procedures*.

“Australian Standard 2187” means Australian Standard 2187.0:1998 *Explosives—Storage, transport and use, Part 0*, Australian Standard 2187.1:1998 *Explosives—Storage, transport and use Part 1* and Australian Standard 2187.2:2006 *Explosives—Storage and use, Part 2* or any updated versions that becomes available from time to time.

“Australian Standard 2885” means Australian Standard 2885.0:2008 *Pipelines – Gas and Liquid Petroleum General Requirements*, Australian Standard 2885.1:2007 *Pipelines – Gas and Liquid Petroleum Design and Construction* and Australian Standard 2885.3:2001 *Pipelines – Gas and Liquid Petroleum Operation and Maintenance*, or any updated versions that becomes available from time to time.

“Australian Standard 4323” means Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*.

“Australian / New Zealand Standard 5667.11” means Australian / New Zealand Standard 5667.11:1998 *Water Quality – Sampling – Guidance on sampling at Groundwaters*.

“Australian / New Zealand Standard 5667.12” means Australian / New Zealand Standard 5667.12:1999 *Guidance on Sampling of Bottom Sediments for permanent, semi-permanent water holes and water storages*.

“authorised person” means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive or chief executive officer of a local government.

“authorised resource activities” for this environmental authority means the resource activities authorised to be carried out under condition (A1).

“background noise level” means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

“bed and banks” for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

“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 environmental authority holder 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.

“beneficial use” means

- with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Waste Reduction and Recycling Act 2011*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - the transfer and use have been approved or authorised under any relevant legislation. Or
- with respect to coal seam gas water, refer to the Department of Environment and Heritage Protection's *Guideline – Approval of Coal Seam Gas Water for Beneficial Use*.

“bore” means a water observation bore or a water supply bore that is either sub-artesian or artesian.

“brine” means saline water with a total dissolved solid concentration greater than 40 000 mg/l.

“brine dam” means a regulated dam that is designed to receive, contain or evaporate brine.

“bund or bunded” in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or bunded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

“BTEX” means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.

“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.

“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 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*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*
- An area identified as “Essential Habitat” or “Essential Regrowth Habitat” under the *Vegetation Management Act 1999* for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*;
- Of Concern Regional Ecosystems identified in the database maintained by the Department of Environment and Heritage Protection called ‘RE description database’ containing Regional Ecosystem numbers and descriptions.

“certification or certified by a suitably qualified and experienced person” in relation to a design plan, ‘as constructed’ drawings or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- exactly what is being certified and the precise nature of that certification.
- the relevant legislative, regulatory and technical criteria on which the certification has been based;
- the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

“certify” or “certification” or “certified” in relation to any matter other than a design plan, ‘as constructed’ drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that:

- a) all relevant material has been considered in the written document; and
- b) that the content of the written document is accurate and true; and
- c) that the written document meets the requirements of the relevant conditions of the environmental authority.

“clearing” for vegetation means removing, cutting down, ringbarking, pushing over, poisoning or destroying in any way including by burning, flooding or draining; but does not include destroying standing vegetation by stock, or **lopping** a tree.

“coal seam gas water” means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. Coal seam gas water is a waste defined under section 13 of the *Environmental Protection Act 1994*.

“coal seam gas water concentrate” means the concentrated saline water waste stream from a reverse osmosis water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.

“coal seam gas water dams” include any type of dam (storage or evaporation) used to contain groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production.

“coal seam gas evaporation dam” is defined as a impoundment, enclosure or structure that is designed to be used to hold coal seam gas water for evaporation.

“construction” in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.

“control measure” has the meaning in section 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.

“declared plant pest species” has the meaning in the Land Protection (Pest and Stock Route Management) Regulation 2003 and is a 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 plant.

“design plan” is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and **certifications**, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include ‘as constructed’ drawings.

“design storage allowance or DSA” means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.

“development well” means a petroleum well which produces or stores petroleum.

For clarity, a development well does not include an appraisal well.

“discharge area” means:

- that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and

- identified by an assessment process consistent with the document *Salinity Management Handbook* Queensland Department of Natural Resources, 1997, as amended from time to time; or
- identified by an approved salinity hazard map held by the Department of Environment and Heritage Protection .

“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 Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Version 3.2 August 2012) 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 or ecosystem function” means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.

“enclosed flare” means a device where the residual gas is burned in a cylindrical or rectangular enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.

“end” means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related petroleum activities such as rehabilitation. In other words, it does not refer to the ‘completion’ of the petroleum activity(ies), the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.

“equivalent person or EP” means an equivalent person under volume 1, section 2 of the *Guidelines for Planning and Design of Sewerage Schemes*, October 1991, published by the Water Resources Commission, Department of Primary Industries, Fisheries and Forestry.

“evaporation dam” means an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.

“existing dam” means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on 7 April 2012.

“existing low hazard dam” means a low hazard dam that was constructed and/or whose construction had substantially commenced on 7 April 2012.

“exploration well” means a petroleum well that is drilled to:

- explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or
- obtain stratigraphic information for the purpose of exploring for petroleum.

For clarity, an exploration well does not include an appraisal or development well.

“exploring for petroleum” means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the *Petroleum and Gas (Production and Safety) Act 2004* for example including:

- conducting a geochemical, geological or geophysical survey;
- drilling a well;
- carrying out testing in relation to a well;
- taking a sample for chemical or other analysis.

“field validation surveys” means vegetation assessments undertaken in accord with the most current version of the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*.

“fill” means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.

“floodplain” has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that—

- is covered from time to time by floodwater overflowing from the watercourse; and
- does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.

“flowable substance” means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

“foreseeable future” means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.

“fuel burning or combustion equipment” means a permanent fuel burning or combustion equipment which is in isolation, or combined in operation, or which are interconnected, is, or is capable of burning more than 500 kg of fuel in an hour.

“general ecologically significant wetland” otherwise known as “wetlands of other environmental value”, is a wetland that meets the definition of a wetland and that is shown as a general ecologically significant wetland or “wetlands of other environmental value” on the map of referable wetlands

“geophysical survey” means a systematic collection of geophysical data.

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

“hazard category” means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“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.

“high value regrowth” vegetation means

- any of the following:
 - an endangered regional ecosystem;
 - an of concern regional ecosystem;
 - a least concern regional ecosystem; and
- have not been cleared since 31 December 1989; and
- is shown on a regrowth vegetation map.

“hydraulic fracturing” means a technique used to create cracks in underground coal seams to increase the flow and recovery of gas or oil out of a well. It involves pumping a fluid, comprised largely of water and sand, under pressure, into a coal seam. This action fractures the coal seam which provides a pathway that increases the ability for gas to flow through the coal.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard

category *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“hydraulic testing” means the testing of a geological formation to evaluate the hydrogeological characteristics of the formation.

“impulsive noise” means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.

“incidental activity” for this environmental authority means an activity that is not a specified relevant activity and is necessary to carry out the activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities*.

“infrastructure” means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps.

Infrastructure does not include other facilities required for the long term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation dams), pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.

“ $L_{Aeq, adj, 15 mins}$ ” means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.

“ $L_{A90, adj, 15 mins}$ ” 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.

“land degradation” has the meaning in the *Vegetation Management Act 1999* and means the following:

- soil erosion
- rising water tables
- the expression of salinity
- mass movement by gravity of soil or rock
- stream bank instability
- a process that results in declining water quality.

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

“landholders’ active groundwater bores” for the purposes of stimulation baseline and impact monitoring in this environmental authority means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *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 a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.

“limited impact camps” mean accommodation camps that:

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- are temporary (no more than 6 months);
- are located within pre-existing areas of clearing or significant disturbance;
- are up to 2 ha or located within well sites; and
- may involve sewage treatment works that are no release works or release works that involve an irrigation release within pre-existing areas of clearing or significant disturbance.

“limit of reporting” means the lowest amount of an analyte in a sample that can be quantifiably determined with stated, acceptable precision and accuracy under stated analytical conditions (i.e. the lower limit of quantification).

“limited petroleum activities” mean any low impact petroleum activity, and:

- single well sites (includes observation, pilot, injection and production wells) up to 1 ha and associated infrastructure (water pumps and generators, sumps, flare pits or dams) located on the well site or up to 1.25 ha if the well pad includes the use of a tank (minimum 1ML) for above ground fluid storage,
- multi-well sites up to an additional (in addition to single well site above) 0.25 ha per additional well and associated infrastructure (water pumps and generators, sumps, flare pits, dams or tanks) located on the well site to a maximum of 3 ha,
- construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone
- upgrading or maintenance of existing roads or tracks,
- power and communication lines,
- gas gathering lines from a well site to the initial compression facility,
- water gathering lines from a well site to the initial water storage or dam,
- camps within well site that may involve sewage treatment works that are a no release works.

“linear infrastructure” means powerlines, communication, pipelines, roads and access tracks.

“long term noise event” is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (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 —

- removing its trunk; and
- cutting or pruning its branches so severely that it is likely to die.

“low flow” means flow up to the one month average recurrence interval.

“low hazard dam” means any dam in the low hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“low impact petroleum activities” means petroleum activities which do not result in the clearing of native vegetation, earthworks or excavation work that cause either, a significant disruption to the soil profile or permanent damage to vegetation that cannot be easily rehabilitated immediately after the activity is completed. Examples of such activities include but are not necessarily limited to:

- chipholes
- coreholes
- geophysical surveys
- seismic surveys
- soil surveys
- topographic surveys
- cadastral surveys
- ecological surveys
- installation of environmental monitoring equipment (including surface water)

“Max $L_{pZ, 15 \text{ min}}$ ” means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.

“Max $L_{pA, 15 \text{ min}}$ ” 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 Hazard Categories and Hydraulic Performance of Dams” prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“medium term noise event” is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.

“meter” means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe.”

“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 (1) 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.

“overburden pressure” means the pressure or stress imposed on a layer of soil or rock by the weight of overlying material. The overburden pressure at a depth z is given by $p(z) = p_0 + g \int_0^z p(z) dz$ where $p(z)$ is the density of the overlying rock at depth z and g is the acceleration due to gravity. p_0 is the datum pressure, like the pressure at the surface.

“permanent sewage treatment plant operations” means sewage treatment plant operations with a design capacity of greater than 21 but less than 450 equivalent persons carried out at one location for of a period of greater than six months in a calendar year.

“pest” means species:

- declared under the *Land Protection (Pest and Stock route Management) Act 2002*;
- declared under Local Government model local laws; and
- which may become invasive in the future.

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

“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.

“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.

“prioritisation hierarchy” has the meaning provided in the *Coal Seam Gas Water Management Policy*, published by the Department of Environment and Heritage Protection, as amended from time to time.

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

“regional ecosystem(s)” 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 geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystems Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.

“regrowth vegetation map” means a map certified by the chief executive as the regrowth vegetation map for the State and showing for the State:

- areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - have not been cleared since 31 December 1989; and
- particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- areas the chief executive decides under section 20AI of the *Vegetation Management Act 1999* to show on the map as high value regrowth vegetation.

“regulated dam” means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, as amended from time to time.

“regulated structure” means any dam or levee in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, 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 the 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 topography, 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).

“remnant unit” means a continuous polygon of remnant vegetation (as defined by the QLD Herbarium) representative of a single RE type or a single heterogeneous unit.

“remnant vegetation” means vegetation, part of which forms the predominant canopy of the vegetation—

- covering more than 50% of the undisturbed predominant canopy; and
- averaging more than 70% of the vegetation's undisturbed height; and
- composed of species characteristic of the vegetation's undisturbed predominant canopy cover.

“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.

“resource activity(ies)” has the meaning in section 107(d) of the *Environmental Protection Act 1994*.

“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 rehabilitations after pipeline decommissioning.

“restricted stimulation fluids” means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 81B of the *Environmental Protection Regulation 2008*:

- petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene; or
- chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.

The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.

"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, B or C Environmentally Sensitive Area means an area within an 100 metre buffer from the boundary of a **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 (7) 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 a particular conditions – to the condition it was in immediately before the disturbance

"site" means the relevant petroleum activity(ies) to which the environmental authority relates.

"species diversity" means the diversity within an ecological community that incorporates both species richness and the evenness of species' abundances.

"species richness" means the number of different species in a given area.

"specified relevant activities" for this environmental activity means an activity that:

- a) but for being carried out as a resource activity, would otherwise be an activity prescribed under section 19 of the *Environmental Protection Act 1994* as an environmentally relevant activity; or
- b) stimulation activities; or
- c) extracting material other than by dredging.

"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.

“stimulation” means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing / hydrofracking, 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. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.

“stimulation impact zone” means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.

“structure” for the purposes of Schedule C 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 a hazard 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 at any time:

- exactly what has been assessed and the precise nature of that assessment;
- the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- 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
- the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

“suitably qualified and experienced person” in relation to regulated structures means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, 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.

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.

“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.

“temporary sewage treatment plant operations” means sewage treatment plant operations with a design capacity of equal to or less than 100 equivalent persons carried out at one location for a period of no greater than six months in a calendar year.

“third party auditor” means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.

“threatening processes” means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).

“tolerable limits” means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).

“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” means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 *Risk Management* or any updated version that becomes available from time to time.

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

“visible salt” means where salt crystals accumulate on the soil surface.

“void” means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

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

“well site” means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.

“wetland” for the purpose of this environmental authority means:

- areas shown on the *Map of Referable Wetlands* which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the *Environmental Protection Regulation 2008*; and
- are wetlands as defined under the Queensland Wetlands Program as areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) 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.

“Wetland of high ecological significance” otherwise known as a “high conservation value wetland”, is a wetland that meets the definition of a wetland and that is shown as a wetland of high ecological significance or high conservation value wetland on the map of referable wetlands

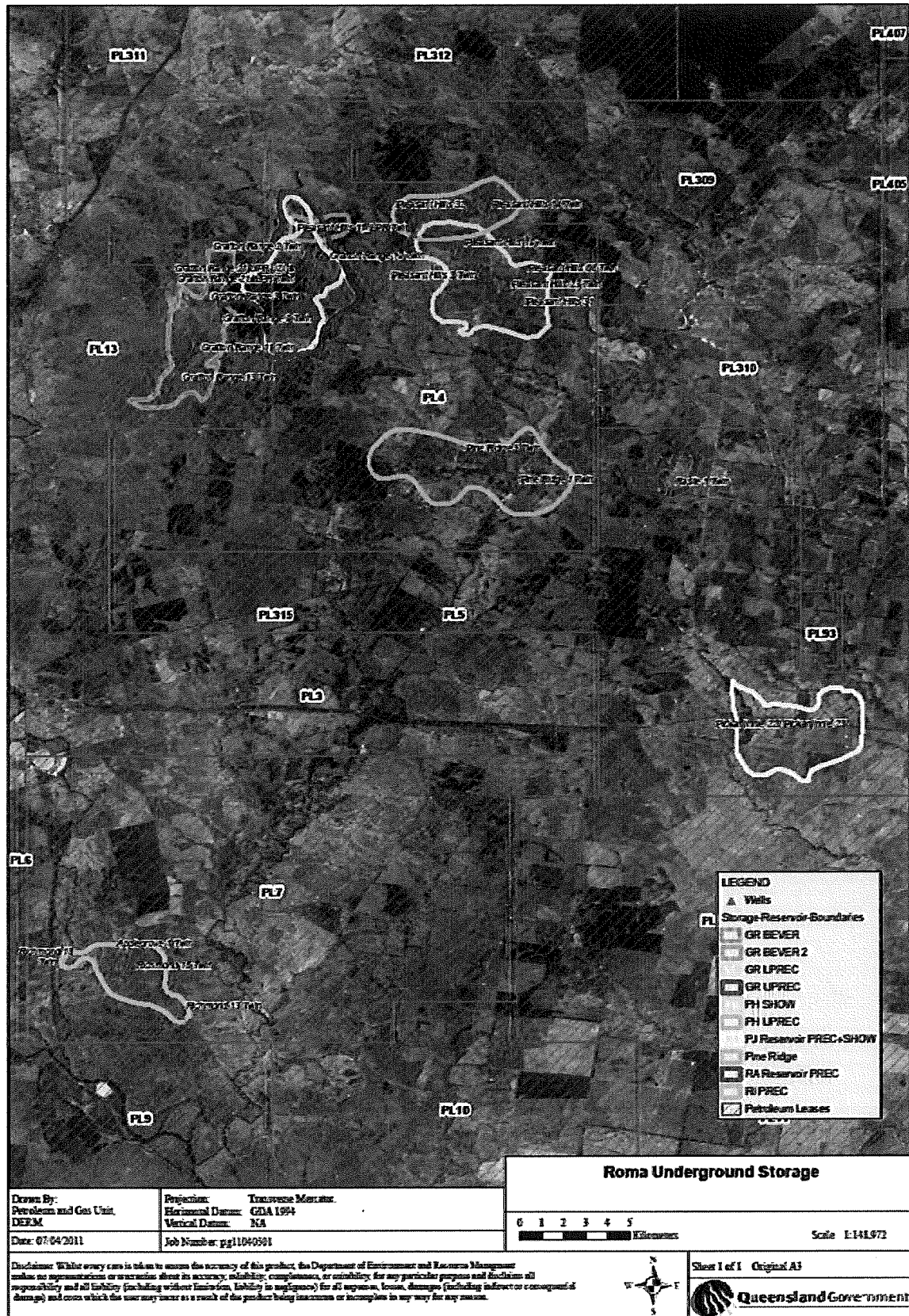
“year” means a period of 12 months.

“80th percentile” in relation to release limits means that not more than one (1) of the measured values is to exceed the stated release limit for any five (5) consecutive samples where:

- the consecutive samples are taken over a five (5) month period; and
- the consecutive samples are taken at approximately equal periods.

End of Conditions

APPENDIX 1 – Underground Gas Storage Map



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Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

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

Permit¹ number: EPPG00928713

Santos Reference: PEN100178208

Project Name: Fairview Arcadia Project Area

Environmental authority takes effect: 15 October 2014

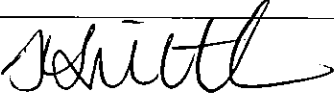
The anniversary date of this environmental authority is **30 January**.

An annual return and the payment of the annual fee will be due each year on this day.

The environmental authority is subject to the attached schedules of conditions.

Environmental authority holders		
Principal Holder:	Santos TOGA Pty Ltd ACN: 077 536 871	Registered Address: Ground Floor - Santos Centre 60 Flinders Street ADELAIDE SA 5000
Joint Holders:	Santos TPY CSG Corp Santos Queensland Corp PAPL (Upstream) Pty Ltd Total E&P Australia II	Santos TPY Corp Bronco Energy Pty Limited Total E&P Australia KGLNG E&P Pty Ltd

Environmentally Relevant Activity	Location
Non-mining resource activities	Authority to Prospect (ATP): 526P and 653 Petroleum Leases (PL): 90, 91, 92, 99, 100, 232, 233, 234, 235, 236, 420, 421 and 440 Petroleum Pipeline Licences (PPL): 76 and 92



Signature

15 October 2014

Date

Kimberley Smith

Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:

Energy Assessment
Level 7, 400 George Street
BRISBANE QLD 4000
GPO Box 2454
BRISBANE QLD 4001
Phone: (07) 3330 5715
Fax: (07) 3330 5634

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Heritage Protection.



Additional Information for Applicants

Environmentally relevant activities

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

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

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

Contaminated land and notifiable activities

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

Responsibilities under the *Environmental Protection Act 1994*

Separate to the requirements of standard conditions, the holder of the environmental authority must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act. For example, the holder must be aware of the following provisions of the *Environmental Protection Act 1994*.

General environmental duty

Section 319 of the *Environmental Protection Act 1994* states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of the successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty, however maintaining your general environmental duty is a defence against the following acts:

- (a) an act that causes serious or material environmental harm or an environmental nuisance
- (b) an act that contravenes a noise standard
- (c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Heritage Protection website www.ehp.qld.gov.au.

Duty to notify

Section 320 of the *Environmental Protection Act 1994* explains the duty to notify. The duty to notify applies to all persons and requires a person or company to give notice where serious or material environmental harm is caused or threatened. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

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The duty to notify arises where:

- a person carries out activities or becomes aware of an act of another person arising from or connected to those activities which causes or threatens serious or material environmental harm
- while carrying out activities a person becomes aware of the happening of one or both of the following events:
 - the activity negatively affects (or is reasonably likely to negatively affect) the water quality of an aquifer
 - the activity has caused the unauthorised connection of 2 or more aquifers.

For more information on the duty to notify requirements refer to the guideline *Duty to notify of environmental harm (EM467)*.

Some Relevant Offences Under the *Environmental Protection Act 1994*

Non-compliance with a condition of an environmental authority (section 430)

Section 430 of the *Environmental Protection Act 1994* requires that a person who is the holder of, or is acting under an environmental authority must not wilfully contravene, or contravene a condition of the environmental authority.

Environmental authority holder responsible for ensuring conditions complied with (section 431)

Section 431 of the *Environmental Protection Act 1994* requires that the holder of an environmental authority must ensure everyone acting under the environmental authority complies with the conditions of the environmental authority. If another person acting under the environmental authority commits an offence against section 430, the holder also commits an offence, namely, the offence of failing to ensure the other person complies with the conditions.

Causing serious or material environmental harm (sections 437–39)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the *Environmental Protection Act 1994*.

It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some Relevant Offences Under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any

gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200L or more) at a place. Illegal dumping can also include abandoned vehicles.

Responsibilities Under Other Legislation

An environmental authority pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for the activity that might be required by other State and/or Commonwealth legislation. Other legislation for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Sustainable Planning Act 2009*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Act 2000*

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

An environmental authority for petroleum activities is not an authority to impact on water levels or pressure heads in groundwater aquifers in or surrounding formations. There are obligations to minimise or mitigate any such impact under other Queensland Government and Commonwealth Government legislation.

Environmental Authority Conditions

This environmental authority consists of the following Schedules:

Schedule A	General Conditions
Schedule B	Water
Schedule BB	Groundwater
Schedule BE	Fluid Injection
Schedule C	Regulated Structures
Schedule D	Land
Schedule E	Disturbance to Land
Schedule F	Environmental Nuisance
Schedule G	Air
Schedule H	Waste
Schedule I	Rehabilitation
Schedule J	Well Construction, Maintenance and Stimulation Activities
Schedule K	Community Issues
Schedule L	Notification Procedures
Schedule M	Definitions
Appendix 1	Existing Regulated Dams
Appendix 2	Plans Referenced in Schedule B, Table 1 – Authorised Works in a Watercourse or within 200 m of Springs
Appendix 3	Plans Referenced in Schedule E, Table 2 – Authorised Disturbance

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SCHEDULE A – GENERAL CONDITIONS

(A1) This environmental authority authorises the carrying out of the following **resource activity(ies)**:

- (a) the petroleum activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities* to the extent they are carried out in accordance with the activity's corresponding scale and intensity;
- (b) the following specified **relevant activities** that occur on all tenures within the Project Area:
 - (i) Sewage Treatment – operating sewage treatment works, other than no release works;
 - (ii) Water Treatment – treating 10 ML or more of raw water in a day;
 - (iii) Stimulation activities;
- (c) the following specified relevant activities on PL90, PL91, PL92, PL99, PL100, PL232, PPL76 and PPL92:
 - (i) Chemical Storage – storing 500 m³ or more of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 subsection (1)(c);
 - (ii) Electricity Generation – generating electricity by using gas at a rated capacity of 10 MW electrical or more;
 - (iii) Fuel Burning – consists of using fuel burning equipment that is capable of burning at least 500 kg of fuel in an hour;
 - (iv) Regulated Waste Treatment – consists of operating a facility for receiving and treating regulated waste or contaminated soil to render the waste or soil non-hazardous or less hazardous;
 - (iv) Waste Disposal – operating a facility for disposing of, in a year, more than 200,000 tonnes of any combination of regulated waste, general waste and limited regulated waste and < 5 tonnes of untreated clinical waste (if in a scheduled area);
 - (v) Extracting, other than by dredging;
- (d) the following specified relevant activities on ATP526, ATP653, PL233, PL234, PL235, PL236, PL420, PL421 and PL440:
 - (i) Extractive and Screening Activities – extracting, other than by dredging, in a year, 5,000 to 100,000 tonnes;
- (e) for the specified relevant activities listed in (A1)(b)-(d) above another activity where Schedule 2 of the Environmental Protection Regulation 2008 (the Regulation) provides exemption for the activity, but only to the extent of the circumstances stated in Schedule 2 of the Regulation; and
- (f) **incidental activities** that are not otherwise specified relevant activities.

Schedule A, Table 1 – Scale and Intensity for the Activities

Tenure Numbers	Petroleum Activities and Infrastructure	Scale (number of activities)	Intensity (maximum size in total)
ATPs: 526P, 653 PLs: 90, 91, 92, 99, 100, 232, 233, 234, 235, 236, 420, 421, 440 PPLs: 76, 92	Coal seam gas exploration, appraisal and development wells	1415 wells	2942ha
	Injection Wells FV77 and FV82	2	6 ha
	Compressor Station(s)	11 A-HCS-01 A-HCS-02 CS1 CS2 CS3 F-HCS-04 F-HCS-05 F-NCS-04-01 F-NCS-04-02 F-NCS-05-01 F-NCS-05-02	360 ha
	Regulated Structure(s) (Dams) ≥400 megalitres	5	250 ha

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	Regulated Structure(s) (Dams) <400 megalitres	43	270 ha
	Low Hazard Dam(s)	5532	1385 ha
	Water Treatment Facilities that allow treated water to be released to waters other than seawater	7	≤50 ML/day
	Water Treatment Facilities	6	≤25 ML/day
	Sewage Treatment Plant(s) that discharge treated effluent to an infiltration trench or through an irrigation scheme, or to land for dust suppression, construction or operational purposes	11	>100 equivalent persons (EP) ≤ 450 EP
		26	>21 EP ≤ 100 EP

- (A2) The resource activities in condition (A1) are authorised subject to the conditions of this environmental authority.
- (A3) This environmental authority does not authorise a relevant act² to occur in carrying out an authorised resource activity unless a condition of this environmental authority expressly authorises the relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Prevent or Minimise Likelihood of Environmental Harm

- (A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of Measures, Plant and Equipment

- (A5) All measures, plant and equipment must be:
- (a) installed to ensure compliance with the conditions of this environmental authority;
 - (b) maintained in their proper and effective condition; and
 - (c) operated in a proper and effective manner.
- (A6) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration materially increases, or is likely to increase, the environmental harm caused by the petroleum activity.

Financial Assurance

- (A7) The holder of this environmental authority must provide a financial assurance from time to time, in the amount and form required by the administering authority for the authorised petroleum activities.
- (A8) The financial assurance is to remain in force until the administering authority is satisfied that no claim is likely to be made on the assurance.

² See section 493A of the *Environmental Protection Act 1994*

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- (A9) The calculation of financial assurance must be in accordance with the most recent version of the administering authority's Guideline *Financial Assurance under the Environmental Protection Act 1994*.
- (A10) Prior to any changes in petroleum activities which would result in an increase to the maximum disturbance since the last financial assurance calculation was submitted, the holder of the environmental authority must submit, and the administering authority must have approved, an application to amend the financial assurance.

Third Party Audit

- (A11) A third party auditor, nominated by the holder of this 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 (3) years.
- (A12) Notwithstanding condition (A12), and prior to undertaking the third party audit, the scope and content of the third party audit can be negotiated with the administering authority.
- (A13) An audit report must be prepared and certified by the third party auditor presenting the findings of each audit carried out.
- (A14) Any recommendations arising from the audit report must be acted upon 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) A written response must be attached 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.

Contingency Procedures for Emergency Environmental Incidents

- (A16) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:
- (a) A clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.
 - (b) Consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.
 - (c) Response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.
 - (d) The practices and procedures to be employed to restore the environment or mitigate any environmental harm caused.
 - (e) Procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.
 - (f) Training of staff to enable them to effectively respond.
 - (g) Procedures to notify the administering authority, local government and any potentially impacted landholder. (General 16).

Infrastructure

- (A17) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:
- (a) regulated dams and low hazard dams;
 - (b) exploration, appraisal and development wells;
 - (c) water treatment facilities;

- (d) sewage treatment facilities;
- (e) authorised discharge points to air and waters;
- (f) any chemical storage facility associated with the environmentally relevant activity of chemical storage; and
- (g) compressor stations.

