

Environmental Authority (Mining Activities) Non Code Compliant Level 1

Mining Project

Permit¹ Number: MIM800086202 – Ensham Mine

Section 228 – Environmental Protection Act 1994

Takes effect from: 27 August 2010

Details:

Permit Holder(s)	Name	Address
Principal Holder	Bligh Coal Limited	C/- Ensham Resources Level 20, AMP Place 10 Eagle Street BRISBANE QLD 4000 GPO Box 814 BRISBANE QLD 4001
Joint Holder	Idemitsu Australia Resources Pty Ltd	
Joint Holder	J-Power Australia Pty Ltd	
Joint Holder	LG International (Australia) Pty Ltd	

Activity(s)	Location(s)
Level 1 Mining Project - Schedule 6 Item 5 - Mining Black Coal	40km east of Emerald ML7459 (including SA No. 3) ML7460 ML70049 ML70326 MLA70365 MLA70366 MLA70367

The anniversary date of the environmental authority is **30 May**.

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



Clancy Mackaway
Delegate of the administering authority
Environmental Protection Act 1994
27 August 2010

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.

Department Interest – General

Financial assurance

- A1** Provide a financial assurance in the amount and form required by the administering authority prior to the commencement of activities proposed under this environmental authority.

NOTE: The calculation of financial assurance for condition A1 must be in accordance with DERM Guideline – Financial Assurance for Mining Activities, and may include a performance discount. The amount is defined as the maximum total rehabilitation cost for complete rehabilitation of all disturbed areas, which may vary on an annual basis due to progressive rehabilitation. The amount required for the financial assurance must be the highest total rehabilitation cost calculated for any year of the Plan of Operations and calculated using the formula: (Financial Assurance = Highest total annual rehabilitation cost x Percentage required).

- A2** The financial assurance is to remain in force until the administering authority is satisfied that no claim on the assurance is likely.

NOTE: Where progressive rehabilitation is completed and acceptable to the administering authority, progressive reductions to the amount of financial assurance will be acceptable where rehabilitation has been completed in accordance with the acceptance criteria defined within this environmental authority.

Prevent and/or minimise likelihood of environmental harm

- A3** In carrying out the environmentally relevant activities, you must take all reasonable and practicable measures to prevent and/or minimise the likelihood of environmental harm being caused. Any environmentally relevant 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 authority.

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

Maintenance of measures, plant and equipment

- A4** The environmental authority holder must ensure:
- a) that all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority are installed;
 - b) that such measures, plant and equipment are maintained in a proper condition; and
 - c) that such measures, plant and equipment are operated in a proper manner.

Monitoring and records

- A5** Record, compile and keep for a minimum of five (5) 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.

- A6** Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

Notification of emergencies, incidents and exceptions

- A7** All reasonable actions are to be taken to minimise environmental harm, or potential environmental harm, resulting from any emergency, incident or circumstances not in accordance with the conditions of this environmental authority.
- A8** As soon as practicable after becoming aware of any emergency, incident or information about circumstances which results or may result in environmental harm not in accordance with the conditions of this environmental authority, the administering authority must be notified in writing.
- A9** Not more than ten (10) business days following the initial notification of an emergency, incident or information about circumstances which result or may result in environmental harm, written advice must be provided to the administering authority in relation to:
- a) proposed actions to prevent a recurrence of the emergency or incident;
 - b) the outcomes of actions taken at the time to prevent or minimise environmental harm; and
 - c) proposed actions to respond to the information about circumstances which result or may result in environmental harm.
- A10** As soon as practicable, but not more than six (6) weeks following the initial notification of an emergency, incident or information about circumstances which result or may result in environmental harm, environmental monitoring must be performed and written advice must be provided of the results of any such monitoring performed to the administering authority.
- A11** Contaminants must not be released to the receiving environment unless they are in accordance with the contaminant limits authorised by this environmental authority.
- A12** This environmental authority does not authorise environmental harm unless a condition contained within the authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

Definitions

- A13** Words and phrases used throughout this environmental authority are defined in Appendix 1 – 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.

Department Interest – Air

Dust nuisance

- B1** The release of dust or particulate matter or both resulting from the mining activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.
- B2** When requested by the administering authority or as a result of a complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer), dust and particulate monitoring must be undertaken, and the results thereof notified to the administering authority within fourteen (14) days following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place. Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:
- a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with *Australian Standard AS 3580.10.1 of 2003* (or more recent editions); and
 - b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, at a nuisance sensitive or commercial place downwind of the site, cannot be exceeded more than five (5) times per year, when monitored in accordance with:
 - i. Australian Standard AS 3580.9.6 of 2003 (or more recent editions) Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet -Gravimetric method; or
 - ii. any alternative method of monitoring PM10 which may be permitted by the *Air Quality Sampling Manual* as published from time to time by the administering authority.
- B3** If monitoring indicates exceedence of the relevant limits in condition B2, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement dust abatement measures so that emissions of dust from the activity do not result in further environmental nuisance.

Odour nuisance

- B4** The release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the mining activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.
- B5** 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 sensitive or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.

- B6** If the administering authority determines the odour released to constitute an environmental nuisance, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement odour abatement measures so that emissions of odour from the activity do not result in further environmental nuisance.

Department Interest – Water

Contaminant release

- W1** Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters except as permitted under the conditions of this environmental authority.
- W2** The release of contaminants to waters must only occur from the release points specified in Table 1 (Contaminant release points, sources and receiving waters) and depicted in Appendix 2 (Release points (RP) and monitoring points (MP) for Ensham Coal Mine) of this environmental authority.

Table 1 (Contaminant release points, sources and receiving waters)

Release Point (RP)	Easting	Northing	Contaminant Source and Location	Monitoring Point	Receiving waters description
RP 1 Nogoa River	653,753	7,401,398	Ramp 24 Fill Point Dam and Ramp 4 Dam	End of pipe	Nogoa River
RP 2 Boggy Creek	654,270	7,412,235	Ramp 8 Pit (Yongala)	End of pipe	Boggy Creek

- W3** The release of contaminants to waters must not exceed the release limits stated in Table 2 (Contaminant release limits) when measured at the monitoring points specified in Table 1 (Contaminant release points, sources and receiving waters) for each quality characteristic.

Table 2 (Contaminant release limits)

Quality Characteristic	Interim release limits until 31 December 2011	Future release limits from 1 January 2012	Monitoring frequency
Electrical conductivity (µS/cm)	1,500	750	Daily during release (the first sample must be taken within 2 hours of commencement of release)
pH (pH Unit)	6.5 (minimum) 9.0 (maximum)	6.5 (minimum) 9.0 (maximum)	Daily during release (the first sample must be taken within 2 hours of commencement of release)
Turbidity (NTU)	360	360	Daily during release* (first sample within 2 hours of commencement of release)
Suspended Solids (mg/L)	150	150	Daily during release* (first sample within 2 hours of commencement of release)
Sulphate (SO ₄ ²⁻) (mg/L)	1,000	250	Daily during release* (first sample within 2 hours of commencement of release)

* local trigger values need to be developed

W4 The release of contaminants to waters from the release points must be monitored at the locations specified in Table 1 (Contaminant release points, sources and receiving waters) for each quality characteristic and at the frequency specified in Table 2 (Contaminant release limits) and Table 3 (Release contaminant trigger investigation levels).

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Table 3 (Release contaminant trigger investigation levels)

Quality characteristic	Trigger levels (µg/L)	Monitoring frequency
Aluminium	300	Commencement of release and thereafter weekly during release
Arsenic	13	
Cadmium	0.2	
Chromium	1.12	
Copper	10	
Iron	300	
Lead	10	
Mercury	1	
Nickel	11	
Zinc	10	
Boron	370	
Cobalt	90	
Manganese	1900	
Molybdenum	34	
Selenium	10	
Silver	1	
Uranium	1	
Vanadium	10	
Ammonia	900	
Nitrate	1100	
Petroleum hydrocarbons (C6-C9)	20	
Petroleum hydrocarbons (C10-C36)	100	
Fluoride (total)	2000	

NOTE:

1. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
2. The list of quality characteristics required to be monitored as per Table 3 will be reviewed once the results of the monitoring data is gathered for the interim period until 31 December 2011 or an earlier date if the data is, or becomes, available and if it is determined that there is no need to monitor for certain individual quality characteristics these can be removed from Table 3.

W5 If quality characteristics of the release exceed any of the trigger levels specified in Table 3 (Release contaminant trigger investigation levels) during a release event, the environmental authority holder must compare the down stream results in the receiving waters to the trigger values specified in Table 3 (Release contaminant trigger investigation levels) and:

1. where the trigger values are not exceeded then no action is to be taken; or
2. where the down stream results exceed the trigger values specified Table 3 for any quality characteristic, compare the results of the down stream site to the data from background monitoring sites and;
 - a) if the result is less than the background monitoring site data, then no action is to be taken; or
 - b) if the result is greater than the background monitoring site data, complete an investigation in accordance with the ANZECC & ARMICANZ 2000 methodology, into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
 - (i) details of the investigations carried out; and
 - (ii) actions taken to prevent environmental harm.

