Permit[1]

Environmental Protection Act 1994

Environmental authority

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

Permit[1] number: EPPR00450013

Environmental authority takes effect on 18-DEC-2015.

The anniversary date of this environmental authority remains 30 April. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder

Name	Registered address
MRV Tarong Basin Coal Pty Ltd	Suite 8, Level 2, 113 Wickham Terrace SPRING HILL QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity	Location
Mining - Mineral development - site specific	MDL385

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.

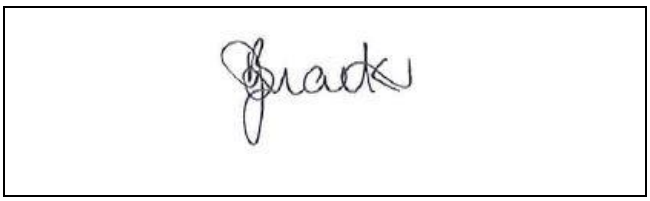
A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

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,

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

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

17 March 2016

Date

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

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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

All reasonable steps must be taken to ensure the activity complies with the eligibility criteria.

The conditions of approval for this environmental authority are site-specific and are listed below:

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)

This environmental authority consists of the following schedules:

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

SCHEDULE A – GENERAL CONDITIONS

Prevent and / or Minimise Likelihood of Environmental Harm

(A1) In carrying out the activities to which this approval relates, you must take all reasonable and practicable measures to prevent and / or to minimise the likelihood of environmental harm being caused. Any activity that, if carried out incompetently or negligently may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this approval.

NOTE: This approval does not authorise environmental harm unless a condition contained within this approval explicitly authorises that harm. Where there is no condition or the approval is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

Financial Assurance

(A2) Prior to any changes in activities which would result in an increase to the maximum significant disturbance since financial assurance was last given to the administering authority, the holder of the environmental authority must amend the financial assurance and give the administering authority the increased amount of financial assurance.

Maintenance of Measures, Plant and Equipment

(A3) The holder must:

(a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; and

(a) maintain such measures, plant and equipment in a proper condition; and

(b) operate such measures, plant and equipment in a proper manner.

Monitoring

(A4) Record, compile and keep for a minimum of five years all monitoring results required by this environmental authority and make available for inspection all or any of these records upon request by the administering authority.

(A5) Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

Notification of Emergencies and Incidents

(A6) As soon as practicable after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this environmental authority, the administering authority must be notified of the release by telephone or facsimile.

Storage and Handling of Flammable and Combustible Liquids

(A7) Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm (other than trivial harm) and maintained in accordance with Section 5.9 of AS 1940 - Storage and Handling of Flammable and Combustible Liquids of 1993.

Definitions

(A8) Words and phrases used throughout this environmental authority are defined in Attachment A – Definitions. Where a definition for a term used in this environmental authority is sought and the term is not defined within this environmental authority, the definitions in the *Environmental Protection Act 1994*, its Regulations and Environmental Protection Policies must be used.

Scope of Approved Underground Coal Gasification Activities

(A9) All underground coal gasification activities on site are limited to decommissioning, rehabilitation, care and maintenance of the site.

Contingency Procedures for Emergency Environmental Incidents

(A10) 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; and
(g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Exploration Drilling

(A11) Exploration activities within the Mineral Development Licence (MDL) must be undertaken in accordance with all Standard Environmental Conditions contained in the *Code of Environmental Compliance for Exploration and Mineral Development Projects*.

SCHEDULE B – AIR

Dust nuisance

(B1) The release of dust or particulate matter or both resulting from the approved activities must not cause an environmental nuisance at any nuisance sensitive place.

(B2) 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 nuisance sensitive place. The results must be notified within 14 days to the administering authority following completion of monitoring.

Odour nuisance

(B3) Notwithstanding any other condition of this approval, the release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the approved activities must not cause an environmental nuisance at any nuisance sensitive place.

(B4) When requested by the administering authority, odour 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 nuisance sensitive place. The results must be notified within 14 days to the administering authority following completion of monitoring.