Monitoring

- (A18) All monitoring must be undertaken by a **suitably qualified person**. (PESCD 1) (General 7).
- (A19) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests, unless NATA accredited tests are not available.
- (A20) Any management or monitoring plans, systems or programs required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three (3) years in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.
- (A21) An annual report must be prepared each year and submitted to the administering authority in a form requested by the administering authority. This report must include but not necessarily be limited to:
- (a) the results of the Seepage Monitoring Program that is required by the conditions of this environmental authority;
 - (b) a summary of:
 - (i) any investigations required for the Seepage Monitoring Program prescribed under this environmental authority;
 - (ii) the regulated dam register in the approved format that is required by the conditions of this environmental authority;
 - (iii) the results of annual regulated dam water quality monitoring that is required by the conditions of this environmental authority;
 - (iv) the results of vibration and blast monitoring required by the conditions of this environmental authority;
 - (v) any well closure reports that are required by the conditions of this environmental authority, where applicable;
 - (vi) the results of any baseline or stimulation impact monitoring program that is required by this environmental authority, where applicable;
 - (vii) non **NATA accredited** laboratory testing methods, where applicable;
 - (viii) in relation to brine injection, the results of monitoring including monthly summaries of injection conditions, commentary on changes to injection fluid characteristics or sources, annulus performance, packer isolation test, mechanical integrity and all other pertinent information;
 - (c) the management criteria report required by section 316A of the *Environmental Protection Act 1994*;
 - (d) if prepared for the subject annual return period, any third party audit report and written response to said report that is required by this environmental authority;
 - (e) a comparison of the previous 12 months monitoring results to both the limits set in this environmental authority and to relevant prior results including data analyses and interpretation to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination and the environmentally relevant activity(ies); and
 - (f) details of any exceedences with the conditions of this environmental authority and the dates and times these exceedences were reported to the administering authority;

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- (g) an outline of actions taken to minimise the risk of environmental harm from any circumstance, condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A20).

Surface Water Sampling Methodology

- (A22) The methods of water sampling required by this environmental authority must comply with that set out in the latest edition of the *Queensland Monitoring and Sampling Manual* as amended from time to time.

Groundwater Sampling Methodology

- (A23) The methods of groundwater sampling required by this environmental authority must comply with the latest edition of the *Queensland Monitoring and Sampling Manual*, AS/NZS 5667:11 1998 *Water Sampling Guidelines – Part 11 Guidance on sampling groundwater*, and the Australian Government's *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1) as relevant and as amended from time to time.

Noise Sampling Methodology

- (A24) Noise must be measured in accordance with the prescribed standards in the Environmental Protection Regulation 2008.

Documentation and Records Management

- (A25) A record of all documents required by this environmental authority must be kept for a minimum of five (5) years.
- (A26) All plans and monitoring programs required by this environmental authority must be certified by a suitably qualified person.
- (A27) All plans and monitoring programs under this environmental authority must be implemented.

SCHEDULE B – WATER

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

Erosion and Sediment Control

- (B2) For activities involving significant disturbance to land, control measures that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:
- (a) preferentially divert stormwater around significantly disturbed land, or 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).

Works in Watercourses, Wetlands, Lakes and Springs

- (B3) Petroleum activity(ies) that require earthworks, vegetation clearing, placing fill and/or that will result in significant disturbance other than that associated with the construction and/or maintenance of **linear infrastructure**, is not permitted in or within:
- (a) 200 metres of any lake or spring; or
 - (b) 100 metres of the high bank of any other watercourse.
- (B4) All reasonable alternative locations must be considered prior to the construction of any linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in condition (B3)(b).
- (B4A) Despite condition (B3), the infrastructure and associated activities necessary for construction and/or maintenance purposes specified in *Schedule B, Table 1 – Authorised Works in a Watercourse or within 200 m of Springs* is permitted in the location specified in *Schedule B, Table 1 – Authorised Works in a Watercourse or within 200 m of Springs*.

Schedule B, Table 1 – Authorised Works in a Watercourse or within 200 m of Springs

Tenure	Description of Infrastructure/Works	Latitude	Longitude
PL232	Pipeline outfall location for ROP2 permeate	-25.732	149.136
PL232	Remedial works in tributary (Reach 1)	-25.732 to -25.729	149.135 to 149.138
PL232	Remedial works in tributary (Reach 2)	-25.729 to -25.726	149.138 to 149.140
PL232	Remedial works in tributary (Reach 3)	-25.726 to -25.726	149.140 to 149.141
PL232	Remedial works in tributary (Reach 4)	-25.726 to -25.718	149.141 to 149.142
PL232	Remedial works in tributary (Reach 5)	-25.718 to -25.715	149.142 to 149.143
PL232	Remedial works in tributary (Reach 6)	-25.715 to -25.710	149.143 to 149.145
PL232	Remedial works in tributary (Reach 7)	-25.710 to -25.708	149.145 to 149.145
PL232	Remedial works in tributary (Reach 8)	-25.708 to -25.705	149.145 to 149.146
PL232	Remedial works in wetland (Reach 9)	-	-

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PL232	Remedial works in tributary (Reach 10)	-25.696 to -25.690	149.162 to 149.161
PL232	Hub 04 Compressor Station Batter Wall within 200 m of a spring as depicted in the plan <i>FV-HCS-04 Delineated Springs</i> (1.4980 ha disturbance)	-25.7271 to -25.7269	149.0849 to 149.0883
PL91	Fairview HCS-05 Flare Zone Area.	-25.6108068 -25.61055504 -25.61040637 -25.60988553 -25.60976285 -25.61083767 -25.60941074 -25.60942276 -25.60959198 -25.61022479	148.919138 148.9192011 148.9192646 148.9194891 148.9195311 148.9191318 148.919622 148.9195673 148.9192641 148.9187133

Note: Coordinates are decimal degrees as per Zone 56, GDA 94 datum

- (B5) The construction and/or maintenance of linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in (B3)(a) and (B3)(b) must be conducted in accordance with the following order of preference:
- (a) conducting works in times when there is no water present;
 - (b) conducting works in times of no flow;
 - (c) conducting works in times of flow but in a way that does not impede low flow.
- (B6) The construction and maintenance of linear infrastructure authorised under condition (B3) and (B11) and authorised works specified in Schedule B, Table 1 must comply with the water quality limits specified in *Schedule B, Table 2 – Release Limits for Construction or Maintenance of Linear Infrastructure*

Schedule B, Table 2 – Release Limits for Construction or Maintenance of Linear Infrastructure

Water Quality Parameters	Units	Water Quality Limits
Turbidity	Nephelometric Turbidity Units (NTU)	For a generally ecologically significant wetland, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within 50m downstream of the construction or maintenance activity. For a generally ecologically significant wetland, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within 50m downstream of the construction or maintenance activity.
Hydrocarbons	-	For a generally ecologically significant wetland, or watercourse, no visible sheen or slick.

- (B7) Monitoring must be undertaken at a reasonable frequency that is appropriate to demonstrate compliance with condition (B6).
- (B8) Written notification detailing the location (GPS coordinates) of any significant disturbance to be undertaken in or on the **bed and banks** of a watercourse, or within the areas specified in

condition (B3)(b), must be provided to the administering authority at least 24 hours prior to the commencement of the significant disturbance.

- (B9) Petroleum activities must occur outside a **wetland of high ecological significance**.
- (B10) Petroleum activities, other than linear infrastructure must occur outside a **general ecologically significant wetland**.
- (B11) Petroleum activities must not negatively impact a wetland of high ecological significance.
- (B12) Linear infrastructure activities, other than linear infrastructure construction and/or maintenance activities, must not change the existing surface water hydrological regime of any general ecologically significant wetland.
- (B13) The construction and/or maintenance of linear infrastructure in any general ecologically significant wetland must not:
 - (a) prohibit the flow of surface water in or out of the wetland;
 - (b) impact surface water quality in the wetland unless specifically authorised by this environmental authority;
 - (c) drain the wetland;
 - (d) fill the wetland;
 - (e) impact bank stability; or
 - (f) result in the clearing of riparian vegetation outside of the required footprint.

Floodplains

- (B14) Where the petroleum activity(ies) is carried out on **floodplains** petroleum activity(ies) must be carried out in a way that does 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.

Contaminant Release

- (B15) Subject to condition (B16), the release of contaminants to waters must only occur from the release points specified in *Schedule B, Table 3 – Contaminant Release Points*.

Schedule B, Table 3 – Contaminant Release Points

Description	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Contaminant	Description of Receiving Waters
Reverse Osmosis Plant 1 "Pony Hills Water Treatment Plant" (ROP1)	-25.76870484	149.030008341	Treated coal seam gas water	Tributary of Hutton Creek
Reverse Osmosis Plant 2 (ROP2)	-25.73	149.14	Treated coal seam gas water	Tributary of the Dawson River

- (B16) The release of contaminants to waters from ROP2 in accordance with condition (B15) must cease on or before 17 May 2024.

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- (B17) The release of contaminants to waters from ROP2 in accordance with condition (B15) must not cause an adverse impact on the **species richness** or **species abundance** of aquatic fauna.
- (B18) The maximum volume of contaminants released to waters from ROP2 under condition (B15) must not exceed 18 ML per day.
- (B19) The release of contaminants to waters from ROP2 must not occur until a baseline biological assessment has been undertaken to identify detectable aquatic flora and fauna of the receiving wetland.
- (B20) The baseline biological assessment required by condition (B19) must include:
- (a) spring (late dry season);
 - (b) autumn (recessional wet season);
 - (c) for aquatic bird and frog communities – four events each consisting of three surveys; and
 - (d) for aquatic flora, macro-invertebrate, fish and turtle communities – four events each consisting of one survey.
- (B21) Biological monitoring must be developed and undertaken to monitor, identify and describe any adverse impacts to aquatic fauna.
- (B22) The baseline biological assessment and biological monitoring required by conditions (B19) and (B21) must be certified by a suitably qualified person and must:
- (a) be designed in accordance with all relevant methodologies detailed in ANZECC & ARMCANZ 2000 and the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland 2012*;
 - (b) include multiple fixed receiving wetland monitoring sites and reference wetlands in accordance with ANZECC & ARMCANZ 2000;
 - (c) include as a minimum surveys of aquatic flora, aquatic macro-invertebrate communities, fish communities, frog communities, turtle communities and water bird communities;
 - (d) include monitoring of hydrology (e.g. flow, duration, periodicity, connectivity with groundwater systems); and
 - (e) include monitoring of quality characteristics specified in *Schedule B, Table 4 – Contaminant Limits*.
- (B23) The baseline biological assessment and biological monitoring required by (B19) and (B21) must include aquatic flora and fauna surveys that account for temporal variability and spatial variability in the aquatic habitat and be designed and implemented to detect adverse impacts to species richness and species abundance.
- (B24) A biological monitoring report must be prepared and certified by a suitably qualified person quarterly and submitted to the administering authority upon request. This report must include but not necessarily be limited to:
- (a) a summary of the previous monitoring results obtained from biological monitoring required by condition (B21) and a comparison of the previous monitoring results; and
 - (b) an evaluation / explanation of the data derived from the biological monitoring required by condition (B21) which determines whether an adverse impact on the species richness or species abundance numbers of aquatic fauna is being caused from the contaminant release to waters.
- (B25) Subject to condition (B19), measurable biological indicators and quantifiable threshold values to determine adverse impacts on aquatic fauna must be developed and submitted to the administering authority by 1 June 2014.

Receiving Environment Monitoring

- (B26) The release of contaminants to waters authorised by condition (B16) must be monitored at the locations and for each quality characteristic and at the frequency specified in *Schedule B, Table 4 – Contaminant Limits*.

Schedule B, Table 4 – Contaminant Limits

Quality Characteristic	Monitoring Point (MP)	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Limit Type	Limit	Monitoring Frequency	
Temperature	Wetland MP1	-25.708	149.146	Maximum	+/- 2°C above background. Background to be measured at Wetland MP4	Daily during release from ROP2	
pH	Wetland MP1	-25.708	149.146	Range	6.5-8.5		
	Wetland MP1	-25.708	149.146	75th %ile	370 µS/cm		
Electrical Conductivity	ROP1 end of pipe	25.768704 84	149.030008 341	Maximum	500 µS/cm	Daily during release from ROP1	
Turbidity	Wetland MP1	-25.708	149.146	Monitor only	Monitor only (NTU)	Daily during release from ROP2	
	Dawson River MP1	-25.690	149.163				
Dissolved Oxygen (85-110% Saturation)	Wetland MP1	-25.708	149.146	Range	6.4-16.1 mg/L		
Total Suspended Solids	Wetland MP1	-25.708	149.146	50th%ile	50 mg/L	Weekly during release from ROP2	
	Dawson River MP1	-25.690	149.163	Monitor only	Monitor only		
Total nitrogen	Wetland MP1	-25.708	149.146	Maximum	620 µg/L		
	Wetland MP2	-25.706	149.143				
	Wetland MP3	-25.707	149.149				
	Wetland MP4	-25.698	149.139				
	Wetland MP5	-25.701	149.153				
Ammonia	Wetland MP1	-25.71	149.145	Maximum	0.9 mg/L		
	Wetland MP2	-25.706	149.143	50%ile	Monitor only		
	Wetland MP3	-25.707	149.419				
Calcium	Inlet to Release Pipe (Dam)	25.730	149.090	Minimum	1 mg/L		
Chloride	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	175 mg/L		
Fluoride	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	1 mg/L		
Magnesium	Inlet to Release Pipe (Dam)	25.730	149.090	Monitor only	mg/L		
Potassium	Inlet to Release Pipe (Dam)	25.730	149.090	Monitor only	mg/L		
Sodium	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	115 mg/L		
Sulphate	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	5 mg/L		
Aluminium	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	55 µg/L		
Arsenic (III)	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	24 µg/L		
Arsenic (IV)	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	13 µg/L		
Boron	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	1 mg/L	Weekly during release from ROP2	
	Wetland MP2	-25.706	149.143				
	Wetland MP4	-25.698	149.139				
		Dawson River MP1	-25.690	149.163	Maximum	1mg/L	Weekly during release from ROP1
		At the location where contaminants are being extracted for irrigation (applies to any current or future irrigation extraction)	-	-	Maximum when irrigation from the receiving waters is being undertaken	0.5 mg/L	Weekly during release from ROP2
Cadmium	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	0.2 µg/L	Weekly during release from ROP2	

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Quality Characteristic	Monitoring Point (MP)	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Limit Type	Limit	Monitoring Frequency
Chromium (VI)	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	1 µg/L	
Copper	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	1.4 µg/L	
Iron	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	300 µg/L	
Lead	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	3.4 µg/L	
Manganese	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	1,900 µg/L	
Mercury	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	0.6 µg/L	
Nickel	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	11 µg/L	
Selenium	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	11 µg/L	
Zinc	Inlet to Release Pipe (Dam)	25.730	149.090	Maximum	8 µg/L	Weekly during release from ROP1
	Dawson River MP1	-25.690	149.163	Maximum	8 µg/L	
Hardness (mg/L)	Inlet to Release Pipe (Dam)	25.730	149.090	Monitor only	Monitor only	Weekly during release from ROP2

Note: All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered in the field).

- (B27) If the quality characteristic of Boron of the release exceeds the release limit of 0.5mg/L specified in *Schedule B, Table 4 – Contaminant Limits*, all third parties that undertake irrigation using water from the receiving waters must be notified.
- (B28) Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build-up of sediment in such waters.
- (B29) Notwithstanding any other condition of this environmental authority, there must be no release of any toxic substance in any amount or concentration, either alone or in combination with substances already in the receiving water or release, that cause acute toxicological effects to aquatic organisms in the receiving environment.

Receiving Environment Monitoring Program

- (B30) A REMP must be developed to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised activity(ies) by 1 February 2014. The REMP must include periodic monitoring for the effects of the discharge on the receiving environment (under natural flow conditions) as a result of contaminant releases to waters from the site.
- (B31) For the purposes of the REMP, the receiving environment is the waters of the Dawson River and connected or surrounding waterways (including the receiving wetland) up to Yebna Crossing, located 8.5 km downstream of the receiving wetland.
- (B32) The REMP must be maintained and certified by a suitably qualified person.
- (B33) The REMP must address but not be limited to the following:
- description of potentially affected receiving waters including key communities and background water quality characteristics based on accurate and reliable monitoring data that takes into consideration any temporal and spatial variation (e.g. seasonality);
 - description of applicable environmental values, including but not limited to:
 - hydrology (flow, duration, periodicity, connectivity with groundwater systems;
 - physiochemical properties;
 - aquatic ecosystem parameters including flow and fauna habitat; and

- (iv) geomorphological features;
- (c) description of water quality objectives to be achieved;
- (d) any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment within which the REMP is proposed;
- (e) water quality targets within the receiving environment to be achieved, and clarification of contaminant concentrations or levels indicating adverse environmental impacts during the REMP.
- (f) monitoring for any potential adverse environmental impacts caused by the release;
- (g) monitoring for algal blooms;
- (h) monitoring of stream flow and hydrology;
- (i) an assessment of bank stability, including monitoring for any potential adverse environmental impacts caused by the release including impacts to bank stability and erosion, and an evaluation of watercourse bank slumping;
- (j) monitoring of physical chemical parameters as a minimum those specified in *Schedule B, Table 4 – Contaminant Limits*;
- (k) monitoring biological indicators in accordance ANZECC & ARMCANZ 2000 (including Before, After, Control, Impact (BACI) Principal) and, where possible, consistent with methodologies specified by FRC Environmental Pty Ltd in their report titled *Santos Coal Seam Gas Fields Aquatic Ecology Impact Assessment*;
- (l) monitoring metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ 2000, *A Guide To The Application Of The ANZECC & ARMCANZ Water Quality Guidelines In The Minerals Industry* (BATLEY et al) and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*) for permanent, semi-permanent water holes and water storages;
- (m) monitoring of a selection of invertebrate species (minimum of three from the local receiving environment) to assess ecosystem health (e.g. exoskeleton density) in respect to the availability of calcium and magnesium;
- (n) the methods for analysis and interpretation all monitoring results;
- (o) the locations of monitoring points (including the locations of proposed background and downstream impacted sites for each release point);
- (p) the frequency or scheduling of sampling and analysis sufficient to determine water quality objectives and to derive site specific reference values within two (2) years (depending on wet season flows) in accordance with the *Queensland Water Quality Guidelines 2009*. For ephemeral streams, this should include periods of flow irrespective of mine or other discharges;
- (q) monitoring of quality characteristics must include the limits specified in *Schedule B, Table 4 – Contaminant Limits* to assess the extent of the compliance of concentrations with water quality objectives derived through condition (B33)(p);
- (r) specify sampling and analysis methods and quality assurance and control;
- (s) any historical data sets to be relied upon;
- (t) description of the statistical basis on which conclusions are drawn,
- (u) any control or reference sites; and
- (v) recording of planned and unplanned releases to watercourses, procedures for event monitoring, monitoring methodology used and procedure to establish background surface water quality.

Well Testing

- (B34) Subject to conditions (B35) and (B36) the injection of CSG water or better quality groundwater is authorised in wells that are not exploration, appraisal or development wells, for the purposes of hydraulic testing, where such hydraulic tests are undertaken for no more than two (2) consecutive days.
- (B35) The maximum volume of CSG water or better quality groundwater injected for the purposes of hydraulic testing identified in condition (B34) must not exceed 1ML per hydraulic test.
- (B36) Written notification detailing the type and location (GPS coordinates) of any hydraulic testing undertaken in accordance with condition (B34) must be provided to the administering authority at least 10 business days prior to the commencement of the hydraulic test.

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SCHEDULE BB – GROUNDWATER

- (BB1) 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.

Seepage Monitoring Program

- (BB2) A Seepage Monitoring Program must be developed to detect any seepage to groundwater as a result of storing contaminants in a regulated structure(s) (e.g. surface dams, monocells).
- (BB3) The Seepage Monitoring Program, must include, but not necessarily be limited to:
- (a) procedures to detect any seepage to groundwater and surrounding soils from regulated structure(s) and its possible effect on groundwater and soils;
 - (b) identification of seepage monitoring bores and their locations including:
 - (i) baseline / hydraulically up-gradient seepage monitoring bores (i.e. bores where groundwater quality will not have been affected by petroleum activities;
 - (ii) seepage monitoring bores that are within aquifers potentially affected by the regulated structure(s) authorised under this environmental authority;
 - (iii) a geodetic survey of all seepage monitoring bores; a geodetic survey showing groundwater potentiometric surface;
 - (c) the Seepage Monitoring Program has been designed consistent with relevant Guidelines and Standards such that the Program design has:
 - (i) a sufficient number of seepage monitoring points and/or wells to obtain representative groundwater samples from the uppermost aquifer up-gradient and down-gradient of the potential influence;
 - (ii) if a salt monocell is authorised under this environmental authority, a sufficient number of seepage monitoring bores located not more than 150 m from the monocell or the boundary of the monocell facility, whichever is the closer;
 - (iii) sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the presence or absence of contaminants;
 - (iv) procedures to determine the quality of groundwater down gradient of any potential sources of contaminants including groundwater passing the relevant seepage monitoring bore(s);
 - (v) procedures to allow an assessment of whether there has been any statistically significant adverse change in groundwater quality at locations hydraulically down gradient of the containment activity(ies).
 - (d) procedures to determine groundwater flow direction, groundwater flow rate and hydraulic conductivity beneath the relevant regulated structure(s);
 - (e) sampling of all baseline or hydraulically up-gradient monitoring bores for the minimum groundwater parameters levels listed below quarterly over the 12 month period immediately prior to the commencement of any new containment activities:
 - (f) identification of the trigger parameter(s) associated with the potential contaminants of concern identified in (e);
 - (g) a sampling program of all seepage monitoring bores:
 - (i) to measure and record standing groundwater levels in metres accurate to 0.01 metres to be plotted as function of time (hydrograph) to identify seasonal patterns;
 - (ii) quarterly monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) whilst activities are being carried out;
 - (iii) annual monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) for a minimum of three (3) years after the containment activity(ies) ceases;
 - (h) a Seepage Trigger Action Response Procedure which must include but not be limited to the following:
 - (i) trigger levels for the relevant trigger parameter(s) identified in (f);
 - (ii) trigger and action response measures at which investigations will be undertaken;
 - (iii) action levels for the relevant possible contaminants of concern at which the holder of this environmental authority will undertake additional investigation into the potential

for environmental harm, including the validation and verification of the source, cause and extent of contamination;

- (i) identification monitoring equipment to be used; and
- (j) a rationale containing details on the Programs purpose, conceptualisation and verification of the procedures, determinations, analysis and assumptions undertaken.

(BB4) Seepage monitoring bores identified in (BB3) must be monitored quarterly for the trigger parameter(s) specified in *Schedule BB, Table 1 – Seepage Monitoring Trigger Parameters*.

Schedule BB, Table 1 – Seepage Monitoring Trigger Parameters

Parameter	Units	Untreated Coal Seam Water	Permeate	Brine
Static Water Level	m	monitor	monitor	monitor
pH	pH unit	monitor	monitor	monitor
EC	µS/cm	monitor	monitor	monitor
Major Anions (sulphate, chloride)	mg/L	monitor	-	-
Major Cations (calcium, magnesium, sodium and potassium)	mg/L	monitor	-	-

Monitoring Bores

(BB5) The following information concerning each newly constructed seepage monitoring bore must be submitted to the administering authority with each annual return:

- (a) bore ID and location presented on a plan;
- (b) design of the monitoring bores installed;
- (c) specific construction information including but not limited to geographical coordinate (including the geophysical coordinate system utilised) depth of bore, depth and length of casing, depth and length of screening, presence of any measuring probe;
- (d) identification of any aquifers intercepted by the monitoring bores;
- (e) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible contaminants of concern; and
- (f) a lithological log and preferably a stratigraphic interpretation to identify the important features.

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SCHEDULE BE – FLUID INJECTION

(BE1) The injection of treated coal seam gas water, treated water or brine into a groundwater aquifer is not authorised unless stated under condition (BE2) of this environmental authority.

Injection of Brine from Pony Hills Water Treatment Plant into Timbury Hills Formation or CSG-Depleted Source Formations

Target Aquifers

- (BE2) The holder of this environmental authority is permitted to inject brine or CSG water (injection fluid), on PL90, PL91, PL92, PL99, PL100, PL232, PPL76 and PPL92, into:
- (a) the Timbury Hills formation; or
 - (b) CSG-depleted source formations; provided the:
 - (i) injection zone formation is shown to be hydraulically isolated from water resource formations, as identified in Attachment 2: *Hydrogeology, 4 May 2008, Environmental Management Plan for the Fairview Project Area*, URS, through substantial and competent aquitards; and
 - (ii) the injection fluid shows inconsequential reactivity with the injection zone formation fluids and the formation itself.

Area of Review

- (BE3) The holder of this environmental authority must identify and review the location of all known wells, faults and other geologic features which could affect containment within 1,000 m of the well, and that penetrate the injection zone formation. If the review identifies the potential for migration of formation or injection fluids out of the injection zone formation, mitigating action to prevent such migration must be taken before using the injection well. Details of the mitigation measures are to be recorded and provided to the administering authority as part of the Well Completion Report.

Minimum Construction Requirements

- (BE4) All injection wells must be cased and cemented to prevent the movement of injection fluids into or between water resource aquifers. The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well.
- (BE5) In determining and specifying casing and cementing requirements, at least the following must be considered:
- (a) identification of formations and water resource aquifers;
 - (b) depth to the bottom of the lowest occurring water resource aquifer;
 - (c) quality of formation fluids;
 - (d) depth to the injection zone;
 - (e) estimated maximum and average injection pressures;
 - (f) external pressure, internal pressure and axial loading;
 - (g) hole size;
 - (h) size and grade of casing strings;
 - (i) class of cement; and
 - (j) thermal regime.
- (BE6) The injection well must include the following:
- (a) surface casing fully cemented at least 20 m into competent impermeable strata of:
 - (i) the uppermost occurring aquitard below the lowest occurring water resource aquifer; or
 - (ii) the aquitard overlying the CSG-depleted source formation;
 - (b) production casing fully cemented into the injection zone formation;
 - (c) an annulus packer located within 30 m of the injection fluid release point;
 - (d) casing centralisers;

- (e) inert fluid in the annulus;
- (f) a fluid level detection system measuring the annulus fluid; and
- (g) injection tubing extending through the packer to the injection zone.

Hydraulic Isolation and Well Completion Report

- (BE7) Upon completion of construction and development of an injection well, a Well Completion Report shall be submitted to the administering authority including logs and other tests conducted during the drilling and construction of the well. The report shall be prepared by an appropriately qualified practitioner and shall include:
- (a) information considered in the design of the well and casing design;
 - (b) details of the "as constructed" well including but not limited to: lithology, injection zone formation fracture pressure, injection zone formation pressure prior to injection, casing strings, and cement type and volumes;
 - (c) substantiated commentary on the potential for reaction between the formation fluid and injection fluid;
 - (d) a detailed interpretation of the logs against their specific objectives, for approval prior to commencement of injection operations;
 - (e) temperature survey and a casing integrity assessment technique such as:
 - (f) radioactive tracer survey; or
 - (g) oxygen activation log; or
 - (h) cement integrity log; or
 - (i) an equivalent survey technique approved by the administering authority; and
 - (j) a completed well schematic diagram.
- (BE8) In the event of converting an existing well to an injection well, as well as the above, a full length casing inspection log must be run.

Mechanical Integrity

- (BE9) The holder of this environmental authority must demonstrate the internal and external mechanical integrity of the injection system. A well demonstrates mechanical integrity if:
- (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.
- (BE10) Mechanical integrity must be demonstrated at the following times:
- (a) prior to commencement of injection;
 - (b) every five years after commencement of operation;
 - (c) following well refurbishment after a demonstration of loss of hydraulic isolation or if the injection tubing has been disturbed; and
 - (d) if the injection well is unused for a continuous period of twelve months, prior to recommencement of use.

Operating Requirements

- (BE11) The rate and volume of injection fluid must not cause wellhead pressures to exceed 90 per cent of:
- (a) the formation fracture pressure; or
 - (b) the pressure at which the hydraulic isolation logging was carried out.
- (BE12) Injection must only occur through the injection tubing.
- (BE13) The injection fluid must be demonstrated to be aseptic.
- (BE14) The injection fluid must not contain more dissolved oxygen than the formation fluid or 200 parts per billion, whichever is the greater.

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Existing Injection Wells

- (BE15) Wells currently in use as injection fluid disposal wells and not specifically authorised for that use must be either refurbished to meet the requirements of this environmental authority or plugged and abandoned in compliance with this environmental authority no later than three (3) years from the anniversary of issuance of this environmental authority.

Plugging and Abandonment

- (BE16) Prior to abandoning an injection well, the well must be plugged with cement which will not allow the movement of injection fluids into or between water resource aquifers. The cement plug(s) shall be placed by methods such as:

- (a) the balance method; or
- (b) the dump bailer method; or
- (c) the two-plug method.

