

Department of Environment and Heritage Protection

Environmental Protection Act 1994

Environmental authority EPML00353213 – Kevin's Corner Project

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

Environmental authority number: EPML00353213

Environmental authority takes effect: date of grant of tenure

The anniversary date of this environmental authority is **5 July**. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name(s)	Registered address
Hancock Galilee Pty Ltd	Level 1, Suite 352 241 Adelaide Street BRISBANE CITY QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 2A, Environmental Protection Regulation 2008: ERA 13 Mining black coal Schedule 2, Environmental Protection Regulation 2008: ERA 8(3) Chemical storage: Storing more than 500m³ of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c). ERA 15(1) Fuel burning: using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour. ERA 16(2)(c) Extractive and Screening Activities: Extracting, other than by dredging, in a year, the following quantity of material—more than 1,000,000t. ERA 31(2)(b) Mineral Processing: processing, in a year, the following quantities of mineral products, other than coke—more than 100,000t. ERA 33(1) Crushing, milling, grinding or screening: crushing, grinding, milling or screening more than 5,000t of material in a year. ERA 38(1)(d) Surface Coating: anodising, electroplating, enamelling or galvanising, using, in a year, the following quantity of surface coating materials—more than 10,000t.	ML70425

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

Environmentally relevant activity/activities	Location(s)
ERA 38(2) Surface Coating: coating, painting or powder coating, using, in a year, more than 100t of surface coating materials. ERA 60(1)(d) Waste Disposal: operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(a)—more than 200,000t. ERA 63(1)(c) Sewage Treatment: operating sewage treatment works, other than no-release works, with a total daily peak design capacity of—more than 1500 but not more than 4,000EP. ERA 64(3) Water Treatment: treating 10ML or more raw water in a day.	

Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority on the nominated day; or

- b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or
- c) otherwise- one the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.



Signature

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



Date

Enquiries:
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Protection
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Obligations under the *Environmental Protection Act 1994*

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

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

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state controlled roads), the Department of Natural Resources and Mines (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Conditions of environmental authority

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

This environmental authority consists of the following Schedules and Appendices:

Schedule A	General
Schedule B	Air
Schedule C	Water
Schedule D	Noise
Schedule E	Waste
Schedule F	Land
Schedule G	Regulated Structures
Schedule H	Sewage Treatment
Schedule I	Water Treatment
Schedule J	Definitions
Schedule K	Figures
Appendix A	Rehabilitation Requirements
Appendix B	Watercourse Subsidence



Schedule A: General

- A1** This environmental authority authorises environmental harm referred to in the conditions. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
- A2** In carrying out the mining activity authorised by this environmental authority, the holder of this environmental authority must comply with *Table 1: Mining Domains*, *Figure 1: Overall Site Layout Domain Plan*; *Figure 2: Site Layout Showing Domain 1*; *Figure 3: Site Layout Showing Domain 2*; *Figure 4: Site Layout Showing Domain 3*; *Figure 5: Site Layout Showing Domain 4*; *Figure 6: Site Layout Showing Domain 5*, and *Figure 7: Site Layout Showing Domain 6*.

Table 1: Mining Domains

Mine Domain	Description	Location	Maximum disturbance areas
1. Infrastructure	Includes CHPP, ROM Stockpiles, workshops, landfill, raw water dam, administration areas.	See Figure 2	2,566 ha
2. Pits, Voids and Overburden Emplacements	Includes Void Pit 1, Void Pit 2, borrow pit and overburden	See Figure 3	3,315 ha
3. Tailings Storage Facility	Tailings Dam	See Figure 4	420 ha
4. Dams and Surface Water Features	See Table 18: Basic Details of Regulated Dams	See Figure 5 and Table 17: Location of Regulated Structures	360 ha
5. Modeled Significant State Significant Biodiversity Values (SSBV) Subsidence Impacted Areas	Areas of subsidence modeled as likely to significantly impact SSBV.	See Figure 6	632 ha
6. Other Lands	Other lands including exploration, groundwater monitoring bores, and underground mining	See Figure 7	30,087 ha
Total			37,380 ha

- A3** The holder of this environmental authority must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;
 - (b) maintain such measures, plant and equipment in a proper and efficient condition;
 - (c) operate such measures, plant and equipment in a proper and efficient manner; and
 - (d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.

Monitoring

- A4** Except where specified otherwise in another condition of this authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.
- A5** The holder of this environmental authority must implement a monitoring program that enables the holder and the administering authority to determine compliance with the environmental authority conditions.

Financial Assurance

- A6** Provide to the administering authority financial assurance for the amount and in the form acceptable to the administering authority in accordance with the most recent edition of the administering authority's Guideline – Calculating financial assurance for mining projects, before the proposed mining activities can commence.
- A7** The amount of financial assurance must be reviewed by the holder of this environmental authority when a plan of operations is amended or replaced or the authority is amended.

Risk Management

- A8** The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirements of the *Standard for Risk Management (ISO31000:2009)*, or the latest edition of an Australian Standard for risk management, to the extent relevant to the environmental management, prior to the commencement of mining activities.

Notification of emergencies, incidents and exceptions

- A9** The holder of this environmental authority must notify the administering authority of any non-compliance with any condition of this environmental authority within 24 hours after becoming aware of the non-compliance.

(Note: a notification of an exceedance under condition C18 does not require additional notification under condition A9)

- A10** The holder of this environmental authority must notify the administering authority by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected not to be in accordance with, the conditions of this environmental authority.
- A11** Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following:
- (a) results and interpretation of any samples taken and analysed;
 - (b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and
 - (c) proposed actions to prevent a recurrence of the emergency or incident.

Complaints

- A12** The holder of this environmental authority must record all environmental complaints received about the mining activities including the following details:
- (a) name, address and contact number for/of the complainant;
 - (b) time and date of complaint;
 - (c) reasons for the complaint;
 - (d) investigations undertaken;
 - (e) conclusions formed;
 - (f) actions taken to resolve the complaint;
 - (g) any abatement measures implemented; and
 - (h) person responsible for resolving the complaint.



- A13** The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

Third Party Reporting

- A14** The holder of this environmental authority must:
- (a) within 1 year of the commencement of this authority, obtain from a suitably qualified and experienced third party a report on compliance with the conditions of this environmental authority;
 - (b) obtain further such reports at regular intervals not exceeding three years from the completion of the report referred to above; and
 - (c) provide each report to the administering authority within 90 days of its completion.
- A15** Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed to provide a better environmental outcome, subsequent to the issue of this environmental authority, the holder must:
- (a) comply with the amended or changed standard, policy or guideline within 2 years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation; and
 - (b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Unless the holder can demonstrate that the existing system provides compliance with the intent of this EA and the proposed changes do not impact on the validity of existing background information.