NOTE: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with W5(2)b)(ii) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

W6 If an exceedence in accordance with condition W5(2)b)(ii) is identified, the holder of the environmental authority must notify the administering authority within fourteen (14) days of receiving the result.

Contaminant release events

W7 The holder must install, operate and maintain a stream flow gauging station to determine and record stream flows at the locations upstream of each release point as specified in Table 4 (Contaminant release during flow events) for any receiving water into which a release occurs.

W8 Notwithstanding any other condition of this environmental authority, the release of contaminants to waters must only take place during periods of natural flow events specified as minimum flow in Table 4 (Contaminant release during flow events) for the contaminant release point(s) specified in Table 1 (Contaminant release points, sources and receiving waters).

Table 4 (Contaminant release during flow events)

Receiving water description	Release point (RP)	Gauging station description	Northing	Easting	Minimum flow in receiving water required for a release event	Flow recording frequency
Nogoa River	RP 1	Gauging Station 2 (GS 2) (At the same location as the existing Duckponds gauging station)	7,402,390	650,482	20m ³ /s	Continuous (minimum daily)
Boggy Creek	RP 2	Gauging Station 3 (GS 3) (Adjacent to Ramp 9 at Yongala)	7,414,491	655,399	2m ³ /s	

- W9** Contaminant release flow rate must not exceed twenty percent (20%) of receiving water flow rate.
- W10** The daily quantity of contaminants released from each release point must be measured and recorded at the monitoring points in Table 1 (Contaminant release points, sources and receiving waters).
- W11** 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.

Notification of release event

- W12** The environmental authority holder must notify the administering authority as soon as practicable (no later than six (6) hours of having commenced releasing mine affected water to the receiving environment). Notification must include the submission of written verification to the administering authority of the following information:
- a) release commencement date/time;
 - b) expected release cessation date/time;
 - c) release point/s;
 - d) release volume (estimated);
 - e) receiving water/s including the natural flow rate; and
 - f) any details (including available data) regarding likely impacts on the receiving water(s).

NOTE: Notification to the administering authority must be addressed to the Manager and Project Manager of the local administering authority via email or facsimile.

- W13** The environmental authority holder must notify the administering authority as soon as practicable, (nominally within twenty-four (24) hours after of cessation of a release) of the cessation of a release notified under condition W12 and within twenty-eight (28) days provide the following information in writing:
- a) release cessation date/time;
 - b) natural flow volume in receiving water;
 - c) volume of water released;
 - d) details regarding the compliance of the release with the conditions of Agency Interest: Water of this environmental authority (i.e. contamination limits, natural flow, discharge volume);
 - e) all in-situ water quality monitoring results; and
 - f) any other matters pertinent to the water release event.

Notification of release event exceedence

- W14** If the release limits defined in Table 2 (Contaminant release limits) are exceeded, the holder of the environmental authority must notify the administering authority within twenty-four (24) hours of receiving the results.

- W15** The environmental authority holder must, within twenty-eight (28) days of a release that exceeds the conditions of this environmental authority, provide a report to the administering authority detailing:
- the reason for the release;
 - the location of the release;
 - all water quality monitoring results;
 - any general observations;
 - all calculations; and
 - any other matters pertinent to the water release event.

Monitoring of water storage quality

- W16** Water storages stated in Table 5 (Water storage monitoring) which are associated with the release points must be monitored for the water quality characteristics specified in Table 6 (Onsite water storage contaminant limits) at the monitoring locations and at the monitoring frequency specified in Table 5.

Table 5 (Water storage monitoring)

Water storage description	Northing	Easting	Monitoring location	Frequency of monitoring
Ramp 24 Fill Point Dam (Southern side of Nogoa River)	7,398,309	652,651	Within 100m of pump intake point	Quarterly
Ramp 4 Dam (Northern side of Nogoa River)	7,403,555	653,862	Within 100m of pump intake point	
Ramp 8 Pit (Northern side of Nogoa River adjacent to the Yongala Pit)	7,412,756	654,376	Within 100m of pump intake point	

- W17** In the event that waters storages defined in Table 5 (Water storage monitoring) exceed the contaminant limits defined in Table 6 (Onsite water storage contaminant limits), the holder of the environmental authority must implement measures, where practicable, to prevent access to waters by all livestock.

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Table 6 (Onsite water storage contaminant limits)

Quality characteristic	Test value	Contaminant limit
pH (pH unit)	Range	Greater than 4, less than 9 ²
EC (µS/cm)	Maximum	5970 ¹
Sulphate (mg/L)	Maximum	1000 ¹
Fluoride (mg/L)	Maximum	2 ¹
Aluminium (mg/L)	Maximum	5 ¹
Arsenic (mg/L)	Maximum	0.5 ¹
Cadmium (mg/L)	Maximum	0.01 ¹
Cobalt (mg/L)	Maximum	1 ¹
Copper (mg/L)	Maximum	1 ¹
Lead (mg/L)	Maximum	0.1 ¹
Nickel (mg/L)	Maximum	1 ¹
Zinc (mg/L)	Maximum	20 ¹

Note:

¹ Contaminant limit based on ANZECC & ARMCANZ (2000) stock water quality guidelines.

² Page 4.2-15 of ANZECC & ARMCANZ (2000) "Soil and animal health will not generally be affected by water with pH in the range of 4–9".

Note: Total measurements (unfiltered) must be taken and analysed.

Receiving environment monitoring and contaminant trigger levels

W18 The quality of the receiving waters must be monitored at the locations specified in Table 8 (Receiving water upstream background sites and down stream monitoring points) and shown in Appendix 2 (Release points (RP) and monitoring points (MP) for Ensham Coal Mine) for each quality characteristic and at the monitoring frequency stated in Table 7 (Receiving waters contaminant trigger levels).

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Table 7 (Receiving waters contaminant trigger levels)

Quality characteristic	Trigger level	Monitoring frequency
pH	6.5 – 8.0	Daily during the release
Electrical Conductivity ($\mu\text{S}/\text{cm}$)	500	
Suspended solids (mg/L)	1,000	
Sulphate (SO_4^{2-}) (mg/L)	250	

Table 8 (Receiving water upstream background sites and down stream monitoring points)

Monitoring point (MP)	Receiving waters location description	Easting	Northing
Monitoring points for RP 1 – Nogoia River discharge point			
Upstream background monitoring points			
MP 2	Nogoia River – upstream Ensham land boundary at Duckponds Crossing	650,482	7,402,390
Downstream monitoring point			
MP 3	Nogoia River – downstream Ensham lease boundary	654,688	7,400,679
Monitoring points for RP3 – Boggy Creek discharge point			
Upstream background monitoring points			
MP 4	Boggy Creek – adjacent to Yongala Ramp 9	655,399	7,414,491
MP 5	Boggy Creek – at haul road crossing north of Ramp 7	653 509	7,408,061

NOTE:

- The upstream monitoring point should be within 10km of the release point.
- The downstream point should not be greater than 1.6km from the release point.
- The data from background monitoring points must not be used where they are affected by releases from other mines.

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W19 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in Table 7 (Receiving waters contaminant trigger levels) during a release event the environmental authority holder must compare the down stream results to the upstream results in the receiving waters and:

1. where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action is to be taken; or
2. where the down stream results exceed the upstream results complete an investigation in accordance with the ANZECC & ARMCANZ 2000 methodology, into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
 - (i) details of the investigations carried out; and
 - (ii) actions taken to prevent environmental harm.

NOTE: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with W19 2(ii) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

Receiving Environment Monitoring Program (REMP)

W20 A REMP must be developed and implemented by **30 March 2010** to monitor and record the effects of the release of contaminants on the receiving environment periodically and whilst contaminants are being discharged from the site, with the aims of identifying and describing the extent of any adverse impacts to local environmental values, and monitoring any changes in the receiving water. A copy of the REMP must be provided to the administering authority prior to its implementation and due consideration given to any comments made on the REMP by the administering authority.

For the purposes of the REMP, the receiving environment is the waters of the Nogoa River downstream of Ensham Coal Mine to Riley's Crossing near the Comet River junction.

- W21** The REMP must address (but not necessarily be limited to) the following:
- a) 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 variation (e.g. seasonality);
 - b) Description of applicable environmental values and water quality objectives to be achieved (i.e. as scheduled pursuant to the *Environmental Protection (Water) Policy 1997*);
 - c) Any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment within which the REMP is proposed;
 - d) Water quality targets within the receiving environment to be achieved, and clarification of contaminant concentrations or levels indicating adverse environmental impacts during the REMP.
 - e) Monitoring for any potential adverse environmental impacts caused by the release;
 - f) Monitoring of stream flow and hydrology;
 - g) Monitoring of toxicants should consider the indicators specified in Table 3 (Release contaminant trigger investigation levels) to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARM CANZ 2000 guidelines for slightly to moderately disturbed ecosystems;
 - h) Monitoring of physical chemical parameters as a minimum those specified in Table 2 (Contaminant release limits) (in addition to dissolved oxygen saturation and temperature);
 - i) Monitoring biological indicators (for macroinvertebrates in accordance with the AusRivas methodology) and metals/metalloids in sediments (in accordance with ANZECC & ARM CANZ 2000, BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*) for permanent, semi-permanent water holes and water storages;
 - j) The locations of monitoring points (including the locations specified in Table 8 (Receiving water upstream background sites and down stream monitoring points) which are background and downstream impacted sites for each release point);
 - k) 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 2006*. For ephemeral streams, this should include periods of flow irrespective of mine or other discharges;
 - l) Specify sampling and analysis methods and quality assurance and control;
 - m) Any historical datasets to be relied upon;
 - n) Description of the statistical basis on which conclusions are drawn; and
 - o) Any spatial and temporal controls to exclude potential confounding factors.
- W22** A report outlining the findings of the REMP, including all monitoring results and interpretations in accordance with conditions W20 & W21 must be prepared and submitted in writing to the administering authority by **1 October 2011**. This should include an assessment of background water quality, any assimilative capacity for those contaminants monitored and the suitability of current discharge limits to protect downstream environment values.

