

# Environmental Authority (Mining Activities) Non Code Compliant Level 1

## Mining Project

Permit<sup>1</sup> Number: MIM800086202 – Ensham Mine

Section 258 – Environmental Protection Act 1994

Takes effect from: 24 December 2009

Details:

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

| Activity(s)       | Location(s)                                                                             |
|-------------------|-----------------------------------------------------------------------------------------|
| Mining Black Coal | 40km east of Emerald<br>ML7459<br>ML7460<br>ML70049<br>ML70326<br>SA 2 (Lot 31 P864573) |

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

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



Tim Southwell  
Delegate

Environmental Protection Act 1994  
24 December 2009

<sup>1</sup> 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.
- A2** The financial assurance is to remain in force until the administering authority is satisfied that no claim on the assurance is likely.

### Maintenance of measures, plant and equipment

- A3** 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

- A4** 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.
- A5** Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

### Storage and handling of flammable and combustible liquids

- A6** Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm (other than trivial harm) and maintained in accordance with Section 5.9 of *AS 1940 - Storage and Handling of Flammable and Combustible Liquids of 1993*.

### Definitions

- A7** 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** All reasonable and practicable measures must be taken to minimise the release of dust or particulate matter or both resulting from the mining activities that causes or is likely to cause an environmental nuisance, at any sensitive place.
- B2** When requested by the administering authority, dust and particulate monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.
- B3** If the environmental authority holder can provide evidence through monitoring that the following limits are not being exceeded then the holder is not in breach of condition B1:
- a) dust deposition of one hundred and twenty (120) milligrams per square metre per day, averaged over one (1) month, when monitored in accordance with *AS 3580.10.1 Methods for sampling and analysis of ambient air - Determination of particulates - Deposited matter - Gravimetric method of 1991* or another method of monitoring/assessment as determined to be appropriate due to the nature of the nuisance decided in consultation with the administering authority; and
  - b) a concentration of particulate matter with an aerodynamic diameter of less than ten (10) micrometer (PM10) suspended in the atmosphere of one hundred and fifty (150) micrograms per cubic meter over a twenty-four (24) hour averaging time, at a sensitive place downwind of the operation land, when monitored in accordance with:
    - (i) *Particulate matter- determination of suspended particulate PM10 high volume sampler with size selective inlet – Gravimetric method*, when monitored in accordance with *AS 3580.9.6 Methods for sampling and analysis of ambient air – determination of suspended particulate matter – PM (sub) 10 high volume sampler with size-selective inlet – Gravimetric method of 1990*; or
    - (ii) Any alternative method of sampling PM10 which may be permitted by the *Air Quality Sampling Manual* as published from time to time by the administering authority.

## 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<br>Nogoa River | 653,753 | 7,401,398 | Ramp 24 Fill Point Dam and Ramp 4 Dam | End of pipe      | Nogoa River                  |
| RP 2<br>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 ( $\mu\text{S}/\text{cm}$ ) | 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)<br>9.0 (maximum)                | 6.5 (minimum)<br>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 ( $\text{SO}_4^{2-}$ ) (mg/L)              | 1,000                                         | 250                                       | Daily during release* (first sample within 2 hours of commencement of release)                  |

Note: NA – not available, \* 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).



**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 & 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 exceedance 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 exceedance 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 <sup>3</sup> /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 <sup>3</sup> /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:
- a) the reason for the release;
  - b) the location of the release;
  - c) all water quality monitoring results;
  - d) any general observations;
  - e) all calculations; and
  - f) 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 | 652,851 | 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.



**Table 6 (Onsite water storage contaminant limits)**

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

Note:

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

<sup>2</sup> 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).

**Table 7 (Receiving waters contaminant trigger levels)**

| Quality characteristic                           | Trigger level | Monitoring frequency     |
|--------------------------------------------------|---------------|--------------------------|
| pH                                               | 6.5 – 8.0     | Daily during the release |
| Electrical Conductivity (µS/cm)                  | 500           |                          |
| Suspended solids (mg/L)                          | 1,000         |                          |
| Sulphate (SO <sub>4</sub> <sup>2-</sup> ) (mg/L) | 250           |                          |

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

| Monitoring point (MP)                                            | Receiving waters location description                              | Easting | Northing  |
|------------------------------------------------------------------|--------------------------------------------------------------------|---------|-----------|
| <b>Monitoring points for RP 1 – Nogoia River discharge point</b> |                                                                    |         |           |
| 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 |
| <b>Monitoring points for RP3 – Boggy Creek discharge point</b>   |                                                                    |         |           |
| 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:

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



**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 exceedance 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 & ARMCANZ 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 & ARMCANZ 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 & ARMCA NZ (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; and
  - d) carried out on representative samples.
  - 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<br>(based on the average of<br>a min of 5 samples) | 1,000         | Colonies per<br>100ml | max        | On release           |

### Groundwater

**W43** Groundwater affected by mining activities must be monitored at the locations and frequencies defined in Table 12 (Groundwater monitoring locations).