Coal Extraction

- A16** The environmental authority holder is approved for a coal extraction rate of up to 45 million tonnes per annum (Mtpa) of run-of-mine (ROM) ore in accordance with this environmental authority.

Schedule B: Air

- B1** Dust and particulate matter must not exceed the following levels when measured at any sensitive place.
- (a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard AS3580.10.1 *Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method*.
 - (b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM₁₀) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time with no more than five exceedances¹ recorded over twelve months, when monitored in accordance with the most recent version of either:
 - (i) Australian Standard AS3580.9.6 *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ high volume sampler with size-selective inlet – Gravimetric method*, or

¹ These five exceedances (as allowed for in the EPP (Air)) are for natural events such as bush fires and dust storms.

- (ii) Australian Standard AS3580.9.9 *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ low volume sampler – Gravimetric method*, or
- (iii) Australian Standard AS3580.9.8 *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ continuous direct mass method using a tapered element oscillating microbalance (TEOM) analyser*.
- (c) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.3:2003 *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method* or using an alternative sampling methodology determined in consultation with EHP.

Schedule C: Water

Release of Contaminants

- C1** 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.

Discharge of Mine Affected Water

- C2** Unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in Table 2: Mine Affected Water Release Points, Sources and Receiving Waters and depicted in Figure 8: Mine Affected Water Release Points attached to this environmental authority.

Table 2: Mine Affected Water Release Points, Sources and Receiving Waters

Release Point (RP)	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Contaminant Source and Location	Monitoring Point	Receiving Waters Description
RP1	-23.0703	146.4299	Mine Water Dam 1 (MWD1)	Outlet works direct into Middle Creek – from release point	Middle Creek
RP2	-23.0658	146.4994	Mine Water Dam 2 (MWD2)	Outlet works direct into Sandy Creek – from release point	Sandy Creek
RP3	-23.0900	146.4991	Mine Water Dam 3 (MWD3)	Outlet works direct into Sandy Creek – from release point	Sandy Creek
RP4	-23.1038	146.5046	Mine Water Dam 4 (MWD4)	Outlet works direct into Sandy Creek – from release point	Sandy Creek
RP6	-23.0736	146.5263	Mine Water Dam 2 (MWD2)	Spillway	Sandy Creek
RP7	-23.0897	146.5048	Mine Water Dam 3 (MWD3)	Spillway	Sandy Creek
RP8	-23.1031	146.5113	Mine Water Dam 4 (MWD4)	Spillway	Sandy Creek

- C3** The release of mine affected water to internal water management infrastructure that is installed and operated in accordance with a Water Management Plan that complies with conditions C34 to C39 inclusive is permitted.

- C4** The release of mine affected water to waters in accordance with condition C2 must not exceed the release limits stated in *Table 3: Mine Affected Water Release Limits*, when measured at the monitoring points specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*, for each quality characteristic.

Table 3: Mine Affected Water Release Limits

Quality Characteristic	Release Limit	Monitoring Frequency
Electrical conductivity ($\mu\text{S}/\text{cm}$)	Release limits specified in Table 6 for variable flow criteria.	Continuously
pH (pH Unit)	6.5 (minimum) 9.0 (maximum)	Continuously
Turbidity (NTU)	264	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the duration of the release.
Suspended Solids (mg/L)	53	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the duration of the release.
Sulphate (SO_4^{2-}) (mg/L)	Release limits specified in Table 6 for variable flow criteria.	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the duration of the release.

- C5** The release of mine affected water to waters from the release points must be monitored at the locations specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters* for each quality characteristic and at the frequency specified in *Table 3: Mine Affected Water Release Limits* and *Table 4: Release Contaminant Trigger Investigation Levels*.
- C6** If quality characteristics of the release exceed any of the trigger levels specified in *Table 4: Release Contaminant Trigger Investigation Levels* during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in *Table 4: Release Contaminant Trigger Investigation Levels* and:
- where the trigger values are not exceeded then no action is to be taken; or
 - where the downstream results exceed the trigger values specified in *Table 4: Release Contaminant Trigger Investigation Levels* for any quality characteristics, compare the results of the downstream site to the data from background monitoring sites and:
 - if the result is less than the background monitoring site data, then no action is to be taken; or
 - if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
 - details of the investigations carried out; and
 - actions taken to prevent environmental harm.
- (Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C6 b) ii. of this condition, no further reporting is required for subsequent trigger events for that quality characteristic)
- C7** If an exceedance in accordance with condition C6 b) ii. is identified, the holder of the authority must notify the administering authority within 14 days of receiving the result.

Table 4: Release Contaminant Trigger Investigation Levels

Quality Characteristic	Trigger Level ³	Monitoring Frequency
Aluminium (µg/L) ¹	220	Monitoring to be commenced within 2 hours of commencement of the release, and then at 24 hour intervals thereafter.
Arsenic (µg/L) ¹	13	
Cadmium (µg/L) ¹	0.2	
Chromium (µg/L) ¹	1.0	
Copper (µg/L) ¹	2	
Iron (µg/L) ¹	610	
Lead (µg/L) ¹	3.4	
Mercury (µg/L) ¹	0.1	
Nickel (µg/L) ¹	11	
Zinc (µg/L) ¹	11	
Boron (µg/L) ¹	370	
Cobalt (µg/L) ¹	1.4	
Manganese (µg/L) ¹	1900	
Molybdenum (µg/L) ¹	34	
Selenium (µg/L) ¹	10	
Silver (µg/L) ¹	10	
Uranium (µg/L) ¹	1	
Vanadium (µg/L) ¹	10	
Ammonia as N (µg/L) ¹	900	
Nitrate as NO ₃ (µg/L) ¹	1100	
Petroleum hydrocarbons (C6-C9) (µg/L) ¹	20	
Petroleum hydrocarbons (C10-C36) (µg/L) ¹	100	
Fluoride (µg/L) ²	2000	
Sodium (µg/L) ¹	180000	

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 Fluoride must be measured as total (unfiltered).

³ Levels below the LOR to be classified as non-detects

Mine Affected Water Release Events

- C8** The holder of this environmental authority must ensure a stream flow gauging stations is/are installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in *Table 5: Mine Affected Water Release during Flow Events*.
- C9** Notwithstanding any other condition of this environmental authority, the release of mine affected water to receiving waters in accordance with condition C2 must only take place during periods of natural flow events in accordance with the receiving water flow criteria for discharge specified in *Table 5: Mine Affected Water Release during Flow Events* when measured at the monitoring points specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*.
- C10** The release of mine affected water to receiving waters in accordance with condition C2 must not exceed the Electrical Conductivity and Sulphate release limits or the Maximum Release Rate (for all combined

release points flows) for each receiving water flow criteria for discharge specified in *Table 5: Mine Affected Water Release during Flow Events* when measured at the monitoring points specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*.