Water reuse

- W23** Water contaminated by mining activity may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority during periods of dry weather for the purpose of supplying stock water to properties directly adjoining properties owned by the environmental authority holder or a third party and subject to compliance with the quality release limits specified in Table 9 (Stock water release limits).

Table 9 (Stock water release limits)

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	5000

1. By third party agreement for any other parameter

- W24** Water contaminated by mining activity may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority during periods of dry weather for the purpose of supplying irrigation water to properties directly adjoining properties owned by the environmental authority holder or a third party and subject to compliance with quality limits specified in Table 10 (Irrigation water release limits).

Table 10 (Irrigation water release limits)

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	Site specific value to be determined in accordance with ANZECC & ARMCANZ (2000) Irrigation Guidelines and provided through an amendment process

1. By third party agreement for any other parameter

- W25** Water contaminated by mining activity may be piped or trucked off the mining lease for the purpose of supplying water to a third party for purpose of construction and/or road maintenance in accordance with the conditions of this environmental authority.
- W26** Water contaminated by mining activity may be piped or trucked for the purpose of supplying water to an adjoining mine in accordance with the conditions of this environmental authority. The volume, pH and electrical conductivity of water transferred to the adjoining mine must be monitored and recorded.

- W27** If the responsibility of water contaminated by mining activities (the water) is given or transferred to another person in accordance with conditions W23, W24, W25 or W26:
- a) the responsibility of the water must only be given or transferred in accordance with a written agreement (the third party agreement); and
 - b) include in the third party agreement a commitment from the person utilising the water to use water in such a way as to prevent environmental harm or public health incidences and specifically make the persons aware of the General Environmental Duty (GED) under section 319 of the *Environmental Protection Act 1994*, environmental sustainability of the water disposal and protection of environmental values of waters.

Water general

- W28** All determinations of water quality must be:
- a) performed by a person or body possessing appropriate experience and qualifications to perform the required measurements;
 - b) made in accordance with methods prescribed in the latest edition of the administering authority's Water Quality Sampling Manual;
 - c) collected from the monitoring locations identified within this environmental authority, within two (2) hours of each other where possible;
 - d) carried out on representative samples; and
 - e) laboratory testing must be undertaken using a laboratory accredited (e.g. NATA) method of analysis.

NOTE: Condition W28 requires the Water Quality Manual to be followed and where it is not followed because of exceptional circumstances this should be explained and reported with the results.

- W29** The release of contaminants directly or indirectly to waters:
- a) must not produce any visible discolouration of receiving waters; and
 - b) must not produce any slick or other visible or odorous evidence of oil, grease or petrochemicals nor contain visible floating oil, grease, scum, litter or other objectionable matter.

Annual water monitoring reporting

- W30** The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format with each annual return:
- a) the date on which the sample was taken;
 - b) the time at which the sample was taken;
 - c) the monitoring point at which the sample was taken;
 - d) the measured or estimated daily quantity of the contaminants released from all release points;
 - e) the release flow rate at the time of sampling for each release point;
 - f) the results of all monitoring and details of any exceedences with the conditions of this environmental authority; and
 - g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

Temporary interference with waterways

- W31** Temporarily destroying native vegetation, excavating, or placing fill in a watercourse, lake or spring necessary for and associated with mining operations must be undertaken in accordance with administering authority's *Water Guideline - Activities in a Watercourse, Lake or Spring associated with Mining Activities*.

Water management plan

- W32** A Water Management Plan must be developed and implemented by **30 March 2010** that provides for the proper and effective management of the actual and potential environmental impacts resulting from the mining activity and to ensure compliance with the conditions of this environmental authority.
- W33** The Water Management Plan must be developed in accordance with Department of Environment and Resource Management's *Guideline for Preparing a Water Management Plan 2009* or any updates that become available from time to time and must include at least the following components:
- a) Contaminant Source Study;
 - b) Site Water Balance and Model;
 - c) Water Management System;
 - d) Saline Drainage Prevention and Management Measures;
 - e) Acid Rock Drainage Prevention and Management Measures (if applicable);
 - f) Emergency and Contingency Planning; and
 - g) Monitoring and Review.

- W34** Each year the holder of the environmental authority must undertake a review of the Water Management Plan prior to the wet season (i.e. **by 1 November**) and a further review following the wet season (i.e. **by 1 May** the following year) to ensure that proper and effective measures, practices or procedures are in place so that the mine is operated in accordance with the conditions of this environmental authority and that environmental harm is prevented or minimised.
- W35** A copy of the Water Management Plan and/or a review of the Water Management Plan must be provided to the administering authority on request.

Saline drainage

- W36** The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of saline drainage.

Acid rock drainage

- W37** The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of acid rock drainage.

Stormwater and water sediment controls

- W38** An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of storm water.
- W39** The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters.
- W40** Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or receiving waters.

Fitzroy River basin study

W41 The administering authority and the holder of this environmental authority both acknowledge that the conditions for release of contaminants to the Nogoa River in this environmental authority have been calculated without the benefit of the findings of projects proposed to be undertaken as per recommendations 2 and 3 of the *Study of cumulative impacts on water quality of mining activities in the Fitzroy River Basin* (April 2009). The administering authority may, based on the information provided in the study report when it becomes available, all relevant information available at the time and the regulatory framework applicable at that time, consult with the holder of this environmental authority about the conditions in the environmental authority concerning the treatment and disposal of waste water.

The aim of the consultation shall be the meaningful review of the contaminant release limits imposed in this environmental authority having regard to:

- a) the study results;
- b) near field monitoring results;
- c) QLD Water Quality Guidelines; and
- d) best practice environmental management.

If this review leads to a change in the requirements on this environmental authority holder, this shall be advanced by way of an environmental authority amendment or a Transitional Environmental Program and as is necessary or desirable.

Sewage effluent

W42 Sewage effluent used for dust suppression or irrigation must not exceed sewage release limits defined in Table 11 (Sewage effluent quality standards).

Table 11 (Sewage effluent quality standards)

Quality	Release limit	Units	Limit type	Monitoring frequency
5 Day BOD	20	mg/L	max	On release
pH	6 - 8		range	On release
Free Chlorine residuals	1.0	mg/L	max	On release
Faecal coliforms (based on the average of a min of 5 samples)	1,000	Colonies per 100ml	max	On release

Groundwater

W43 Groundwater affected by mining activities must be monitored at the locations and frequencies and for the parameters defined in Table 12 (Groundwater monitoring locations). The groundwater monitoring locations are shown in Appendix 3. If, based on assessment of the monitoring results by a suitably qualified person, the Ensham mine is demonstrated to have adversely affected the use of privately owned bores listed in Table 12 (Groundwater monitoring locations), the holder of the environmental authority will provide an equivalent (in quality and quantity), alternative water supply to the owner of the bore/s for the impact caused by the Ensham mine. Monitoring of bores owned by private landholders is subject to the landholder providing access to the bore and ensuring that the bore is in a suitable condition such that it is able to be monitored.