(B5) If monitoring indicates Condition (B3) is not being met then the environmental authority holder must:
- (a) immediately implement odour abatement measures so that emissions of odour from the activity do not result in further environmental nuisance; and
- (b) address the complaint including the use of appropriate dispute resolution if required.

Operation of Fuel Burning or Combustion Equipment

(B6) The operation of fuel burning or combustion equipment that is capable of burning more than 500 kg of fuel in an hour is not authorised.

SCHEDULE C – WATER

Release to Waters

(C1) With the exception of releases of stormwater in accordance with Condition (C8), contaminants must not be released to any waters (including groundwater outside the underground coal gasification working cavity) or the bed and banks of any waters.

Water Management System

(C2) Water must be managed to prevent incident stormwater and stormwater run-off from contacting general refuse and regulated wastes at the site.

(C3) Water must be managed to divert upstream run-off away from disturbed areas, or areas containing wastes or contaminants.

(C4) Water from disturbed areas must be captured and managed in accordance with condition (C8) to (C10).

Erosion Protection Measures and Sediment Controls

(C5) All reasonable and practicable erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment. Reasonable and practicable measures are outlined in "Soil and Erosion Control. Engineering Guidelines for Queensland Construction Sites", June 1996 published by the Institution of Engineers, Australia Queensland Division.

(C6) Erosion control and sediment control structures must be maintained at all times during the periods of construction, plant operation, decommissioning and any necessary rehabilitation. The structures must be checked, repaired or replaced as required after each rain event.

(C7) There must be no disturbance to, filling or obstruction of any part of any watercourse.

Stormwater Management

(C8) There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain, unless it complies with the following quality characteristics:

(a) the pH value must not be less than 6.5 and not more than 9.0;
(b) the concentration of dissolved oxygen must not be less than 6 milligrams per litre;
(c) the concentration of suspended solids must not exceed 50 milligrams per litre if an overflow is caused by rainfall and 30 milligrams per litre at all other times;
(d) the concentration of total dissolved solids suspended solids must not exceed 1000 milligrams per litre; and
(e) the release must not produce any slick or other visible evidence of oil or grease, contain visible floating oil, grease, scum, litter or other objectionable matter nor contain other contaminants in concentrations that adversely affects the environmental values of the receiving environment.

(C9) Ponds or other structures used for the collection and /or treatment of stormwater runoff from disturbed areas must be appropriately sized and effectively maintained to avoid releases. Such maintenance measures must include, but not be limited to, the removal of settled solids as often as necessary to maintain the required capacity.

(C10) Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from any pits or other structures used for the storage or treatment of contaminants or wastes.

Water Quality Sampling Methodology

(C11) The method of water sampling required by this environmental authority must comply with that set out in the latest edition of the Department of Environment and Heritage Protection's Water Quality Sampling Manual.

Flammable and Combustible Liquids

(C12) Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm (other than trivial harm) and maintained in accordance with Section 5.9 of AS 1940 - Storage and Handling of Flammable and Combustible Liquids of 1993.

Spillage Control

(C13) Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such wastes, contaminants or material to any external storm water drainage system, roadside gutter or waters. To remove any doubt this condition does not apply to hosing, sweeping, etc of areas and oily materials that drain to an oily-water management system.

Maintenance and cleaning of vehicles

(C14) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas that prevent contaminants being released into any waters

Protection of Groundwater Values

(C15) A groundwater monitoring program must be developed and implemented to characterise background water quality levels within aquifers.

(C16) The groundwater monitoring program required by condition (C15) must be consistent with Schedule B6 of the 'National Environment Protection (Assessment of Site Contamination) Measure 1999'.

(C17) The groundwater monitoring program required by condition (C15) must be developed by a person possessing appropriate qualifications and experience in hydrogeology and groundwater monitoring program design.

(C18) The groundwater monitoring required by condition (C15) must include the monitoring of each of the water quality characteristics identified in Schedule C – Table 2 (Groundwater Monitoring Requirements) at each of the bores identified in Schedule C – Table 2 (Groundwater Monitoring Requirements).