Table 5: Mine Affected Water Release during Flow Events

Receiving Waters	Release Point (RP)	Gauging Station ¹	Gauging Station Latitude (decimal degree, GDA94)	Gauging Station Longitude (decimal degree, GDA94)	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m ³ /s)	Maximum Release Rate for all Combined RP flows (m ³ /s)	Electrical Conductivity and Sulphate Release Limits
Sandy Creek	RP2, RP3, RP4, RP5, RP6, RP7	Sandy Creek Gauging Station	-23.0756	146.4986	Continuous	<4.3m ³ /s for a period of 28 days after natural flow events that exceed 4.3m ³ /s	<0.2 m ³ /s	Maximum Electrical Conductivity: 168 µS/cm Maximum Sulphate (SO ₄ ²⁻): 250 mg/L
						>4.3m ³ /s	<0.35m ³ /s	Maximum Electrical Conductivity: 1500 µS/cm Maximum Sulphate (SO ₄ ²⁻): 600 mg/L
						>15m ³ /s	<0.45m ³ /s	Maximum Electrical Conductivity: 3500 µS/cm Maximum Sulphate (SO ₄ ²⁻): 1500 mg/L
Middle Creek	RP1	Middle Creek Gauging Station	-23.0777	146.4327	Continuous	Low Flow <0.5m ³ /s for a period of 28 days after natural flow events that exceed 1m ³ /s	<0.2 m ³ /s	Maximum Electrical Conductivity: 168 µS/cm Maximum Sulphate (SO ₄ ²⁻): 250 mg/L
						Medium Flow >1m ³ /s	<0.97m ³ /s	Maximum Electrical Conductivity: 1200 µS/cm Maximum Sulphate (SO ₄ ²⁻): 500 mg/L

Receiving Waters	Release Point (RP)	Gauging Station ¹	Gauging Station Latitude (decimal degree, GDA94)	Gauging Station Longitude (decimal degree, GDA94)	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m ³ /s)	Maximum Release Rate for all Combined RP flows (m ³ /s)	Electrical Conductivity and Sulphate Release Limits
						> 5 m ³ /s	<1.1m ³ /s	Maximum Electrical Conductivity: 3500 µS/cm Maximum Sulphate (SO ₄ ²⁻): 1300 mg/L
						High Flow >10m ³ /s	<1.1m ³ /s	Maximum Electrical Conductivity: 5000 µS/cm Maximum Sulphate (SO ₄ ²⁻): 2500 mg/L

C11 The daily quantity of mine affected water released from each release point must be measured and recorded at the monitoring points in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*.

C12 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.

Cessation of Release

C13 During the release of mine affected water to receiving waters from the release points, the receiving waters must be monitored at the locations specified in *Table 6: Receiving waters release limits* for each quality characteristic and at the frequency specified in *Table 6: Receiving waters release limits*.

C14 Notwithstanding any other condition of this environmental authority, the release of mine affected water:

- (a) must not commence if the water quality at the upstream site exceeds the water quality characteristics in *Table 6: Receiving water release limits*; and
- (b) must cease if the water quality characteristics at the downstream or the upstream sites in *Table 6: Receiving waters release limits* are met and or exceeded.

Table 6: Receiving waters release limits

Monitoring Point	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Quality Characteristic	Limit	Monitoring Frequency
Upstream					
MP1	-23.1113	146.5075	Electrical conductivity (µS/cm)	700	Continuously
MP11	-23.1311	146.4170	Electrical conductivity (µS/cm)	700	Continuously

Downstream					
MP4	-22.9985	146.5116	Electrical conductivity (µS/cm)	700	Continuously

- C15** In accordance with conditions C14(b), the release of mine affected water may recommence after a cessation if the water quality characteristics in *Table 6: Receiving waters release limits* are at levels below the water quality characteristics at the downstream and upstream sites in *Table 6: Receiving waters release limits*.

(Note: If the release of mine affected water is ceased under condition C14, and the water quality within the receiving environment drops below the water quality characteristic limit in Table 6: Receiving water release limits, the release may recommence if all other release conditions are complied with)

Notification of Release Event

- C16** The environmental authority holder must notify the administering authority as soon as practicable, and no later than 24 hours, after commencing to release mine affected water to the receiving environment.

Notification must include the submission of written advice 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 rate and volume (estimated);
- (e) receiving water/s including the natural flow rate; and
- (f) 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)

- C17** The environmental authority holder must notify the administering authority as soon as practicable (nominally within 24 hours after cessation of a release event) of the cessation of a release notified under condition C16 and within 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 Department 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.

(Note: Successive or intermittent releases occurring within 24 hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with conditions C17 and C18, provided the relevant details of the release are included within the notification provided in accordance with conditions C16 and C17.

Notification of Release Event Exceedance

- C18** If the release limits defined in *Table 3: Mine Affected Water Release Limits* are exceeded, the holder of the environmental authority must notify the administering authority within 24 hours of receiving the results.

- C19** The authority holder must, within 28 days of a release that exceeds the conditions of this authority, provide a report to the administering authority detailing:

- (a) the reason of 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

- C20** Water storages containing mine affected water which are accessible to livestock must be monitored for the water quality characteristics and at the monitoring frequency specified in *Table 7: Onsite Water Storage Contaminant Limits*.
- C21** In the event that water storages exceed the contaminant limits defined in *Table 7: 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 7: Onsite Water Storage Contaminant Limits

Quality Characteristic	Water Storage Contaminant Limit	Monitoring Frequency
pH (pH unit)	6.5 (minimum) 9.0 (maximum)	Quarterly
EC (µS/cm)	5970	
Sulphate (mg/L)	1000 ¹	
Fluoride (mg/L)	2 ¹	
Aluminium (mg/L)	5 ¹	
Arsenic (mg/L)	0.5 ¹	
Cadmium (mg/L)	0.01 ¹	
Cobalt (mg/L)	1 ¹	
Copper (mg/L)	1 ¹	
Lead (mg/L)	0.1 ¹	
Nickel (mg/L)	1 ¹	
Zinc (mg/L)	20 ¹	

¹ All metals and metalloids must be measured as total (unfiltered).

- C22** The quality of the receiving waters must be monitored at the locations specified in *Table 8: Receiving Water Upstream Background and Downstream Monitoring Locations* and shown in *Figure 9: Receiving Water Upstream Background and Downstream Monitoring Locations* for each quality characteristic and at the monitoring frequency stated in *Table 9: Receiving Waters Contaminant Trigger Levels*.