Table 12 (Groundwater monitoring locations)

Location	Monitoring Point	Easting (GDA94)	Northing (GDA94)	Aquifer	Parameters	Frequency
Nogoa River channel	Bore EC01	650018.8	7403061.2	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	Every 3 months
	Bore EC02	650355.8	7402927.7	Alluvium	pH, EC, water level	
	Bore ECO3	650338.7	7402548.2	Alluvium		
	Bore EC04	650600.9	7402332.7	Alluvium		
	Bore EC05	650505.5	7402065.2	Alluvium		
	Bore EC06	650805.2	7402076.2	Alluvium		
	Bore EC07	650974.2	7401744.2	Alluvium		
	Bore EC08	651378.4	7401755.2	Alluvium		
	Bore EC09	651362.9	7401496.7	Alluvium		
	Bore EC09A	651356.2	7401502.0	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	
	Bore EC10	651618.4	7401418.7	Alluvium	pH, EC, water level	
	Bore EC11	651518.4	7401190.0	Alluvium		
	Bore EC12	651664.0	7400916.2	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	
	Bore EC13	651518.4	7400773.2	Alluvium	pH, EC, water level	
	Bore EC14	651678.0	7400650.2	Alluvium		
	Bore EC15	651950.1	7400541.7	Alluvium		
	Bore EC16	652379.8	7400993.7	Alluvium		
	Bore EC17	652797.6	7400706.2	Alluvium		
	Bore EC18	652832.9	7400919.7	Alluvium		
	Bore EC19	653128.8	7401328.0	Alluvium		
Bore EC20	652316.1	7400687.7	Alluvium			

cm

Location	Monitoring Point	Easting (GDA94)	Northing (GDA94)	Aquifer	Parameters	Frequency
	Bore EC21	651661.9	7400589.7	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	
	Bore EC22	651694.6	7400490.7	Alluvium	pH, EC, water level	
	Bore EC23	651684.2	7400420.7	Alluvium		
	Bore GW1	653934	7400423	Alluvium		
	Bore GW2	651462	7402401	Alluvium		
Nogoa River floodplain	DERM bore 13020176	651156.7	7403150.7	Alluvium	pH, EC, water level	Every 3 months
	DERM bore 13020177	650665.7	7402645.2	Alluvium		
	DERM bore 13020178	650153.6	7401552.7	Alluvium		
	DERM bore 13020179	650033	7400729	Alluvium		
	DERM bore 13020180	649848	7400006	Alluvium		
	DERM bore 13020181	649733	7399715	Alluvium		
Private Property	Mc Camley Bore	645331	7400178	Understood to be in the alluvium	pH, EC, water level	Every 3 months, if required by property owner
	Weir Bore	643983	7402238	Coal Measures Overburden		
	RN 38845 (House Bore)	643384	7400545	Coal Measures Overburden		
	Jamar stockyard bore	642016	7399091	Coal Measures Overburden		
	100169	645116	7411290	Understood to be in the Coal Measures Overburden		
	100037	645259	7411381	Understood to be in the Coal Measures Overburden		
	132290	640966	7396404	Understood to be in the Coal Measures Overburden		
	37512	638173	7391640	Understood to be in the Coal Measures Overburden		
	103685	646319	7390738	Understood to be in the Coal Measures Overburden		
	Bore RN100036	634003	7411732	To be advised		
	Bore RN103024	636088	7412591	To be advised		

W44 Subject to requirements of condition W46, if the groundwater investigation trigger levels defined in Table 13 (Groundwater investigation trigger levels) are exceeded then the environmental authority holder must complete an investigation into the potential for environmental harm and notify the administering authority with twenty-eight (28) days of receiving the analysis results.

Table 13 (Groundwater investigation trigger levels)

Parameter	Unit	Trigger Levels	Limit Type
pH	pH Units	6.5 - 8.5	Minimum/Maximum
Electrical Conductivity	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Total Dissolved Solids	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Calcium	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Magnesium	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Sodium	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Potassium	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Chlorine	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
SO ₄	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
CO ₃	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
HCO ₃	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Iron	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Aluminium	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Silver	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Arsenic	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Mercury	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Antimony	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Molybdenum	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Selenium	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.
Total Petroleum Hydrocarbons	To be provided as per condition W46.	To be provided as per condition W46.	To be provided as per condition W46.

- W45** Subject to requirements of condition W47, groundwater levels and groundwater drawdown fluctuations, not resulting from the pumping of licensed bores, must be notified within twenty-eight (28) days to the administering authority following completion of monitoring.

Background groundwater monitoring program

- W46** A background groundwater monitoring program must be developed to include bore(s) that are located an appropriate distance from potential sources of impact from mining activities to provide the following:
- a) representative groundwater samples from the aquifers potentially affected by mining activities;
 - b) at least twelve (12) sampling events (monthly sampling) to determine background groundwater quality as far as practicable;
 - c) background groundwater quality in hydraulically isolated background bore(s) that have not been affected by any mining activities; and
 - d) the final groundwater contaminant parameters and trigger levels required for each bore type must be provided for condition W44 and Table 13 (Groundwater contaminant trigger levels).
- W47** The groundwater monitoring data must be reviewed on an annual basis. The review must include the assessment of groundwater levels and quality data, and the suitability of the monitoring network. The assessment must be submitted to the administering authority within twenty-eight (28) days of receiving the report.
- W48** Groundwater contaminant trigger levels as per Table 13 (Groundwater contaminant trigger levels) must be finalised based on a background groundwater monitoring program defined in condition W46 and submitted to the administering authority by **30 January 2012**.
- W49** The following information must be recorded in relation to all groundwater water sampling:
- a) the date on which the sample was taken;
 - b) the time at which the sample was taken;
 - c) the monitoring point at which the sample was taken; and
 - d) the results of all monitoring.

Department Interest – Dams and levees

All dams

- C1** 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.
- C2** 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. Hazard category is to be determined in accordance with the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland 1995*.
- C3** Dams having a hazard category assessed as significant or high, must be specifically authorised by this environmental authority.
- C4** 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.
- C5** 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 minimise any actual or potential environmental harm, and report in writing any findings and actions taken to the administering authority within twenty eight (28) days of that event.
- C6** The holder of this environmental authority must not abandon any dam but must decommission each dam such that ongoing environmental harm is prevented.
- C7** As a minimum, decommissioning must be conducted such that each dam is:
- a) either:
 - i. a stable landform, that no longer contains flowable substances, or
 - ii. approved or authorised under relevant legislation for a beneficial use, or
 - iii. is a void authorised by the administering authority to remain after decommissioning; and
 - b) compliant with the rehabilitation requirements of this environmental authority.

Certification and operation

- C8** Documentation required by the conditions in this schedule must be kept available for inspection by the administering authority for a period of five (5) years after the conclusion of the environmentally relevant activity in respect of which this environmental authority has been granted.
- C9** 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 (2) copies of a design plan, together with the certification of a suitably qualified and experienced person that the design of the regulated dam will deliver the performance stated in the design plan and that it will be compliant in all respects with this environmental authority, and
 - b) at least twenty (20) business days has passed since the receipt of those documents, or the administering authority notifies the holder that a design plan and certification in accordance with this environmental authority, has been received.
- C10** Each design plan for a regulated dam under this environmental authority, must consider the likely outcomes for releases to the environment using estimates of likely contaminant concentrations using data from contact testing, output from modelling on site and modelling for flows in the nearby watercourses.
- C11** Each design plan for a regulated dam under this environmental authority, must include the outcomes from water balance modelling of the worst case scenarios of wet season storage and discharges. This information must be presented graphically at a suitable time step and be able to compare the incident rainfall, runoff and environmental releases for all regulated dams.
- C12** When construction or modification of any regulated dam is complete, the holder of this environmental authority must submit to the administering authority two (2) copies of a set of 'as constructed' drawings, together with the certification of a suitably qualified and experienced person that the dam 'as constructed' will deliver the performance stated in the design plan and that it will be compliant in all respects with this environmental authority.
- C13** 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.
- C14** 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.
- C15** The holder of this environmental authority must ensure that, where a current operational plan covers decommissioning and rehabilitation, operations are consistent with the objectives in any design plan for the dam.

- C16** 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 (7) days.

Annual inspection and report

- C17** 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.
- C18** 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.
- C19** The holder of this environmental authority must immediately act upon recommendations arising from an annual inspection on condition and adequacy of a dam.
- C20** At each annual inspection, the adequacy of the available storage against the design storage allowance (DSA) specified must be assessed and, if a MRL is required, it must be determined and marked on each regulated dam.
- C21** 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**.
- C22** For each annual inspection, two (2) 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**.

Flood protection levee – Additional conditions

- C23** The design plan in accordance with condition C9 must include:
- a) drawings describing the location and dimensions of the levee and the mining excavations in the vicinity of the levee, including confirmation the levee meets the specified design requirements in condition C24; and
 - b) a documented procedure for surveillance of the levee and any adjacent mining excavation slopes to detect and report to the administering authority any ground movement that compromises or may compromise the integrity of the levee.

- C24** Design requirements for the levee and adjacent mining excavation include:
- a) the design level of the levee crest shall be at least one (1) metre above the estimated 1 in 1,000 ARI flood event for the adjacent watercourses; and
 - b) mining excavation slopes adjacent to the levee must remain stable and are to be designed with a factor of safety of one point five (1.5) (calculated from the levee toe) or above based on an accepted stability analysis.
- C25** The flood protection levee authorised under this environmental authority must be constructed and maintained such that:
- a) it does not result in increased erosion of the bank or bed of the Nogoa River;
 - b) it does not significantly impact upon riparian or existing remnant vegetation; and
 - c) the levee itself will not erode during any flood events up to the 1 in 1,000 ARI event.

Flood protection levee – Surveillance and remedial works

- C26** The condition of constructed levees including the surface area between the downstream toe of the levee and the end wall crest of the open-cut mining pit should be monitored for surface cracks and must at a minimum be inspected and assessed by a suitably qualified and experienced person at least once per year between the months of May and October inclusive (i.e. during the 'dry' season and before the onset of the 'wet' season), and at any time if alarming, unusual or otherwise unsatisfactory conditions are observed.
- C27** For each flood protection levee annual inspection, two copies of the surveillance report, including any recommendations for remedial works, must be provided to the administering inspection within twenty-eight (28) days of the date of inspection.
- C28** Remedial works identified as being required for the flood protection levee during the inspections and assessments conducted under conditions C26 and C27, must be notified in writing to the administering authority within fifteen (15) business days of the completion of the inspections, and commenced within twenty-eight (28) days unless otherwise agreed in writing by the administering authority.
- C29** The annual return for this environmental authority shall be accompanied by a report, by a suitably qualified and experienced person, that certifies that the documented procedure for surveillance of the levee has been applied in accordance with the procedure, that there has been no erosion, cracking or vertical or horizontal deformation that has impacted on the integrity of the levee, and that the levee has been maintained in accordance with the certified design plan.