(C19) The groundwater monitoring required by condition (C15) must be undertaken at the minimum frequencies specified for each bore and water quality characteristic specified in Schedule C – Table 2 (Groundwater Monitoring Requirements).

(C20) On any occasion that groundwater samples are obtained as part of the groundwater monitoring program required by conditions (C15), the standing water levels must be measured and recorded to an accuracy of 0.01 metres relative to Australian Height Datum (AHD) for each sample.

(C21) Groundwater levels within the vicinity of the underground coal gasification plant must be monitored and groundwater draw down fluctuations in excess of 2 m per year, not resulting from the pumping of licensed bores, must be notified within 14 days to the administering authority following completion of monitoring.

Schedule C – Table 2 (Groundwater Monitoring Requirements)

Bore (Target Layer)	Water Quality Characteristic	Units	Minimum Frequency
P2 T5058 T5061 (Source Zone)	Total Dissolved Salts	mg/L	Every six months.
	pH	pH units	
	Sulphate	mg/L	
	Ammonia	mg/L	
	Phenols (speciated)	µg/L	
	Total Petroleum Hydrocarbons (speciated)	µg/L	
	BTEX (speciated)	µg/L	
	Polycyclic Aromatic Hydrocarbons (speciated)	µg/L	
	Fluoride	mg/L	
	Cadmium	mg/L	
	Arsenic	mg/L	
	Lead	mg/L	
	Zinc	mg/L	

(C22) The results of each round of groundwater sampling required by condition (C15) must be provided to the administering authority within one month of the completion of sampling.

(C23) An interpretation of the groundwater monitoring results required by condition (C22) must be provided to the administering authority with the results required by condition (C22).

(C24) The interpretation of groundwater monitoring results required by condition (C23) must include a comparison with the relevant 80th percentile water quality values specified in Schedule C – Table 3

(80th Percentile Water Quality Values For Specified Parameters) relevant to that bore and water quality characteristic, if available.

(C25) If a relevant 80th percentile water quality value for that bore and water quality characteristic is not specified in Schedule C – Table 3 (80th Percentile Water Quality Values for Specified Parameters), then the interpretation required by condition (C23) must include a comparison of the groundwater monitoring results with the background water quality levels characterised in condition (C15).

(C26) All sampling of groundwater required by this environmental authority must be undertaken in accordance with the most recent version of the Australian Government 'Geoscience Australia guidelines, Groundwater Sampling and Analysis – A Field Guide'.

Schedule C – Table 3 (80th Percentile Water Quality Values For Specified Parameters)

Bore (Target Layer)	Quality characteristic	80th Percentile Water Quality Values
P2 T5058 T5061 (Source Zone)	Total Dissolved Salts	740 mg/L
	pH	8.2 pH units
	Sulphate	154mg/L
	Ammonia	0.18 mg/L
	Cadmium	0.0003 mg/L
	Arsenic	0.003 mg/L
	Zinc	0.014 mg/L

SCHEDULE D — NOISE

Noise nuisance

(D1) Noise from the activities must not cause an environmental nuisance at any sensitive place.

(D2) 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 in the opinion of an authorised officer is neither frivolous nor vexatious nor based on mistaken belief) of environmental nuisance at any sensitive place, and the results must be notified within 14 days to the administering authority following completion of monitoring.

(D3) Noise Monitoring must include:
- (a) background noise level;
- (b) $L_{Amax,\ adj,\ 15\ mins}$ or where they can be justified as appropriate, $L_{A\ 10,\ adj,\ 15\ mins}$ and $L_{A\ 1,\ adj,\ 15\ mins}$;
- (c) the level and frequency of occurrence of impulsive or tonal noise;
- (d) atmospheric conditions including wind speed and direction;
- (e) effects due to extraneous factors such as traffic noise; and
- (f) location, date and time of recording.