Table 8: Receiving Water Upstream Background and Downstream Monitoring Locations

Monitoring Point (MP)	Receiving Waters Location Description	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)
Upstream Background Monitoring Locations			
MP1	Sandy Creek: 1,100m upstream of RP4/RP7; and 2,600m upstream of RP3/RP6	-23.1113	146.5053
MP7	Well Creek 8,700m upstream of RP5	-23.0203	146.3909
MP8	Middle Creek: 600m upstream of RP1	-23.0776	146.4327
MP11	Little Sandy Creek: 8200m upstream of RP1 and 1500m upstream of the diversion	-23.1311	146.4170
Downstream Monitoring Locations			
MP6	Middle Creek: 5,250m downstream of RP1	-23.3045	146.4648
MP2	Sandy Creek: 1,600m downstream of RP3/RP6; and 3,300m downstream of RP4/RP7	-23.0756	146.4986
MP3	Sandy Creek 50m downstream of Well Creek Confluence: 3,100m downstream of RP2	-23.0396	146.5059
MP4	Sandy Creek downstream lease boundary: 15,800m downstream of RP1; 8,100m downstream of RP2; 10,800m downstream of RP3 12,500m; and downstream of RP4.	-22.9985	146.5116
MP5	Well Creek 50m upstream of Sandy Creek Confluence: 11,800m downstream of RP1; 11,500m downstream of RP5	-23.0401	146.5056

Table 9: Receiving Waters Contaminant Trigger Levels

Quality Characteristic	Receiving Water Trigger Level	Monitoring Frequency
pH	6.5 (minimum) 8.0 (maximum)	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the release.
Electrical Conductivity ($\mu\text{S}/\text{cm}$)	700	
Suspended solids (mg/L)	165	
Sulphate (SO_4^{2-}) (mg/L)	250	
Sodium (mg/L)	180	

C23 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in *Table 9: Receiving Waters Contaminant Trigger Levels* during a release event

the environmental authority holder must compare the downstream results to the upstream results in the receiving waters and:

- (a) 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
- (b) where the downstream results exceed the upstream results complete an investigation 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 C23 b) of this condition, no further reporting is required for the subsequent trigger events for that quality characteristic)

Receiving Environment Monitoring Program (REMP)

- C24** The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site.

For the purpose of the REMP, the receiving environment is the waters of Lagoon Creek and Sandy Creek and connected or surrounding waterways within 10km downstream of the release. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.

- C25** The Receiving Environment Monitoring Program (REMP) must:

- (a) assess the condition or state of receiving waters, including upstream conditions, spatially within the REMP area, considering background water quality characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality); and
- (b) be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected;
- (c) include monitoring from background reference sites (e.g. upstream or background) and downstream sites from the release (as a minimum, the locations specified in *Table 8: Receiving Water Upstream Background and Downstream Monitoring Locations*);
- (d) specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site specific background reference values in accordance with the *Queensland Water Quality Guidelines* (2006). This should include monitoring during periods of natural flow irrespective of mine or other discharges;
- (e) include monitoring and assessment of dissolved oxygen saturation, temperature and all water quality parameters listed in *Table 3: Mine Affected Water Release Limits* and *Table 4: Release Contaminant Trigger Investigation Levels*;
- (f) include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARMICANZ (2000), BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*);
- (g) include, where appropriate, monitoring of macroinvertebrates in accordance with the AusRivas methodology;
- (h) apply procedures and/or guidelines from ANZECC and ARMICANZ (2000) and other relevant guidelines and documents;
- (i) describe sampling and analysis methods and quality assurance and control; and
- (j) incorporate stream flow and hydrological information in the interpretations of water quality and biological data.



- C26** A Receiving Environment Monitoring Program (REMP) Design Document that addresses each criterion presented in Conditions C24 and C25 must be prepared and submitted to the administering authority prior to commencement of activities. Due consideration must be given to any comments made by the administering authority on the REMP Design Document and subsequent implementation of the program.
- C27** A report outlining the findings of the Receiving Environment Monitoring Program, including all monitoring results and interpretations in accordance with conditions C24 and C25 must be prepared annually and made available on request to the administering authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

Water Reuse

- C28** Mine affected water may be piped, trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder for a third party for the purpose of:
- (a) supplying stock water subject to compliance with the quality release limits specified in *Table 10: Stock Water Release Limits*; or
 - (b) supplying water for construction and/or road maintenance in accordance with the conditions of this environmental authority.

Table 10: Stock Water Release Limits

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

- C29** Mine affected water may be piped, trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as dams or tanks, for the purpose of supplying water to Alpha Coal Mine. The volume, pH and electrical conductivity of water transferred to Alpha Coal Mine must be monitored and reported.
- C30** If the responsibility of mine affected water is given or transferred to another person in accordance with C28 and C29:
- (a) the responsibility for the mine affected water must only be given or transferred in accordance with a written agreement (third party agreement); and
 - (b) the third party agreement must be signed by both parties to the agreement.
- C31** All determinations of water quality and biological monitoring 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 authorities Monitoring and Sampling Manual;
 - (c) collected from the monitoring locations identified within this environmental authority, with 6 hours of each other where possible;

- (d) carried out on representative samples; and
- (e) analysed at a laboratory accredited (e.g. NATA) for the method of analysis being used.

C32 The release of any contaminants as permitted by this environmental authority, directly or indirectly to waters, other than internal water management infrastructure that is installed and operated in accordance with a Water Management Plan that complies with conditions of this environmental authority, must not:

- (a) produce any visible discolouration of receiving waters; and
- (b) 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.

C33 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 mine affected water released from all release points;
- (e) the results of all monitoring and details of any exceedances of the conditions of this environmental authority; and
- (f) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

Water Management Plan

C34 A Water Management Plan must be developed by an appropriately qualified person and implemented prior to the commencement of mining activities.

C35 The Water Management Plan must:

- (a) provide for effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and
- (b) be developed in accordance with the administering authorities guideline *Preparation of water management plans for mining activities* and include:
 - (i) a study of the source of contaminants;
 - (ii) a water balance model for the site;
 - (iii) a water management system for the site;
 - (iv) measures to manage and prevent saline drainage;
 - (v) measures to manage and prevent acid rock drainage;
 - (vi) contingency procedures for emergencies; and
 - (vii) a program for monitoring and review of the effectiveness of the water management plan.

C36 The Water Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:

- (a) assess the plan against the requirements under condition C35;
- (b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and



(c) identify any amendments made to the Water Management Plan following the review.

C37 The holder of this environmental authority must attach to the review report required by condition C36, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates, to:

- (a) ensure compliance with this environmental authority; and
- (b) prevent a recurrence of any non-compliance issues identified.

C38 The review report required by condition C36 and the written response to the review report required by condition C37 must be submitted to the administering authority with the subsequent annual return under the signature of the appointed signatory for the annual return.

C39 A copy of the Water Management Plan must be provided to the administering authority on request.

Saline Drainage

C40 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

C41 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

C42 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 stormwater.

C43 Stormwater, other than mine affected water, is permitted to be released to receiving waters from:

- (a) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by condition C42;
- (b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with conditions C34 through C39, for the purpose of ensuring water does not become mine affected water.