- W44** Subject to Condition W43 groundwater levels must be monitored and groundwater draw down fluctuations in excess of 2m per year, not resulting from the pumping of licensed bores, must be notified within fourteen (14) days to the administering authority following completion of monitoring.

**Table 12 (Groundwater monitoring locations)**

| Monitoring point                  | Easting (AMD) | Northing (AMG) | Sampling point | Frequency         |
|-----------------------------------|---------------|----------------|----------------|-------------------|
| Alluvium groundwater (upstream)   | 651,140       | 7,402,054      | GW2            | Quarterly (depth) |
| Alluvium groundwater (downstream) | 654,627       | 7,399,513      | GW1            | Quarterly (depth) |

- W45** The method of water sampling required by this environmental authority must comply with that set out in the latest edition of the administering authority's Water Quality Sampling Manual.

## Department Interest – Dams

### 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 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 13 (Location of regulated dams).

**Table 13 (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 14 (Basic specification of regulated dams).

**Table 14 (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 15 (Hydraulic performance of regulated dams) below.

**Table 15 (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** Subject to conditions D2 and D3 noise from the mining activity must not cause an environmental nuisance, at any sensitive or commercial place.
- D2** When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which 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.
- D3** The method of measurement and reporting of noise levels must comply with the latest edition of the administering authority's *Noise Measurement Manual*.



## Department Interest – Waste

- E1** Tyres stored awaiting disposal or transport for take-back and, recycling, or waste-to-energy options – should be stockpiled in volumes less than three (3) metre in height and two hundred (200) square metre in area and at least ten (10) metre from any other tyre storage area.
- E2** All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a ten (10) metre radius of the scrap tyre storage area.
- E3** Disposal of scrap tyres resulting from the mining activities in spoil emplacement is acceptable provided:
- a) all other stages (options) in the waste hierarchy have been considered; and
  - b) tyres are placed as deep in the spoil as reasonably practicable.
- 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.

## Department Interest – Land

### Rehabilitation landform criteria

- F1** Progressive rehabilitation must commence when areas become available within the operational land.
- F2** Complete an investigation into rehabilitation of the disturbed areas and submit a report to the administering authority proposing success criteria and landform design criteria by **31 December 2010**. The rehabilitation success criteria must be detailed in the Plan of Operations.

- F3** A Rehabilitation Management Plan for all mining areas must be developed by **31 December 2010** and submitted to the administering authority for approval. The Rehabilitation Management Plan must:
- a) map existing areas of rehabilitation;
  - b) detail rehabilitation methods applied to areas in F3 a);
  - c) identify success factors from areas in F3 a);
  - d) detail future rehabilitation actions to be completed on areas in F3 a);
  - e) identify three (3) analogue and three (3) rehabilitation sites to be used to develop rehabilitation success criteria;
  - f) detail landform design criteria;
  - g) detail future planned rehabilitation methods for disturbed areas;
  - h) detail planned native vegetation rehabilitation areas and corridors;
  - i) detail rehabilitation monitoring and maintenance requirements to be applied to all areas of disturbance;
  - j) detail end of mine landform design plan;
  - k) detail spoil characteristics, soil analysis, soil separation for use on rehabilitation; and
  - l) detail potential problem and how they will be addresses.

- F4** Upon submission of the Rehabilitation Management Plan (condition F3) an amended environmental authority will be issued redressing new rehabilitation landform criteria conditions relative to the results identified.

**Residual voids**

- F5** All reasonable and practicable measures shall be taken to minimise or prevent serious environmental harm being caused by the void other than the environmental harm constituted by the existence of the residual void itself and subject to any other condition within this environmental authority.



- F6** If residual voids are to be left, an investigation into void options must be prepared and a report submitted to the administering authority. The investigation must at a minimum include the following:
- a) A study of options available for minimising residual void area and volume;
  - b) 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;
  - c) 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;
  - d) A hydrological study into the long-term risk of the Nogoa River, Boggy Creek / residual void interaction, including erosion of the levee and extreme hydrological events, and the consequences of such interaction to the long-term stability of the residual voids;
  - 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 residual void areas and volumes.

These studies will be undertaken during the life of the mine, and will include detailed research and modelling. All studies must be complete prior to five (5) years before end of open cut mining.

#### **Topsoil management**

- F7** Topsoil resources, that are suitable for use in rehabilitation, must be salvaged ahead of mining disturbance (or additional spoil placement) for strategic use in rehabilitation of the mine/spoil dump area. This topsoil removal and relocation must be documented in a Topsoil Stockpile Register.