- (BE17) The well to be abandoned must be in a state of static equilibrium with the mud weight equalized top to bottom by circulating mud at least once prior to the placement of the cement plug(s).

Well Closure Plan

- (BE18) The holder of this environmental authority must, within three (3) months from the date of this approval, develop and submit a well closure plan including the following:

- (a) the type and number of plugs to be used;
- (b) the placement of each plug including the elevation of the top and bottom of each plug;
- (c) the type, grade and quantity of material to be used in plugging;
- (d) the method of placement of the plugs;
- (e) any proposed test or measure to be made; and
- (f) the estimated cost of closure.

Note: These requirements are in addition to any other requirements that may exist under other Acts [for example, *Minimum standards for the construction and reconditioning of water bores that intersect the sediments of artesian basins in Queensland*, Natural Resources and Mines, 2004, Queensland Government].

Well Integrity

- (BE19) Unless otherwise stated in the conditions of this environmental authority, injection wells must be constructed according to the current standards applicable to water bore drilling activities under the *Water Act 2000*. (i.e. Minimum Construction Requirements for Water Bores in Australia [National Water Commission, 2012 or subsequent revisions]).
- (BE20) Fluid injection 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.
- (BE21) Wells used for untreated coal seam water or brine fluid injection must have:
- (a) an annulus packer at the junction of the aquitard and the target formation within the production casing;
 - (b) injection tubing installed which extends through the packer into the target formation;
 - (c) an inert fluid in the annulus between the injection tubing and the production casing; and
 - (d) a system installed to record any loss of containment of the inert fluid.

(BE22) For fluid injection:

- (a) where injection tubing is required by condition (BE20), injection must only occur through injection tubing;
- (b) the injection pressure must not exceed the dry overburden pressure of the base of the overlying aquitard for injection at depth less than 100 m or 90 per cent of the formation fracture pressure for injection at depth greater than 100m.

Brine Injection Monitoring and Reporting

(BE23) The holder of this environmental authority must:

- (a) monitor the nature of the injection fluid at sufficient frequency to yield data statistically representative of its characteristics. The sampling program shall have regard to changes in source of injection fluid, changes in flow rates from source aquifers and changes in any injection fluid treatment train;
- (b) continuously record injection pressure, flow rate, and cumulative volume of the injection fluid;
- (c) record the annulus pressure each hour;
- (d) measure the standing volume of annulus fluid each six months;
- (e) undertake pressure testing of packer, casing and cement each six months;
- (f) undertake an annual packer isolation test; and
- (g) in the event of an anomalous pressure or volume recording, to inform the administering authority within 24 hours of the occurrence.

Injection Management Plan

(BE24) An Injection Management Plan, prepared by a suitably qualified person, must be submitted to the administering authority prior to any proposed fluid injection activity(ies).

(BE25) The Injection Management Plan required by condition (BE24) must include but not necessarily be limited to:

- (a) estimated volumes and rates of fluid to be produced and injected;
- (b) a description of the physical, chemical and biological components and their concentrations of the fluid to be produced;
- (c) details of how and where the fluid will be produced, aggregated, stored and kept separate from waters until it is, treated and injected into the source aquifer;
- (d) details of where the fluid is proposed to be treated including a description of the treatment process;
- (e) a demonstration that the injection fluid has inconsequential reactivity with the target formation and native groundwater it will come into contact with;
- (f) the characteristics of the receiving environment;
- (g) identification of the water quality impact zone and the hydraulic impact zone;
- (h) identification of all existing bores, springs, lakes, wetlands, 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) identification of proposed fluid injection wells;
- (j) 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 Act 1994*, *Environmental Protection Regulation 2008*, *Environmental Protection (Water) Policy 1997* and the *Queensland Water Quality Guidelines 2006*;
- (k) an assessment of the potential impacts on the environmental values of the receiving environment including migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourses, faults or other geologic features likely to impact on other aquifers;
- (l) 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

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- risk assessment including details on sampling and analysis methods including frequency and locations, and quality assurance and control;
- (m) verification methods to assess performance of the injection activities;
 - (n) 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;
 - (o) the indicators or other criteria against which the performance of fluid injection will be assessed;
 - (p) 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;
 - (q) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;
 - (r) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and
 - (s) a program to monitor impacts on the environmental values of the receiving environment identified by condition (BE25)(k).

SCHEDULE C – REGULATED STRUCTURES

Assessment of Hazard Category

- (C1) The **hazard category** of any **structure** must be assessed by a suitably qualified and experienced person in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* as amended from time to time.
- (C2) The **hazard assessment** required under condition (C1) must occur in any of the following situations:
- (a) prior to the design and construction of the structure;
 - (b) prior to any change in its purpose or its stored contents;
 - (c) for a structure assessed and certified as a high or significant hazard structure, at least biennially after its construction; and
 - (d) for an **existing low hazard dam**, by 30 May 2012.
- (C3) A hazard assessment report and **certification** must be prepared by a **suitably qualified and experienced person** for any **structure** assessed.

Note: The hazard assessment report may include a hazard assessment for more than one structure.

- (C4) Where an existing structure is for the first time assessed as significant or high, the structure must meet the conditions required for regulated structures under this environmental authority within 12 months of that assessment.

Construction of Low Hazard Dam to Contain Wetting Front

- (C5) Where a dam is assessed as low hazard, it must be:
- (a) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the dam is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation.
- (C6) In the event of early signs of loss of structural or hydraulic integrity of a low hazard dam:
- (a) immediate action to prevent or minimise any actual or potential environmental harm must be taken; and
 - (b) any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Hazard Dams

- (C7) The condition of all low hazard dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.

Design and Construction of a Regulated Structure

- (C8) Construction of any dam determined to be a regulated structure is prohibited until:
- (a) a hazard category assessment report and certification has been submitted to the administering authority;
 - (b) a design plan for the regulated structure has been prepared by a suitably qualified and experienced person; and

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- (c) certification from a suitable qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant conditions of this environmental authority has been received.
- (C9) The design plan must contain the information prescribed in the *Guideline – Structures which are dams or levees constructed as part of environmentally relevant activities*.
- (C10) 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 Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C11) All regulated structures must be constructed in accordance with a design plan that has been certified by a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C12) Certification by a suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:
 - (a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - (b) construction of the regulated structure is in accordance with the design plan.
- (C13) All regulated structures must be designed and constructed to prevent:
 - (a) floodwaters from entering the regulated structures from a watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time;
 - (b) wall failure due to erosion by floodwaters arising from the watercourse or drainage line to the annual exceedance probability specified in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time; and
 - (c) overtopping as a result of a flood event of the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.

Operation of a Regulated Structure

- (C14) Operation of a regulated structure is prohibited unless:
 - (a) one paper copy and one electronic copy of the design plan and certification, and a set of 'as constructed' drawings and specifications has been submitted to the administering authority, together with certification that the structure:
 - (i) has been constructed in accordance with the design plan;
 - (ii) is capable of delivering the performance stated in the design plan; and
 - (iii) is compliant with the relevant conditions of this environmental authority;
 - (b) the conditions of this environmental authority relating to the construction of the structure have been met; and
 - (c) for regulated dams, the details required under this environmental authority have been entered into a Register of Regulated Dams.

Regulated Dam Register

- (C15) A register of regulated dams must be established in accordance with the administering authority's *Regulated Dam Register* template, as amended from time to time.
- (C16) The information contained in the register of regulated dams must always be current and complete on any given day.

Mandatory Reporting Level

- (C17) The mandatory reporting level must be marked on each regulated structure in such a way that it is clearly observable during routine inspections of each dam.
- (C18) On becoming aware that the mandatory reporting level has been reached, action must be taken to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.

Design Storage Allowance

- (C19) On 1 November of each year, storage must be available in each regulated structure to meet the design storage allowance for the dam in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C20) On becoming aware that the regulated structure will not have the available storage to meet the design storage allowance on 1 November of any year, action must be taken to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.

Monitoring

- (C21) The condition of all containment structures must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.
- (C22) Each regulated structure must be monitored for the water quality characteristics and at the monitoring location and frequency specified in *Schedule C – Table 1 Regulated Structure Contaminant Monitoring* as follows:

Schedule C – Table 1 Regulated Structure Contaminant Monitoring

Quality Characteristic	Monitoring Location	Frequency of Monitoring
pH (pH unit)	At least three (3) different structure profile depths for each sampling event and be taken as far as practicable from the edge of the regulated structure	During the month of October every year
Electrical Conductivity (µS/m)		
Turbidity (NTU)		
Temperature		
Dissolved Oxygen (mg/L)		
Sodium adsorption ratio (SAR)		
Aluminium (µg/L)		
Arsenic (µg/L)		
Barium (µg/L)		
Boron (µg/L)		
Cadmium (µg/L)		
Chromium (CrVI) (µg/L)		
Copper (µg/L)		
Iron (µg/L)		
Fluoride (µg/L)		
Lead (µg/L)		
Manganese (µg/L)		
Mercury (µg/L)		
Nickel (µg/L)		
Selenium (µg/L)		
Silver (µg/L)		
Strontium (µg/L)		
Tin (µg/L)		
Zinc (µg/L)		
Total phosphorus (mg/L)		
Total nitrogen (mg/L)		
Total petroleum hydrocarbons (µg/L)		

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Quality Characteristic	Monitoring Location	Frequency of Monitoring
BTEX (µg/L)		
Polycyclic aromatic hydrocarbons (µg/L)		
Gross alpha + gross beta or radionuclides by gamma spectroscopy (Bq/L)		

Annual Inspection and Report

(C23) Each regulated structure must:

- (a) be inspected annually by a suitably qualified and experienced person; and
- (b) be assessed for the condition and adequacy for dam safety and against the necessary structural, geotechnical and hydraulic performance against the criteria in each annual inspection.

(C24) A suitably qualified and experienced person must:

- (a) prepare an annual inspection report containing details of assessment and including recommended actions to ensure the integrity of the structure; and
- (b) certify the annual inspection report in accordance with the *Manual for Assessing Categories and Hydraulic Performance of Dams*, as amended from time to time.

(C25) The recommendations contained within the annual inspection report must be considered and action(s) taken to ensure that the regulated structure will safely perform its intended function.

(C26) Within 20 days of receipt of the annual inspection report, the administering authority must be notified in writing of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each regulated structure.

SCHEDULE D — LAND

General

- (D1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.
- (D2) The release of contaminants to land must be carried out in a manner such that:
- (a) vegetation is not damaged;
 - (b) soil quality is not adversely impacted;
 - (c) there is no surface ponding or runoff to waters;
 - (d) there is no aerosols or odours;
 - (e) deep drainage below the root zone of any vegetation is minimised; and
 - (f) the quality of shallow aquifers is not adversely affected.

Chemical Storage

- (D3) All chemical storages must:
- (a) be stored in, or serviced by, an effective containment system that is impervious to the materials stored therein;
 - (b) be stored and handled in accordance with the relevant Australian Standard where such Standard is available; and
 - (c) be managed to prevent the release of substances to waters or land.

Hydrostatic Test Water and Low Point Drains

- (D4) Contaminants that are hydrostatic test water from pipelines and contaminants from low point drains may be released to land in accordance with condition (D2).

Use of Coal Seam Gas Water

- (D5) Coal seam gas water produced from the authorised petroleum activity(ies) which is used for:
- (a) domestic or stock purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for stock and domestic purposes, as amended from time to time;
 - (b) irrigation purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for irrigation purposes, as amended from time to time.
- (D6) Coal seam gas water produced from the authorised petroleum activity(ies) may be used for:
- (a) dust suppression on roads; and
 - (b) for construction and operational purposes for the petroleum activity(ies) authorised by this environmental authority.
- (D7) Coal seam gas water may be transferred to a third party to be used for the following purposes subject to compliance with conditions (D8) and (D9):
- (a) dust suppression;
 - (b) construction and operational purposes;
 - (c) livestock watering purposes.
- (D8) Any coal seam gas water supplied to a third party for livestock watering purposes in accordance with condition (D7)(c) must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for livestock watering purposes, as amended from time to time.
- (D9) If the responsibility of coal seam gas water is given or transferred to a third party in accordance with condition (D7), the holder of environmental authority must ensure that:

- (a) the responsibility of the coal seam gas water is given or transferred in accordance with a written agreement (the 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*.

Sewage Treatment Works

(D10) Treated sewage effluent may only:

- (a) be released to land by sub-surface or spray irrigation at designated, fenced contaminant release area(s);
- (b) be used for dust suppression, construction and operational purposes in accordance with conditions (D21) and (D23).

Conditions (D11) to (D14) apply to temporary and permanent sewage treatment plant operations

- (D11) Treated sewage effluent may only be released to land by large droplet or by subsurface irrigation at designated, fenced and signed contaminant release areas.
- (D12) A buffer distance of 50 m must be applied from the location of the effluent irrigation area to any watercourse, wetland or protected area and 100 m from any potable water supply (bore or a catchment) or stock drinking water supply.
- (D13) When circumstances prevent the irrigation of treated sewage effluent to land, the contaminants must be directed to on-site storage or lawfully disposed of off-site.
- (D14) The quantity of treated sewage effluent used in accordance with condition (D10) must be determined by an appropriate method, for example, a flow meter.

Conditions (D15) to (D16) apply to temporary and permanent sewage treatment plant operations with a design capacity of greater than 21 to 100 equivalent persons

- (D15) Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land*.
- (D16) Treated sewage effluent released to land must be monitored at the frequency and for each quality characteristic specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land*.

Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land

Quality Characteristic	Sampling and <i>In-situ</i> Measurement Point Location	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment works	Maximum	20 mg/L	Quarterly
E. coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100 mL	
		Maximum	10000 cfu per 100 mL	
pH		Range	6.0-8.5	Monthly
Dissolved Oxygen		Minimum	2mg/L	
Electrical Conductivity		Monitor only	-	

Conditions (D17) through (D20) apply only to permanent sewage treatment plant operations with a design capacity of greater than 100 to 450 equivalent persons

- (D17) Prior to construction of a sewage treatment facility, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated.
- (D18) All nominated locations and minimum areas of land in condition (D17) must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.
- (D19) A copy of results of the determinations required in condition (D18) must be submitted to the administering authority.
- (D20) If, within 20 business days following the submission of the results required by condition (D19), the administering authority provides comments on the submission, the holder of this environmental authority must:
 - (a) have due regard to that comment in the finalisation of the amended results;
 - (b) submit the finalised amended results within 40 business days after the administering authority provided comments; and
 - (c) implement the amended results.

Conditions (D21) through (D23) apply only to treated sewage effluent use for the purposes of dust suppression, construction and operational purposes.

- (D21) Treated sewage effluent produced from the authorised petroleum activity(ies) may only be used for dust suppression, construction and operational purposes provided that:
 - (a) the treated sewage effluent has not been stored in a dam or tank prior to use; and
 - (b) the treated sewage effluent quality meets the release limits specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each of the water quality characteristics; and
 - (c) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority.
- (D22) Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each quality characteristic.
- (D23) Treated sewage effluent released to land must be monitored at the frequency and for each quality characteristics specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes*.

Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes

Quality Characteristic	Sampling and <i>In-situ</i> Measurement Point Location	Limit Type	Release Limit	Frequency
pH	e.g. treated sewage effluent storage	Range	6.0 to 8.5	Weekly ¹
5 – day Biochemical Oxygen Demand (BOD)		Median	20 mg/L	
E. coli		Median	<10 cfu per 100 mL	
Electrical Conductivity		Maximum	1600 uS/cm	
Turbidity		95%ile (max)	2 (5) NTU	
Total Suspended Solids		Median	5 mg/L	

¹ Monitoring is to be conducted on a weekly basis until 12 months of monitoring demonstrates no exceedances of the release limits. Monthly monitoring can occur thereafter, excluding E. coli.

SCHEDULE E – DISTURBANCE TO LAND

Soil Management Plan

- (E1) The identification and management of soil must be undertaken in accordance with the Soils Management Plan as amended from time to time.
- (E2) A copy of the Soil Management Plan must be made available to any potentially affected landholder upon request by that landholder.

Fauna Management

- (E3) Measures must be employed to prevent fauna entrapment:
 - (a) during the construction of pipelines in pipe sections and pipeline trenches; or
 - (b) during the construction and operation of well infrastructure and dams.

Confirming Environmentally Sensitive Areas, Wetlands and Springs

- (E4) Prior to undertaking petroleum activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground environmentally sensitive areas, wetlands and springs at that location must be undertaken by a suitably qualified person.
- (E5) A suitably qualified person must develop and certify a methodology so that condition (E4) can be complied with and which is appropriate to confirm on-the-ground environmentally sensitive areas, wetlands and springs by 8 December 2014.
- (E6) Where areas mapped as environmentally sensitive areas, wetlands and springs differ from those confirmed under conditions (E4) and (E5), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground values.
- (E7) All documentation survey information photographs, field data or any material associated with the field validation requirements in (E4) must be maintained for the life of the environmental authority to demonstrate to the administering authority that surveys were conducted in a manner consistent with requirements contained in (E5).

Planning for Land Disturbance

- (E8) The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles:
 - (a) maximise the use of areas of pre-existing disturbance;
 - (b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative; impacts, on areas of native vegetation or other areas of ecological value;
 - (c) minimise disturbance to land that may otherwise result in **land degradation**;
 - (d) minimise isolation, fragmentation or dissection of tracts of native vegetation; and
 - (e) minimise clearing of native mature trees.

Disturbance to Land – Environmentally Sensitive Areas

- (E9) Petroleum activities must be carried out in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, *Schedule E, Table 2 – Authorised Disturbance* and any other relevant conditions of this environmental authority.

Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary Protection Zone of the ESA	Secondary Protection Zone of the ESA
Category A ESAs	No petroleum activities permitted	Only low impact petroleum activities permitted.	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are Nature Refuges, Koala Habitat and/or Declared Catchment Areas	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E10) and (E11)	N/A
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A
Category C ESAs that are Essential Habitat, Essential Regrowth Habitat and/or 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E10) and (E11)	N/A
Category C ESAs that are Resource Reserves	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11)	N/A

Category C ESAs that are State Forests and/or Timber Reserves	Limited petroleum activities permitted subject to condition (E12) Petroleum activities that are extraction activities and screening activities permitted. Limited impact camps permitted.	N/A	N/A
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Note: Approvals may be required under the Forestry Act 1959 where the petroleum activity(ies) is proposed to be carried out in ESAs that are State Forests or Timber Reserves.

Dist

Schedule E, Table 2 – Authorised Disturbances

Authorised Activity	Authorised Activity Section	Location of Development (GDA94)		Size of Development		ESA
		Latitude	Longitude	Length (m)	Area of Disturbance (ha)	
Dawson's Bend Road Widening and Co-located Power Lines	Section 1	-25.720723 to -25.719763	149.050898 to 149.048122	Length within PPZ of Category C ESA 283 m	Area within PPZ of Category C ESA 1.11 ha	PPZ of Category C ESA (Of Concern RE 11.10.7/ 11.10.9/11.3.25)
	Section 2	-25.71906 to -25.721033	149.040465 to 149.036057	Length within Category C ESA 70 m Length within PPZ of Category C ESA 414 m	Area within Category C ESA 0.23 ha Area within PPZ of Category C ESA 1.53 ha	Category C ESA (Of Concern RE 11.10.7/ 11.10.9/11.3.25)
	Section 3	-25.737755 to -25.742661	149.009531 to 148.998035	Length within PPZ of Category C ESA 1325 m	Area within PPZ of Category C ESA 3.82 ha	PPZ of Category C ESA (Of Concern RE 11.3.2/ 11.3.25)
	Section 4	-25.751823 to -25.75041	148.983035 to 148.947449	Length within Category C ESA 2580 m Length within PPZ of Category C ESA 1280 m	Area within Category C ESA 7.26 ha Area within PPZ of Category C ESA 3.62 ha	Category C ESA (State Forest/ Timber Reserve which is predominantly RE 11.10.9)
	Section 5	-25.727628 to -25.727588	149.075484 to 149.073348	Length within PPZ of Category C ESA 216 m	Area within PPZ of Category C ESA 0.58 ha	PPZ of Category C ESA (Of Concern RE 11.10.8)
Total for sections within ESA and PPZ				6168 m	18.15 ha	
Water to Grade Flowlines	FV36 (FV06-37)	-25.648185 to -25.649338	148.930447 to 148.92969	Length within PPZ of Category C ESA 354 m	Area within PPZ of Category C ESA 0.38 ha	Category C ESA (Essential Habitat within RE 11.10.1/ 11.10.13a and RE 11.9.4a)
	FV103 (FV06-38)	-25.644467 to -25.650721	148.936713 to 148.9391135	Length within PPZ of Category C ESA 735 m	Area within PPZ of Category C ESA 0.89 ha	Category C ESA (Essential Habitat within RE 11.10.1/ 11.10.13a and RE 11.9.4a)
	FV34 (FV06-32) and Connecting	-25.641787 to -25.642241	148.943019 to 148.938051	Length within Category	Area within Category C ESA	Category C ESA (Essential Habitat within RE 11.10.1/

Authorised Activity	Authorised Activity Section	Location of Development (GDA94)		Size of Development		ESA
		Latitude	Longitude	Length (m)	Area of Disturbance (ha)	
	Flowlines	-25.641787 to -25.641818	148.943019 to 148.945227	C ESA 685 m	0.83 ha	11.10.13a)
		-25.642471 to -25.642241	148.930648 to 148.938051	Length within PPZ of Category C ESA 952 m	Area within PPZ of Category C ESA 1.4 ha	
		-25.642471 to -25.64314	148.930648 to 148.933636			
		-25.642241 to -25.64342	148.938051 to 148.936485			
		-25.641787 to -25.641818	148.943019 to 148.945227			
	FV10-03 (FV-WP-49)	-25.678885 to -25.680651	148.895576 to 148.900354	Length within PPZ of Category C ESA 659 m	Area within PPZ of Category C ESA 1.3 ha	Category C ESA (Essential Habitat within RE 11.10.1/ 11.10.13a)
Total for sections within ESA and PPZ				3385 m	4.8 ha	
Brine Dams	Brine Dam A+B (as per 6399 – Fairview F-HCS-04 Remote Brine Pond A and B Constraints Mapping, dated 23 May 2012)	-25.751025 -25.751261 -25.751242 -25.751220 -25.751156 -25.751110 -25.750970 -25.750952 -25.750853 -25.750194 -25.749429 -25.749322 -25.749188 -25.749091 -25.749088 -25.748916 -25.748500 -25.748468 -25.747809 -25.747611 -25.747516 -25.747253 -25.747835 -25.748766 -25.749702 -25.750627 -25.750863	149.073924 149.072946 149.072660 149.072508 149.072194 149.072048 149.071686 149.071650 149.071470 149.070739 149.070477 149.070469 149.070463 149.070475 149.070464 149.070189 149.069686 149.069628 149.068897 149.068825 149.068957 149.070644 149.070963 149.071797 149.071624 149.072405 149.073808		Area within PPZ of Category C ESA 6.72 ha	PPZ Category C ESA (Of Concern RE) (11.10.8)
	Brine Dam C+D (as per 6399 – Fairview F-HCS-04 Remote Brine Pond C and D Constraints Mapping, dated 23 May 2012)	-25.741196 -25.743597 -25.743510 -25.743221 -25.742409 -25.742232 -25.741825 -25.741343 -25.741210 -25.741173 -25.740292 -25.739765 -25.739636 -25.740474	149.073263 149.071490 149.071493 149.071507 149.071772 149.071901 149.072205 149.072807 149.073125 149.073226 149.073412 149.073637 149.073745 149.073879		Area within PPZ of Category C ESA 1.71 ha	PPZ Category C ESA (Of Concern RE) (11.10.8)

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Authorised Activity	Authorised Activity Section	Location of Development (GDA94)		Size of Development		ESA
		Latitude	Longitude	Length (m)	Area of Disturbance (ha)	
		-25.740806 -25.740891 -25.744807 -25.745344 -25.745153 -25.745059 -25.745042 -25.744835	149.074079 149.073333 149.070273 149.069394 149.069606 149.069814 149.069853 149.070173			
	Flowline	-25.73526 to -25.746804	149.080295 to 149.068909	Length within PPZ of Category C ESA 2069 m	Area within PPZ of Category C ESA 4.14 ha	PPZ Category C ESA (Of Concern RE) (11.10.8)
Total for sections within ESA and PPZ				2069 m	12.56 ha	
Pipeline Route (gas and water gathering lines)	FV530/531/532 (FV07-10) and connecting flowlines			3755	8.146	In accordance with Appendix 3 – Well Pad FV530/531/532 (FV07-10) and connecting flowlines Category A ESA Primary Protection Zone Category A ESA Secondary Protection Zone Category B ESA Category B ESA Primary Protection Zone Category C ESA (State Forest, Timber Reserve or Of Concern RE) Category C ESA (Essential Habitat) Category C ESA Primary Protection Zone (State Forest, Timber Reserve or Of Concern RE) Category C ESA Primary Protection Zone (Essential Habitat) Category C ESA Secondary Protection Zone (Essential Habitat)
	0	-25.65680	149.04005			
	1	-25.65713	149.04038			
	2	-25.65714	149.04070			
	3	-25.65790	149.04230			
	4	-25.65826	149.04280			
	5	-25.65997	149.04311			
	6	-25.66007	149.04279			
	7	-25.66031	149.04262			
	8	-25.66068	149.04250			
	9	-25.66163	149.04183			
	10	-25.66179	149.04117			
	11	-25.66242	149.04013			
	12	-25.66330	149.04008			
	13	-25.66332	149.04061			
	14	-25.66371	149.04126			
	15	-25.66401	149.04106			
	16	-25.66391	149.04086			
	17	-25.66475	149.03999			
	18	-25.66483	149.04021			
	19	-25.66515	149.04080			
	20	-25.66524	149.04127			
	21	-25.66545	149.04192			
	22	-25.66576	149.04254			
	23	-25.66613	149.04278			
	24	-25.66721	149.04383			
	25	-25.66738	149.04385			
	26	-25.66778	149.04434			
	27	-25.66837	149.04426			
	28	-25.66903	149.04445			
	29	-25.66963	149.04482			
	30	-25.67003	149.04508			
	31	-25.67181	149.04529			
	32	-25.67328	149.04556			
	33	-25.67380	149.04536			
	34	-25.67399	149.04548			
	35	-25.67451	149.04725			
	36	-25.67489	149.04770			
	37	-25.67556	149.04918			
	38	-25.67666	149.05016			
	39	-25.67012	149.04373			
	40	-25.67015	149.04334			
	41	-25.67031	149.04265			

Authorised Activity	Authorised Activity Section	Location of Development (GDA94)		Size of Development		ESA
		Latitude	Longitude	Length (m)	Area of Disturbance (ha)	
	42	-25.67005	149.04223			
	43	-25.67001	149.04171			
	44	-25.67002	149.04086			
	45	-25.66992	149.04049			
	46	-25.67025	149.03818			
	47	-25.67099	149.03503			
	48	-25.67150	149.03343			
	49	-25.67192	149.03286			
Access Track Upgrade	Way Point (WP) 27 to WP 38	-25.671168	149.139478	14500	0.0087	Category A ESA and PPZ (RE 11.10.1)
		-25.582716	149.074461			
CDJV Temporary Workers Camp and Office	Point 1 to Point 33 as depicted in the plan titled F-HCS-04 CDJV Camp	-25.738082 to -25.736834	149.079144 to 149.079201	N/A	2.44ha	Primary Protection Zone of a Category C ESA (Of Concern Regional Ecosystem)
FKG Temporary Workers Camp	Point 1 to Point 14 as depicted in the plan titled F-HCS-04-FKG Camp	-25.714544 to -25.714518	149.042233 to 149.042306	N/A	3.19ha	Primary Protection Zone of a Category C ESA (Of Concern Regional Ecosystem)
Tenix Temporary Workers Camp	Point 1 to Point 45 as depicted in the plan titled F-HCS-04 Tenix Camp	-25.718279 to -25.714581	149.048019 to 149.048076	N/A	2.71	Primary Protection Zone of a Category C ESA (Of Concern Regional Ecosystem)
Pony Hills Long Distance Water Line	Flowline	-25.762684 to -25.765751	149.044457 to 149.043946	334	0.5	Category C ESA (State Forest)
Brine Transfer Pipeline	ROP1-ROP2	-25.76586952 to -25.76850752	149.0442076 to 149.0274380	1850 m	2.4 ha	Category C ESA (State Forest)
Communications Tower	N/A	-25.731826	149.059830	N/A	0.1	Primary Protection Zone of a Category C ESA (Of Concern Regional Ecosystem) (11.10.7)
		-25.731674	149.059648			
		-25.732094	149.059580			
		-25.731945	149.059386			
Multi-Well Pad FV530, 531, 532 (FV07-10,1,2,3)	1	-25.6643180	149.0398467	N/A	1.76	Category C ESA (Essential Habitat)
	2	-25.6637166	149.0402548			
	3	-25.6634887	149.0404102			
	4	-25.6640964	149.0414963			
	5	-25.6643332	149.0413410			
	6	-25.6649257	149.0409328			Category C ESA (State Forest or Timber Reserve or Of Concern RE) Category C Primary Protection Zone

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Authorised Activity	Authorised Activity Section	Location of Development (GDA94)		Size of Development		ESA (State Forest or Timber Reserve or Of Concern RE)
		Latitude	Longitude	Length (m)	Area of Disturbance (ha)	
Mt Kingsley Well Pad	Multi directional well pad	-25.23202138	148.90189708	N/A	0.78	
Mt Kingsley Pad to Mt Kingsley Dam water flow line	Flow line	-25.23193209 to -25.257497	148.90112716 to 148.872817	N/A	0.008	
Access Road Upgrade (FV87 FV03-15)	WP38 to WP77	-25.582716	149.074461	26000	0.0156	
		-25.544839	149.006555			
Access Road (Ironbark Gully)	PSC 1 to PSC 4	-25.4887	148.8309	N/A	N/A	
		-25.4827	148.8775			

(E10) **Limited impact camps** must not be located within a primary protection zone of Category C ESA (Essential Habitat) or Category C ESA (Nature Refuges).