C44 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.

Overflow of Mine Affected Water from Regulated Structures

C45 The overflow of mine affected water from one or more of the dams listed in *Table 17: Location of Regulated Structures* must only occur if:

- (a) the holder has complied with **ALL** conditions listed in *Schedule G – Regulated Structures* of this environmental authority; and
- (b) the overflow is a direct result of rainfall events which since November 1 have generated a total rainfall depth in excess of that determined under the Design Storage Allowance (DSA) annual exceedance probability (AEP) event listed in *Table 17: Location of Regulated Structures* for the relevant dam (or network of linked containment systems);



- (c) the dam and release point is listed in *Table 11: Overflow release to the receiving environment*;
- (d) the holder has taken all reasonable and practicable measures to prevent an overflow from the relevant dam; and
- (e) the overflow of mine affected water does not cause serious or material environmental harm.

C46 Any release of mine affected water resulting from an overflow from one or more of the dams listed in *Table 17: Location of Regulated Structures* and *Table 11: Overflow release to the receiving environment* to receiving waters must be monitored at the locations specified in *Table 11: Overflow release to the receiving environment* and *Table 12: Monitoring Locations for Overflow Releases* for those quality characteristics and at the frequencies specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases*.

Table 11: Overflow Release to the Receiving Environment

Release Point (RP)	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Contaminant Source and Location	Receiving waters description
RP5	-23.0547	146.4194	Mine Water Dam 1 (MWD1)	Well Creek
RP6	-23.0736	146.5263	Mine Water Dam 2 (MWD2)	Sandy Creek
RP7	-23.0897	146.5048	Mine Water Dam 3 (MWD3)	Sandy Creek
RP8	-23.1031	146.5113	Mine Water Dam 4 (MWD4)	Sandy Creek
RP9	-23.0996	146.4270	Borefield Dam 1	Little Sandy/Rocky Creek Diversion
RP10	-23.1200	146.4269	Borefield Dam 2	Little Sandy/Rocky Creek Diversion
RP11	-23.1516	146.4404	Adit/ROM dam south	Green Tree Creek

Table 12: Monitoring Locations for Overflow Releases

Monitoring Point (MP)	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Associated release point	Monitoring Point description	Location description
Upstream					
MP7	-23.0203	146.3909	RP5	Well Creek	8,700m upstream of RP5
MP2	-23.0756	146.4986	RP6	Sandy Creek	1,600m downstream of RP7 and 3,300m downstream of RP8
MP1	-23.1113	146.5053	RP7	Sandy Creek	2500m upstream of RP7
MP1	-23.1113	146.5053	RP8	Sandy Creek	800m upstream of RP4/RP8
MP11	-23.1311	146.4170	RP9	Little Sandy Creek	4800m upstream of RP9
MP11	-23.1311	146.4170	RP10	Little Sandy Creek	2500m upstream of RP10
MP9	-23.1608	146.4193	RP11	Green Tree Creek	3,200m upstream, of RP11
Downstream					
MP5	-23.0401	146.5056	RP5	Well Creek	11,500m downstream of RP 5
MP3	-23.0396	146.5059	RP6	Sandy Creek	3,100m downstream of RP2

Monitoring Point (MP)	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Associated release point	Monitoring Point description	Location description
MP2	-23.0756	146.4986	RP7	Sandy Creek	1,600m downstream of RP7
MP2	-23.0756	146.4986	RP8	Sandy Creek	3,300m downstream of RP8
MP8	-23.0776	146.4327	RP9	Middle Creek	2,550m downstream of RP9
MP8	-23.0776	146.4327	RP10	Middle Creek	5,550m downstream of RP10
MP1	-23.1113	146.5053	RP11	Sandy Creek	11,150m downstream of RP11

Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases

Quality Characteristic	Trigger Level ³	Monitoring Frequency
Electrical conductivity (µS/cm)	700	Continuously
pH (pH Unit)	6 – 8.5	
Turbidity	250	
Suspended Solids (mg/L)	87	Monitoring to be commenced within 2 hours of commencement of the release and daily thereafter.
Sulphate (SO ₄ ²⁻) (mg/L)	500	
Aluminium (µg/L) ¹	410	
Arsenic (µg/L) ¹	13	
Cadmium (µg/L) ¹	0.2	
Chromium (µg/L) ¹	1.0	
Copper (µg/L) ¹	2.0	
Iron (µg/L) ¹	790	
Lead (µg/L) ¹	3.4	
Mercury (µg/L) ¹	0.2	
Nickel (µg/L) ¹	11	
Zinc (µg/L) ¹	8	
Boron (µg/L) ¹	370	
Cobalt (µg/L) ¹	90	
Manganese (µg/L) ¹	1900	
Molybdenum (µg/L) ¹	34	
Selenium (µg/L) ¹	10	
Silver (µg/L) ¹	1	
Uranium (µg/L) ¹	1	
Vanadium (µg/L) ¹	10	
Ammonia (µg/L) ¹	900	
Nitrate (µg/L) ¹	1100	
Petroleum hydrocarbons (C6-C9) (µg/L) ¹	20	
Petroleum hydrocarbons (C10-C36) (µg/L) ¹	100	
Fluoride (µg/L) ²	2000	
Sodium (µg/L) ¹	180000	

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 Fluoride must be measured as total (unfiltered).

³ Levels below the LOR to be classified as non-detects

- C47** If quality characteristics of the release exceed any of the trigger levels specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases* during an overflow release, the holder must compare the downstream results in the receiving waters to the trigger values specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases* and:
- (a) where the trigger values are not exceeded at downstream locations then no action is to be taken; or
 - (b) where the downstream results exceed the trigger values specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases* for any quality characteristics, compare the results of the downstream site to the data from background monitoring sites and from the release point and:
 - (i) if the result is less than the background monitoring site data, then no action is to be taken; or
 - (ii) if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority within 28 days of the cessation of the release, outlining:
 - details of the investigations carried out; and
 - actions taken to prevent environmental harm.

(Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C47b) ii. of this condition, no further reporting is required for subsequent trigger events for that quality characteristic)

- C48** The holder must notify the administering authority as soon as practicable and no later than 24 hours after the commencement of an overflow release of mine affected water to the receiving environment in accordance with conditions C46 and C47 of this environmental authority. Notification must include the submission of written advice to the administering authority of the following information:
- (a) release commencement date/time;
 - (b) release points;
 - (c) receiving water/s; and
 - (d) any details (including available data) regarding likely impacts on the receiving environment.

(Note: Notification to the administering authority must be addressed to the Project Manager of the local administering authority via email or facsimile)

- C49** The holder must notify the administering authority as soon as practicable and no later than 24 hours after the cessation of a release notified under condition C48. Notification must include the submission of written advice to the administering authority of the following information:
- (a) release cessation date/time;
 - (b) volume of water released;
 - (c) all in-situ water quality monitoring results; and
 - (d) any other matters pertinent to the water release event.