(D4) In the event of a complaint about noise environmental nuisance that the administering authority considers is not frivolous or vexatious, the environmental holder is to develop a noise management plan within two (2) weeks of being advised in writing of the complaint. The noise management plan must address at least, but not be limited to, the following matters:
- (a) identification of component noise sources and activities at the place(s) which impact on noise sensitive areas;
- (b) the measured and/or predicted level of these noise sources and activities at noise sensitive places;
- (c) the reasonable and practicable control or abatement measures that can be undertaken to reduce identified intrusive noise sources;
- (d) the level of noise at noise sensitive places that would be achieved from implementing these measures.
- (e) the handling of future noise complaints;
- (f) community liaison and consultation; and
- (g) training of staff in noise management practices.

(D5) Upon the completion of the noise management plan it must be submitted to the administering authority within 14 days for its review and comment.

(D6) The activities must be carried out by such reasonable and practicable means necessary to prevent the emission of noise that constitutes an environmental nuisance. The reasonable and practicable measures adopted may include but not necessarily be limited to the following noise abatement measures:
- (a) ensure that any equipment to be used is assessed for potential noise nuisance impacts and appropriately attenuated;
- (b) ensure that all plant and equipment is operated and maintained in a proper and efficient manner;

(c) ensure that engine cowlings and high efficiency silencers are fitted to all the engines of all plant and equipment identified as impacting on noise sensitive receivers;
(d) ensure that noise generating activities are not undertaken in close proximity to noise sensitive places or commercial places;
(e) ensure that, where required, noise abatement barriers are sited such that they effectively intercept the sound transmission path between the sources of noise and receptor premises;
(f) locate access routes within the premises as far away from sensitive places as is practical having regard to operational convenience; and
(g) where operation of reversing beepers is likely to cause environmental nuisance, taking measures to ensure mitigation of the nuisance, for example by de-tuning the reversing beepers, replacing the reversing beepers with other warning devices and/or replacing reversing beepers with alternative reversing beepers which adjust their noise level output in accordance with the prevailing background noise level.

SCHEDULE E – WASTE

General

(E1) Waste must not be released to the environment, stored, transferred or disposed of contrary to any condition of this environmental authority.

(E2) Except as otherwise provided by the conditions of this authority, all disposal of waste generated in carrying out the approved activities must be to a proper and appropriate facility that is authorised to accept such waste.

Regulated Waste Handling

(E3) All regulated waste (including sewage) must be removed from the site by a person who holds an appropriate approval to transport such waste under the provisions of the *Environmental Protection Act 1994* (Qld) or equivalent interstate legislation, and must be disposed of at a facility authorised to accept such waste.

SCHEDULE F – LAND

Preventing Contaminated Land

(F1) There must be no releases of contaminants to land that may cause the land to become contaminated land.

Decommissioning of the Underground Coal Gasification Facility

(F2) A decommissioning procedure must be developed for the underground coal gasification pilot plant.

(F3) The procedure required by condition (F2) must:
- (a) detail steps that will be taken to cease combustion /gasification of coal underground;
- (b) detail tests that will be completed during and following the shutdown process to confirm that combustion and/or pyrolysis of coal has ceased; and
- (c) ensure that on shutdown the cavity is flushed using proven processes to ensure removal of residual pollutants.

(F4) The procedure detailed in condition (F2) must be implemented immediately on cessation of the underground coal gasification trial or if otherwise requested by the administering authority.

Rehabilitation Criteria

(F5) Prior to commencing activities authorised by this approval, the following surveys must be undertaken for any areas to be disturbed:
- (a) survey of topsoil to determine its suitability for use in rehabilitation;
- (b) survey of land suitability;
- (c) baseline ground level surveys;
- (d) survey of flora, fauna and nature conservation values; and
- (e) survey of cultural heritage values.

(F6) All areas disturbed as a result of the approved activities must be rehabilitated to a stable, non-polluting landform with a self-sustaining vegetation cover in accordance with Schedule F – Table 1 (Landform Design and Suitability Criteria), and must comply with the maximum distance between erosion control structures specified in Schedule F – Table 2 (Maximum distance between erosion control structures).