Regulated dams – Location and basic specifications

C30 The following are the only regulated dams authorised under this environmental authority, and those dams are to be located within the control points defined in Table 14 (Location of regulated dams).

Table 14 (Location of regulated dams)

Name of regulated dam	Latitude (GDA94)	Longitude (GDA94)
Northern Flood Protection Levee	23.452678S	148.479443E
	23.462094S	148.479971E
	23.469485S	148.484359E
	23.478121S	148.484996E
	23.484577S	148.492496E
	23.484823S	148.503565E
	23.472116S	148.503753E
Southern Flood Protection Levee	23.511969S	148.463875E
	23.49669S	148.471324E
	23.498229S	148.497999E
	23.503798S	148.505249E
	23.514765S	148.501661E
	23.527258S	148.486488E

C31 The following are the only regulated dams authorised under this environmental authority, and those dams are to accord with the basic specifications in Table 15 (Basic specification of regulated dams).

Table 15 (Basic specification of regulated dams)

Name of regulated dam	Maximum surface area of dam (ha)	Maximum volume of dam (ML)	Maximum height of Dam (m)	Purpose of dam
Northern Flood Protection Levee	N/A	N/A	8	Flood protection for mine workings
Southern Flood Protection Levee	N/A	N/A	6.5	Flood protection for mine workings

- C32** The following are the only regulated dams authorised under this environmental authority, and those dams are to accord with the hydraulic specifications in Table 16 (Hydraulic performance of regulated dams) below.

Table 16 (Hydraulic performance of regulated dams)

Regulated Dam	Design Storage Allowance	Spillway or Protection Critical Design Event	Mandatory Reporting Level
Northern Flood Protection Levee	N/A	AEP 0.001 (1-in-1,000) plus 1 metre minimum freeboard	N/A
Southern Flood Protection Levee	N/A	AEP 0.001 (1-in-1,000) plus 1 metre minimum freeboard	N/A

Department Interest – Noise and vibration

Noise nuisance

- D1** Noise from activities must not cause an environmental nuisance at any sensitive receptor or commercial place.
- D2** All noise from activities must not exceed the levels for the time periods specified in Table 17 (Noise limits) at any sensitive receptor or commercial place.

Table 17 (Noise limits)

Noise Level dB(A)	7am – 6pm	6pm – 10pm	10pm – 7am
<i>Noise measured at a 'Noise sensitive place'</i>			
L _A 10, adj, 10 mins	B/g + 5	B/g + 5	B/g + 3
L _A 1, adj, 10 mins	N/A	N/A	B/g + 8
<i>Noise measured at a 'Commercial place'</i>			
L _A 10, adj, 10 mins	B/g + 10	B/g + 10	B/g + 5

Noise monitoring

- D3** When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results notified within fourteen (14) days to the administering authority. Monitoring must include:
- a) L_A 10, adj, 10 mins
 - b) L_A 1, adj, 10 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** Noise is not considered to be a nuisance under condition D1 if monitoring shows that noise does not exceed the levels in the time periods specified in Table 17 (Noise limits).
- D5** The method of measurement and reporting of noise monitoring must comply with the current edition of the administering authority's *Noise Measurement Manual*.
- D6** If monitoring indicates exceedence of the relevant limits in condition D4, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement noise abatement measures so that emissions of noise from the activity do not result in further environmental nuisance.

Vibration nuisance

- D7** Vibration from the licensed activities must not cause an environmental nuisance at any sensitive or commercial place.
- D8** When requested by the administering authority, vibration 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 or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.

- D9** If the environmental authority holder can provide evidence through monitoring that the limits defined in Table 18 (Vibration limits) are not being exceeded then the environmental authority holder is not in breach of condition D7. Monitoring must include:
- a) location of the blast(s) within the mining area (including which bench level); and
 - b) atmospheric conditions including temperature, relative humidity and wind speed and direction; and
 - c) location, date and time of recording.

Table 18 (Vibration limits)

Location	Vibration measured
Sensitive or commercial place	5 mm/s peak particle velocity for nine (9) out of ten (10) consecutive blasts and not greater than 10 mm/s peak particle velocity at any time

- D10** If monitoring indicates exceedence of the relevant limits in Table 18 (Vibration limits), then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement vibration abatement measures so that vibration from the activity does not result in further environmental nuisance.

Airblast overpressure nuisance

- D11** The airblast overpressure level from blasting operations on the premises must not exceed the limits defined in Table 19 (Airblast overpressure level) at any nuisance sensitive or commercial place.

Table 19 (Airblast overpressure level)

Location	Airblast Overpressure Measured
Sensitive or commercial place	Air blast overpressure level of 115 db (Linear peak) for nine (9) out of ten (10) consecutive blasts initiated and not greater than 120 db (Linear peak) at any time.

- D12** When requested by the administering authority, airblast overpressure 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 or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.

- D13** Airblast overpressure monitoring must include the following descriptors, characteristics and conditions:
- a) location of the blast(s) within the mining area (including which bench level);
 - b) atmospheric conditions including temperature, relative humidity and wind speed and direction; and
 - c) location, date and time of recording.
- D14** If monitoring indicates exceedence of the relevant limits in Table 19 (Airblast overpressure level), then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement airblast overpressure abatement measures so that airblast overpressure from the activity does not result in further environmental nuisance.
- D15** The method of measurement and reporting of airblast overpressure levels must comply with the current edition of the administering authority's *Noise Measurement Manual*.

Department Interest – Waste

E1 Storage of tyres

Scrap tyres stored awaiting disposal or transport for take-back and recycling, or waste-to-energy options must be stored in stable stacks and at least 10m from any other scrap tyre storage area, or combustible or flammable material, including vegetation.

E2 All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10m radius of the scrap tyre storage area.

E3 Disposing of scrap tyres resulting from the authorised activities in spoil emplacements is acceptable, provided tyres are placed as deep in the spoil as reasonably practicable. A record must be kept of the number and location for tyres disposed.

E4 Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.

Waste Management

- E5** A Waste Management Plan, in accordance with the *Environmental Protection (Waste Management) Policy 2000*, must be implemented and must cover:
- a) describe how Ensham mine recognise and apply the waste management hierarchy;
 - b) identify characterisations of wastes generated from the project and general volume trends over the past five (5) years;
 - c) a program for safe recycling or disposal of all wastes - reusing and recycling where possible;
 - d) waste commitments with auditable targets to reduce, reuse and recycle;
 - e) The waste management control strategies must consider:
 - the type of wastes;
 - segregation of the wastes;
 - storage of the wastes;
 - transport of the wastes;
 - monitoring and reporting matters concerning the waste;
 - emergency response planning;
 - disposal, reused and recycling options;
 - f) identify the potential adverse and beneficial impacts of the wastes generated;
 - g) detail the hazardous characteristics of the waste generated (if any);
 - h) cover a disposal procedure for hazardous wastes ;
 - i) outline the process to be implemented to allow for continuous improvement of the waste management systems;
 - j) identify responsible staff (positions) for implementing, managing and reporting the Waste Management Plan; and
 - k) cover a staff awareness and induction program that encourages re-use and recycling.
- E6** Waste must not be burned or allowed to be burned on the licensed site unless by approval of the administering authority.
- E7** A designated area must be set aside for the segregation of economically viable, recyclable solid and liquid waste.

- E8** Records must be kept for five (5) years, and must include the following information:
- a) date of pickup of waste;
 - b) description of waste;
 - c) cross reference to relevant waste transport documentation;
 - d) quantity of waste;
 - e) origin of the waste;
 - f) destination of the waste; and
 - g) intended fate of the waste, for example, type of waste treatment, reprocessing or disposal.

NOTE: Records of documents maintained in compliance with a waste tracking system established under the Environmental Protection Act 1994 or any other law for regulated waste will be deemed to satisfy this condition.

- E9** Records of trade and regulated wastes or material leaving the mining lease for recycling or disposal, including the final destination and method of treatment, must be in accordance with the *Environmental Protection (Waste Management) Policy 2000*.
- E10** All regulated waste received at and removed from the site must be transported by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- E11** Except as otherwise provided by the conditions of this authority, all waste removed from the site must be taken to a facility that is lawfully allowed to accept such waste under the provisions of the *Environmental Protection Act 1994*.

Department Interest – Land

Preventing contaminant release to land

- F1** Contaminants must not be released to land in manner which constitutes nuisance, material or serious environmental harm.