(Note:: Successive or intermittent releases occurring within 24 hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purposed of compliance with conditions C48 and C49, provided the relevant details of the release are included within the notification provided in accordance with conditions C48 and C49))

- C50** Within 28 days of a release notified under condition C48, the holder must provide a report to the administering authority demonstrating compliance with condition C45.

Groundwater

- C51** A groundwater monitoring program must be developed by an appropriately qualified person that will determine compliance with the environmental authority conditions, prior to the commencement of mining activities.



Table 14: Groundwater Quality Triggers and Limits

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
		Minimum	Maximum	Minimum	Maximum	
Alluvium						
Aluminium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	N/A
Antimony	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Arsenic	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Iron	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Molybdenum	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Mercury	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Selenium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Silver	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Dissolved Solids	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Electrical Conductivity	µS/cm	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sulphate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Calcium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Magnesium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sodium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Potassium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Chloride	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Carbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Bicarbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Petroleum Hydrocarbons	ppb	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
pH	unit	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Bandana Formation						
Aluminium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	N/A
Antimony	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Arsenic	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Iron	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Molybdenum	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Mercury	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Selenium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Silver	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Dissolved Solids	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Electrical Conductivity	µS/cm	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sulphate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Calcium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Magnesium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sodium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Potassium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Chloride	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Carbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Bicarbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Petroleum Hydrocarbons	ppb	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
pH	unit	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Colinlea Sandstone						
Aluminium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	N/A
Antimony	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Arsenic	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Iron	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Molybdenum	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Mercury	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	

Gn

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
Selenium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Silver	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Dissolved Solids	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Electrical Conductivity	µS/cm	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sulphate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Calcium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Magnesium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sodium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Potassium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Chloride	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Carbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Bicarbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Petroleum Hydrocarbons	ppb	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
pH	unit	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Rewan Formation						
Aluminium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	N/A
Antimony	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Arsenic	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Iron	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Molybdenum	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Mercury	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Selenium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Silver	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Dissolved Solids	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Electrical Conductivity	µS/cm	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sulphate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Calcium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Magnesium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sodium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Potassium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Chloride	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Carbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Bicarbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Petroleum Hydrocarbons	ppb	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
pH	unit	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Tertiary						
Aluminium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	N/A
Antimony	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Arsenic	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Iron	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Molybdenum	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Mercury	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Selenium	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Silver	µg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Dissolved Solids	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Electrical Conductivity	µS/cm	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sulphate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Calcium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Magnesium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Sodium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Potassium	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Chloride	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
Carbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Bicarbonate	mg/L	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
Total Petroleum Hydrocarbons	ppb	TBA ¹	TBA ¹	TBA ¹	TBA ¹	
pH	unit	TBA ¹	TBA ¹	TBA ¹	TBA ¹	

¹ Limit and trigger to be determined based on a background monitoring program of representative groundwater samples from aquifers identified as potentially affected by mining activities, including at least 12 sampling events, (with sampling distribution to ensure sufficient samples are obtained in all seasons, and is submitted to the administering authority in accordance with condition C53. Triggers to be determined on 85th percentile of background. Limit to be determined based on 99th percentile of background.

- C52** Contaminant triggers and contaminant limits as per *Table 14: Groundwater Quality Triggers and Limits* must be finalised and submitted to the administering authority prior to the commencement of mining activities.
- C53** If quality characteristics of groundwater exceed any of the trigger levels stated in *Table 14: Groundwater quality triggers and limits* at any of the monitoring locations identified in *Figure 10: Groundwater Monitoring Locations*, the holder of this environmental authority must complete an investigation into the potential for environmental harm and notify the administering authority within 28 days of receiving the analysis results.
- C54** Results of monitoring of groundwater must not exceed any of the limits defined in *Table 14: Groundwater quality triggers and limits*.
- C55** Groundwater must not exceed any of the limits defined in *Table 14: Groundwater quality triggers and limits* at lease boundary.
- C56** The construction, maintenance and management of groundwater monitoring bores must be undertaken in a manner that prevents or minimises impacts to the environment and ensures the integrity of the bores to obtain accurate monitoring.
- C57** No impact to groundwater levels within the groundwater aquifers is to occur other than where authorised under an approval of the *Water Act 2000*.

Schedule D – Noise

- D1** Noise from mining activities must not exceed the levels specified in *Table 15: Noise Limits – Mine Noise* when measured at a sensitive place.

Table 15: Noise Limits – Mine Noise

Noise Level dB(A) (outside)	Monday to Sunday		
	7am – 6pm	6pm – 10pm	10pm – 7am
L _{Aeq} , adj 15 mins	45	35	33
L _{A1} , adj 15 mins	55	50	40

Vibration

- D2** Vibration from mining activities must not exceed the following levels when measured at any sensitive place:

Gn

- (a) 10 mm/s for ground vibration of no more than 35 Hz; and
- (b) 25 mm/s for ground vibration of more than 35 Hz.

Airblast Overpressure

- D3** Airblast overpressure from mining activities must not exceed the following levels when measured at any sensitive place:
- (a) 115 dB(Z) Peak for 4 out of 5 consecutive blasts; and
 - (b) 120 dB(Z) Peak for any single blasts.

Schedule E: Waste

Landfill

- E1** General and regulated waste, other than tyres, must only be disposed of into the landfill facility located on ML70425 or removed from the site.
(Note: It is an offence under the Stock Act 1915 and subordinate legislation to allow or fail to take every reasonable measure to prevent stock access to animal matter or animal-contaminated matter)
- E2** The landfill facility must be located within the area identified in Table 16: Landfill Facility (Waste Disposal).

Table 16: Landfill Facility (Waste Disposal)

Waste Disposal Facility Name	Latitude (Decimal Degree GDA94)	Longitude (Decimal Degree GDA94)
Landfill Facility	-23.0810	146.5078
	-23.0814	146.5095
	-23.0828	146.5073
	-23.0832	146.5090

- E3** Landfill gas must not exceed the following levels:
- (a) 500 parts per million of methane at a height of 50mm above the final and intermediate cover surface including the batter slopes of the landfill facility;
 - (b) 25 percent of the lower explosive limit when measured in facility structures (but excluding facility structures used for landfill gas and leachate control and landfill gas and leachate recovery system components); and
 - (c) the lower explosive limit at the landfill facility boundary.
- E4** Notwithstanding any condition of this approval, the following waste materials are not permitted or allowed to be deposited in the landfill unit:
- (a) liquid or semi liquid waste other than liquid or semiliquid waste which has been produced in carrying out the environmentally relevant activity identified as Waste Disposal;
 - (b) hot ash;
 - (c) material that is smouldering or aflame;
 - (d) material containing a substance which is corrosive, reactive or toxic (other than materials containing a toxic substance from domestic premises) unless this material is to be deposited into a dedicated monocell approved in writing by the administering authority;
 - (e) all radioactive wastes, unless otherwise approved under the *Radiation Safety Act 1999* or contaminated soil;
 - (f) explosive(s); or

- (g) ammunition, other than ammunition that no longer contains explosives, pyrotechnics or propellants apart from trace residues that are no longer capable of supporting combustion or an explosive reaction.