(F7) Progressive rehabilitation in accordance with the conditions of this schedule must commence as soon as areas become available within the operational land.

Final Land Use and Rehabilitation Plan

(F8) The holder of this environmental authority must develop and implement a Final Land Use and Rehabilitation Plan to ensure that all areas disturbed by approved activities will be suitably rehabilitated in accordance with Schedule F – Table 1 (Landform Design and Suitability Criteria) and the other conditions of this environmental authority. The Plan must include, but is not limited to the following:
- (a) disturbance type;

(b) disturbance area;
(c) pre and post mine land descriptions;
(d) pre mine and post mine land suitability;
(e) proposed vegetation species;
(f) a description of rehabilitation management techniques incorporating works and monitoring programs and timetables (including monitoring subsidence of ground within disturbed areas for at least 12 months following cessation of underground coal gasification);
(g) indicators for success; and
(h) keeping of appropriate records of rehabilitation measures implemented including taking of photographs demonstrative of rehabilitation achieved and the preparation of annual rehabilitation progress reports. A summary of the annual rehabilitation progress report must be submitted to the administering authority with each annual return.

(F9) The holder of this authority must submit a copy of the Final Land Use and Rehabilitation Plan, as required by condition (F8), to the administering authority, and in finalising the plan must have due regard to comments made by the administering authority.

(F10) This plan must be submitted on or before 1 March 2011 or within 3 months following the cessation of the underground coal gasification trial; whichever occurs first.

Grazing Pasture / Agricultural Crops Outcome

(F11) Areas which are to be rehabilitated to productive land use, including but not limited to cropping, forestry or grazing, must comply with the following outcomes:
(a) generate vegetation with projective cover, species composition and species distribution similar to what existed prior to disturbance; and
(b) landforms are stable and have been reshaped as close as practicable to the landform of the site prior to the commencement of activities associated with the underground coal gasification;
(c) topsoil on rehabilitated areas is reinstated to a depth that is consistent with the depth of topsoil on the site prior to the commencement of activities associated with the underground coal gasification; and
(d) measures of productivity (e.g. sustainable dry matter production of pasture species, sustainable yield for crop species) are similar to what existed prior to underground coal gasification activities.

(F12) Prior to surrendering this authority, an investigation into rehabilitated areas must be conducted and a report submitted to the administering authority proposing acceptance criteria to meet the outcomes specified in condition (F6) and Schedule F – Table 1 (Landform Design and Suitability Criteria).

Schedule F – Table 1 (Landform Design and Suitability Criteria)

Disturbance		Post-mine land capability class	Maximum Final Slope	Final Land Use Description
Type	Estimated Area (ha)			
All disturbed areas	1 hectare	The same as existed prior to underground coal gasification	As close as practicable to the landform of the site prior to the commencement of activities associated with the underground coal gasification	The same as existed prior to underground coal gasification, unless otherwise negotiated with the landowner.

Schedule F – Table 2 (Maximum distance between erosion control structures)

Slope range (%)	Maximum distances between erosion control structures (m)
0 - 5	150
6 - 10	100
11 - 15	70
> 15	25

(F13) Notwithstanding the maximum distances stipulated in Schedule F - Table 2 (Maximum distance between erosion control structures), where the land is rehabilitated for a final land use of agriculture, contour banks must be installed in consultation with the landowner and as per local practice.

Infrastructure

(F14) All infrastructure constructed by or for the environmental authority holder including water storage structures, must be removed from the site prior to mining lease surrender, except where agreed in writing by the post-mining land owner / holder.

Weed Management

(F15) The holder of the environmental authority must prevent the spread of Declared Plants by ensuring that all vehicles and machinery are adequately cleaned before taking the vehicles and machinery out of a Declared Plant Area.