Bord and pillar – factors of safety

- F2** The holder of the environmental authority will determine relevant pillar and roadway dimensions to ensure that the following factors of safety are achieved:
- 2.11 for bord and pillar workings beneath the Nogoa River anabranh;
 - 2.11 for access roadways beneath the Nogoa River to connect the bord and pillar and longwall mining areas; and
 - 1.6 for all other bord and pillar workings beneath the floodplain of the Nogoa River.
- F3** Operational management protocols must be put in place to ensure that minimum pillar and roadway dimensions calculated to achieve the factors of safety in condition F2 are achieved during the life of the bord and pillar operation.

Topsoil

- F4** Topsoil resources that are suitable for use in rehabilitation must be salvaged ahead of mining disturbance (or spoil placement) for strategic use in rehabilitation of the mine spoil dump area. This topsoil removal relocation must be documented in a topsoil management plan.

Rehabilitation landform criteria

- F5** All areas significantly disturbed by mining activities must be rehabilitated to a stable landform with a self-sustaining vegetation cover in accordance with Table 20 (Landform design criteria) which will be populated and submitted in conjunction with an environmental authority amendment application required by condition F7.
- F6** Progressive rehabilitation must commence within three (3) years when areas become available within the operational land.

- F7** A Rehabilitation Management Plan proposing completion criteria for all mining areas must be developed by **30 January 2013** and submitted to the administering authority for review and comment. The Rehabilitation Management Plan must, at a minimum:
- a) map existing areas of rehabilitation;
 - b) develop design objectives for rehabilitation of disturbed areas and post mining land uses across the mine;
 - c) specify spoil characteristics, soil analysis, soil separation for use on rehabilitation;
 - d) detail rehabilitation methods applied to areas;
 - e) detail landform design criteria including end of mine design;
 - f) detail how landform design will be consistent with surrounding topography;
 - g) identify success criteria for areas and itemize revegetation criteria;
 - h) explain planned native vegetation rehabilitation areas and corridors;
 - i) identify at least a minimum of three (3) reference and three (3) rehabilitation sites to be used to develop rehabilitation success criteria;
 - j) describe rehabilitation indicators and the monitoring program to be used;
 - k) develop a contingency plan for rehabilitation maintenance or redesign;
 - l) describe end of mine landform design planning and post mining land uses across the mine; and
 - m) include a cost benefit analysis/triple bottom line assessment (or a comparative alternative assessment method) of the proposed final landform design criteria and alternatives.

Residual void outcome

- F8** Residual voids must not cause any serious environmental harm to land, surface waters or any recognised groundwater aquifer, other than the environmental harm constituted by the existence of the residual void itself and subject to any other condition within this environmental authority.
- F9** An investigation into residual voids proposing acceptance criteria to meet the outcomes in condition F8 and landform design criteria must be developed by **30 January 2013** and submitted to the administering authority for review and comment. On acceptance of the criteria proposed in the residual void management plan, the criteria must be specified in the environmental authority. The investigation must at a minimum include the following:
- a) a study of options available for minimising final void area and volume;
 - b) design criteria for rehabilitation of final voids;
 - c) a void hydrology study, addressing the long-term water balance in the voids, connections to groundwater resources and water quality parameters in the long term;
 - d) a pit wall stability study, considering the effects of long-term erosion and weathering of the pit wall and the effects of significant hydrological events;
 - e) a study of void capability to support native flora and fauna; and
 - f) a proposal/s for end of mine void rehabilitation success criteria and final void areas and volumes.

- F10** The rehabilitated landform criteria and residual void outcomes must be reviewed every three (3) years from the **30 January 2013** submission date. Any amendments to rehabilitation criteria and landform designs must be re-submitted to the administering authority.

Rehabilitation Monitoring Program

- F11** Once rehabilitation has commenced, the holder of the environmental authority must conduct a Rehabilitation Monitoring Program on a yearly basis, which must include sufficient spatial and temporal replication to enable statistically valid conclusions as established under the rehabilitation program.
- F12** The Rehabilitation Monitoring Program must be developed and implemented by a person possessing appropriate qualifications and experience in the field of rehabilitation management, nominated by the environmental authority holder.
- F13** The Rehabilitation Monitoring Program must be included in the Plan of Operations and updated with each subsequent Plan of Operations, describing:
- a) how the rehabilitation objectives as per condition F7 will be achieved; and
 - b) verification of rehabilitation success.

Post Closure Management Plan

- F14** A Post Closure Management Plan for the site must be prepared at least 18 months prior to the final coal processing on site and implemented for a nominal period of:
- a) at least thirty (30) years following final coal processing on site; or
 - b) a shorter period if the site is proven to be geotechnically and geochemically stable and it can be demonstrated to the satisfaction of the administering authority that no release of contaminants from the site will result in environmental harm.
- F15** The Post Closure Management Plan must include the following elements:
- a) operation and maintenance of:
 - i. wastewater collection and reticulation systems;
 - ii. wastewater treatment systems;
 - iii. the groundwater monitoring network;
 - iv. final cover systems; and
 - v. vegetative cover.
 - b) monitoring of:
 - i. surface water quality;
 - ii. groundwater quality;
 - iii. seepage rates;
 - iv. erosion rates;
 - v. the integrity and effectiveness of final cover systems; and
 - vi. the health and resilience of native vegetation cover.

Tailings storage facility

F16 The management of tailings disposal must be in accordance with the following:

- a) all tailings material must be progressively characterised during disposal for acid generating capacity and selected metals and salts. Samples shall be tested for the following parameters: pH, Electrical Conductivity (EC), Acid Neutralising Capacity (ANC), Net Acid Generation (NAG) (reporting NAG capacity and NAG pH after oxidation), Total Sulphur (S), Chromium Reducible Sulphur (Scr), Boron (B) Cadmium (Cd), Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na), Zinc (Zn) and Sulphate (SO₄);
- b) the sample parameters in a) above can be reviewed following 6 months of mine coal wash plant operation, and if it can be demonstrated that certain individual sample parameters are not present in sufficient quantities to warrant further monitoring, these can be removed from a) above;
- c) one tailing sample will be collected each and every week while the mine coal wash plant is operational and the sample will be stored. After 4 samples have been collected the samples will be composited and the composite sample characterised as outlines in (a) above. Subject to operation of the coal wash plant, a minimum of 1 composite tailing sample will undergo characterisation per month. Subject to operation of the coal wash plant a minimum of 12 composite tailing samples will undergo characterisation per year;
- d) records must be kept of the tailings disposal to indicate locations and characteristics of tailings stored within the tailings storage facility;
- e) where the acid producing potential of tailings material has not been conclusively determined, geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies; and
- f) tailings identified as potentially acid producing will be covered or placed to minimise surface oxidation. The maximum duration of surface exposure of these materials is one (1) month.

Mine Waste

- F17** A Mining Waste Management Plan together with the certification by an appropriately qualified person must be developed and implemented during the continuation of the environmental authority. The Mining Waste Management Plan must at a minimum include:
- a) characterisation programs to ensure that all mining waste is progressively characterised during disposal for net acid producing potential, salinity and the following parameters: pH, Electrical Conductivity (EC), Acid Neutralising Capacity (ANC), Net Acid Generation (NAG) (reporting NAG capacity and NAG pH after oxidation), Total Sulphur (S); Chromium Reducible Sulphur (Scr), Boron (B) Cadmium (Cd), Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na), Zinc (Zn) and Sulphate (SO₄);
 - b) individual parameters in a) above can be removed following sufficient mine waste characterisation to demonstrate that certain individual parameters are not present in sufficient quantities to warrant further characterisation;
 - c) characterisation programs to ensure that the physical properties of the mining waste is progressively characterised during disposal;
 - d) the availability or leachability of metals from the mining waste;
 - e) quantification of PAF from mining waste present;
 - f) review impacts of the PAF mining waste on the rehabilitation;
 - g) management actions for mining waste that has been identified as having a high availability or leachability of metals;
 - h) management actions for mining waste that has been defined as PAF;
 - i) identification of environmental impacts and potential environmental impacts;
 - j) control measures for routine operations to minimise likelihood of environmental harm;
 - k) contingency plans and emergency procedures for non-routine situations; and
 - l) periodic review of environmental performance and continual improvement.

Storage and handling of flammable and combustible liquids

- F18** All flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of AS 1940 – *Storage and Handling of Flammable and Combustible Liquids*.
- F19** Spillage of all flammable and combustible liquids must be controlled in a manner that prevents environmental harm.

Storage and handling of chemicals

- F20** All chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of the relevant Australian Standard.

F21 Spillage of all chemicals must be controlled in a manner that prevents environmental harm.

Infrastructure

F22 All infrastructure, constructed by or for the environmental authority holder during the licensed activities including water storage structures, must be removed from the site prior to surrender, except where agreed in writing by the post mining land owner / holder.

NOTE: This is not applicable where the landowner / holder is also the environmental authority holder.

Exploration

F23 Disturbance due to exploration activities in areas not authorised to be mined must be rehabilitated in accordance with provisions detailed in the *Code of Environmental Compliance for Exploration and Mineral Development Projects*.

Department Interest – 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.

G2 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) time, date, name and contact details of the complainant;
- b) reasons for the complaint;
- c) conclusions formed; and
- d) any actions taken.