Tyres

- E5** Scrap tyres are authorised to be stored awaiting disposal or disposed of on Mining Lease 70425 in a manner that minimises environmental harm.
(Note: For the disposal and storage of scrap tyres, reference to *Operational policy – Disposal and storage of scrap tyres at mine sites EM729* should be made)

Burning Waste

- E6** Unless otherwise permitted by the conditions of this environmental authority, or with approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.
- E7** The holder of this environmental authority may burn vegetation, in accordance with condition E8, cleared in the course of carrying out resource activities provided the activity does not cause environmental harm at any nuisance sensitive place.
- E8** Vegetation must not be burnt at the landfill facility.

Schedule F: Land Rehabilitation

- F1** Land disturbed by mining activities must be rehabilitated in accordance with *Appendix A: Rehabilitation Requirements* and *Figure A1: Rehabilitated Final Landform*.
- F2** Rehabilitation must commence progressively as areas become available and in accordance with the Plan of Operations.

Infrastructure

- F3** All buildings, structures, mining equipment and plant erected and/or used for the mining activities must be removed from the site prior to surrender, except where agreed in writing by the administering authority and the landowner.

Contaminants

- F4** The mining activity must not result in a contaminant, other than a contaminant authorised to be released under condition **C2**, being deposited:
- (a) in waters; or
 - (b) at another place, and in a way, so that the contaminant could reasonably be expected to wash, blow, fall or otherwise move into waters.
- F5** The mining activity must not result in a contaminant, other than a contaminant authorised to be released under condition **C2** or meeting the requirements of condition **B1**, being deposited:
- (a) off Mining Lease 70425; or
 - (b) at another place, and in a way, so that the contaminant could reasonably be expected to wash, blow, fall or otherwise move off Mining Lease 70425.

Mining Waste

- F6** A Mining Waste Management Plan must be developed by an appropriately qualified and suitable person and implemented prior to the commencement of mining activities.



F7 The Mining Waste Management Plan must include:

- (a) programs for progressive characterisation of overburden tailings and coarse reject waste prior to disposal for net acid producing potential and the following contaminants: Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na) and Sulphate (SO₄);
- (b) identification of environmental issues and potential environmental impacts from the overburden and CHPP waste;
- (c) control measures for routine operations to minimise the likelihood of environmental harm;
- (d) contingency plans and emergency procedures for non-routine situations;
- (e) a program for monitoring and review of the effectiveness of the Mining Waste Management Plan.
- (f) the process for the quantification of availability or leachability of metals from the tailings;
- (g) the keeping of records of:
 - (i) disposal to indicate locations and characteristics of coarse reject waste disposed of within mining waste emplacement areas.
 - (ii) mining waste emplacements to indicate locations and characteristics of mining waste.
- (h) placement strategies of tailings material within the Tailings Storage Facility;
- (i) the progressive 3D survey of all tailings disposal locations within the mining waste emplacement areas;
- (j) placement strategies of coarse reject waste in the mining waste emplacement area to enable successful rehabilitation outcomes in accordance with conditions of this environmental authority;
- (k) the process for the identification and quantification of Potentially Acid Forming (PAF) mining waste;
- (l) management actions for mining waste that has been identified as having a high availability or leachability of metals in accordance with condition F7c;
- (m) management actions for mining waste that has been defined as Potentially Acid Forming (PAF), including a review of the potential impacts on rehabilitation;
- (n) where the acid producing potential of mining waste material has not been conclusively determined, geochemical kinetic testing to indicate oxidation rates, potential reaction products and effectiveness of control strategies; and
- (o) an overburden waste emplacement area operational plan in accordance with condition F13.

F8 The Mining Waste Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:

- (a) assess the plan against the requirements under condition F7;
- (b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and
- (c) identify any amendments made to the Mining Waste Management Plan following the review.

F9 The holder of this environmental authority must attach to the review report required by condition F8, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates:

- (a) to ensure compliance with this environmental authority; and
- (b) to prevent a recurrence of any non-compliance issues identified.



- F10** The review report required by condition F8 and the written response to the review report required by condition F9 must be submitted to the administering authority with the subsequent annual return under the signature of the appointed signatory for the annual return.
- F11** A copy of the Mining Waste Management Plan must be provided to the administering authority on request.
- F12** The mining waste emplacement areas shall be designed to prevent environmental harm arising from contaminants being released to the environment.
- F13** An operational plan must be developed and implemented prior to commencement of mining activities and maintained for the mining waste emplacement areas. The operational plan must include, but not be limited to:
- (a) description of landform development stages of the mining waste emplacement areas;
 - (b) description of placement techniques for mining waste and coarse reject waste from the coal handling and processing plant;
 - (c) identification of areas that are, or are proposed, to contain Potentially Acid Forming mining waste emplacements;
 - (d) identification of areas that are, or are proposed, to contain coarse rejects within mining waste emplacements;
 - (e) identification of areas that are, or are proposed, to contain tailings within mining waste emplacements;
 - (f) demonstration of how operations of the mining waste emplacement areas are consistent with the accepted design plan for the facility; and
 - (g) decommissioning and rehabilitation strategies for the mining waste emplacement areas that demonstrate consistency with the conditions of this environmental authority.
- F14** The mining waste emplacement areas within the open pit must be designed to ensure all seepage from the mining waste is appropriately confined and contained prior to decommissioning and rehabilitation.
- F15** The disposal of all PAF coarse reject waste, identified by condition F7, must be encapsulated with Non Acid Forming (NAF) mining waste and disposed in a manner such that the coarse reject waste will not cause significant harm to the environment for the foreseeable future.
- F16** All tailings must be disposed of within an authorised Tailings Storage Facility.