SCHEDULE G – COMMUNITY

Complaint response

(G1) All complaints received must be recorded including details of complainant, reasons for the complaint, investigations undertaken, conclusions formed and actions taken. This information must be made available for inspection by the administering authority on request.

SCHEDULE H – DAMS

All Dams

(H1) The holder of this environmental authority must ensure that each dam is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.

(H2) The hazard category of each dam must be assessed by a suitably qualified and experienced person at least once per year, based on documented evidence sufficient to define or confirm the current nature and extent of environmental consequences for potential failure of that dam.

(H3) Where the hazard category of a dam is assessed as significant or high, the holder of the environmental authority must act immediately to ensure:

(a) the administering authority is advised 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) that dam meets the hydraulic performance required of the assessed hazard category within twelve months of that assessment.

(H4) The condition of 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 that suitably qualified and experienced person, based on the hazard category and particular circumstances of each dam.

(H5) In the event of early signs of loss of structural or hydraulic integrity, the holder of this environmental authority must immediately take action to prevent or minimize any actual or potential environmental harm, and report in writing any findings and actions taken to the administering authority within 28 days of that event.

(H6) The holder of this environmental authority must not abandon any dam but must decommission each dam such that ongoing environmental harm is prevented.

(H7) As a minimum, decommissioning must be conducted such that each dam:

(a) either:
   i. has become a stable landform, that no longer contains flowable substances, or
   ii. has been approved or authorised under relevant legislation for a beneficial use and is subject to legally enforceable conditions of management, or
   iii. is a void authorised by the administering authority to remain after decommissioning subject to legally enforceable conditions of management; and,

(b) complies with the rehabilitation requirements of this environmental authority.

Regulated Dams - Location and Basic Specifications

(H8) The location of the regulated dam authorised under this environmental authority must be defined by control points which are shown and tabulated in the Design Plan for the dam. Sufficient control points consisting of latitudes and longitudes in the current Australian geodetic datum must be provided to form a perimeter around the dam and its associated works.

(H9) The following is the only regulated dam authorised under this environmental authority, and this dam is to accord with the basic specifications in Schedule H - Table 1(Location of Regulated Dams), below.

Schedule H – Table 1 (Location of Regulated Dams)

Name of Regulated Dam	Hazard Category	Maximum Surface Area of Dam	Maximum Volume of Dam (m^3)	Maximum Depth of Dam (m)	Purpose of Dam
Cougar Energy Production Water Dam	Significant	10,000m^2	25,000m^3	2.5m	To receive and evaporate contaminated by-product water from the underground coal gasification process.

(H10) The following is the only regulated dam authorised under this environmental authority, and this dam is to accord with the hydraulic specifications in Schedule H - Table 2 (Hydraulic Performance of Regulated Dams), below.

Schedule H – Table 2 (Hydraulic Performance of Regulated Dams)

Name of Regulated Dam	Spillway Capacity or Diversion Capacity (Levees) AEP	Design Storage Allowance (Dams other than Levees) AEP	Mandatory Reporting Level (Dams other than Levees) AEP
Cougar Energy Production Water Dam	0.001	0.02	0.01 for 72hr storm event.

Regulated Dams – Certification and Operation

(H11) Documentation required by the conditions in this schedule must be kept available for inspection by the regulating authority for a period of seven years after the conclusion of the environmentally relevant activity in respect of which this environmental authority has been granted.

(H12) The holder of this environmental authority must not commence construction of a regulated dam unless:

(a) the holder has submitted to the administering authority two copies of a design plan, together with the certification of a suitably qualified and experienced person that the design of the

regulated dam is fit for the purpose for that dam stated in that plan, and compliant in all respects with this environmental authority, and

(b) at least 28 days has passed since the submission of the design plan, or the regulating authority has advised the holder that the design plan is compliant with this condition.

(H13) When construction or modification of any regulated dam is complete, or within 12 months of dam becoming a regulated dam by virtue of a hazard assessment, the holder of this environmental authority must submit to the administering authority two copies of a set of 'as constructed' drawings, together with the certification by a suitably qualified and experienced person that the dam 'as constructed' is fit for the purpose stated in the hazard assessment and the design plan if the latter exists, and compliant in all respects with this environmental authority.