(E11) Limited petroleum activities or limited impact camps located within a primary protection zone or secondary protection zone of an environmentally sensitive area must not negatively affect the adjacent environmentally sensitive area.

(E12) Prior to carrying out limited petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, it must demonstrated, in the following order of preference, that:

1. no reasonable or practicable alternative exists for carrying out the limited petroleum activities within the environmentally sensitive area;
2. the limited petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance;
3. clearance widths for linear infrastructure is minimised to the maximum extent possible, taking into account the following matters:
 - (a) safe vehicle movement;
 - (b) drainage devices installed are of a type that is appropriate for the track type and location;
 - (c) erosion and sediment control measures installed are in accordance with condition (B2); and
 - (d) power line stays have been preferentially located within the pipeline right of way where possible;
4. the maximum clearance widths specified in *Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure

Type of Linear Infrastructure	Clearance Width (m)
(A) Access track(s) not associated with a pipeline(s), communication lines(s) or power line(s):	
(a) single carriage access tracks	18
(b) dual carriage access tracks	21
(c) single or dual carriage access track and associated turnaround bay	35
(B) Access track(s) associated with a pipeline(s), communication line(s) or power line(s):	
(a) single carriage access tracks with a single pipeline, communication line or power line	24
(b) dual carriage access track with a single pipeline, communication line or power line	27
(c) single or dual carriage access track and associated turnaround bay with a single pipeline, communication line or power line	41
(d) additional clearing for any additional parallel pipeline, communication line or power line associated with (B)(a), (b) or (c)	7 ¹
(C) Additional clearing for take-off drains, power line stays or turnaround bays or other work areas:	
(a) additional clearing for power line stays associated with (B)	10
(b) additional clearing for take-off drains associated with (A) or (B)	10

¹ Maximum total disturbance for (B) is 62 m.

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SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, Dust and Other Airborne Contaminants

- (F1) 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.

Nuisance Monitoring

- (F2) When the administering authority advises of a complaint alleging nuisance, the complaint must be investigated as soon as practicable. The investigation is to include monitoring of environmental nuisance at any sensitive place within a reasonable and practical timeframe as specified by the administering authority.
- (F3) The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the complaint within five (5) business days of completing the complaint investigation, unless a longer time is agreed to by the administering authority.
- (F4) If the investigation or monitoring in accordance with condition (F2) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then:
- (a) the complaint must be addressed including the use of alternative dispute resolution services if required; and/or
 - (b) abatement or attenuation measures must be implemented so that the authorised petroleum activity(ies) do not result in further environmental nuisance.
- (F5) Noise monitoring and recording under this environmental authority must include, but not necessarily be limited to:
- (a) $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and $T=15$);
 - (b) $L_{Aeq\ adj, 15\ mins}$;
 - (c) background noise level as $L_{A\ 90, 15\ mins}$;
 - (d) $Max\ L_{pA, 15\ mins}$;
 - (e) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to measured noise levels;
 - (f) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (g) effects due to any extraneous factors such as traffic noise;
 - (h) location, date and time of monitoring;
 - (i) if the complaint concerns low frequency noise, $Max\ L_{pZ, 15\ mins}$; and
 - (j) If the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range for both the noise source and the background noise in the absence of the noise source.

Noise

- (F6) Noise planning must be undertaken in accordance with the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area* dated 29 June 2011 or any subsequent version.
- (F7) Any subsequent revision of the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area* must include but not necessarily be limited to:
- (a) a commitment by the Chief Executive Officer for the holder of this environmental authority, or their delegate, to ensure adequate allocation of staff and resources to the establishment and operation of the Noise Management Plan;
 - (b) definition of roles, responsibilities and authorities within the staffing of the Noise Management Plan;
 - (c) delivery of training to staff and contractors and maintenance of competencies;

- (d) risk / constraint analysis methods to be undertaken prior to any new operation (e.g. drill site) or installation of new equipment that has the potential to create noise nuisance;
 - (e) procedures and methods to undertake assessments to determine compliance with the noise limits in *Schedule F, Table 1 – Noise limits at Sensitive Receptors* in the event of a valid complaint being received and when there are no alternative arrangements in place, taking in to account any tonal or impulsive noise impacts;
 - (f) procedures for handling noise complaints;
 - (g) community liaison and consultation procedures including but not limited to consultation for when night time petroleum activities are likely to exceed the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (h) procedures for managing records associated with all aspects of the Noise Management Plan including standardised forms for recording monitoring results and complaints;
 - (i) details of petroleum activities and measured and / or predicted noise levels of noise sources associated with those activities;
 - (j) reasonable and practicable control or abatement measures (including relocating the activity, altering the hours of operation, or having an alternate arrangement in place with any potentially affected person) that can be undertaken to ensure compliance with the noise limits in *Schedule F, Table 1 – Noise limits at Sensitive Receptors*;
 - (k) the level of noise at sensitive receptors that would be achieved from implementing the measures detailed under condition (F7)(j); and
 - (l) mediation processes to be used in the event that noise complaints are not able to be resolved.
- (F8) Prior to undertaking petroleum activities that will result in **short-term, medium-term or long term noise events** that are likely to impact on a sensitive receptor, and where there are no alternative arrangements in place, any potential noise emissions from the relevant petroleum activity(ies) must be modelled or calculated to demonstrate that noise emissions will not exceed the noise levels specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*.
- (F9) The emission of noise from the petroleum activities authorised under this environmental authority must not result in levels greater than those specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	$L_{Aeq,adj,15\ min}$	45dBA	43dBA	40dBA
6:00 pm – 10:00 pm	$L_{Aeq,adj,15\ min}$	40dBA	38dBA	35dBA
10:00 pm – 6:00 am	$L_{Aeq,adj,15\ min}$	28dBA	28dBA	28dBA
	Max $L_{pA, 15\ mins}$	55dBA	55dBA	55dBA
6:00 am – 7:00 am	$L_{Aeq,adj,15\ min}$	40dBA	38dBA	35dBA

Note: The noise limits in Table 1 have been set based on the following deemed background noise levels (L_{ABG}):

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

- (F10) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in *Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors* are to be added to the measured noise level(s) to derive $L_{Aeq, adj, 15\ min}$.

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Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

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

- (F11) Where alternative arrangements are in place with an affected person(s) at a sensitive receptor as referred to by condition (F7)(j), the noise limits in *Schedule F, Table 1 – Noise limits at Sensitive Receptors* do not apply at that sensitive receptor for the duration for which the alternative arrangements are in place.

Low Frequency Noise

- (F12) Notwithstanding condition (F9), emission of any low frequency noise must not exceed the following limits in the event of a valid complaint about low frequency noise being made to the administering authority:
- (a) 60 dB(C) measured outside the sensitive receptor; and
 - (b) the difference between external A-weighted and C-weighted noise levels is no greater than 20 dB; or
 - (c) 50 dB(Z) measured inside the sensitive receptor; and
 - (d) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Vibration and Blasting

- (F13) A Blast Management Plan must be developed for each blasting activity in accordance with **Australian Standard 2187**.
- (F14) Noise from blasting operations must not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive receptor.
- (F15) Ground-borne vibration peak particle velocity caused by blasting operations must not exceed 10 mm/s at any time, when measured at or extrapolated to any sensitive receptor.

Blast and Vibration Monitoring

- (F16) Monitoring and recording of the air blast overpressure and ground borne vibration of every blast must be undertaken.
- (F17) Blast and vibration monitoring must include but not necessarily be limited to:
- (a) maximum instantaneous charge;
 - (b) location of the blast within the site (including any bench level);
 - (c) airblast overpressure level (dB Linear Peak);
 - (d) peak particle velocity (mm/s);
 - (e) location, date and time of recording;
 - (f) measurement instrumentation and procedure;
 - (g) meteorological conditions for blast monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction); and
 - (h) distances from the blast site to potentially noise-affected buildings or structures.

SCHEDULE G – AIR

Fuel Burning or Combustion Equipment

- (G1) This environmental authority does not authorise emissions from **fuel burning or combustion equipment** on ATP526P, ATP653, PL233, PL234, PL235, PL236, PL420, PL421 and PL440.
- (G2) If compressor stations A-HCS-01, A-HCS-02, F-NCS-04-01, F-NCS-04-02, F-NCS-05-01 and F-NCS-05-02 meet the definition of fuel burning or combustion equipment, the design of the equipment must be capable of achieving air quality objectives for each environmental value stated in the *Environmental Protection (Air) Policy 2008*.
- (G3) Fuel burning or combustion equipment must:
- not be operated unless it is listed in *Schedule G, Table 1 – Authorised Releases of Contaminants to Air from Point Sources*;
 - not exceed the release limits specified in *Schedule G, Table 1 – Authorised Releases of Contaminants to Air from Point Sources*;
 - be monitored for the release limits at the release point locations and at the monitoring frequency specified in *Schedule G, Table 1 – Authorised Releases of Contaminants to Air from Point Sources*.

Schedule G, Table 1 – Authorised Releases of Contaminants to Air from Point Sources

Resource Authority	Facility	Release Point Locations	Release Limits			Monitoring Frequency
			Minimum Release Height (m)	Minimum Efflux Velocity (m/sec)	NOx as Nitrogen Dioxide Maximum Mass Emission Rate (g/s)	
PL91	CS1	Compressor 2 (K048)	5.5	24	2	At least one release point must be monitored per year on a rotational basis.
		Compressor 3 (K049)	6.0	33	2	
		Compressor 4 (K044)	6.0	23	2	
		Compressor 6 (K046)	8.0	23	2	
PL92	CS2	Compressor A (K057)	6.0	23	2	At least one release point must be monitored per year on a rotational basis.
		Compressor B (K058)	6.0	23	2	
		Compressor C (K059)	6.0	23	2	
		Compressor D (K055)	8.1	17	2	
		Compressor E (K056)	8.1	17	2	
		Compressor F (K050)	10.0	17	10	At least one release point must be monitored per year on a rotational basis.
		Compressor G (K051)	10.0	17	10	
		Compressor H (K052)	10.0	17	10	
		Compressor J (K053)	10.0	17	10	

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PL92	CS3	Compressor 1 (K063)	8.3	17	2	At least one release point must be monitored per year on a rotational basis, with all release points monitored at least once in a 6 year period
		Compressor 2 (K064)	8.3	17	2	
		Compressor 3 (K065)	8.3	17	2	
		Compressor 4 (K066)	8.3	17	2	
		Compressor 5 (K067)	8.3	17	2	
		Compressor 6 (K068)	8.3	17	2	
		Compressor 7 (K069)	8.3	17	2	
		Compressor 8 (K070)	8.3	17	2	
PL232	F-HSC-04	Hub GTC1	15.0	18	2	All release points must be monitored during commissioning of the facility. Thereafter, at least one release point must be monitored per year on a rotational basis, with all release points monitored at least once in a 6 year period.
		Hub GTC2	15.0	18	2	
		Hub GTC3	15.0	18	2	
		Hub GTC4	15.0	18	2	
		Hub GTC5	15.0	18	2	
		Hub GTA1	15.0	20	2	
		Hub GTA2	15.0	20	2	
		Hub GTA3	15.0	20	2	
		Hub GTA4	15.0	20	2	
	Hub GTA5	15.0	20	2		
PL91	F-HSC-05	Hub GTC1	15.0	18	2	All release points must be monitored during commissioning of the facility. Thereafter, at least one release point must be monitored per year on a rotational basis, with all release points monitored at least once in a 6 year period.
		Hub GTC2	15.0	18	2	
		Hub GTC3	15.0	18	2	
		Hub GTC4	15.0	18	2	
		Hub GTA1	15.0	20	2	
		Hub GTA2	15.0	20	2	
		Hub GTA3	15.0	20	2	
		Hub GTA4	15.0	20	2	
		Hub GTA5	15.0	20	2	
	Hub GTA6	15.0	20	2		
Note: The above NOx release limits are applicable during all timings except start-up, shut down and calibration of emission monitoring devices. The start-up duration is allowed up to 30 minutes.						

(G4) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas from compression stations A-HCS-01, A-HCS-02, F-NCS-04-01, F-NCS-04-02, F-NCS-05-01 and F-NCS-05-02 must be flared in a manner that complies with all of (G4)(a) and (G4)(b) and (G4)(c) or with (G4)(d):

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

SCHEDULE H – WASTE

General

- (H1) All general and regulated waste must only be removed from the site and sent to a facility licensed to accept the waste under the *Environmental Protection Act 1994* except as permitted under another condition of this environmental authority.
- (H2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- (H3) Waste must not be burned unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

Coal Seam Gas Water Management Plan

- (H4) Amendments to a Coal Seam Gas Water Management Plan must be submitted to the administering authority prior to its implementation.
- (H5) If, within 20 business days following the submission of the amended Coal Seam Gas Water Management Plan, the administering authority provides comments on the amended Coal Seam Gas Water Management Plan:
 - (a) due regard must be given to that comment in the finalisation of the amended Coal Seam Gas Water Management Plan; and
 - (b) the finalised amended Coal Seam Gas Water Management Plan must be submitted within 40 business days after the administering authority provided comments.

Brine and Salt Management

- (H6) Following the completion of the petroleum activity(ies), any residual brine and / or solid salt present in any structure must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994*.

Investigation into Alternative CSG Water Management Options

- (H7) For the purpose of preventing salt produced by the operations contaminating the environment, in accordance with the waste management hierarchy for the management, treatment and disposal of brine and solid salt, you must implement a Salt and Brine Management Plan that has investigated the following matters:
 - (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 and does or could supply water for potable or agricultural purposes;
 - (c) procedures for identifying and implementing opportunities to improve the CSG water management practices; and
 - (d) a report, by December 2014, detailing the outcomes of the investigations and proposed actions forward, and the final method for the beneficial use of brine and salt.

Residual drilling materials

- (H8) If sumps are used to store **residual drilling material** or drilling fluids, they must only be used for the duration of drilling activities. (Waste 15).
- (H9) 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. (Waste 16).

(H10) Records must be kept to demonstrate compliance with conditions H8 and H9. (Waste 17).

SCHEDULE I – REHABILITATION

Rehabilitation Planning

- (I1) 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 (I2) to (I7) inclusive; and
 - (ii) provide for appropriate monitoring and maintenance.

Transitional Rehabilitation

- (I2) **Significantly disturbed areas** that are no longer required for the on-going petroleum activities, must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria:
- (a) contaminated land resulting from petroleum activities is remediated and rehabilitated;
 - (b) the areas are:
 - (i) non-polluting;
 - (ii) a stable landform;
 - (iii) re-profiled to contours consistent with the surrounding landform
 - (c) surface drainage lines are re-established;
 - (d) top soil is reinstated; and
 - (e) either:
 - (i) groundcover, that is not a **declared pest species**, is **growing**; or
 - (ii) an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final Rehabilitation Acceptance Criteria

- (I3) 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 per cent 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) where the adjacent land use contains, or the pre-clearing land use contained, one or more **regional ecosystem(s)**, then:
 - (i) at least one Regional Ecosystem(s) from the same broad vegetation group, as demonstrated by the predominant species in the ecologically dominant layer, must be present; and,
 - (ii) the Regional Ecosystem present in (I3)(d)(i) must possess an equivalent or higher conservation value (biodiversity status) than the Regional Ecosystem(s) in either the adjacent land or pre-disturbed land.

Final Rehabilitation Acceptance Criteria in Environmentally Sensitive Areas

- (I4) 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 (E4) and (E6)) must be met:
- (a) greater than or equal to 70 per cent 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 per cent of organic litter cover
 - (e) greater than or equal to 50 per cent of **total density of coarse woody material**; and

- (f) all **predominant species** in the **ecologically dominant layer**, that define the pre-disturbance Regional Ecosystem(s) are present.

Continuing Conditions

- (15) Conditions (12), (13) and (14) continue to apply after this environmental authority has ended or ceased to have effect.

Remaining Dams

- (16) Where there is a dam, (including a low consequence dam) that is being or intended to be used 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.

Pipeline Activities

- (17) Land that has been significantly disturbed by the pipeline activities must be managed to ensure that gully erosion or subsidence do not occur on that land.

SCHEDULE J – WELL CONSTRUCTION, MAINTENANCE AND STIMULATION ACTIVITIES

Drilling Activities

- (J1) Oil based or synthetic based drilling must not be used in the carrying out of the petroleum activity(ies).
- (J2) Drilling activities must not result in the connection of the target gas producing formation and another aquifer.
- (J3) Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target gas producing formation and another aquifer as a result of drilling activities.

Stimulation Activities

- (J4) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.
- (J5) Stimulation activities must not negatively affect water quality, other than that within the stimulation impact zone of the target gas producing formation.
- (J6) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.
- (J7) The internal and external mechanical integrity of the well system prior to and during well stimulation must be ensured 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.
- (J8) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

Stimulation Risk Assessment

- (J9) Prior to undertaking well stimulation activities, a risk assessment be developed to ensure that stimulation activities are managed to prevent environmental harm.
- (J10) The stimulation risk assessment required must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well and address issues at a relevant geospatial scale such that changes to features and attributes are adequately described and must include, but not necessarily be limited to:
 - (a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice;
 - (b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority;
 - (c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s);
 - (d) naturally occurring geological faults;
 - (e) seismic history of the region (e.g. earth tremors, earthquakes);
 - (f) proximity of overlying and underlying aquifers;
 - (g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation.
 - (h) identification and proximity of **landholders' active groundwater bores** in the area where stimulation activities are to be carried out;
 - (i) the environmental values of groundwater in the area;

- (j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to stimulation monitoring in order to accurately assess the risks to environmental values of groundwater;
- (k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
- (l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
- (m) a description of the well mechanical integrity testing program;
- (n) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc);
- (o) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation;
- (p) groundwater transmissivity, flow rate, hydraulic conductivity and direction(s) of flow;
- (q) a description of the 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;
- (r) a mass balance estimating the concentrations and absolute masses of chemicals that will be reacted, returned to the surface or left in the target gas producing formation subsequent to stimulation;
- (s) an environmental hazard assessment of the chemicals used including their mixtures and the resultant chemicals that are formed after stimulation including:
 - (i) toxicological and ecotoxicological information of chemicals used;
 - (ii) information on the persistence and bioaccumulation potential of the chemicals used;
 - (iii) identification of the stimulation fluid chemicals of potential concern derived from the risk assessment;
- (t) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities;
- (u) if used, identification and an environmental hazard assessment of using radioactive tracer beads in stimulation activities
- (v) an environmental hazard assessment of leaving stimulation chemicals in the target gas producing formation for extended periods subsequent to stimulation;
- (w) human health exposure pathways to operators and the regional population;
- (x) risk characterisation of environmental impacts based on the environmental hazard assessment;
- (y) potential impacts to landholder bores as a result of stimulation activities;
- (z) the determination of the likelihood of causing interconnectivity and/or negative water quality as a result of stimulation activities undertaken in close proximity or each other; and
- (aa) potential environmental or health impacts which may result from stimulation activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

- (J11) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the quality of:
- (a) all landholders' active groundwater bores (subject to access being permitted by the landholder) that are spatially within a two (2) kilometre horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and
 - (b) all active landholders' groundwater bores (subject to access being permitted by the landholder) in any aquifer that is within 200 metres above or below the target gas producing formation and is spatially located with a two (2) kilometre radius from the location 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 (J9) and (J10).

- (J12) 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 (J13).
- (J13) Stimulation baseline bore assessments required in condition (J11) must include the minimum water quality analytes and physico-chemical parameters identified in the Baseline Assessment Guideline (EHP) and any restricted stimulation fluids as defined in the *Environmental Protection Act 1994*, as amended from time to time, in order to establish baseline water quality.

Stimulation Impact Monitoring Program

- (J14) A Stimulation Impact Monitoring Program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (J9) and (J10) 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 per cent of the volume used in stimulation activities has been extracted from the stimulated well; and
 - (d) all bores in accordance with condition (J11) at the following minimum frequency:
 - (i) monthly for the first six (6) months subsequent to the stimulation activities being undertaken; then
 - (ii) annually for the first five (5) years subsequent to the stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (J13) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.
- (J15) 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 (J13); 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.
- (J16) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholders upon request by that landholder.

SCHEDULE K – COMMUNITY ISSUES

- (K1) A record of all complaints and actions taken in response to the valid complaint must be maintained and kept.
- (K2) The holder of this environmental authority must record the following details for all complaints received and provide this information to the administering authority on request:
- (a) name, address and contact number for complainant;
 - (b) time and date of complaint;
 - (c) reasons for the complaint as stated by the complainant;
 - (d) investigations undertaken in response to the complaint;
 - (e) conclusions formed;
 - (f) actions taken to resolve complaint;
 - (g) any abatement measures implemented to mitigate the cause of the complaint; and
 - (h) name and contact details of the person responsible for resolving the complaint.

SCHEDULE L – NOTIFICATION PROCEDURES

- (L1) The Department of Environment and Heritage Protection Pollution Hotline must be notified as soon as reasonably practicable, but within 48 hours after becoming aware of:
- (a) any unauthorised significant disturbance to land; or
 - (b) any unauthorised release of contaminants greater than:
 - (i) 200 L of hydrocarbons; or
 - (ii) 200 L of **stimulation additives**; or
 - (iii) 500 L of **stimulation fluids**; or
 - (iv) 1 000 L of brine; or
 - (v) 5 000 L of coal seam gas water; or
 - (vi) 10 000 L of sewage effluent; or
 - (vii) 100 000 L of irrigation-quality coal seam gas water, in accordance with condition (D5)(b), inside a designated irrigation area.
 - (c) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (d) when the level of the contents of any regulated dam reaches the mandatory reporting level; or
 - (e) when a regulated dam will not have available storage to meet the design storage allowance on the 1 November of any year; or
 - (f) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during stimulation increases by more than 3.5 MPa from the pressure immediately preceding stimulation); or
 - (g) any detection of restricted stimulation fluids from stimulation fluid monitoring; or
 - (h) any analyses result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource; or
 - (i) any analyses result from groundwater monitoring that exceeds trigger action investigation levels, if provided in this environmental authority.
- (L2) The notification of emergencies or incidents as required by condition (L1) must include but not be limited to the following information:
- (a) the environmental authority number and name of the holder;
 - (b) the tenure type and number where the emergency or incident occurred;
 - (c) the name and telephone number of the designated contact person;
 - (d) the location of the emergency or incident (GDA94);
 - (e) the date and time that the emergency or incident occurred;
 - (f) the date and time the holder of this environmental authority became aware of the emergency or incident;
 - (g) details of the nature of the event and the circumstances in which it occurred;
 - (h) the estimated quantity and type of any contaminants involved in the incident;
 - (i) the actual or potential suspected cause of the emergency or incident;
 - (j) a description of the land use at the site of the emergency or incident (eg. grazing, pasture, forest etc.) and/or the name of any relevant waters and other environmentally sensitive features;
 - (k) a description of the possible impacts from the emergency or incident;
 - (l) a description of whether stock and/or wildlife were exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
 - (m) any sampling conducted or proposed, relevant to the emergency or incident;
 - (n) landholder details and details of landholder consultation;
 - (o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
 - (p) whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.

- (L3) Within 10 business days following the initial notification under conditions (L1) and (L2) unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):
- (a) the root cause of the emergency or incident;
 - (b) the confirmed quantities and types of any contaminants involved in the incident;
 - (c) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
 - (d) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
 - (e) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
 - (f) results and current status of landholder consultation, including commitment to resolve any outstanding issues / concerns; and
 - (g) actions and / or procedural changes to prevent a recurrence of the emergency or incident.

SCHEDULE M – DEFINITIONS

“accepted engineering standards”, in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the *Australian National Committee on Large Dams* (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.

“adjacent land use” 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 Heritage Protection; 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 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, vegetation community attributes 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.

“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.

“appraisal well” means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum.
For clarity, an appraisal well does not include an exploration well.

“approved quality criteria” for 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	20dS/m (20,000µS/cm)
Chloride*	8000mg/L

OK

*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:

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

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

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

"areas of pre-disturbance" means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term 'areas of pre-disturbance' does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.

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

- any kind and all things associated with the construction and operation of a dam; and
- any land used for those operations.

"Australian Standard 1055" means Australian Standard 1055.1:1997 *Description and Measurement of Environmental Noise – General Procedures*.

"Australian Standard 2187" means Australian Standard 2187.0:1998 *Explosives—Storage, transport and use, Part 0*, Australian Standard 2187.1:1998 *Explosives—Storage, transport and use Part 1* and Australian Standard 2187.2:2006 *Explosives—Storage and use, Part 2* or any updated versions that becomes available from time to time.

"Australian Standard 2885" means Australian Standard 2885.0:2008 *Pipelines – Gas and Liquid Petroleum General Requirements*, Australian Standard 2885.1:2007 *Pipelines – Gas and Liquid Petroleum Design and Construction* and Australian Standard 2885.3:2001 *Pipelines – Gas and Liquid Petroleum Operation and Maintenance*, or any updated versions that become available from time to time.

"Australian Standard 4323" means Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*.

"Australian / New Zealand Standard 5667.11" means Australian / New Zealand Standard 5667.11: 1998 *Water Quality – Sampling – Guidance on Sampling at Groundwaters*.

"Australian / New Zealand Standard 5667.12" means Australian / New Zealand Standard 5667.12:1999 *Guidance on Sampling of Bottom Sediments for permanent, semi-permanent water holes and water storages*.

"authorised person" means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive or chief executive officer of a local government.

"authorised resource activities" for this environmental authority means the resource activities authorised to be carried out under condition (A1).

"background noise level" means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

"bed and banks" for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

"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 environmental authority holder 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.

"beneficial use" means

- with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Waste Reduction and Recycling Act 2011*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - the transfer and use have been approved or authorised under any relevant legislation. Or,
- with respect to coal seam gas water, refer to the Department of Environment and Heritage Protection's *Guideline – Approval of Coal Seam Gas Water for Beneficial Use*.

"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.

"BTEX" means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.

"bund or banded" in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used

for fire protection, product recovery and process isolation.

"business day" has the meaning in the *Acts Interpretation Act 1954* and *Environmental Protection Act 1994* 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; or
- a business day that occurs during the period starting on 20 December in a year and ending on 5 January in the following year.

"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 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*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*
- An area identified as "Essential Habitat" or "Essential Regrowth Habitat" under the Vegetation Management Act 1999 for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*;
- Of Concern Regional Ecosystems identified in the database maintained by the Department of Environment and Heritage Protection called 'RE description database' containing Regional Ecosystem numbers and descriptions.

"certification or certified by a suitably qualified and experienced person" in relation to a design plan, 'as constructed' drawings or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- exactly what is being certified and the precise nature of that certification.
- the relevant legislative, regulatory and technical criteria on which the certification has been based;
- the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

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

- (a) all relevant material has been considered in the written document; and
- (b) that the content of the written document is accurate and true; and
- (c) that the written document meets the requirements of the relevant conditions of the environmental authority.

"clearing" for vegetation means removing, cutting down, ringbarking, pushing over, poisoning or destroying in any way including by burning, flooding or draining; but does not include destroying standing vegetation by stock, or lopping a tree.

"coal seam gas water" means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. Coal seam gas water is a waste defined under section 13 of the *Environmental Protection Act 1994*.