Appendix 1 – Definitions

Words and phrases used throughout this licence are defined below except where identified in the *Environmental Protection Act 1994* or subordinate legislation. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

“20th percentile flow” means the 20th percentile of all daily flow measurements (or estimations) of daily flow over a 10 year period for a particular site. The 20th percentile calculation should only include days where flow has been measured (or estimated), i.e. not dry weather days.

“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:

- a) stability of final land forms in terms of settlement, erosion, weathering, pondage and drainage;
- b) control of geochemical and contaminant transport processes;
- c) quality of runoff waters and potential impact on receiving environment;
- d) vegetation establishment, survival and succession;
- e) vegetation productivity, sustained growth and structure development;
- f) fauna colonisation and habitat development;
- g) 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;
- h) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;
- i) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;
- j) resilience of vegetation to disease, insect attack, drought and fire; and
- k) vegetation water use and effects on ground water levels and catchment yields.

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

“acid rock drainage” means any contaminated discharge emanating from a mining activity formed through a series of chemical and biological reactions, when geological strata is disturbed and exposed to oxygen and moisture as a result of mining activity.

“administering authority” means the Department of Environment and Resource Management or its successor.

“airblast overpressure” means energy transmitted from the blast site within the atmosphere in the form of pressure waves. The maximum excess pressure in this wave, above ambient pressure is the peak airblast overpressure measured in decibels linear (dB).

“ambient (or total) noise” at a place, means the level of noise at the place from all sources (near and far), measured as the Leq for an appropriate time interval.

“Annual Exceedence Probability” or **“AEP”** means the probability that at least one event in excess of a particular magnitude will occur in any given year.

“ANZECC” means the *Australian and New Zealand Guidelines for Fresh Marine Water Quality 2000*.

“authority” means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

“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 on performance relative to the subject matter using the relevant protocols, standards, methods or literature.

“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.

“authority” means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

“competent person” means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

“bed and banks” for a waters, river, creek, stream, lake, lagoon, pond, swamp, wetland or dam means land over which the water of the waters, lake, lagoon, pond, swamp, wetland or dam 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 and banks that is from time to time covered by floodwater.

“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.

“blasting” means the use of explosive materials to fracture-

- a) rock, coal and other minerals for later recovery; or
- b) structural components or other items to facilitate removal from a site or for reuse.

‘certification’, “certifying” 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.

"chemical" means –

- a) an agricultural chemical product or veterinary chemical product within the meaning of the *Agricultural and Veterinary Chemicals Code Act 1994* (Commonwealth); or
- b) a dangerous good under the dangerous goods code; or
- c) a lead hazardous substance within the meaning of the *Workplace Health and Safety Regulation 1997*; or
- d) a drug or poison in the *Standard for the Uniform Scheduling of Drugs and Poisons* prepared by the Australian Health Ministers' Advisory Council and published by the Commonwealth; or
- e) any substance used as, or intended for use as –
 - i. a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product; or
 - ii. a surface active agent, including, for example, soap or related detergent; or
 - iii. a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide; or
 - iv. a fertiliser for agricultural, horticultural or garden use; or
- f) a substance used for, or intended for use for –
 - i. mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater; or
 - ii. manufacture of plastic or synthetic rubber.

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

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

"contaminated" means the substance has come into contact with a contaminant.

"contaminant" A 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.

"dam" means a land-based structure or a void that is designed to contain, divert or control flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does 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.

"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 all investigation and design reports, plans and specifications sufficient to hand to a contractor for construction, and planned decommissioning and rehabilitation outcomes; so as to address all hazard scenarios that would be identified by a properly conducted hazard assessment for the structure. Documentation must be such that a 'suitable qualified and experience person' could conduct an independent review without seeking further information from the designer.

"design storage allowance" or "DSA" means an available volume, estimated in accordance with the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland* (DME 1995), that must be provided in a dam as at the first of November each year in order to prevent a discharge from that dam to a probability (AEP) specified in that guideline. The DSA is estimated based on 100% runoff of wet season rainfall at the relevant AEP, taking account of process inputs during that wet season, with no allowance for evaporation.

"effluent" treated waste water discharged from sewage treatment plants.

"environmental authority" means an environmental authority granted in relation to an environmentally relevant activity under the *Environmental Protection Act 1994*.

"environmental authority holder" means the holder of this environmental authority.

"financial assurance" means a security required under the *Environmental Protection Act 1994* by the administering authority to cover the cost of rehabilitation or remediation of disturbed land or to secure compliance with the environmental authority.

"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.

"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 acceptable 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 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).

“hazardous waste” means any substance, whether liquid, solid or gaseous, derived by or resulting from, the processing of minerals that tends to destroy life or impair or endanger health.

“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 of 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.

“lake” includes –

- a) lagoon, swamp or other natural collection of water, whether permanent or intermittent; and
- b) the bed and banks and any other element confining or containing the water.

“ $L_{A\ 10, \text{adj}, 10 \text{ mins}}$ ” 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.

“ $L_{A\ 1, \text{adj}, 10 \text{ mins}}$ ” 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.

“ $L_{A, \text{max adj}, T}$ ” means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

“land capability” as defined in the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (DME 1995).

“land suitability” as defined in the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (DME 1995).

"land use" term to describe the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

"levee", "dyke" or "bund" means a long embankment 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 releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.

"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). An MRL is the lowest level required in a regulated dam to allow either of the following to be retained:

- a) the runoff from a 72 hour duration storm at the AEP specified in Table 15 of this environmental authority;
or
- b) a wave allowance at that AEP as estimated using a recognised engineering method.

"mg/L" means milligrams per litre.

“mineral” means a substance which normally occurs naturally as part of the earth’s crust or is dissolved or suspended in water within or upon the earth’s crust and includes a substance which may be extracted from such a substance, and includes—

- a) clay if mined for use for its ceramic properties, kaolin and bentonite;
- b) foundry sand;
- c) hydrocarbons and other substances or matter occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connection with mining for shale or coal or for the purpose of enhancing the safety of current or future mining operations for coal or the extraction or production of mineral oil there from;
- d) limestone if mined for use for its chemical properties;
- e) marble;
- f) mineral oil or gas extracted or produced from shale or coal by in situ processes;
- g) peat;
- h) salt including brine;
- i) shale from which mineral oil may be extracted or produced;
- j) silica, including silica sand, if mined for use for its chemical properties;
- k) rock mined in block or slab form for building or monumental purposes;

but does not include—

- l) living matter;
- m) petroleum within the meaning of the Petroleum Act 1923;
- n) soil, sand, gravel or rock (other than rock mined in block or slab form for building or monumental purposes) to be used or to be supplied for use as such, whether intact or in broken form;
- o) water.

“natural flow” means the flow of water through waters caused by nature.

“nature” includes:

- a) ecosystems and their constituent parts; and
- b) all natural and physical resources; and
- c) natural dynamic processes.

“noxious” means harmful or injurious to health or physical well being, other than trivial harm.

“offensive” means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

“operational land” means the land associated with the project for which this environmental authority has been issued.

“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.

“peak particle velocity (ppv)” means a measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second (mms^{-1}).

“protected area” means - a protected area under the *Nature Conservation Act 1992*; or
- a marine park under the *Marine Parks Act 1992*; or
- a World Heritage Area.

“progressive rehabilitation” means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining operations are ongoing.

“receiving environment” means all groundwater, surface water, land, and sediments that are not disturbed areas authorised by this environmental authority.

“receiving waters” means all groundwater and surface water that are not disturbed areas authorised by this environmental authority.

“reference site” (or analogue site) may reflect the original location, adjacent area or another area where rehabilitation success has been completed for a similar biodiversity. Details of the reference site may be as photographs, computer generated images and vegetation models etc.

“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).

“rehabilitation” 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.

“representative” means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.

“residual void” means an open pit resulting from the removal of ore and/or waste rock which will remain following the cessation of all mining activities and completion of rehabilitation processes.

“saline drainage” The movement of waters, contaminated with salt(s), as a result of the mining activity.

“self sustaining” means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

“sensitive place” means;

- 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) an 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 park or gardens.

“sewage” means the used water of person's to be treated at a sewage treatment plant.

“significant disturbance” – includes land

- a) if 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.

Some examples of disturbed land include:

- 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; (vegetation & topsoil)
- c) areas where land use suitability or capability has been diminished;
- d) areas within a watercourse, waterway, wetland or lake where mining activities occur;
- e) areas submerged by tailings or hazardous contaminant 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 mining activities have ceased; or
- g) areas where land has been contaminated and a suitability statement has not been issued.

However, the following areas are not included:

- a) areas off lease (e.g. roads or tracks which provide access to the mining lease);
- b) areas previously significantly disturbed which have achieved the rehabilitation outcomes;
- c) by agreement with the administering authority, areas previously significantly disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
- d) areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement with the landowner. The agreement to leave permanent infrastructure must be recorded in the Landowner Agreement and lodged with the administering authority; and
- e) disturbances that pre-existed the grant of the tenure unless those areas are disturbed during the term of the tenure.

“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 land form 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.

“suitably qualified and experienced person” in relation to dams means a person 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:

1. knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
2. 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
3. a total of five years of suitable experience and demonstrated expertise each, in three of the following categories:
 - a) investigation and design of dams;
 - b) Construction, operation and maintenance of dams;
 - c) hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology;
 - d) hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes;
 - e) hydrogeology with particular reference to seepage, groundwater;
 - f) solute transport processes and monitoring thereof; and
 - g) dam safety.