#### **Infrastructure**

- F8** All infrastructure, constructed by or for the environmental authority holder during the mining activities including water storage structures, must be removed from the site prior to mining lease surrender, except where agreed in writing by the post mining land owner / holder.

*Note: This is not applicable where the landowner / holder is the environmental authority holder.*

### **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.

## 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.

**"20<sup>th</sup> percentile flow"** means the 20<sup>th</sup> percentile of all daily flow measurements (or estimations) of daily flow over a 10 year period for a particular site. The 20<sup>th</sup> 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.

**“ $L_{A, \text{max adj}, 1}$ ”** 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 ( $\text{mms}^{-1}$ ).

**"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:

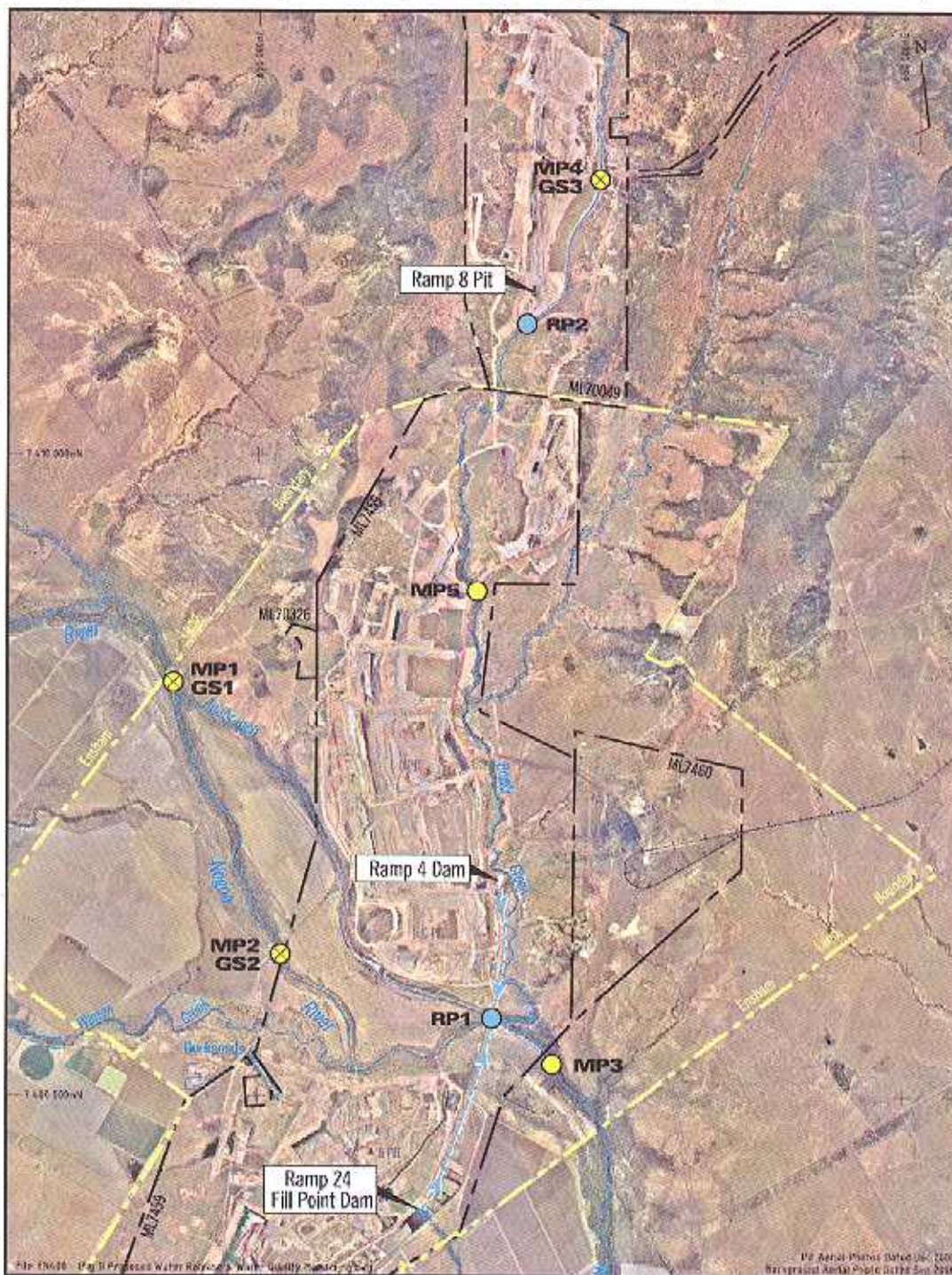
- a) continuous bed and banks;
- b) an extended period of flow for some months after rain ceases, and
- c) an adequacy of flow that sustains basic ecological processes and maintains biodiversity.

"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



Ensham  
PROJECTS

Hansen Bailey

**FIGURE 1**

**END OF ENVIRONMENTAL AUTHORITY**