"coal seam gas water concentrate" means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.

"coal seam gas water dams" include any type of dam (storage or evaporation) used to contain groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production.

"coal seam gas evaporation dam" is defined as a impoundment, enclosure or structure that is designed to be used to hold coal seam gas water for evaporation.

"construction" in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.

"control measure" has the meaning in section 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 Regulation and includes reproductive material of the animal or plant.

"declared plant pest species" has the meaning in the Land Protection (Pest and Stock Route Management) Regulation 2003 and is a 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 Regulation and includes reproductive material of the plant.

"design plan" is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.

"design storage allowance or DSA" means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.

"development well" means a petroleum well which produces or stores petroleum.
For clarity, a development well does not include an appraisal well.

"discharge area" means:

- that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- identified by an assessment process consistent with the document *Salinity Management Handbook* Queensland Department of Natural Resources, 1997, as amended from time to time; or
- identified by an approved salinity hazard map held by the Department of Environment and Heritage Protection.

"document" has the meaning in the *Acts Interpretation Act 1954* and means:

- any paper or other material on which there is writing;
- any paper or other material on which there are marks;
- 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 Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) 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 or ecosystem function” means the interactions between and within living and non-living components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.

“enclosed flare” means a device where the residual gas is burned in a cylindrical or rectangular enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.

“end” means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related petroleum activities such as rehabilitation. In other words, it does not refer to the ‘completion’ of the petroleum activity(ies), the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.

“equivalent person or EP” means an equivalent person under volume 1, section 2 of the *Guidelines for Planning and Design of Sewerage Schemes*, October 1991, published by the Water Resources Commission, Department of Primary Industries, Fisheries and Forestry.

“evaporation dam” means an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.

“existing dam” means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on 2 June 2011.

“existing low hazard dam” means a low hazard dam that was constructed and/or whose construction had substantially commenced on 2 June 2011.

“exploration well” means a petroleum well that is drilled to:

- explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or
- obtain stratigraphic information for the purpose of exploring for petroleum.

For clarity, an exploration well does not include an appraisal or development well.

“exploring for petroleum” means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the *Petroleum and Gas (Production and Safety) Act 2004* for example including:

- conducting a geochemical, geological or geophysical survey;
- drilling a well;
- carrying out testing in relation to a well;
- taking a sample for chemical or other analysis.

“field validation surveys” means vegetation assessments undertaken in accord with the most current version of the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*.

“fill” means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.

“floodplain” has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that—

- is covered from time to time by floodwater overflowing from the watercourse; and
- does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.

“flowable substance” means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

“foreseeable future” means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.

“fuel burning or combustion equipment” means a permanent fuel burning or combustion equipment which is in isolation, or combined in operation, or which are interconnected, is, or is capable of burning more than 500 kg of fuel in an hour.

“general ecologically significant wetland” otherwise known as “wetlands of other environmental value”, is a wetland that meets the definition of a wetland and that is shown as a general ecologically significant wetland or “wetlands of other environmental value” on the map of referable wetlands.

“geophysical survey” means a systematic collection of geophysical data.

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

“hazard category” means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“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.

“high value regrowth” vegetation means

- any of the following:
 - an endangered regional ecosystem;
 - an of concern regional ecosystem;
 - a least concern regional ecosystem; and
- have not been cleared since 31 December 1989; and
- is shown on a regrowth vegetation map.

“hydraulic fracturing” means a technique used to create cracks in underground coal seams to increase the flow and recovery of gas or oil out of a well. It involves pumping a fluid, comprised largely of water and sand, under pressure, into a coal seam. This action fractures the coal seam which provides a pathway that increases the ability for gas to flow through the coal.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“hydraulic testing” means the testing of a geological formation to evaluate the hydrogeological characteristics of the formation.

"impulsive noise" means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.

"incidental activity" for this environmental authority means an activity that is not a specified relevant activity and is necessary to carry out the activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities*.

"infrastructure" means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps.

Infrastructure does not include other facilities required for the long term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation dams), pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.

" $L_{Aeq, adj, 15 mins}$ " means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.

" $L_{A90, adj, 15 mins}$ " 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.

"land degradation" has the meaning in the *Vegetation Management Act 1999* and means the following:

- soil erosion
- rising water tables
- the expression of salinity
- mass movement by gravity of soil or rock
- stream bank instability
- a process that results in declining water quality.

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

"landholders' active groundwater bores" for the purposes of stimulation baseline and impact monitoring in this environmental authority means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *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 a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.

"limited impact camps" mean accommodation camps that:

- are temporary (no more than 6 months);
- are located within pre-existing areas of clearing or significant disturbance;

- are up to 2 ha or located within well sites; and
- may involve sewage treatment works that are no release works or release works that involve an irrigation release within pre-existing areas of clearing or significant disturbance.

"limit of reporting" means the lowest amount of an analyte in a sample that can be quantifiably determined with stated, acceptable precision and accuracy under stated analytical conditions (i.e. the lower limit of quantification).

"limited petroleum activities" mean any low impact petroleum activity, and:

- single well sites (includes observation, pilot, injection and production wells) up to 1 ha and associated infrastructure (water pumps and generators, sumps, flare pits or dams) located on the well site or up to 1.25 ha if the well pad includes the use of a tank (minimum 1ML) for above ground fluid storage,
- multi-well sites up to an additional (in addition to single well site above) 0.25 ha per additional well and associated infrastructure (water pumps and generators, sumps, flare pits, dams or tanks) located on the well site to a maximum of 3 ha,
- construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone
- upgrading or maintenance of existing roads or tracks,
- power and communication lines,
- gas gathering lines from a well site to the initial compression facility,
- water gathering lines from a well site to the initial water storage or dam,
- camps within well site that may involve sewage treatment works that are a no release works.

"linear infrastructure" means powerlines, communication, pipelines, roads and access tracks.

"long term noise event" is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (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 —

- removing its trunk; and
- cutting or pruning its branches so severely that it is likely to die.

"low flow" means flow up to the one month average recurrence interval.

"low hazard dam" means any dam in the low hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

"low impact petroleum activities" means petroleum activities which do not result in the clearing of native vegetation, earthworks or excavation work that cause either, a significant disruption to the soil profile or permanent damage to vegetation that cannot be easily rehabilitated immediately after the activity is completed. Examples of such activities include but are not necessarily limited to:

- chipholes
- coreholes
- geophysical surveys
- seismic surveys
- soil surveys
- topographic surveys
- cadastral surveys
- ecological surveys
- installation of environmental monitoring equipment (including surface water)

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

"Max $L_{pA, 15 \text{ min}}$ " 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 Hazard Categories and Hydraulic Performance of Dams* prepared by the Department of Environment and Heritage Protection, as amended from time to time.

"medium term noise event" is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.

"meter" means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe."

"mix-bury-cover method" means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology:

- the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material ($k_w=10-8\text{m/s}$) 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 (1) 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.

"overburden pressure" means the pressure or stress imposed on a layer of soil or rock by the weight of overlying material. The overburden pressure at a depth z is given by $p(z) = p_0 + g \int_0^z p(z) dz$ where $p(z)$ is the density of the overlying rock at depth z and g is the acceleration due to gravity. p_0 is the datum pressure, like the pressure at the surface.

"permanent sewage treatment plant operations" means sewage treatment plant operations with a design capacity of greater than 21 but less than 450 equivalent persons carried out at one location for of a period of greater than six months in a calendar year.

"pest" means species:

- declared under the *Land Protection (Pest and Stock Route Management) Act 2002*;
- declared under Local Government model local laws; and
- which may become invasive in the future.

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

"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.

"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.

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

"receiving wetland" for the purposes of conditions (B41) to (B63) means the receiving water that has the following characteristics: off-stream ephemeral oxbow wetland system subject to grazing land use.

"reference wetland" means a wetland that has the similar characteristics to the receiving wetland located within 50 km of the receiving wetland.

"regional ecosystem(s)" 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 geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystems Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.

"regrowth vegetation map" means a map certified by the chief executive as the regrowth vegetation map for the State and showing for the State:

- areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - have not been cleared since 31 December 1989; and
- particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- areas the chief executive decides under section 20A1 of the *Vegetation Management Act 1999* to show on the map as high value regrowth vegetation.

"regulated dam" means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, as amended from time to time.

"regulated structure" means any dam or levee in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, 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 the 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 topography, 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).

"remnant unit" means a continuous polygon of remnant vegetation (as defined by the Queensland Herbarium) representative of a single Remnant Ecosystem type or a single heterogeneous unit.

"remnant vegetation" means vegetation, part of which forms the predominant canopy of the vegetation—

- covering more than 50% of the undisturbed predominant canopy; and
- averaging more than 70% of the vegetation's undisturbed height; and
- composed of species characteristic of the vegetation's undisturbed predominant canopy cover.

"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.

"resource activity(ies)" has the meaning in section 107(d) of the *Environmental Protection Act 1994*.

"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 rehabilitations after pipeline decommissioning.

"restricted stimulation fluids" means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 81B of the Environmental Protection Regulation 2008:

- petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene; or
- chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.

The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.

"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, B or C Environmentally Sensitive Area means an area within an 100 metre buffer from the boundary of a **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 (7)** 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 a particular conditions – to the condition it was in immediately before the disturbance

“site” means the relevant petroleum activity(ies) to which the environmental authority relates.

“species diversity” means the diversity within an ecological community that incorporates both species richness and the evenness of species' abundances.

“species richness” means the number of different species in a given area.

“specified relevant activities” for this environmental activity means an activity that:

- (a) but for being carried out as a resource activity, would otherwise be an activity prescribed under section 19 of the *Environmental Protection Act 1994* as an environmentally relevant activity; or
- (b) stimulation activities; or
- (c) extracting material other than by dredging.

“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.

“stimulation” means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing / hydrofracking, 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. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.

“stimulation impact zone” means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.

“structure” for the purposes of Schedule C 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 a hazard 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 at any time:

- exactly what has been assessed and the precise nature of that assessment;
- the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- 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
- the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

“suitably qualified and experienced person” in relation to regulated structures means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, 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.

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.

"temporary sewage treatment plant operations" means sewage treatment plant operations with a design capacity of equal to or less than 100 equivalent persons carried out at one location for a period of no greater than six months in a calendar year.

"third party auditor" means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.

"threatening processes" means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).

"tolerable limits" means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).

"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 10 cm 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” means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 *Risk Management* or any updated version that becomes available from time to time.

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

“visible salt” means where salt crystals accumulate on the soil surface.

“void” means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

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

“well site” means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.

“wetland” for the purpose of this environmental authority means:

- areas shown on the Map of Referable Wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and
- are wetlands as defined under the Queensland Wetlands Program as areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) 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.

“wetland of high ecological significance” otherwise known as a “high conservation value wetland”, is a wetland that meets the definition of a wetland and that is shown as a wetland of high ecological significance or high conservation value wetland on the map of referable wetlands

“year” means a period of 12 months.

“80th percentile” in relation to release limits means that not more than one (1) of the measured values is to exceed the stated release limit for any five (5) consecutive samples where:

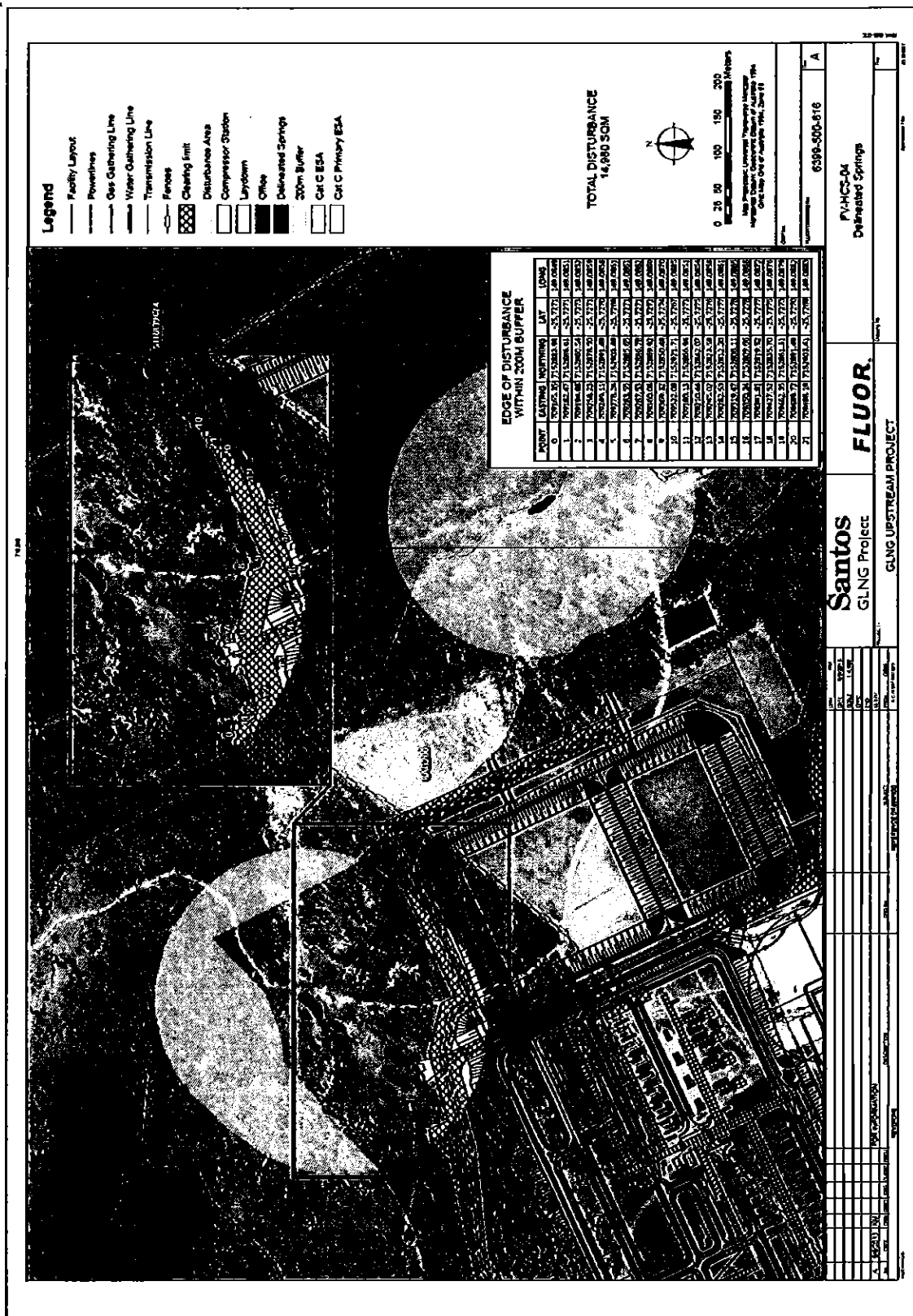
- the consecutive samples are taken over a five (5) month period; and
- the consecutive samples are taken at approximately equal periods.

Appendix 1 – Existing Regulated Dams

Name of Regulated Dam	MGA Zone 55 (GDA 94) 'Point' Coordinates	
	Easting	Northing
FV77 Feed Buffer	703250	7148635
FV82	706109	7146865
AWAF 2 10+15ML Feed Buffer	698537	7164185
AWAF 1 100ML Feed Buffer	695709	7150752
Spring Rock 240ML	677279	7152230

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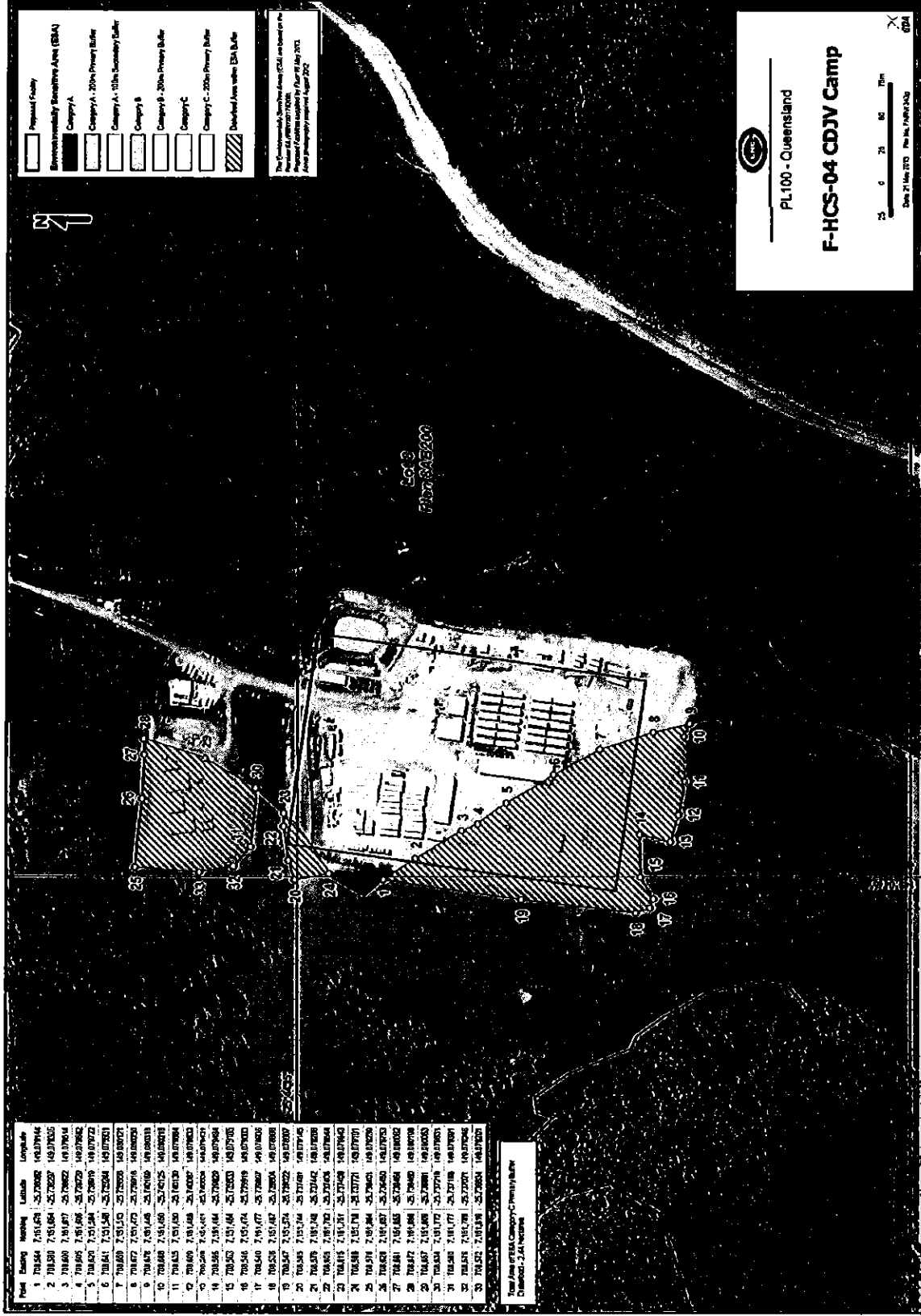
Appendix 2 – Plans Referenced in Schedule B, Table 1 – Authorised Works in a Watercourse or within 200 m of Springs



Date Granted 15 October 2014



CDJV Temporary Workers Camp and Office

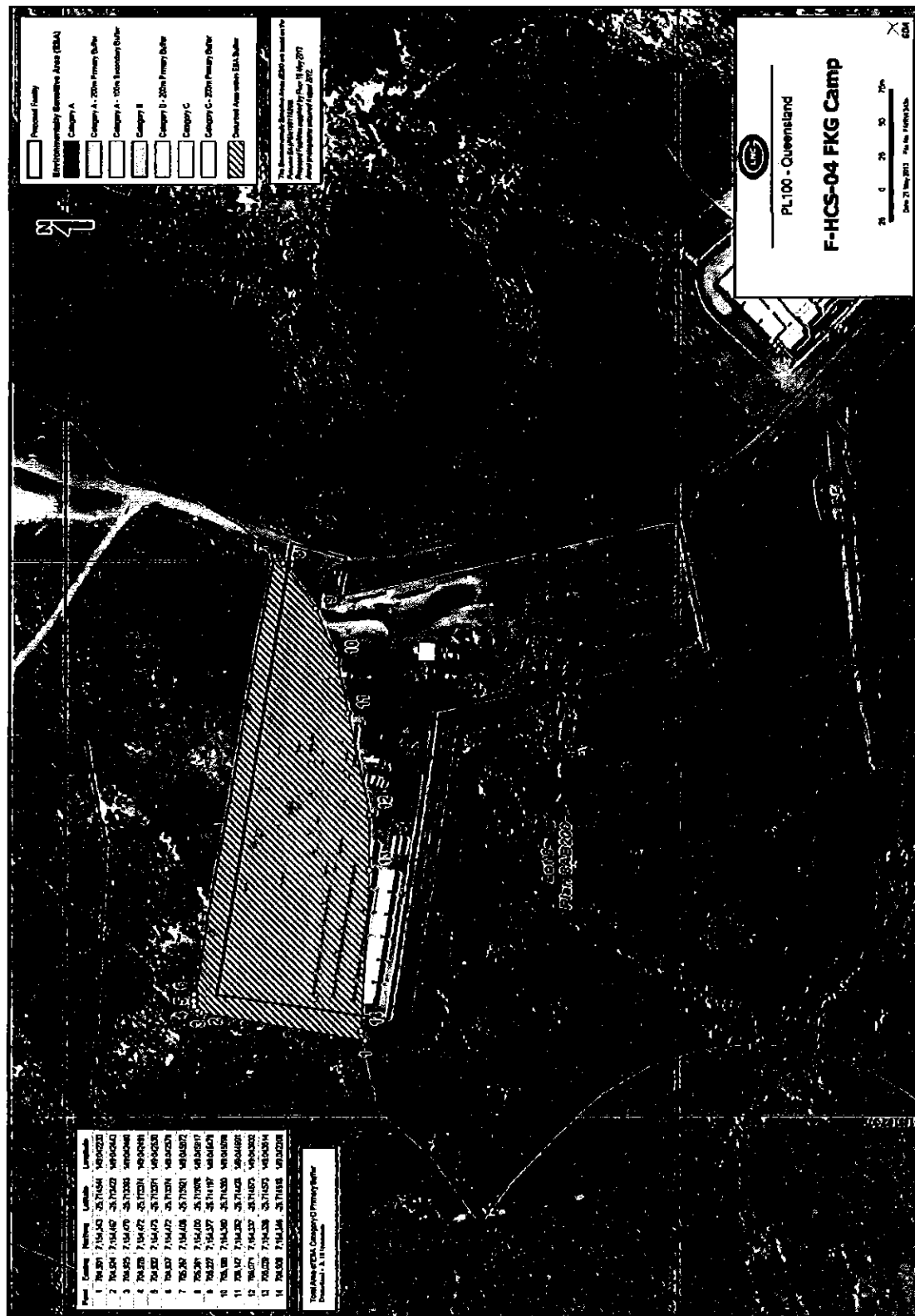


Tenix Temporary Workers Camp



OK

FKG Temporary Workers Camp



Under section 311H of the *Environmental Protection Act 1994* this permit is issued to:

Principal Holder:

Bronco Energy Pty Ltd
Ground Floor Santos Centre
60 Flinders Street
ADELAIDE SA 5000

ACN: 121 979 664

Joint Holders:

Total E&P Australia III

KGLNG E&P II Pty Ltd

PAPL (Upstream II) Pty Limited

in respect to carrying out a level 1 chapter 5A activity(ies) as per Section 23 of the *Environmental Protection Regulation 2008* on the relevant resource authorities listed below:

Project Name	Relevant Resource Authority(ies)
EQ – Bowen Trough	Authority to Prospect (ATP) 803

This environmental authority takes effect from 10 January 2012.

The anniversary date of this environmental authority is 14 February.

This environmental authority is subject to the attached schedule of conditions.



10/01/11

Date

Kylie Coleman

Delegate of Administering Authority
Department of Environment and Resource Management

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Resource Management.

Additional advice about the approval

1. This approval is for the carrying out the following level 1 chapter 5A activity(ies):

Schedule 5 of the <i>Environmental Protection Regulation 2008</i>
--

(6) A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam

2. This approval pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for this activity which might be required by other State and / or Commonwealth legislation. Other legislation administered by the Department of Environment and Resource Management for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*;
- Contaminated land provisions of the *Environmental Protection Act 1994*;
- *Forestry Act 1959*;
- *Nature Conservation Act 1992*;
- *Water Act 2000*;
- *Water Supply (Safety and Reliability) Act 2008*.

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

3. This approval, issued under the *Environmental Protection Act 1994*, for the carrying out of a level 1 petroleum activity(ies) is not an authority to impact on water levels or pressure heads in groundwater aquifers in or surrounding coal seams. The holder of this environmental authority will have obligations to minimise or mitigate any such impact under other Queensland Government and Australian Government legislation.
4. This environmental authority consists of the following schedules

Schedule A	General Conditions
Schedule B	Water
Schedule C	Dams
Schedule D	Land
Schedule E	Disturbance to Land
Schedule F	Environmental Nuisance
Schedule G	Air
Schedule H	Waste
Schedule I	Rehabilitation
Schedule J	Stimulation Activities
Schedule K	Community Issues
Schedule L	Notification
Schedule M	Definitions

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

- (A1) In the carrying out of the petroleum activity(ies), the holder of this 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 each petroleum tenure.

Schedule A, Table 1 – Authorised Petroleum Activities

Resource Authority Number	Petroleum Activity	Number of Existing Petroleum activities	Number of Proposed Petroleum activities	Maximum size (where applicable)
ATP 803	Seismic			
	- 2D	N/A	600km	600km
	- 3D	N/A	100 km ²	100km ²
	Total Coal Seam Gas (CSG) wells	3	60	60ha total disturbance
	- CSG Exploration Wells (indicative)	3	30	
	- CSG Appraisal Wells (indicative)	0	30	
	- CSG Development Wells (indicative)	0	0	
	Field Compressor Stations	0	0	N/A
	Central Compressor Stations	0	0	N/A
	Regulated dams > 401 megalitres	0	0	N/A
	Regulated dams < 400 megalitres			
	• Brine	0	0	N/A
	• Aggregation	0	2	240ML /dam 6ha/dam
	• Exploration/Appraisal Evaporation Dams	0	0	N/A
	Low hazard dams	0	180	- 45ha maximum total disturbance - 0.25ha/dam

DMC

				maximum disturbance
	Water treatment Facilities	0	0	N/A
	Brine Encapsulation Facilities	0	0	N/A
	Sewage Treatment Plants	0	0	N/A

Prevent or Minimise Likelihood of Environmental Harm

- (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.

Maintenance of Measures, Plant and Equipment

- (A3) The holder of the environmental authority must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;
 - (b) maintain such measures, plant and equipment in their proper and effective condition; and
 - (c) operate such measures, plant and equipment in a proper and effective manner.
- (A4) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration materially increases, or is likely to increase, the environmental harm caused by the petroleum activity(ies).