(H14) The holder of this environmental authority must ensure that there is always a current operational plan for each regulated dam, which may form part of other plans required by legislation.

(H15) The operational plan shall at least cover all matters relevant to the operation and maintenance of the regulated dam so that it is compliant in all respects with this environmental authority.

(H16) The holder of this environmental authority must ensure that, where a current operational plan covers decommissioning and rehabilitation, those operations are consistent with the objectives in any design plan for the dam.

(H17) The holder of this environmental authority must notify the administering authority immediately of the level in any regulated dam reaching the mandatory reporting level (MRL), and confirm in writing within seven days.

Regulated Dams - Annual Inspection and Report

(H18) The holder of this environmental authority must arrange for each regulated dam to be inspected annually by a suitably qualified and experienced person, in accordance with the following conditions.

(H19) At each annual inspection, the condition of each regulated dam must be assessed, including the structural, geotechnical and hydraulic adequacy of the dam and the adequacy of the works with respect to dam safety, and any recommended actions conveyed immediately to the holder of this environmental authority.

(H20) The holder of this environmental authority must immediately act upon recommendations arising from an annual inspection on condition and adequacy of a dam.

(H21) At each annual inspection, the adequacy of the available storage against the design storage allowance specified must be assessed and, if a mandatory reporting level is required, it must be determined and marked on each regulated dam.

(H22) A final assessment of adequacy of available storage in each regulated dam must be based on a dam level observed within the month of October, accepted as valid by the suitably qualified and experienced person, and resulting in an estimate of the level in that dam as at 1 November.

(H23) For each annual inspection, two copies of a report certified by the suitably qualified and experienced person, including any recommended actions to be taken to ensure the integrity of each regulated dam, must be provided to the administering authority by 1 December.

Preventing Access by Livestock and Native Fauna

(H24) The environmental authority holder must implement measures to prevent access by all livestock and minimise access by fauna to the production water evaporation dam.

SCHEDULE I – 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.
acceptance criteria	means the measures by which actions implemented are deemed to be complete. The acceptance criteria indicate the success of the decommissioning and rehabilitation outcomes or remediation of areas which have been significantly disturbed by the environmentally relevant activities. Acceptance criteria may include information regarding: • stability of final land forms in terms of settlement, erosion, weathering, pondage and drainage; • control of geochemical and contaminant transport processes; • quality of runoff waters and potential impact on receiving environment; • vegetation establishment, survival and succession; • vegetation productivity, sustained growth and structure development; • fauna colonisation and habitat development; • ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes; • microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration; • effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development; • resilience of vegetation to disease, insect attack, drought and fire; • vegetation water use and effects on ground water levels and catchment yields.
administering authority	means the Department of Environment and Heritage Protection or its successor.

AEP	means the Annual Exceedance Probability, which is the probability that at least one event in excess of a particular magnitude will occur in any given year.
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) exactly 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 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.
beneficial use	in respect of dams means 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.
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.
commercial place	means a place used as an office or for business or commercial purposes.
construction	in relation to a dam includes building a new dam and modifying or lifting an existing dam.
dam	means a land-based structure or a void that is designed to contain, divert or control flowable substances; and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void, and any associated works; but does *not* mean a fabricated or manufactured tank or container designed to a recognised standard. To avoid any doubt, a levee, dyke or bund is a dam.
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 the minimum storage required in a dam at the first of November each year in order to meet the hydraulic performance requirements.
declared plant area	means areas designated by the Department of Natural Resources or Local Government as areas infested with plants declared under section 69 of the *Rural Lands Protection Act* 1985 (section 70 (3) lists the categories of declared plants).
dwelling	means any of the following structures or vehicles that is principally used as a residence (a) a house, unit, motel, nursing home or other building or part of a building; (b) a caravan, mobile home or other vehicle or structure on land; (c) a water craft in a marina
environmental authority	means an environmental authority granted in relation to an environmentally relevant activity under the *Environmental Protection Act 1994.*
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.
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 a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the Site

	Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).
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 Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).
infrastructure	means water storage dams, roads and tracks, buildings and other structures built for the purpose and duration of the conduct the environmentally relevant 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, waste dumps, voids, or stockpiles and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.
"intrusive noise"	means noise that, because of its frequency, duration, level, tonal characteristics, impulsiveness or vibration – (a) is clearly audible to, or can be felt by, an individual; and (b) annoys the individual. (c) In determining whether a noise annoys an individual and is unreasonably intrusive, regard must be given to Australian Standard 1055.2 - 1997 Acoustics - Description and Measurement of Environmental Noise Part 2 - Application to Specific Situations.
land	in the "land schedule" of this document means land excluding waters and the atmosphere.
$L_{A\ 10,\ adj.\ 10\ mins}$	means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10% of any 10 minute measurement period, using Fast response.
$L_{A\ 1,\ adj.\ 10\ mins}$"	means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1% of any 10 minute measurement period, using Fast response
$L_{A,\ max\ adj.\ T}$	means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.
levee	means a dam, 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.

mandatory reporting level or MRL	means a warning and reporting level determined in accordance with the Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).
mg/L	means milligrams per litre.
noxious	means harmful or injurious to health or physical well being.
nuisance sensitive place	includes - (a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or (b) a motel, hotel or hostel; or (c) a kindergarten, school, university or other educational institution; or (d) a medical centre or hospital; or (e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or (f) a public thoroughfare, park or gardens; or (g) a place used as a workplace, an office or for business or commercial purposes. (h) and includes a place within the curtilage of such a place reasonably used by persons at that place.
odour	means organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances.
offensive	means causing offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive.
operational plan	means a document that amongst other things sets out procedures and criteria to be used for operating a dam during a particular time period. The operational plan as defined herein may form part of a plan of operations or plan otherwise required in legislation.
protected area	means -- (a) a protected area under the *Nature Conservation Act 1992*; or (b) a marine park under the *Marine Parks Act 1992*; or (c) a World Heritage Area.
regulated dam	means any dam in the significant or high hazard category as assessed using the Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).
regulated waste	means non-domestic waste mentioned in Schedule 7 of the Environmental Protection Regulation 1998 (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.

restoration	means the replacement of structural habitat complexity, ecosystem processes, services and function from a disturbed or degraded site to that of a pre-determined or analogue site. For the purposes of pipelines, restoration applies to final rehabilitation after pipeline decommissioning.
site	means the place to which this environmental authority relates.
spillway	means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges form 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.
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 at least four of the following categories, with the 'geomechanics of dams' category being compulsory: • geomechanics of dams with particular emphasis on stability, geology and geochemistry. • investigation, design or construction of dams. • 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.
this authority	means this environmental authority.
this approval	means this environmental authority.

void	means any man-made, open excavation in the ground.
waters	- includes all or any part of a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and banks of a watercourse, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater.
watercourse	means a river, creek or stream in which water flows permanently or intermittently— (a) in a natural channel, whether artificially improved or not; or (b) in an artificial channel that has changed the course of the watercourse; (c) but, in any case, only— (d) unless a regulation under paragraph (d), (e) or (f) declares otherwise—at every place upstream of the point (***point A***) to which the high spring tide ordinarily flows and reflows, whether due to a natural cause or to an artificial barrier; or (e) if a regulation has declared an upstream limit for the watercourse—the part of the river, creek or stream between the upstream limit and point A; or (f) if a regulation has declared a downstream limit for the watercourse—the part of the river, creek or stream upstream of the limit; or (g) if a regulation has declared an upstream and a downstream limit for the watercourse—the part of the river, creek or stream between the upstream and the downstream limits. *Watercourse* includes the bed and banks and any other element of a river, creek or stream confining or containing water.
you	means the holder of this Environmental Authority.

End of Approval