“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.

“trivial harm” means environmental harm which is not material or serious environmental harm and will not cause actual or potential loss or damage to property of an amount of, or amounts totalling more than \$5,000.

“void” means any man-made, open excavation in the ground.

“waste” as defined in section 13 of the *Environmental Protection Act 1994*.

“water” means –

- a) water in waters or spring;
- b) underground water;
- c) overland flow water; or
- d) water that has been collected in a dam.

“**waste water**” means used water from the activity, process water or contaminated storm water.

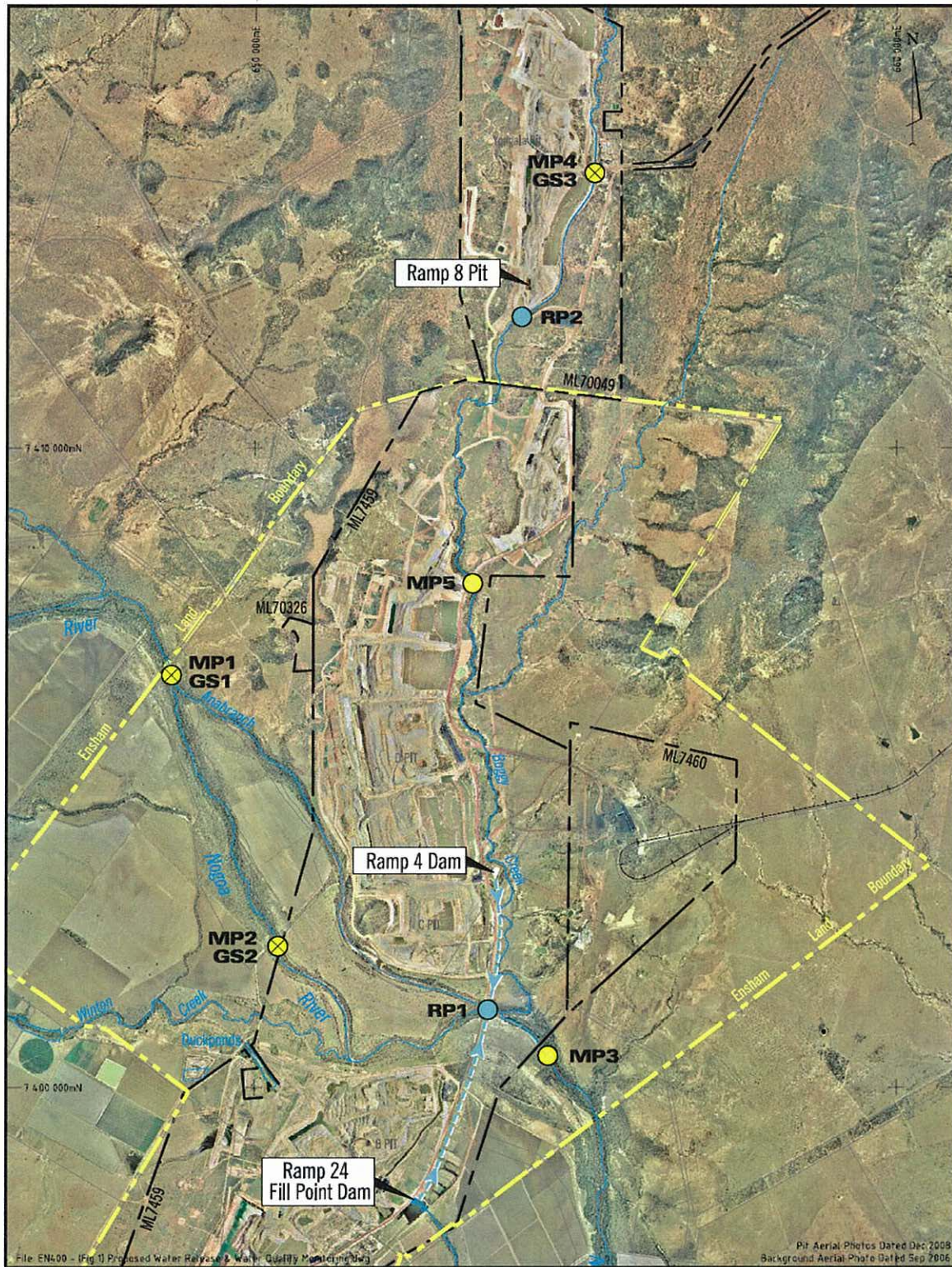
“**watercourse**” means a river, creek or stream in which water flows permanently or intermittently in a visibly defined channel (natural, artificial or artificially improved) with:

- a) continuous bed and banks;
- b) an extended period of flow for some months after rain ceases, and
- c) an adequacy of flow that sustains basic ecological processes and maintains biodiversity.

“**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.

“**µg/L**” means micrograms per litre.

Appendix 2 (Release points (RP) and monitoring points (MP) for Ensham Mine)



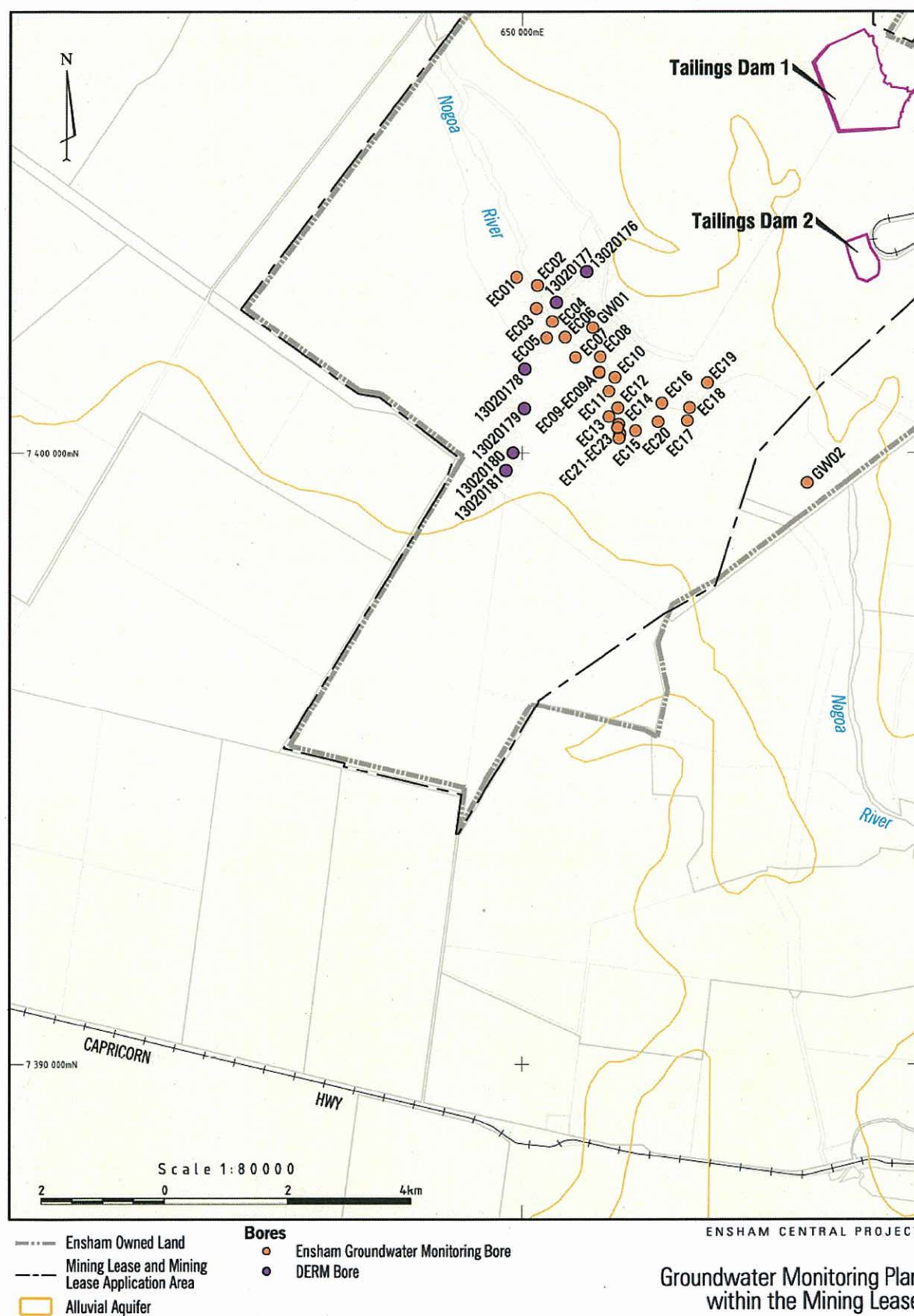
- Mining Lease and Mining Lease Application Areas
- Proposed Release Points
- Proposed Water Quality Monitoring Point
- ⊗ Proposed Gauging Station Location
- Pipeline to Water Release Point

Proposed Water Release Points and
Water Quality Monitoring Locations



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Appendix 3 (Groundwater monitoring locations)



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