Operational Plan

- (A5) An Operational Plan must be developed and submitted to the administering authority by 9 December 2011 which provides detailed information about the petroleum activity(ies) to be carried out under this environmental authority.
- (A6) The petroleum activity(ies) identified in the Operational Plan must set out the maximum scope of the petroleum activity(ies) and incorporate the petroleum activities set out in the approved Work Program and / or Development Plan for the relevant resource authority as required under the *Petroleum Act 1923* or the *Petroleum and Gas (Production and Safety) Act 2004*.
- (A7) The Operational Plan must be consistent with the requirements of this environmental authority and include, but not be limited to:
- (a) a stated period for the Operational Plan which is at least one (1) **year** but does not exceed three (3) **years** duration and which specifies an end date;
 - (b) a description of the existing and all proposed petroleum activities under the period of the Operational Plan;
 - (c) a map or series of maps that:
 - (i) record the location of all **infrastructure** and its unique reference name / number that exists at the commencement of the period of the Operational Plan, including but not necessarily being limited to:
 - (a) **regulated dams**;
 - (b) **exploration, appraisal and development wells**;
 - (c) water and gas gathering and flow lines;
 - (d) gas processing facilities (including generators and compressors);
 - (e) water treatment facilities;
 - (f) **brine** encapsulation facilities;

pmc

- (g) sewage treatment facilities;
 - (h) field compressor stations;
 - (i) central compressor stations;
 - (j) power lines;
 - (k) tracks and roads;
 - (ii) show the location of all **programmed and approved infrastructure** that will be developed during the period of the Operational Plan, including the items listed under condition (A7)(c)(i) and their unique reference name / number, if applicable;
 - (iii) show major environmental features such as **waters, sensitive places** and environmentally sensitive areas; and
 - (d) spatial datasets (GIS) which depict those requirements under condition (A7)(c)(i), (A7)(c)(ii) and (A7)(c)(iii) in shapefile format.
- (A8) The Operation Plan must contain a record of **significant disturbance to land** as a result of existing and **programmed and approved infrastructure** during the period of the Operational Plan, which must include, but not necessarily be limited to the following:
- (a) as at the commencement of the Operational Plan period:
 - (i) minimum undisturbed area;
 - (ii) maximum existing disturbed area;
 - (iii) total areas(s) of disturbance to **Category A, B and C Environmentally Sensitive Areas** by area type (e.g. Of concern RE, Endangered RE, State Forest);
 - (iv) total area(s) rehabilitated;
 - (v) identification of rehabilitated areas by category (e.g. age, status);
 - (vi) maps showing rehabilitated areas by category;
 - (vii) the results of the Rehabilitation Monitoring Program undertaken on **rehabilitation** carried out under the previous Operational Plan(s) and an assessment in relation to the requirements and acceptance criteria set out in this environmental authority; and
 - (b) **programmed and approved infrastructure** for the current Operational Plan period:
 - (i) maximum area(s) to be disturbed;
 - (ii) a description of each area(s) to be disturbed including tenure, coordinates, general site characteristics and disturbance types (e.g. well lease, flow lines, access track);
 - (iii) existing land use(s) of each area(s) to be disturbed; and
 - (iv) forecasted total area to be rehabilitated for the period of the Operation Plan;
- (A9) The Operational Plan must include a calculation of financial assurance for the maximum proposed and existing disturbance during the period of the Operational Plan.
- (A10) The commencement of the first Operational Plan period is the 9 December 2011.
- (A11) The holder of this environmental authority must implement the Operational Plan.
- (A12) A subsequent Operational Plan must be submitted to the administering authority not less than 20 **business days** prior to the expiry of the current Operational Plan.

Financial Assurance

- (A13) The holder of this environmental authority must:
- (a) provide to the administering authority financial assurance in the amount and form required from time to time by the administering authority; and
 - (b) review and maintain the amount of financial assurance based on the maximum disturbance from the proposed and existing petroleum activity(ies).
- (A14) The calculation of financial assurance must be in accordance with the Department of Environment and Resource Management's Guideline "Financial assurance for petroleum activities", as amended from time to time.
- (A15) The financial assurance is to remain in force until the administering authority is satisfied that no claim is likely to be made on the assurance.

Done

Existing Petroleum Activities

- (A16) Conditions (E1) to (E15) in the Disturbance to Land Schedule only apply to the petroleum activity(ies) which commenced after 5 October 2011 subject to the holder of this environmental authority having complied with all disturbance conditions of the relevant environmental authority that applied at the time the existing petroleum activity(ies) was constructed.

Third Party Audit

- (A17) A **third party auditor**, nominated by the holder of this 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 (3) **years**.
- (A18) Notwithstanding condition (A17), the holder of this environmental authority may, prior to undertaking the third party audit, negotiate with the administering authority the scope and content of the third party audit.
- (A19) An audit report must be prepared by the **third party auditor** presenting the findings of each audit carried out.
- (A20) The **third party auditor** must **certify** the findings in the audit report.
- (A21) The holder of this 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.
- (A22) The holder of this environmental authority must attach to the audit report, a written response to the audit report detailing the actions taken or to be taken on stated dates:
- (a) by the holder of this environmental authority to ensure compliance with this environmental authority; and
 - (b) to prevent a recurrence of any non-compliance issues identified.
- (A23) The audit report required by condition (A19) and the written response to the audit report required by condition (A22) must be submitted to the administering authority with the subsequent annual return.
- (A24) The financial cost of the third party audit is to be borne by the holder of this environmental authority.

Contingency Plan for Emergency Environmental Incidents

- (A25) A Contingency Plan for Emergency Environmental Incidents which has been **certified** by a **suitably qualified person** must be developed by 2 November 2011.
- (A26) The Contingency Plan for Emergency Environmental Incidents must include, but not necessarily be limited to:
- (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (b) identification of the types of environmental incidents that may occur, including but not limited to flooding impacts, relevant to the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (c) response procedures to be implemented to prevent or minimise the risk of environmental

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- harm arising from environmental emergency incidents;
- (d) response procedures to minimise the extent and duration of environmental harm caused by environmental emergency incidents;
- (e) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;
- (f) communication procedures and lines of communication within and beyond the organisation, including but not limited to Local Government, to be employed in responding to environmental emergency incidents;
- (g) the resources to be used in response to environmental emergency incidents;
- (h) procedures to investigate the cause of any incidents including releases or near misses, and where necessary, the remedial actions to be implemented to reduce the likelihood of recurrence of similar events;
- (i) procedures for responding to incidents resulting from **stimulation** activities, including specific rectification measures in the event of non-routine stimulation events;
- (j) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;
- (k) procedures to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of a **dam**;
- (l) procedures to respond to a **regulated dam** reaching its **mandatory reporting level**;
- (m) procedures to respond to a **regulated dam** reaching its **design storage allowance**.
- (n) a receiving environment monitoring program, to be specifically implemented in the event of a release to **waters** or land to examine / assess environmental impacts. For monitoring of **waters**, this program must include upstream, downstream and impact site monitoring procedures. For soils monitoring, three replicate samples must be taken at depth intervals of 0-10 cm, 20-30 cm and 50-60 cm at both a reference site and the impact site as a minimum;
- (o) the provision and availability of documented procedures to staff attending any emergency environmental incident to enable them to effectively respond;
- (p) training of staff that will be called upon to respond to emergency environmental incidents to enable them to effectively respond;
- (q) timely and accurate reporting of the circumstance and nature of emergency environmental incidents to the administering authority and any affected landholder, occupier and / or their nominated representative in accordance with conditions of this environmental authority; and
- (r) procedures for accessing monitoring locations during emergency environmental incidents.

(A27) The holder of this environmental authority must implement the Contingency Plan for Emergency Environmental Incidents.

Underground Gas Storage

(A28) Testing, evaluating, developing and using natural underground reservoirs for petroleum storage or to store **prescribed storage gases** is not authorised under this environmental authority.

Infrastructure

(A29) The following **infrastructure** must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

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

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Monitoring

- (A30) The holder of this environmental authority must develop and implement a monitoring program for all monitoring required by the conditions of this environmental authority by 9 December 2011.
- (A31) All monitoring under this environmental authority must be conducted by a **suitably qualified person**.
- (A32) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated, operated and maintained effectively in accordance with the manufacturer's specifications.
- (A33) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests, except as otherwise authorised by the administering authority.
- (A34) Any management or monitoring plans, systems, programs or procedures required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three (3) **years** in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.
- (A35) If monitoring conducted in accordance with this environmental authority indicates a condition or contaminant level has caused, or has potential to cause, environmental harm, the holder of this environmental authority must, as soon as is practicable, take the necessary actions to rectify the condition or contaminant level so as to avoid or minimise environmental harm.
- (A36) An annual monitoring report must be prepared each **year** and submitted to the administering authority in the form requested by the administering authority. This report must include but not necessarily be limited to:
- (a) a summary of the previous 12 **months** monitoring results obtained under all monitoring programs required under this environmental authority and a comparison of the previous 12 **months** monitoring results to both the limits set in this environmental authority and to relevant prior results;
 - (b) the date on which the samples was taken;
 - (c) the time at which the samples was taken;
 - (d) the monitoring point at which the sample was taken;
 - (e) the results of all monitoring and details of any exceedences with the conditions of this environmental authority and the dates and times these exceedences were reported to the administering authority;
 - (f) details regarding the status of disturbance, progressive **rehabilitation** associated with the petroleum activity(ies) and the schedule of disturbance submitted to the administering authority as part of the financial assurance calculations;
 - (g) an evaluation / explanation of the data derived from any monitoring programs;
 - (h) data analyses and interpretation to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination and the environmentally relevant activity(ies); and
 - (i) an outline of actions taken to minimise the risk of environmental harm from any condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A35).
- (A37) The evaluation and explanation of data for the purposes of the annual monitoring report must be performed by a **suitably qualified person**.

Documentation and Records Management

- (A38) A record of all **documents** required by this environmental authority must be:

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- (a) kept for a minimum of five (5) **years**; and
- (b) be made available to an **authorised person** upon request.

(A39) The holder of this environmental authority must develop all **documents** required under this environmental authority in a way that is consistent with the requirements of this environmental authority.

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SCHEDULE B – WATER

Contaminant Release

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

Sewage Treatment Works

- (B2) Sewage treatment works with a total daily peak design capacity greater than 21 **equivalent persons** are not permitted.
- (B2A) The **construction** and operation of sewage treatment works is authorised if the total daily peak design capacity is less than 21 **equivalent persons**
- (B2B) Notwithstanding condition (B2A), the disposal of sewage effluent disposal must not cause environmental harm.

Erosion and Sediment Control Plan

- (B3) An Erosion and Sediment Control Plan which has been **certified** by a **suitably qualified person** must be developed by 9 December 2011 or prior to the commencement of any significant disturbance to land (whichever is the sooner).
- (B4) The Erosion and Sediment Control Plan must include but not necessarily be limited to:
- (a) managing and / or diverting uncontaminated stormwater run-off around areas disturbed by the petroleum activity(ies) or where contaminants or wastes are stored or handled that may contribute to contamination of **waters**;
 - (b) ensuring that contaminated stormwater runoff and incident rainfall is collected, treated, reused, or released in accordance with the conditions of this environmental authority;
 - (c) roofing or minimising the size of areas where contaminants or wastes are stored or handled;
 - (d) revegetating disturbed areas as soon as practicable after the completion of works;
 - (e) using materials and or processes (e.g. dry absorbents) to clean up spills that will minimise contamination of **waters**;
 - (f) placing erosion and sediment control structures to minimise erosion of disturbed areas and prevent the contamination of **waters**;
 - (g) an inspection and maintenance program for the erosion and sediment control measures;
 - (h) provision for adequate access to maintain all erosion and sediment control measures especially during the wet season from November to April;
 - (i) additional erosion and sediment control measures for **construction** of wells and pipelines on slopes >10%;
 - (j) a surface water monitoring program designed to detect impacts from sediment runoff into **waters**;
 - (k) identification of remedial actions required to ensure compliance with the conditions of this environmental authority; and
 - (l) details of community consultation strategies and processes to be used in further developing and implementing the Erosion and Sediment Control Plan.
- (B5) The holder of this environmental authority must implement the Erosion and Sediment Control Plan.
- (B6) A copy of the Erosion and Sediment Control Plan must be made available to any potentially affected landholder upon request by that landholder.

Maintenance and Cleaning



- (B7) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants cannot be released into any **waters**.

Watercourses, Wetlands and Springs

- (B8) In the carrying out of the petroleum activity(ies) the holder of this environmental authority must not excavate, clear vegetation or place **fill**, in or within:
- (a) 200 metres from any **wetland, lake or spring**; or
 - (b) 100 metres of the **high bank** of any other **watercourse**.
- (B9) Despite condition (B8), powerline, pipeline, track and road **construction** works may be undertaken within 200 metres of, and in a **wetland, lake or spring** or within 100 metres of, and in a **watercourse** where there is no reasonable and practicable alternative (e.g. **trenchless methods**) and only for a maximum period of 10 **business days**, provided that the works are conducted in accordance with the following order of preference:
- (a) conducting work in times of no flow;
 - (b) conducting work in times of flow but in a way that does not:
 - (i) adversely impact the flow of water within the **watercourse**; or
 - (ii) permanently impound water; or
 - (iii) permanently divert the course of flow of water.
- (B10) Powerline, pipeline, track and road **construction** works resulting in **significant disturbance** to the **bed and banks** of a **watercourse, wetland, lake or spring** must:
- (a) be no greater than the minimum area necessary for the purpose of the significant disturbance;
 - (b) be designed and undertaken by a **suitably qualified person** taking into account the matters listed in the "Planning Activities" and "Impact Management During Activities" sections of the Department of Environment and Resource Management's "Guideline – Activities in a **watercourse, lake or spring** associated with mining operations" December 2010, as amended from time to time; and
 - (c) upon cessation of the works, commence **rehabilitation** immediately.
- (B11) Sediment control measures must be implemented to minimise any increase in water turbidity due to powerline, pipeline, track and road **construction** works in the **bed and banks** of a **watercourse, wetland, lake or spring**.
- (B12) Routine, regular and frequent visual monitoring must be undertaken while carrying out powerline, pipeline, track and road **construction** work and any maintenance of completed works in a **watercourse, wetland, lake or spring**.
- (B13) If, due to powerline, pipeline, track and road **construction** works, water turbidity increases in a **watercourse, wetland, lake or spring** outside contained areas, works must cease and the sediment control measures must be rectified to limit turbidity before the works 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.

Floodplains

- (B15) Where the petroleum activity(ies) is carried out on **floodplains**, the holder of this environmental authority must ensure that the petroleum activity(ies) does not:

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- (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.

Water Monitoring

- (B16) The method of water sampling required by this environmental authority must comply with that set out in the most recent version of the Department of Environment and Resource Management's "Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009 Version 2 September 2010" as amended from time to time.

Note: Condition (B16) requires the "Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009 Version 2 September 2010" to be followed. Where it is not followed because of exceptional circumstances this should be explained and reported with the results.

Groundwater

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

Groundwater Impact Monitoring Program

- (B18) A Groundwater Monitoring Program must be developed and implemented which is able to detect any changes to groundwater quality as a result of storing contaminants in a containment facility(ies) (e.g. surface **dams**, monocells) by 9 December 2011.
- (B19) The Groundwater Monitoring Program must be developed and implemented by a **suitably qualified person** in the fields of hydrogeology, groundwater sampling design and groundwater monitoring program design.
- (B20) The Groundwater Monitoring Program, must include, but not necessarily be limited to:
- (a) locations of monitoring sites, monitoring methodology and trigger values for detecting impacts on groundwater quality;
 - (b) as a minimum, sampling of the parameters and at the frequency listed in Schedule B, Table 1 – Minimum Groundwater Monitoring Parameters and Monitoring Frequency;
 - (c) procedures to establish background groundwater quality;
 - (d) sampling of groundwater in accordance with the requirements for baseline bore, well and **stimulation** impact monitoring as per conditions (J14) to (J20);
 - (e) a sufficient number of monitoring sites to provide information on the following:
 - (i) seepage to groundwater and surrounding soils from any **regulated dam** and its effect on groundwater and soils; and
 - (ii) background water quality (i.e. groundwater quality in representative **bores** that have not been affected by the petroleum activity(ies) authorised under this environmental authority);
 - (ii) the conduct of a geodetic survey of all monitoring **bores** to determine the relative water surface elevations of each bore and reported in metres relative to the **AHD**; and
 - (iii) the determination of groundwater flow direction, groundwater flow rate and hydraulic conductivity;
 - (f) a rationale containing details on the program purpose, program conceptualisation and verification of assumptions.

- (B21) The holder of this environmental authority must implement the Groundwater Monitoring Program.



- (B22) All groundwater monitoring **bore**s must be installed according to the standards outlined in the Department of Environment and Resource Management's "Minimum Construction Requirements for Water Bore in Australia" 2003 or the "Minimum Standards for the Construction and Reconditioning of Water Bore that Intersect the Sediments of Artesian Basins in Queensland" 2010, as amended from time to time.
- (B23) Groundwater monitoring **bore**s must be constructed by, or under the supervision of a licensed Queensland water bore driller who has the correct endorsements on their licence for the type of activity being performed.
- (B24) Groundwater samples must be monitored for the water quality parameters at the minimum frequencies specified in Schedule B, Table 1 – Groundwater Monitoring Parameters and Monitoring Frequency.

Schedule B, Table 1 – Groundwater Monitoring Parameters and Monitoring Frequency

Groundwater parameter	Monitoring frequency
Water level [m]	Quarterly
Groundwater pressure in geological strata [kPa]	Biannually
pH	Biannually
Electrical conductivity [μ S/m]	Biannually
Total dissolved solids [mg/L]	Biannually
Temperature [°C]	Biannually
Dissolved oxygen [mg/L]	Biannually
Alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [mg/L]	Biannually
Sodium adsorption ratio (SAR)	Biannually
Anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L]	Biannually
Cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L]	Biannually
Silica [mg/L]	Biannually
Dissolved and total metals and metalloids (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, chromium III, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [μ g/L]	Biannually
Total phosphorus as phosphorus [mg/L]	
Ammonia, nitrate and nitrite as nitrogen [mg/L]	Biannually
Total petroleum hydrocarbons [mg/L]	Biannually
BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [μ g/L];	Biannually
Polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [μ g/L]	Biannually
Gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L]	Biannually

- (B25) All groundwater monitoring **bore**s must be maintained in an operative condition and be accessible at all times to any **authorised person**.

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SCHEDULE C – DAMS

Assessment of Hazard Category

- (C1) The **hazard category** of any **dam** must be assessed by a **suitably qualified and experienced person** in accordance with the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C2) The hazard assessment required under condition (C1) must occur in any of the following situations:
- (a) prior to the design and **construction** of the **dam**;
 - (b) prior to any change in its purpose or its stored contents;
 - (c) for a **dam** assessed and **certified** as a high or significant hazard **dam**, at least biennially after its **construction**;
 - (d) for an **existing low hazard dam**, within 120 **business days** of 5 October 2011.
- (C3) A **hazard assessment** report and **certification** must be prepared for any **dam assessed** and the report may include a **hazard assessment** for more than one **dam**.
- (C4) The holder must, on receipt of a **hazard assessment** report and **certification**, provide to the **Administering Authority** one paper copy and one electronic copy of the **hazard assessment** report and **certification**.
- (C5) All **certifications** must be in the form set out in the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.

Construction of Low Hazard Dam to Contain Wetting Front

- (C6) Where a **dam** is assessed as **low hazard**, it must be
- (a) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the **dam** is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and **rehabilitation**.
- (C7) Where a **dam** is for the first time assessed as significant or high, the holder of this environmental authority must ensure that within 12 **months** of that assessment, the **dam** meets the conditions required for **regulated dams** under this environmental authority.
- (C8) In the event of early signs of loss of structural or hydrological integrity of a **low hazard dam**, the holder of this environmental authority must:
- (a) take immediate action to prevent or minimise any actual or potential environmental harm; and
 - (b) report in writing to the administering authority, any findings and actions taken within 20 **business days** of that event,

Monitoring of Low Hazard Dams

- (C10) The condition of all **low hazard dams** must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each **dam**.

Design and Construction of a Regulated Dam

- (C11) All **regulated dams** must be designed by, and constructed under the supervision of a **suitably qualified and experienced person** in accordance with the requirements of the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C12) Construction of a **regulated dam** is prohibited unless the **holder** has:
- (a) submitted a **hazard category assessment** report and **certification** to the administering authority;
 - (b) commissioned a **suitably qualified and experienced person** to prepare a design plan for the **dam**; and
 - (c) received the design plan for the **dam**, together with **certification** of that plan from the **suitably qualified and experienced person**, that:
 - (i) the design plan is in accordance with the requirements of the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time;
 - (ii) the **dam** is capable of delivering the performance stated in the design plan; and
 - (d) when **constructed** and operated in accordance with the design plan, the **dam** will be compliant in all respects with conditions (C11) to (C16) of this environmental authority.
- (C13) **Regulated dams** must be designed and constructed to prevent:
- (a) floodwaters from entering the **regulated dam** from a **watercourse** or drainage line to the **annual exceedance probability** specified for determining **spillway** capacity in the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time; and
 - (b) wall failure due to erosion by floodwaters arising from the **watercourse** or drainage line to the **annual exceedance probability** specified for determining **spillway** capacity in the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time; and
 - (c) overtopping as a result of a flood event of the **annual exceedance probability** specified for determining **spillway** capacity in the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C14) The **design plan** for a **regulated dam** must include, but not necessarily be limited to:
- (a) a design report which provides:
 - (i) **certification** of the **design plan**;
 - (ii) a description of all the **documents** which constitute the **design plan**;
 - (iii) a statement of:
 - 1. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory **documents** relied upon in preparing the **design plan**; and
 - 2. all relevant facts and data used in preparing the **design plan**, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the **design plan**;
 - 3. the **hazard category** of the **dam**; and
 - 4. the reasoning of the certifying **suitably qualified and experienced person** as to how the **design plan** provides the necessary required performance;
 - (iv) documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;
 - (v) detailed criteria for the design, operation, maintenance and decommissioning of the **dam** including any assumptions;
 - (vi) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;

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- (vii) reasoning for how the **design plan** provides the required performance;
- (viii) details of any other matter which may substantially affect, or is critical to, the **design plan**; and
- (ix) evidence that the certifier is a **suitably qualified and experienced person**.
- (b) drawings showing the lines and dimensions of built structures and land forms associated with the **regulated dam**;
- (c) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;
- (d) a description of any containment systems;
- (e) an operational plan that includes;
 - (i) normal operating procedures and rules;
 - (ii) emergency and contingency plans including operating procedures designed to avoid and / or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the **dam**;
- (f) a plan for the decommissioning and **rehabilitation** of the **dam** at the **end** of its operational life;
- (g) details of reports on investigations and studies done in support of the **design plan**; and
- (h) any other matter required by the **suitably qualified and experienced person**.

(C15) All **aggregation dams** must:

- (a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and **rehabilitation**; and
- (b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the **dam**.

Operation of a Regulated Dam

(C17) Operation of a **regulated dam** is prohibited unless the holder of this environmental authority has:

- (a) submitted to the administering authority one paper copy and one electronic copy of the design plan and **certification**, and a set of 'as constructed' drawings and specifications, together with **certification** that the **dam**:
 - (i) has been constructed in accordance with the design plan;
 - (ii) is capable of delivering the performance stated in the **design plan**; and
 - (iii) is compliant with the relevant conditions of this environmental authority;
- (b) the conditions of this environmental authority relating to the construction of the **dam** have been met; and
- (c) the holder of this environmental authority has entered the details required under this environmental authority, into a Register of Regulated Dams.

(C18) Each **regulated dam** must be maintained and operated in a manner that is consistent with the current design plan and the associated **certified** 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.

Mandatory Reporting Level

- (C19) The **mandatory reporting level** must be marked on a **regulated dam** in such a way that it is clearly visible.
- (C20) The holder must, on becoming aware that the **mandatory reporting level** has been reached, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Annual Inspection Report

- (C21) Each **regulated dam** must be inspected annually by a **suitably qualified and experienced person**.



- (C22) At each annual inspection, the condition and adequacy of all components of the **regulated dam** must be assessed:
- (a) against the most recent hazard assessment report and **design plan**;
 - (b) against recommendations contained in previous annual inspections reports;
 - (c) against recognised **dam** safety deficiency indicators;
 - (d) for changes in circumstances potentially leading to a change in **hazard category**;
 - (e) for conformance with the conditions of this environmental authority;
 - (f) for conformance with the drawings of the **certified design plan**;
 - (g) for the adequacy of the available storage in each **regulated dam**, based on an actual observation(s) taken in May of each **year**, of accumulated sediment, state of the containment barrier and the level of liquids in the **dam**.
- (C23) A **suitably qualified and experienced person** must prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the **dam**.
- (C24) The **suitably qualified and experienced person** who prepared the annual inspection report must **certify** that report in accordance with the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C25) The holder of this environmental authority must:
- (a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the **regulated dam** will safely perform its intended function; and
 - (b) within 20 **business days** of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each **regulated dam**.

Design Storage Allowance

- (C26) On 1 November of each **year**, storage must be available in each **regulated dam** to meet the **design storage allowance** estimated for the **dam** in accordance with the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C27) The **holder** must, immediately on becoming aware that the **regulated dam** will not have the available storage to meet the **design storage allowance** on 1 November of any year, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Performance review

- (C28) The holder of this environmental authority must assess the performance of each **regulated dam** over the preceding November to May period based on actual observations of the available storage in each regulated dam taken in May of each year.
- (C29) The holder of this environmental authority must take action to modify its water management system so as to ensure that the **regulated dam** will perform in accordance with the requirements of this authority, for the subsequent November to May period.

Repair requirements

- (C33) Where the holder of this environmental authority detects any passage of the wetting front through the floor or sides of the **regulated dam**, they must, as soon as practicable:

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- (a) repair the **dam** to rectify the detected passage of the wetting front or entrained contaminants through the floor or sides of the **dam**; or
- (b) decommission and rehabilitate the **dam**.

Decommissioning

- (C34) The holder of this environmental authority must not abandon any **dam** but must decommission each **dam** such that ongoing environmental harm is prevented.

Transfer arrangements

- (C35) The holder of this environmental authority must provide a copy of any reports, documentation and certifications prepared under this environmental authority, including but not limited to any Register of Regulated Dams, hazard assessment, design plan and other supporting documentation, to a new holder of an environmental authority and the administering authority on transfer of the environmental authority.

Register of Regulated Dams

- (C36) A register of regulated dams must be established and maintained by the holder of this environmental authority and include, but not necessarily be limited to, the following information for each **regulated dam**:
- (a) date of entry in the register;
 - (b) name of the **dam**, its purpose and intended / actual contents;
 - (c) location of the **dam** defined by coordinates (GDA94) within five metres at any point from the outside of the **dam** including its storage area;
 - (d) the **hazard category** of the **dam** as assessed using the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time;
 - (e) dates, names, and reference numbers of all **document(s)** lodged as part of a **design plan** for the **dam**;
 - (f) name and qualifications of the certifier of the **design plan** and 'as constructed' drawings;
 - (g) for the **regulated dam**, other than in relation to any **levees**:
 - (i) dimensions (metres) and surface area (hectares) of the **dam** measured at the foot print of the **dam**;
 - (ii) **dam crest volume** (megalitres);
 - (iii) **spillway crest level** (metres **AHD**);
 - (iv) maximum operating level (metres **AHD**);
 - (v) storage rating table of stored volume versus level (metres **AHD**);
 - (vi) **design storage allowance** (megalitres);
 - (vii) **mandatory reporting level** (metres **AHD**);
 - (h) **design plan** title and reference relevant to the **dam**;
 - (i) date **construction** was **certified** as compliant with the **design plan**;
 - (j) name and qualifications of certifier;
 - (k) details of the composition and **construction** of any liner;
 - (l) the system for the detection of any leakage through the floor and sides of the **dam**;
 - (m) dates when the **dam** underwent an annual inspection for structural and operational adequacy;
 - (n) dates when the **dam** was inspected for the detection of leakage through the liner;

- (o) dates when the **dam** was inspected for the purpose of annually ascertaining the available storage capacity;
- (p) dates when recommendations and actions in the annual inspection report were provided to the administering authority; and
- (q) **dam** water quality as obtained from monitoring required under conditions (C42) to (C44).

*Note: The dam register in the approved departmental format is available for download at:
http://www.derm.qld.gov.au/environmental_management/coal-seam-gas/environment.html.*

- (C37) The holder of this environmental authority 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.
- (C38) The holder of this environmental authority must make a final entry of the required information in the register of **regulated dams** once compliance with condition (C17) has been achieved.
- (C39) The holder of this environmental authority must ensure that the information contained in the register of **regulated dams** is always current and complete.
- (C40) All entries in the register of **regulated dams** must be approved by the chief executive officer for the holder of this environmental authority, or their delegate, as being accurate and correct.
- (C41) The holder of this environmental authority 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.

Regulated Dam Water Quality Monitoring

- (C42) The holder of this environmental authority must monitor the quality of water in all **regulated dams** on the relevant resource authority(ies) in the **month** of October every **year**.
- (C43) The monitoring of **regulated dam** water must include sufficient **analytes** and physico-chemical parameters to characterise water quality in the **dam** and must include, but not necessarily be limited to:
 - (a) pH;
 - (b) electrical conductivity [$\mu\text{S/m}$];
 - (c) turbidity [NTU];
 - (d) total dissolved solids [mg/L];
 - (e) temperature [$^{\circ}\text{C}$];
 - (f) dissolved oxygen [mg/L];
 - (g) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [mg/L];
 - (h) sodium adsorption ratio (SAR);
 - (i) anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L];
 - (j) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];
 - (k) silica [mg/L];
 - (l) dissolved and total metals (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, chromium III, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [$\mu\text{g/L}$];
 - (m) total phosphorus [mg/L];
 - (n) ammonia, nitrate, nitrite as nitrogen [mg/L];
 - (o) total petroleum hydrocarbons [$\mu\text{g/L}$];
 - (p) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [$\mu\text{g/L}$];
 - (q) polycyclic aromatic hydrocarbons (including but not necessarily being limited to naphthalene, phenanthrene, benzo[a]pyrene) [$\mu\text{g/L}$];
 - (r) chlorophyll a [$\mu\text{g/L}$]; and
 - (s) total cyanobacteria biovolume [cells/mg/L]; and

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

- (C44) Water quality samples of **regulated dams** must be taken from at least three (3) different **dam** profile depths for each sampling event and be taken as far as practicable from the edge of the **regulated dam**.

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SCHEDULE D — LAND

General

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

Soil Management Plan

- (D2) A Soil Management Plan which has been **certified** by a **suitably qualified person** must be developed by 9 December 2011 or prior to the commencement of petroleum activities involving significant disturbance to land (whichever is the sooner).
- (D3) The Soil Management Plan must include, but not necessarily be limited to:
- (a) procedures for identifying soil units within areas to be disturbed by the petroleum activity(ies) at a scale of 1:50 000, in accordance with the "Guidelines for Surveying Soil and Land Resources, 2nd Edition" (McKenzie et al. 2008), "Australian Soil and Land Survey Handbook, 3rd Edition" (National Committee on Soil and Terrain 2009), "The Australian Soil Classification" (Isbell 2002) and the "Guidelines for agricultural land evaluation in Queensland" (Queensland Department of Primary Industries Information Series QI90005 1990), as amended from time to time;
 - (b) procedures for establishing baseline soils information for areas to be disturbed including soil depth, pH, electrical conductivity (EC), chloride, cations (aluminium, calcium, magnesium, potassium and sodium), exchangeable sodium percentage (ESP), particle size and soil fertility (including carbon, nitrogen, phosphorous, potassium, sulphur and micronutrients);
 - (c) identification of the types of soils and soil units requiring specific management practices (e.g. saline or sodic soils) relevant to assessment for agricultural suitability, erodibility and **rehabilitation**;
 - (d) for areas of good quality agricultural land, detailed methods to be undertaken to minimise potential impacts to soil productivity;
 - (e) detailed horizon and soils compaction management procedures for each soil unit, including **top soil** and **top soil** stockpile management procedures and methods of keeping soil horizons separate on excavation, storage and backfilling so as to minimise the impacts of soil disturbance and promote successful **rehabilitation**;
 - (f) detailed mitigation measures and procedures for each soil unit to manage the risk of adverse soil disturbance in the carrying out of the petroleum activity(ies); and
 - (g) a soils impact monitoring program outlining parameters to be monitored, frequency of monitoring and acceptable ranges for each parameter for each soil unit.
- (D4) The holder of this environmental authority must implement the Soil Management Plan whenever **significant disturbance to land** occurs as a result of the petroleum activity(ies).
- (D5) A copy of the Soil Management Procedures must be made available to any potentially affected landholder upon request by that landholder.

Fauna Management Procedures

- (D9) Fauna management procedures must be developed prior to the commencement of the petroleum activity(ies) authorised under this environmental authority.
- (D10) The fauna management procedures must be **certified** by a **suitably qualified person**.
- (D11) The fauna management procedures must ensure that the petroleum activity(ies) is carried out in a manner that minimises the risk of injury, harm, or entrapment to wildlife and stock.
- (D12) **Well infrastructure** and **dams** must be securely fenced and / or screened after **construction** is completed to:

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- (a) exclude and prevent the entrapment of livestock and wildlife; and
- (b) provide escape arrangements for any trapped livestock and wildlife; and
- (c) limit habitats for the introduction or spread of **pests**.

(D13) The fauna management procedures must include training and awareness of staff and contractors.

(D14) Planned fauna handling must be undertaken by a **suitably qualified person**.

(D15) The holder of this environmental authority must implement the fauna management procedures.

Note: The procedures required by conditions (D9) to (D13) should consider the "Australian Pipeline Industry Association Code of Environmental Practice – Onshore Pipelines" March 2009, as amended from time to time.

Pest Management Program

(D16) Pest management procedures must be developed prior to the commencement of the petroleum activity(ies) authorised under this environmental authority.

(D17) The pest management procedures must be **certified** by a **suitably qualified person**.

(D18) The pest management procedures must include, but not necessarily be limited to:

- (a) identification of **pest** species and infestation areas;
- (b) a list of potential **pest** species known to occur in the project area;
- (c) prevention and / or minimisation of the introduction and / or spread of pests;
- (d) control and management of **pest** outbreaks as a result of the petroleum activity(ies); and
- (e) details of community consultation in developing the pest management procedures.

(D19) A copy of the pest management procedures must be made available to any potentially affected landholder upon request by that landholder.

(D20) The holder of this environmental authority must implement the pest management procedures.

Note: The pest management procedures required by conditions (D16) – (D18) should consider the "Petroleum Industry (including coal seam methane gas) Minimising Pest Spread Guidelines" June 2008, as amended from time to time. This document is available for download from:

http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Minimising-Pest-Spread-Advisory-Guidelines.pdf

Chemical and Fuel Storage

(D21) All explosives, hazardous chemicals, corrosive **substances**, toxic substances, gases, dangerous goods, flammable and combustible liquids (including petroleum products and associated piping and **infrastructure**) must be stored and handled in accordance with the relevant Australian Standard where such is available.

(D22) Notwithstanding the requirements of any Australian Standard, any liquids stored on site that have the potential to cause environmental harm must be stored in, or serviced by, an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to **waters** or land.

(D23) Where no relevant Australian Standard is available for the chemical and / or fuel storage activity, the following requirements apply:

- (a) storage tanks must be **bunded** so that the capacity and **construction** of the **bund** is sufficient to contain at least 110 % of a single storage tank or 100 % of the largest storage tank plus 10 % of the second largest storage tank in multiple storage areas; and



- (b) drum storages must be **bunded** so that the capacity and **construction** of the **bund** is sufficient to contain at least 25 % of the maximum design storage volume within the **bund**.

(D24) All containment systems must be designed to minimise rainfall collection within the system.

Pipelines

(D25) Pipelines and other transmission lines must be co-located where feasible to reduce total disturbance.

(D26) Pipelines must be preferentially located alongside existing linear **infrastructure** such as roads, tracks and powerlines.

(D27) Pipeline trenches must only be left open for the minimum time practicable.

(D28) The length of pipeline trench open at any one time must be minimised as far as practicable.

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SCHEDULE E - DISTURBANCE TO LAND

General

- (E1) Prior to conducting petroleum activities that involve **significant disturbance to land**, an assessment must be undertaken of the condition, type and ecological value of soils and vegetation in such areas where the activity is proposed to take place.
- (E2) The assessment required by condition (E1) 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*.
- (E3) The assessment required by condition (E1) must include, but not necessarily be limited to:
- (a) baseline soils quality data and maps for the soil units to be disturbed as provided for in the Soils Management Plan;
 - (b) identification of the vegetation communities present (including species composition and regional ecosystem type¹ for native vegetation communities) within each area(s) to be disturbed;
 - (c) data representing each vegetation community present within each area(s) to be rehabilitated including:
 - (i) flora species richness and diversity;
 - (ii) structural data including woody stem count densities for dominant species within each stratum; and
 - (iii) percent foliage cover (accounting for seasonal variation and excluding **pests**);
 - (d) data regarding habitat features, including but not necessarily limited to:
 - (i) organic litter cover (%); and
 - (ii) trees with hollows $\geq 10\text{cm}$ diameter (count and number per hectare);
 - (iii) hollow bearing logs (count and number per hectare); and
 - (iv) fallen woody material (total length of logs $\geq 10\text{ cm}$ diameter per hectare and number of logs $\geq 10\text{cm}$ diameter per hectare); and
 - (e) a map or series of maps of suitable scale displaying the distributing of vegetation communities.
- (E4) If the assessment required by conditions (E1) to (E3) 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.
- (E5) If, within the 20 **business days** following the lodgement of the notification under condition (E4) 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.
- (E6) The holder of this environmental authority, when carrying out the petroleum activity(ies) must:
- (a) in order of preference, avoid, minimise or mitigate any impacts on areas of vegetation or other areas of ecological value;
 - (b) minimise disturbance to land that may otherwise result in land degradation;
 - (c) ensure that for land that is to be **significantly disturbed** by the petroleum activity(ies):
 - (i) the top layer of the soil profile is removed;

¹ Regional ecosystem type should be established using the most current version of the Qld Government's "Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland". Assessment of the vegetation communities should be sufficient to establish any inherent variation within a single regional ecosystem type.

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- (ii) soils is stockpiled in a manner that will preserve its biological and chemical properties; and
- (iii) soils are used for **rehabilitation** purposes;
- (d) avoid **clearing** mature trees; and
- (e) prior to carrying out field based **petroleum activities**, make all relevant staff, contractors or agents carrying out those petroleum activities, aware of the location of any **Category A, B or C Environmentally Sensitive Areas, wetlands** and presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992* 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 relevant approvals will need to be obtained.

- (E7) Despite condition (E6), **significant disturbance to land** caused by the carrying out of the petroleum activity(ies) must not involve **clearing** vegetation or placing **fill**:
- (a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of **ecosystem functioning**, ecological connectivity (i.e. stepping stone or contiguous bioregional / local corridor networks) and / or results in an increase in **threatening processes**; or
 - (b) on slopes greater than 10 % for the petroleum activity(ies) other than for pipelines and wells; or
 - (c) in **discharge areas**.
- (E8) Where petroleum activities are undertaken within **high value regrowth or remnant vegetation** that is other than a **Category A, B or C Environmentally Sensitive Area** and their associated protection zones, the holder of this environmental authority must be able to demonstrate that no reasonable or practicable alternative exists and for lineal **infrastructure**, that **significant disturbance to land** does not exceed the following areas:
- (a) 18 meters in width for dual carriage way roads;
 - (b) six (6) metres in width for access tracks not associated with a water or gas line; or
 - (b) for pipelines, including provision for a utility corridor and access track:
 - (i) 12 metres width for a single water or gas gathering line; or
 - (ii) 18 metres width for a trench with one water gathering line and one parallel gas gathering pipeline; or
 - (iii) 25 metres width for multiple trenches where there are three (3) parallel gas or water gathering lines; and
 - (iv) seven (7) metres width for any additional trench for a water or gas line.
- (E9) Documentation demonstrating compliance with the requirements of condition (E8) must be prepared by the holder of this environmental authority before any disturbance to land takes place.
- (E10) Cleared vegetation must be stockpiled in a manner that facilitates respreading or salvaging and does not impede vehicle, stock or wildlife movements.

Disturbance to Land – Environmentally Sensitive Areas

- (E11) Petroleum activities must be carried out in accordance with Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

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Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category A ESAs	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted. Subject to conditions (E12) and (E16).
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted. Subject to conditions (E12) and (E16).
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	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 conditions (E12) and (E16).
Category C ESAs that are State Forests, Timber Reserves and 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Petroleum activities permitted.

Note: Approvals may be required under the Forestry Act 1959 where the petroleum activity(ies) is proposed to be carried out in ESAs that are State Forests or Timber Reserves.

Indicative Environmentally Sensitive Area mapping is available on the Department of Environment and Resource Management website at:

http://www.derm.qld.gov.au/ecoaccess/maps_of_environmentally_sensitive_areas.php.

- (E12) **Low impact or limited petroleum activities** carried out within an ESA, **primary protection zone** or **secondary protection zone** must not be conducted in those areas where there is overlap with another ESA or **primary protection zone** where **low impact or limited petroleum activities** are not authorised.
- (E13) Where **limited petroleum activities** are undertaken within the **primary protection zone** of, or within 'Endangered' or 'Of Concern' Regional Ecosystems, State Forests or Timber Reserves, the holder of this environmental authority must be able to demonstrate that no reasonable or practicable alternative exists and that **significant disturbance to land** only be located, and carried out in areas according to the following order of preference:

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- (a) pre-existing cleared areas or **significantly disturbed land** within the **primary protection zone** of an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve;
 - (b) pre-existing cleared areas or **significantly disturbed land** within the **primary protection zone** of an 'Endangered' Regional Ecosystem;
 - (c) undisturbed areas within the **primary protection zone** of an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve;
 - (d) undisturbed areas within the **primary protection zone** of an 'Endangered' Regional Ecosystem;
 - (e) pre-existing areas of significant disturbance within an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve (e.g. areas where significant **clearing** or thinning has been undertaken within the 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 an 'Endangered' Regional Ecosystem (e.g. areas where significant **clearing** or thinning has been undertaken within the 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 an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve is unavoidable; and
 - (h) areas where **clearing** of an 'Endangered' Regional Ecosystem is unavoidable.
- (E14) Documentation demonstrating compliance with the requirements of condition (E13) must be prepared by the holder of this environmental authority before any disturbance to land takes place.
- (E15) For **limited petroleum activities** undertaken within the **primary protection zone** of, or within 'Endangered' or 'Of Concern' Regional Ecosystems, State Forests or Timber Reserves, 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 (E1) to (E3) of this environmental authority; and
 - (b) 6 metres in width for access tracks not associated with a water or gas line; or
 - (c) for lineal **infrastructure**, including provision for a utility corridor and access track:
 - (i) 12 metres width for a single water or gas gathering line; or
 - (ii) 18 metres width for a trench with one water gathering line and one parallel gas gathering pipeline; or
 - (iii) 25 metres width for multiple trenches where there are three (3) parallel gas or water gathering lines; and
 - (iv) seven (7) metres width for any additional trench for a water or gas line.
- (E16) The record of the assessment required by conditions (E1) to (E3) and the extent of **significant disturbance to land** in the following areas must be submitted to the administering authority with each annual return:
- (a) the **primary protection zone** of, or within an 'Endangered' or 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve; and
 - (b) in the **secondary protection zone** of ESAs; and
 - (c) other **remnant vegetation** areas; and
 - (d) **wetlands**.
- (E17) **Limited petroleum activities** carried out in the **secondary protection zone** must be located in pre-existing areas of **clearing** or significant disturbance to the greatest practicable extent and must avoid the **clearing** of mature trees where possible.

Offsets

- (E18) The holder of this environmental authority must enter in to an environmental offset agreement with the administering authority where **significant disturbance to land** with **State significant biodiversity values** cannot be avoided or minimised.

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- (E19) The environmental offset agreement must be entered in to within six (6) **months** after submitting the record of significant disturbance required by condition (E16), unless otherwise agreed to by the administering authority.
- (E20) The holder of this environmental authority must implement any environmental offset agreement entered in to in accordance with conditions (E18) and (E19) as soon as practicable after finalisation.

Note: Offset requirements will be determined in accordance with principles and guidelines of the "Queensland Government Environmental Offsets Policy" June 2008 and with the 'Queensland Biodiversity Offset Policy' when it becomes available.

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SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, dust and other airborne nuisance

- (F1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activity(ies) must not cause an environmental nuisance at any **sensitive place**.

Nuisance monitoring (other than noise)

- (F2) When the administering authority advises the holder of this environmental authority of a complaint alleging nuisance other than noise, the holder must investigate the complaint as soon as practicable.
- (F3) The holder of this environmental authority must advise the administering authority in writing of the action proposed or undertaken to resolve the complaint within three (3) **business days** of completing the complaint investigation.
- (F4) When requested by the administering authority, the holder of this environmental authority must undertake monitoring as specified by the administering authority, within a reasonable and practical timeframe nominated by the administering authority to investigate any complaint of environmental nuisance at any **sensitive place**.
- (F5) The results of the investigation (including an analysis and interpretation of the monitoring results) and the abatement measures implemented must be provided to the administering authority within five (5) **business days** of receiving the advice under condition (F4), unless a longer time is agreed to in writing by the administering authority.
- (F6) If monitoring in accordance with condition (F4) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then the holder of this environmental authority must:
- (a) address the complaint including the use of alternative dispute resolution services if required; and / or
 - (b) implement abatement or attenuation measures so that the authorised petroleum activity(ies) does not result in further environmental nuisance.

Noise

- (F7) A Noise Management Plan which has been **certified** by a **suitably qualified person** must be developed prior to the commencement of the petroleum activity(ies) authorised by this environmental authority.
- (F8) The Noise Management Plan must include, but not necessarily be limited to:
- (a) a commitment by the Chief Executive Officer for the holder of this environmental authority, or their delegate, to ensure adequate allocation of staff and resources to the establishment and operation of the Noise Management Plan;
 - (b) definition of roles, responsibilities and authorities within the staffing of the Noise Management Plan;
 - (c) delivery of training to staff and contractors and maintenance of competencies;
 - (d) risk / constraint analysis methods to be undertaken prior to any new operation (e.g. drill site) or installation of new equipment that has the potential to create noise nuisance;
 - (e) procedures and methods to undertake assessments to determine compliance with the noise limits in Schedule F, Table 1 – Noise limits at Sensitive Receptors in the event of a **valid complaint** being received and when there are no **alternative arrangements** in place, taking in to account any tonal or **impulsive noise** impacts;
 - (f) procedures for handling noise complaints;
 - (g) community liaison and consultation procedures including but not limited to consultation for when night time petroleum activities (i.e. between 10:00 pm and 6:00 am) are likely to exceed 25 dBA;

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- (h) procedures for managing records associated with all aspects of the Noise Management Plan including standardised forms for recording monitoring results and complaints;
 - (i) details of petroleum activities and measured and / or predicted noise levels of noise sources associated with those activities;
 - (j) reasonable and practicable control or abatement measures (including relocating the activity, altering the hours of operation, or having an alternate arrangement in place with any potentially affected person) that can be undertaken to ensure compliance with the noise limits in Schedule F, Table 1 – Noise limits at Sensitive Receptors;
 - (k) the level of noise at **sensitive receptors** that would be achieved from implementing the measures detailed under condition (F8)(j); and
 - (l) mediation processes to be used in the event that noise complaints are not able to be resolved.
- (F9) The holder of this environmental authority must implement the Noise Management Plan.
- (F10) Prior to undertaking petroleum activities that will result in **short-term, medium-term or long term noise events** that are likely to impact on a sensitive receptor, the holder of this environmental authority must model or calculate any potential noise emissions from the relevant petroleum activity(ies) to ensure that noise emissions will not exceed the noise levels specified in Schedule F, Table 1 – Noise limits at Sensitive Receptors.
- (F11) The emission of noise from the petroleum activity(ies) authorised under this environmental authority must not result in levels greater than those specified in Schedule F, Table 1 – Noise limits at Sensitive Receptors in the event of a **valid complaint** about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	$L_{Aeq,adj,15\ min}$	45 dBA	43 dBA	40 dBA
6:00 pm – 10:00 pm	$L_{Aeq,adj,15\ min}$	40 dBA	38 dBA	35 dBA
10:00 pm – 6:00 am	$L_{Aeq,adj,15\ min}$	28 dBA	28 dBA	28 dBA
	Max $L_{pA, 15\ mins}$	55 dBA	55 dBA	55 dBA
6:00 am – 7:00 am	$L_{Aeq,adj,15\ min}$	40 dBA	38 dBA	35 dBA

1. The noise limits in Table 1 have been set based on the following deemed **background noise levels** (L_{ABG}):

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

- (F12) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors are to be added to the measured noise level(s) to derive $L_{Aeq, adj, 15\ min}$.

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Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

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

- (F13) Where **alternative arrangements** are in place with an affected person(s) at a **sensitive receptor** as referred to by condition (F8)(j), the noise limits in Schedule F, Table 1 – Noise limits at Sensitive Receptors do not apply at that **sensitive receptor** for the duration for which the **alternative arrangements** are in place.

Low Frequency Noise

- (F14) Notwithstanding condition (F11), emission of any low frequency noise must not exceed the following limits in the event of a **valid complaint** about low frequency noise being made to the administering authority:
- (a) 60 dB(C) measured outside the **sensitive receptor**; and
 - (b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB; or
 - (c) 50 dB(Z) measured inside the **sensitive receptor**; and
 - (d) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Noise Monitoring

- (F15) The holder of this environmental authority must undertake noise monitoring as soon as practicable when requested by the administering authority.
- (F16) The holder of this environmental authority must report the results of noise monitoring to the administering authority within three (3) **business days** of completion of the monitoring event.
- (F17) Noise monitoring and recording must include, but not necessarily be limited to:
- (b) $L_{A,N,T}$ (where N equals the statistical levels of 1, 10 and 90 and T=15 mins);
 - (c) $L_{Aeq\ adj, 15\ mins}$;
 - (c) **background noise level** as $L_{A\ 90, 15\ mins}$;
 - (d) **Max $L_{pA, 15\ mins}$** ;
 - (e) the level and frequency of occurrence of **impulsive** or tonal noise and any adjustment and penalties to measured noise levels levels;
 - (f) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (g) effects due to any extraneous factors such as traffic noise;
 - (h) location, date and time of monitoring;
 - (i) if the complaint concerns low frequency noise, **Max $L_{pZ, 15\ mins}$** ; and
 - (h) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range for both the noise source and the background noise in the absence of the noise source.
- (F18) The method of measurement and reporting of noise levels and background sound pressure levels must comply with the Department of Environment and Resource Management's "Noise Measurement Manual" 2000 or **Australian Standard 1055**, as amended from time to time.

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Vibration and Blasting

- (F19) A Blast Management Plan must be developed in accordance with **Australian Standard 2187** by a **suitably qualified person** prior to each blasting activity.
- (F20) The Blast Management Plan must include measures to minimise the likelihood of any adverse effects being caused by airblast overpressure and / or ground borne vibrations at any **sensitive receptor** and demonstrate current best practice environmental management.
- (F21) All blasting must be carried out in a proper manner by a **suitably qualified person**.
- (F22) All blasting must be carried out in accordance with the Blast Management Plan.
- (F23) Noise from blasting operations must not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any **sensitive receptor**.
- (F24) Ground-borne vibration peak particle velocity caused by blasting operations must not exceed 10 mm/s at any time, when measured at or extrapolated to any **sensitive receptor**.

Blast and Vibration Monitoring

- (F25) Monitoring and recording of the air blast overpressure and ground borne vibration of every blast must be undertaken.
- (F26) Blast and vibration monitoring must include but not necessarily be limited to:
 - (a) maximum instantaneous charge;
 - (b) location of the blast within the site (including any bench level);
 - (c) airblast overpressure level (dB Linear Peak);
 - (d) peak particle velocity (mm / s);
 - (e) location, date and time of recording;
 - (f) measurement instrumentation and procedure;
 - (g) meteorological conditions for blast monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction); and
 - (h) distances from the blast site to potentially noise-affected buildings or structures.



SCHEDULE H – WASTE

General

- (H1) All general waste must only be removed from the site and sent to a recycling facility or disposal facility licensed to accept the waste under the *Environmental Protection Act 1994*.
- (H2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.
- (H3) Waste must not be burned on the site, unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.
- (H4) All waste fluids and muds resulting from drilling and exploration petroleum activities must be contained in a properly lined **dam** or containment structure for disposal, remediation or reuse where applicable.

Coal Seam Gas Water Management Plan

- (H5) The holder of this environmental authority must develop and implement a Coal Seam Gas Water Management Plan for the proper and effective management of **coal seam gas water** produced in the carrying out of the petroleum activity
- (H6) The Coal Seam Gas Water Management Plan must include, but not necessarily be limited to:
 - (a) the matters required by sections 310D (5) and 662 of the *Environmental Protection Act 1994*; and
 - (b) a water management strategy that:
 - (i) addresses **coal seam gas water** management across all integrated operations; and
 - (ii) minimises the development footprint of water management **infrastructure**; and
 - (iii) does not allow for **coal seam gas water** to be disposed of, as the primary means, in **coal seam gas evaporation dams**, unless otherwise approved by the administering authority.
 - (c) commitments, actions and milestones for the delivery and implementation of the Coal Seam Gas Water Management Plan.
- (H7) The holder of this environmental authority must not implement or amend a Coal Seam Gas Water Management Plan where such implementation or amendment would result in a contravention of any condition of this environmental authority.
- (H8) The holder of this environmental authority must submit any amendments to the Coal Seam Gas Water Management Plan to the administering authority prior to its implementation.
- (H9) If, within 20 **business days** following the submission of the amended Coal Seam Gas Water Management Plan, the administering authority provides comments on the amended Coal Seam Gas Water Management Plan, the holder of this environmental authority must:
 - (a) have due regard to that comment in the finalisation of the amended Coal Seam Gas Water Management Plan; and
 - (b) submit the finalised amended Coal Seam Gas Water Management Plan within 40 **business days** after the administering authority provided comments; and
 - (c) implement the amended Coal Seam Gas Water Management Plan.
- (H10) The holder of this environmental authority must ensure that **coal seam gas water** is contained, is not released to land or **waters** and is only used for purposes specifically authorised:
 - (a) under this environmental authority; or

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- (b) under Section 186 of the *Petroleum and Gas (Production and Safety) Act 2004*; or
- (c) under Section 86 of the *Petroleum Act 1923*; or
- (d) under an approval of resource for **beneficial use** as provided for under the *Environmental Protection Act 1994*.

- (H11) The holder of this environmental authority must ensure that the **coal seam gas water** to be used for domestic or stock purposes meets the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time.
- (H12) **Coal seam gas water** released to the environment in accordance with condition (H10) must not have any properties that could cause, nor contain any contaminants in concentrations that are capable of causing environmental harm.

Note: Coal seam gas water that is beneficially used under an approval issued under the Environmental Protection (Waste Management) Regulation 2000 will be regulated under the conditions of that approval.

Coal Seam Gas Water Use for Dust Suppression

- (H13) **Coal seam gas water** produced from the authorised petroleum activity(ies) may only be used for dust suppression:
- (a) on roads; and
 - (b) for **construction** and operational purposes for the petroleum activity(ies) authorised by this environmental authority.
- (H14) **Coal seam gas water** produced from the authorised petroleum activity(ies) may only be used for dust suppression as provided for in condition (H13) provided that:
- (a) the water quality meets the limits specified in Schedule H, Table 1 – Dust suppression water contaminant release limits
 - (b) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority.

Schedule H, Table 1 – Dust suppression water contaminant release limits

Water Quality Characteristics	Unit	Limit	Limit Type
pH	ph Units	6.0 to 9.0	Range
Sodium adsorption ratio	ratio	8	80 th percentile
		12	Maximum
Total dissolved solids	mg/L	2000	Maximum
Total petroleum hydrocarbons	mg/L	10	Maximum

- (H15) Use of **coal seam gas water** for dust suppression in accordance with conditions (H13) and (H14) must be carried out in a manner such that:
- (a) vegetation is not damaged; or
 - (b) soil quality is not adversely impacted; or
 - (c) there is no surface ponding or runoff of the coal seal gas water from the application area; or
 - (d) deep drainage below the root zone of any vegetation is minimised; or
 - (e) the quality of shallow aquifers is not adversely affected; or
 - (f) there are no release of **coal seam gas water** to **waters**.

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Brine and Salt Management

- (H16) Following the completion of the petroleum activity(ies), any residual **brine** and / or solid salt present in any **dam** must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994*.

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SCHEDULE I – REHABILITATION

Rehabilitation Plan

- (I1) A Rehabilitation Plan which has been **certified** by a **suitably qualified person** must be developed prior to the carrying out of the petroleum activity(ies).
- (I2) The Rehabilitation Plan must include strategies for the determination of final land use(s) and **rehabilitation** goals and details of how **rehabilitation** objectives will be achieved. The Rehabilitation Plan must include:
 - (a) a rehabilitation hierarchy for:
 - (i) reinstating a native ecosystem as similar as possible to the original ecosystem as the preferred option; then
 - (ii) establishing an alternative outcome with a higher environmental value than the previous land use; then
 - (iii) reinstating the previous land use (e.g. grazing or cropping); and
 - (b) methods to achieve **rehabilitation** goals including, but not necessarily being limited to:
 - (i) establishing final land use(s) in consultation with affected landholder(s) and the administering authority;
 - (ii) identifying suitable **analogue**¹ **sites** to measure **rehabilitation** success that may either be the pre-disturbed area or another area that has equivalent values and characteristics as the intended final land use(s); and
 - (iii) for sites that are being reinstated to a land use other than a native ecosystem, the Rehabilitation Plan must identify any additional and relevant indicators to be measured at both the **analogue** and **rehabilitation** site(s) so as to assess progressive and final **rehabilitation** success for that land use;
 - (iv) for sites that are being reinstated to native ecosystems and the **analogue site** is the pre-disturbed site, the Rehabilitation Plan must include indicators that, as a minimum include those in condition (E3)(a) – (E3)(d) and will be able to measure success against the progressive and final **rehabilitation** criteria in this environmental authority;
 - (v) identification of any land use constraints which have resulted from the petroleum activity(ies);
 - (vi) residual pollution risks with strategies for managing and mitigating them;
 - (vii) landscape planning and landform design principles to achieve **stable** landforms including slope designs, erosion controls and drainage lines;
 - (viii) integrating rehabilitated areas so they are compatible with the surrounding landscape, including linking rehabilitated areas of native vegetation with undisturbed native vegetation to provide larger areas and wildlife corridors where feasible;
 - (ix) ensuring that **significantly disturbed areas** are rehabilitated progressively and that the progressive **rehabilitation** criteria are routinely measured;
 - (x) site preparation such as re-profiling, re-instating surface drainage systems;
 - (xi) **top soil** management such as **top soil** handling and stockpiling to preserve soil fertility and biota, respreading techniques, planned thickness, ripping, **top soil** treatments / amendments and mulching in consideration of **analogue** data;
 - (xii) flora to be established, including required species diversity, abundance and composition and projective cover in consideration of **analogue** data;
 - (xiii) plant propagation and / or supply methods including using seeds / spores of local provenance where feasible;

¹ The latest version of the Qld Government's "Biocondition, a Condition Assessment Framework for Terrestrial Biodiversity in Queensland, Assessment Manual" and accompanying document "Methodology for the Establishment and Survey of Reference Sites for Biocondition" may be used to establish suitable analogue sites for like native vegetation communities.



- (xiv) establishment methods to maximise **rehabilitation** success such as seed treatments, seed spreading, timing of seeding to suit best local climatic conditions, hydroseeding, transplanting;
- (xv) weed control;
- (xvi) sourcing habitat structures for native fauna and installation methods in consideration of matching **analogue** data;
- (xvii) on going maintenance program for rehabilitated areas; and
- (xviii) rehabilitation monitoring program as required by conditions (I13) and (I14) of this environmental authority; and
- (c) timeframes for commencing **rehabilitation** of **significantly disturbed areas** that are not required for the ongoing conduct of the petroleum activity(ies), not greater than three (3) **months** for the **rehabilitation** of buried pipelines and not greater than nine (9) **months** for any other **significantly disturbed area**.

(I3) The holder of this environmental authority must implement the Rehabilitation Plan.

Progressive Rehabilitation for Significantly Disturbed Land

- (I4) Pipelines trenches must be backfilled immediately after pipe laying and rehabilitated as soon as practicable but not longer than three (3) **months** after completion.
- (I5) During backfilling of pipeline trenches, soils must be replaced so that the soil horizons are consistent with the soil horizons of the immediately surrounding area.
- (I6) Backfilled and rehabilitated pipeline trenches must:
 - (a) be a **stable** landform;
 - (b) exhibit no subsidence or erosion gullies for the life of the operational pipeline; and
 - (c) be re-profiled to a level consistent with surrounding soils; and
 - (d) be re-profiled to original contours and established drainage lines; and
 - (e) be visually consistent with the surround land features; and
 - (f) be vegetated with groundcover as a minimum to ensure that erosion is minimised.
- (I7) Progressive **rehabilitation** of **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) (other than constructing pipelines) which is not required for the ongoing conduct of the petroleum activity(ies) must commence as soon as practicable, but not longer than nine (9) **months** following the completion of any **construction** or operational works associated with the petroleum activity(ies).
- (I8) Progressive **rehabilitation** of **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) must be undertaken in accordance with the Schedule of Disturbance as submitted to the administering authority as part of the financial assurance calculations.
- (I9) Progressive **rehabilitation** of **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) must:
 - (a) remediate any contaminated land (e.g. contaminated soils, decommissioned **dams** containing salt);
 - (b) reshape all **significantly disturbed land** to a **stable** landform;
 - (c) reprofile all **significantly disturbed land** to original contours;
 - (d) on all **significantly disturbed land**:
 - (i) re-establish surface drainage lines;
 - (ii) reinstate the top layer of the soil profile;
 - (iii) establish groundcover to ensure that erosion is minimised;
 - (iv) establish vegetation of floristic species composition found in **analogue sites**;
 - (e) undertake **rehabilitation** in a manner such that any actual and potential **acid sulfate soils** in or on the site are either not disturbed, or submerged, or are treated to prevent and / or minimise environmental harm.

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Final Acceptance Criteria for Significantly Disturbed Land

(I10) All **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) must be rehabilitated to meet the following final acceptance criteria:

(a) For all land use(s):

- (i) all **significantly disturbed land** is reinstated to the pre-disturbed soil suitability class;
- (ii) the landform is safe for humans and fauna;
- (iii) the landform is **stable** with no subsidence or erosion gullies for at least three (3) **years**;
- (iv) all **significantly disturbed land** is reinstated so that the distribution of vegetation communities represents the **analogue site**;
- (v) the water quality of any residual **void** or water bodies constructed by the petroleum activity(ies) meets criteria for subsequent uses and does not have potential to cause environmental harm;
- (vi) there is no ongoing contamination to **waters**;
- (vii) there is no ongoing contamination to groundwater from **dams** or monocells (demonstrated via groundwater monitoring and leak detection monitoring systems); and
- (viii) the maintenance requirements for rehabilitated land is no greater than that required for the land prior to its disturbance caused by carrying out the petroleum activity(ies).

(b) Additional requirements for sites that are being reinstated to native ecosystems:

- (i) each vegetation community must be re-established so that each of the following **rehabilitation** parameters are maintained for at least three (3) **years**;
- (ii) the rehabilitated site shows distinct and progressive re-establishment of the various strata which characterise the vegetation community in the **analogue site**;
- (iii) all dominant species within each strata are re-established at densities equivalent to that of the **analogue site**;
- (iv) notwithstanding (I10)(b)(i) and (I10)(b)(ii), a minimum of 70% **species richness** and **species diversity** is observed when compared to the relevant **analogue site**;
- (v) a minimum of 50% **foliage cover** is observed when compared to the relevant **analogue site**;
- (vi) each vegetation community must be rehabilitated and maintained until it can be demonstrated that it is resilient and self-sustaining; and
- (vii) percent organic litter cover, count and density of hollow bearing logs and nest boxes (as replacement for trees with hollows $\geq 10\text{cm}$ diameter) and fallen woody material (total length of logs $\geq 10\text{ cm}$ diameter per hectare and number of logs $\geq 10\text{cm}$ per hectare) have been installed at numbers and densities no lower than the **analogue site**.

(I11) Notwithstanding condition (I10), all buried pipelines must be decommissioned in accordance with the requirements of **Australian Standard 2885**, as amended from time to time.

(I12) Despite condition (I10), any dam may be decommissioned for a **beneficial use** provided that it:

- (a) no longer contains contaminants that will migrate in to the environment; and
- (b) the administering authority and the landholder agree in writing that the **dam** will be used by the landholder following the cessation of the petroleum activity(ies).

Rehabilitation Monitoring Program

(I13) A Rehabilitation Monitoring Program which has been **certified** by a **suitably qualified person** must be developed by 9 December 2011.



- (I14) The Rehabilitation Monitoring Program must include, but not necessarily be limited to:
- (a) methods to measure subsidence and erosion rates at rehabilitated buried transmission pipeline corridors and buried flow lines;
 - (b) monitoring of indicators identified in the Rehabilitation Plan at **analogue sites** to measure progressive and final **rehabilitation** success relevant to the final land use(s); and
 - (c) frequency and seasonality of monitoring **analogue sites** and rehabilitated areas to assess **rehabilitation** success; and
 - (d) identification of the experimental design for analysing **analogue** and rehabilitated site data including statistical methods of analyses.
- (I15) The holder of this environmental authority must implement the Rehabilitation Monitoring Program.

Monitoring of Progressive Rehabilitation

- (I16) Regular maintenance and at least yearly monitoring of rehabilitated areas must take place to measure compliance with condition (I6) and (I9).

Monitoring of Final Rehabilitation Success

- (I17) Final acceptance criteria are deemed to be met when monitoring of rehabilitated areas demonstrate compliance with the requirements of condition (I10) for three (3) consecutive **years**.

Rehabilitation Reporting for Relinquishment of Part of an Authority to Prospect Area

- (I18) Prior to relinquishing part of an authority to prospect area, the holder of this environmental authority must prepare a rehabilitation report which specifically relates to the area to be relinquished and which:
- (a) reports on the condition of the area to be relinquished against the requirements of conditions (I10) and (I11) of this environmental authority; and
 - (b) includes the results of all rehabilitation monitoring undertaken in the area to be relinquished in accordance with the Rehabilitation Monitoring Program and conditions (I16) and (I17) of this environmental authority.
- (I19) The report required under condition (I18) must be submitted to the administering authority twenty (20) **business days** prior to the relinquishment notice being lodged with the administering authority of the *Petroleum and Gas (Production and Safety) Act 2004*.

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SCHEDULE J – STIMULATION ACTIVITIES

Well Drilling, Completion and Stimulation

- (J1) **Oil based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J2) **Synthetic based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J3) **Stimulation** activities are not permitted.



SCHEDULE K – COMMUNITY ISSUES

- (K1) The holder of this environmental authority must maintain a record of all **valid complaints** and incidents causing environmental harm, and actions taken in response to the **valid complaint** or incident.
- (K2) The holder of this environmental authority must record the following details for all **valid complaints** received:
- (a) name, address and contact number for valid complainant;
 - (b) time and date of **valid complaint**;
 - (c) reasons for the complaint as stated by the valid complainant;
 - (d) investigations undertaken in response to the **valid complaint**;
 - (e) conclusions formed;
 - (f) actions taken to resolve the **valid complaint**;
 - (g) any abatement measures implemented to mitigate the cause of the **valid complaint**; and
 - (h) name and contact details of the person responsible for resolving the **valid complaint**.



SCHEDULE L - NOTIFICATION PROCEDURES

- (L1) The holder of this environmental authority must telephone the Department of Environment and Resource Management's Pollution Hotline (telephone: 1300 130 372) and any affected landholder, occupier or their nominated representative as soon as reasonably practicable, but within 24 hours after becoming aware of:
- (a) a release of contaminants as provided for in condition (L3); or
 - (b) any event where environmental harm (excluding environmental nuisance) has been caused or may be caused; or
 - (c) any detection of **restricted stimulation fluids** from **stimulation** fluid monitoring; or
 - (d) any result from baseline **bore**, well or **stimulation** water impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource.
- (L2) Notwithstanding condition (L1), the holder of this environmental authority must telephone the Department of Environment and Resource Management's Pollution Hotline (telephone: 1300 130 372) as soon as reasonably practicable, but within 24 hours after becoming aware of:
- (a) any non-compliance with any condition of this environmental authority other than in relation to a release of contaminants; or
 - (b) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (c) when the level of the contents of any **regulated dam** reaches the **mandatory reporting level**; or
 - (d) when a **regulated dam** will not have available storage to meet the **design storage allowance** on the 1 November of any year; or
 - (e) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during **stimulation** increases by more than 3.5 MPa from the pressure immediately preceding **stimulation**).
- (L3) Subject to condition (L1), the holder of this environmental authority must report spills of contaminants (including but not limited to hydrocarbons, **coal seam gas water**, **stimulation fluids** or any mixtures) of the following volumes or kind:
- (a) releases of any volume of contaminants to water;
 - (b) releases of volumes of contaminants to land greater than:
 - (i) 200L of hydrocarbons; or
 - (ii) 200 L of **stimulation** additives; or
 - (iii) 500 L of **stimulation fluids**; or
 - (iv) 1000 L of **brine**; or
 - (v) 5 000 L of **coal seam gas water**;
 - (c) releases of any volumes of contaminants where potential serious or material environmental harm has occurred or may occur.
- (L4) The notification of emergencies or incidents as required by conditions (L1), (L2) and (L3) must include but not be limited to the following information:
- (a) the environmental authority number and name of the holder;
 - (b) the tenure type and number where the emergency or incident occurred;
 - (c) the name and telephone number of the designated contact person;
 - (d) the location of the emergency or incident (GDA94);
 - (e) the date and time that the emergency or incident occurred;
 - (f) the date and time the holder of this environmental authority became aware of the emergency or incident;
 - (g) details of the nature of the event and the circumstances in which it occurred;
 - (h) the estimated quantity and type of any contaminants involved in the incident;
 - (i) the actual or potential suspected cause of the emergency or incident;
 - (j) a description of the land use at the site of the emergency or incident (e.g. grazing, pasture, forest etc) and / or the name of any relevant **waters** and other environmentally sensitive features;

- (k) a description of the possible impacts from the emergency or incident;
 - (l) a description of whether stock and / or wildlife were actually or potentially exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
 - (m) any sampling conducted or proposed, relevant to the emergency or incident;
 - (n) landholder details and details of landholder consultation;
 - (o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
 - (p) whether further examination / root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.
- (L5) Within 10 **business days** following the initial notification, unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):
- (a) the information required by condition (L4);
 - (b) the root cause of the emergency or incident;
 - (c) the confirmed quantities and types of any contaminants involved in the incident;
 - (d) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
 - (e) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
 - (f) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
 - (g) results and current status of landholder consultation, including commitment to resolve any outstanding issues / concerns; and
 - (h) actions and / or procedural changes to prevent a recurrence of the emergency or incident.
- (L6) As soon as reasonably practicable, but not more than 24 hours, after becoming aware of one of the circumstances described in conditions (J6) or (J7) that relate to **stimulation** activities, the holder of this environmental authority must give written notice of the event, its nature and the circumstances in which it happened to;
- (a) the administering authority; and
 - (b) each owner and occupier of land that is, has been, or is reasonably likely to be, affected by the event.
- (L7) As soon as reasonably practicable after the notification in condition (L6), the holder of this environmental authority must give the administering authority written notice of:
- (a) the rectification measures implemented under condition (J10);
 - (b) the results of any monitoring carried out on those rectification measures; and
 - (c) the success of the rectification measures implemented.
- (L8) Within 10 **business days** following the initial notification of an emergency or incident or receipt of monitoring results indicating any significant changes in groundwater quality caused by the petroleum activity(ies) other than that relating to the circumstances described in condition (J7), then the analysis results indicating these changes, including any proposed actions to mitigate the changes in groundwater quality information must be submitted to the administering authority.
- (L9) If groundwater contamination caused by the petroleum activity(ies) is encountered, the following must be reported to satisfy requirements under condition (L8):
- (a) the level of environmental harm caused as a result of such contamination to soils and groundwater;
 - (b) the conduct of a geodetic survey of all monitoring **bore**s to determine the relative water surface elevations of each bore and reported in metres relative to the **AHD**; and
 - (c) the determination of groundwater flow direction, groundwater flow rate and hydraulic conductivity.

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SCHEDULE M - DEFINITIONS

*Note: Terms which are defined in this environmental authority are **bolded** throughout. 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.*

"acid sulfate soils" means soil or sediment containing highly acidic soil horizons or layers affected by the oxidation of iron sulfides (*actual acid sulfate soils*) and / or soil or sediment containing iron sulfides or other sulfidic material that has not been exposed to air and oxidised (*potential acid sulfate soils*). The term acid sulfate soil generally includes both actual and potential acid sulfate soils. Actual and potential acid sulfate soils are often found in the same soil profile, with actual acid sulfate soils generally overlying potential acid sulfate soil horizons.

"accepted engineering standards", in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the Australian National Committee on Large Dams (ANCOLD), guidelines published by Queensland government departments and relevant Australian and New Zealand Standards.

"active" for the purposes of landholders' groundwater bores means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use.

"aggregation dam" means a regulated dam that receives and contains coal seam gas water or coal seam gas 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 arrangement may include, but not necessarily be limited to a range of noise abatement measures to be installed at a sensitive receptor and / or provision of alternative accommodation for the duration of the defined noise nuisance impact.

"analogue site" means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters such as that ground truthing assessment 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.

"appraisal well" means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.

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



- any kind and all things associated with the construction and operation of a dam; and
- any land used for those operations.

“Australian Standard 1055” means Australian Standard 1055.1:1997 “Description and Measurement of Environmental Noise – General procedures”.

“Australian Standard 2187” means Australian Standard 2187.0:1998 “Explosives—Storage, transport and use, Part 0”, Australian Standard 2187.1:1998 “Explosives—Storage, transport and use Part 1” and Australian Standard 2187.2:2006 “Explosives—Storage and use, Part 2” or any updated versions that becomes available from time to time.

“Australian Standard 2885” means Australian Standard 2885.0:2008 “Pipelines – Gas and Liquid Petroleum General Requirements”, Australian Standard 2885.1:2007 “Pipelines – Gas and Liquid Petroleum Design and Construction” and Australian Standard 2885.3:2001 “Pipelines – Gas and Liquid Petroleum Operation and Maintenance”, or any updated versions that becomes available from time to time.

“Australian Standard 4323” means Australian Standard 4323.1:1995 “Stationary source emissions method 1: Selection of sampling positions”.

“Australian / New Zealand Standard 5667.11” means Australian / New Zealand Standard 5667.11:1998 “Water Quality – Sampling – Guidance on sampling at Groundwaters”.

“Australian / New Zealand Standard 5667.12” means Australian / New Zealand Standard 5667.12:1999 “Guidance on Sampling of Bottom Sediments” for permanent, semi-permanent water holes and water storages”.

“authorised person” means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive or chief executive officer of a local government.

“background noise level” means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

“bed and banks” for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

“beneficial use” means

- with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Environmental Protection Act 1994*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - the transfer and use have been approved or authorised under any relevant legislation. Or
- with respect to coal seam gas water, refer to the Department of Environment and Resource Management’s “Operational Policy - Management of water produced in association with petroleum activities” and “Notice of decision to approve a resource for beneficial use – CSG water” as amended from time to time which can be accessed on the Department of Environment and Resource Management’s website at www.derm.qld.gov.au.

“black earth” means a type of soil, also known as vertosols and is a soil order of the Australian Soil Classification. These are clay soils with shrink / swell properties that display strong cracks when dry and / or lenticular structural aggregates at depth. They have high soil fertility and a large water holding capacity.

“bore” means a water observation bore or a water supply bore that is either sub-artesian or artesian.

“brine” means saline water with a total dissolved solid concentration greater than 40 000 mg/l.

“brine dam” means a regulated dam that is designed to receive, contain or evaporate brine.

“bund or banded” in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

“business day” has the meaning in the *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 Section 25 of the *Environmental Protection Regulation 2008*.

“Category B Environmentally Sensitive Area” means any area listed in Section 26 of the *Environmental Protection Regulation 2008*.

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

- Nature Refuges as defined 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*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*;
- An area identified as “Essential Habitat” or “Essential Regrowth Habitat” under the *Vegetation Management Act 1999* for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*; or
- Of Concern Regional Ecosystems identified in the database maintained by the Department of Environment and Resource Management called ‘RE description database’ containing Regional Ecosystem numbers and descriptions.

“certification or certified by a suitably qualified and experienced person” in relation to a design plan, ‘as constructed’ drawings or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- exactly what is being certified and the precise nature of that certification.
- the relevant legislative, regulatory and technical criteria on which the certification has been based;
- the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

“certify” or “certification” or “certified” in relation to any matter other than a design plan, ‘as constructed’ drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that:

- all relevant material has been considered in the written document; and
- that the content of the written document is accurate and true; and
- that the written document meets the requirements of the relevant conditions of the environmental authority.

“clearing” for vegetation means removing, cutting down, ringbarking, pushing over, poisoning or destroying in any way including by burning, flooding or draining; but does not include destroying standing vegetation by stock, or **lopping** a tree.

RNL

"coal seam gas water" means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. CSG water is a waste, as defined under s13 of the EP Act.

"coal seam gas water concentrate" means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.

"coal seam gas water dams" include any type of dam (storage or evaporation) used to contain groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production.

"coal seam gas evaporation dam" is defined as a impoundment, enclosure or structure that is designed to be used to hold coal seam gas water for evaporation.

"construction" in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.

"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).

"design plan" is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.

"design storage allowance or DSA" means an available volume, estimated in accordance with the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.

"development well" means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.

"discharge area" means:

- that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- identified by an assessment process consistent with the document "Salinity Management Handbook" Queensland Department of 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).

"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.

"end" means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related petroleum activities such as rehabilitation. In other words, it does not refer to the 'completion' of the petroleum activity(ies), the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority.

BWMC

“equivalent person or EP” means an equivalent person under volume 1, section 2 of the “Guidelines for Planning and Design of Sewerage Schemes”, October 1991, published by the Water Resources Commission, Department of Primary Industries, Fisheries and Forestry.

“evaporation dam” means a land based structure designed to contain or impound coal seam gas water, the purpose of which is to contain or impound the water.

“existing aggregation dam” means *[insert names and locations of aggregation dams that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“existing brine dam” means *[insert names and locations of brine dams that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“existing dam” means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on *[insert the approval date of this environmental authority]*.

“existing coal seam gas evaporation dam” means *[insert names and locations of existing dams containing coal seam gas water for the primary purpose of evaporation that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“existing low hazard dam” means *[insert names and locations of existing low hazard dams that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“exploration well” means a petroleum well that is drilled to:

- explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or
- obtain stratigraphic information for the purpose of exploring for petroleum.

For clarity, an exploration well does not include an appraisal or development well.

“exploring for petroleum” means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the *Petroleum and Gas (Production and Safety) Act 2004* for example including:

- conducting a geochemical, geological or geophysical survey;
- drilling a well;
- carrying out testing in relation to a well;
- taking a sample for chemical or other analysis.

“fill” means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.

“floodplain” has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that—

- is covered from time to time by floodwater overflowing from the watercourse; and
- does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.

“flowable substance” means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

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"foreseeable future" means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the **end** of a 150 year foreseeable future with an acceptably low probability of failure before that time.

"hazard category" means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time.

"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.

"high value regrowth" vegetation means

- any of the following:
 - an endangered regional ecosystem;
 - an of concern regional ecosystem;
 - a least concern regional ecosystem; and
- have not been cleared since 31 December 1989; and
- is shown on a regrowth vegetation map.

"hub" means more than one unit of fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined, located within five (5) km of any other fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined.

"hydraulic performance" means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time..

"impulsive noise" means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.

"infrastructure" means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps.

Infrastructure does not include other facilities required for the long term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation dams), pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.

" $L_{Aeq, adj, 15 mins}$ " means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.

" $L_{A 90, adj, 15 mins}$ " 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).

"leachate" means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of on site which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

"levee" means a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of

DMC

those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or **flowable substances** at any other times.

"limited petroleum activities" mean only the following petroleum activities:

- **well sites** not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance. Well sites may include the following infrastructure:
 - 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;
 - temporary campsites for the purpose of establishing the limited petroleum activity;
- geophysical surveys (including seismic petroleum activities);
- ecological geological surveys (including seismic petroleum activities);
- gathering / flow pipelines from a well head to the initial compression facility;
- supporting access tracks; and
- communication and power lines that are necessary for the undertaking of petroleum activities and that are located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities.

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

- the construction of infrastructure for processing or storing petroleum or by-products;
- low hazard dams (that do not meet the limitations prescribed above);
- regulated dams;
- borrow pits;
- compressor stations;
- campsites / workforce accommodation;
- pipelines which are used to transport gas after the initial compression facility (e.g. trunk pipelines, transmission pipelines or pipelines that require a pipeline licence) except for those pipelines authorized under the conditions of Schedule D of the Environmental Authority;
- waste disposal; or
- other supporting infrastructure for the project (e.g. sewage treatment plants).

"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—

- removing its trunk; and
- cutting or pruning its branches so severely that it is likely to die.

"low hazard dam" means any dam that is:

- not classified as high or significant as assessed using the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time; and
- that contains contaminants in concentrations which exceed the values or range shown in Table 3 of the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time at any time.

"low impact petroleum activities" means limited petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land. Examples of such activities include but are not necessarily limited to soil surveys, topographic surveys, cadastral surveys and ecological surveys and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.



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

"Max $L_{pA, 15 \text{ min}}$ " 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 Hazard Categories and Hydraulic Performance of Dams" prepared by the Department of Environment and Resource Management, as amended from time to time.

"medium term noise event" is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.

"meter" means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe."

"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 (1) 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.

"pest" means species:

- declared under the *Land Protection (Pest and Stock route Management) Act 2002*;
- declared under Local Government model local laws; and
- which may become invasive in the future.

"populated area" includes towns and cities which have a populated of 200 or more people and with a minimum density of 40 people / km².

"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.

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

"regulated dam" means any dam in the significant or high hazard category as assessed using the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time.

"rehabilitation" means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

"regrowth vegetation map" means a map certified by the chief executive as the regrowth vegetation map for the State and showing for the State:

- areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - have not been cleared since 31 December 1989; and

- o particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- o areas the chief executive decides under section 20AI to show on the map as high value regrowth vegetation.

“remnant unit” means a continuous polygon of remnant vegetation (as defined by the QLD Herbarium) representative of a single RE type or a single heterogeneous unit.

“remnant vegetation” means vegetation, part of which forms the predominant canopy of the vegetation—

- o covering more than 50 % of the undisturbed predominant canopy; and
- o averaging more than 70 % of the vegetation’s undisturbed height; and
- o composed of species characteristic of the vegetation’s undisturbed predominant canopy cover.

“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.

“restricted stimulation fluids” means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 81B of the *Environmental Protection Regulation 2008*:

- o petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene; or
- o chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.

The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid.

“secondary protection zone” in relation to a Category A Environmentally Sensitive Area means an area within an 800 metre buffer from the boundary of a **primary protection zone**.

“secondary protection zone” in relation to a Category B or C Environmentally Sensitive Area means a area within a 300 metre buffer from the boundary of a **primary protection zone**.

“sensitive place” means:

- o a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- o a library, childcare centre, kindergarten, school, university or other educational institution;
- o a medical centre, surgery or hospital; or
- o a protected area; or
- o 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
- o a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads.

“sensitive receptor” means an area or place where noise (including low frequency, vibration and blasting) is measured to investigate whether nuisance impacts are occurring and includes:

- o a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- o a library, childcare centre, kindergarten, school, university or other educational institution;
- o a medical centre, surgery or hospital; or
- o a protected area; or
- o 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
- o 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 (7)

days. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.

“significantly disturbed land or significant disturbance to land or significant disturbance” means disturbance to land as defined in section 28 of the *Environmental Protection Regulation 2008*.

“species richness” means the number of different species in a given area.

“species diversity” means the diversity within an ecological community that incorporates both species richness and the evenness of species' abundances.

“spring” means the land to which water rises naturally from below the ground and the land over which the water then flows.

“spillway” means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.

“stable” in relation to land, means landform dimensions are or will be stable within **tolerable limits** now and in the **foreseeable future**. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, **leachate** and related contaminant generation.

“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 / hydrofracturing, 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.

“stimulation impact zone” means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.

“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 a hazard 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 at any time:

- exactly what has been assessed and the precise nature of that assessment;
- the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- 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
- the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

“suitably qualified and experienced person” in relation to dams means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the Professional Engineers Act 1988, or registered as a National Professional Engineer (NPER) with the Institution of Engineers Australia, or holds equivalent professional qualifications to the satisfaction of the administering authority for the *Environmental Protection Act 1994*, and the administering authority for the *Environmental Protection Act 1994* is satisfied that person has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

- knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- a total of five (5) years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry, and
- a total of five (5) years of suitable experience and demonstrated expertise each, in three (3) of the following categories:

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- investigation and design of dams.
- construction, operation and maintenance of dams.
- hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology.
- hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes.
- hydrogeology with particular reference to seepage, groundwater.
- solute transport processes and monitoring thereof.
- dam safety.

“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.

“third party auditor” means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority

“threatening processes” means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).

“tolerable limits” means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).

“top soil” means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300 mm in depth from the natural surface.

“transmissivity” means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.

“trenchless methods” means construction methods for the installation of pipelines and cables below the ground with minimal excavation. Trenchless methods can include, but not necessarily be limited to:

- moling
- pipe ramming method
- horizontal directional drilling
- utility tunneling, pipe jacking, auger boring
- microtunnelling and pipe jacking
- on-line replacement

“unacceptable risk” means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 “Risk Management” or any updated version that becomes available from time to time.

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

“void” means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

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



“well site” means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.

“wetland” means a wetland as defined under the Queensland Wetlands Program and are areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres. To be classified as a wetland, the area must have one or more of the following attributes:

- at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

For the purposes of Chapter 5A activities, wetlands do not include springs and watercourse and those wetlands that are defined in the document entitled *“Wetland Mapping and Classification Methodology”* (Department of Environment and Resource Management, 2005) as:

- H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel;
- H2M3p Ponded pastures;
- H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (e.g. cropping);
- H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage;
- H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;
- H3C1 Artificial stand-alone water storages not within a natural water body or channel; or
- H3C2 Artificial Channel drain / canal –bore drains, swales, **bores** and irrigation channel overflows / ponding.

“year” means a period of 12 months.

“80th percentile” in relation to release limits means that not more than one (1) of the measured values is to exceed the stated release limit for any five (5) consecutive samples where:

- the consecutive samples are taken over a five (5) **month** period; and
- the consecutive samples are taken at approximately equal periods.

End of Environmental Authority

RMK