Subsidence

- F17** A Subsidence Management Plan must be developed by an appropriately qualified person(s) and implemented by the holder of this environmental authority prior to the commencement of activities that result in subsidence.
- F18** The Subsidence Management Plan must:
- (a) provide 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;
 - (b) be developed in accordance with Appendix B;

- (c) describe the proposed impacts of subsidence on any land, watercourse and floodplain including but not limited to:
- (i) physical condition of surface drainage:
 - erosion;
 - areas susceptible to higher levels of erosion such as watercourse confluences;
 - incision processes;
 - stream widening;
 - tension cracking;
 - lowering of bed and banks;
 - creation of instream waterholes;
 - changes to local drainage patterns;
 - (ii) overland flow:
 - capture of overland flow by subsided long-wall panels;
 - increased overbank flows due to lowering of high bank of watercourses;
 - the portion of local and large scale catchment likely to be captured by subsided long-wall panels and the associated impacts on downstream users;
 - (iii) water quality:
 - surface water;
 - groundwater;
 - (iv) land condition: current land condition to be impacted by subsidence;
 - (v) infrastructure: detail of existing infrastructure (pipelines, railway, powerlines and haul roads) should be identified where there is a potential impact from effects of land subsidence;
- (d) propose options for mitigating any impacts associated with subsidence and how these mitigation methods will be implemented;
- (e) describe cumulative impacts on watercourses or catchments;
- (f) describe impacts on groundwater;
- (g) describe contingency procedures for emergencies; and
- (h) include a program for monitoring and review of the effectiveness of the Subsidence Management Plan

F19 The Subsidence Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:

- (a) assess the plan against the requirements under condition F18;
- (b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and
- (c) identify any amendments made to the Subsidence Management Plan following the review.

F20 The holder of this environmental authority must attach to the review report required by condition F19, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority on stated dates:

- (a) to ensure compliance with this environmental authority; and
- (b) to prevent a recurrence of any non-compliance issues identified.

- F21** The review report required by condition F19 and the written response to the review report required by condition F20 must be submitted to the administering authority upon request.

Annual Inspection of Subsidence

- F22** The holder of this environmental authority must arrange for each subsided longwall panel to be inspected annually by a suitably qualified and experienced person, in accordance with conditions F23 through F25.
- F23** The annual inspection must be conducted between 1 April and 1 November each year.
- F24** At each annual inspection, the condition of each subsided longwall panel must be assessed, including the structural, geotechnical and hydraulic adequacy of the subsided longwall panel and the adequacy of the works with respect to the Subsidence Management Plan.
- F25** For each inspection, copies of a report certified by the suitably qualified and experienced person, including any recommendations to ensure the integrity of each subsided longwall panel must be provided to the administering authority upon request.

Overland Flow

- F26** The subsided longwall panels must not result in the capture of overland flow and must allow water to drain from the panel.

Ecological Equivalence Assessment

- F27** The holder of this environmental authority must undertake an ecological equivalence assessment of the whole impact area – including opencut and all subsidence area where State Significant Biodiversity Values occur using the Ecological Equivalence Methodology (Queensland Biodiversity Offsets Policy) or an alternative method as agreed by the administering authority. The ecological equivalence assessment must:
- (a) identify the presence, type and extent of any State Significant Biodiversity Values; and
 - (b) be undertaken by an appropriately qualified person.

Biodiversity Offset Plan

- F28** A Biodiversity Offset Plan must be developed by an appropriately qualified person.
- F29** The Biodiversity Offset Plan must:
- (a) include the ecological equivalence assessment required under condition F27;
 - (b) identify and quantify impacts to any State Significant Biodiversity Values;
 - (c) provide for how potential impacts to State Significant Biodiversity Values will be assessed in accordance with the Queensland Biodiversity Offset Policy or an alternative approach approved by the administering authority;
 - (d) identify how the impacts of subsided areas will be monitored and identified to determine that sufficient offset areas have been provided in accordance with condition F41; and
 - (e) include a detailed description of how the Biodiversity Offset Plan aligns with the requirements for offsets imposed on the holder under the *Environmental Protection and Biodiversity Act 1999* (Cth).
- F30** The Biodiversity Offset Plan described in condition F29 must be provided to the administering authority prior to the commencement of mining activities.



Biodiversity Offset Delivery Agreement

- F31** A Biodiversity Offset Delivery Agreement must be developed by an appropriately qualified person.
- F32** The Biodiversity Offset Delivery Agreement must:
- (a) quantify the offset requirements and include a detailed description of the surveyed locations of State Significant Biodiversity Values, having regard to the assessment conducted under condition F27;
 - (b) describe if the holder of the environmental authority proposes to offset impacts to State Significant Biodiversity Values through:
 - 1. a Legally Secured offset:
 - (i) Identify the land, (including the land on which the relevant mining activity is carried out) or on other land in the State which may have the relevant State Significant Biodiversity Values. Preferably the identified land should be located within areas mapped as priority 1 and 2 areas to provide for long term landscape scale ecosystem function and connectivity consistent with the Galilee Basin Offset Strategy (2012 EHP), however if land within this areas is not able to be utilised for offsets the Biodiversity Offset Delivery Agreement should identify why.
 - (ii) Include the completed assessment of the land to be provided for the offset including Ecological Equivalence Assessment; and/or
 - 2. an offset payment:
 - (i) Indicate any commitment to make an offset payment in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, including the amount(s) and timing of that payment; and/or
 - (ii) Indicate the level of offset delivery for which an offset payment(s) may be considered; and/or
 - 3. an offset transfer, indicate the level of offset delivery for which an offset transfer may be considered; and
 - (c) include details on the delivery of offsets as per conditions F34, F35 and F36.
- F33** The Biodiversity Offset Delivery Agreement must be submitted to the administering authority by 3 years from grant of the Environmental Authority.

Offset Delivery

- F34** The holder must provide a Legally Secured offset for any land identified in condition F32 in accordance with the *Queensland Biodiversity Offset Policy*, or an alternative approach approved by the administering authority, within 6 months of the administering authorities written approval of the Biodiversity Offset Delivery Agreement.
- F35** The holder must provide any offset payment(s) identified in condition F32 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, within 6 months of the administering authorities written approval of the Biodiversity Offset Delivery Agreement.
- F36** The holder must enter into an agreement with the administering authority to provide any offset transfer identified in condition F32 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority within 6 months of the administering authorities written approval of the Biodiversity Offset Delivery Agreement.

Legally Secured Offsets

- F37** The holder must develop an Offset Area Management Plan for the land that is Legally Secured under condition F34 and/or F45 in the format specified by the administering authority.



- F38** The Offset Area Management Plan required under condition F37 must contain the following information:
- (a) the proposed management of land to ensure the environmental values of the land are maintained or enhanced;
 - (b) management and environmental objectives and outcomes, performance criteria and monitoring requirements;
 - (c) an analysis of the risks to achieve the objectives and outcomes;
 - (d) any restrictions imposed on the use of the offset area, including the management/control of weeds, cattle and site access;
 - (e) the activities that will be undertaken to achieve the objectives and outcomes, including the management/control of weeds, site access, erosion and sediment and fire management;
 - (f) a map that shows spatially the areas subject to the Offset Area Management Plan; and
 - (g) a reporting program.
- F39** Land Legally Secured under condition F34 and/or F45 must be managed in accordance with the Offset Area Management Plan for each stage for a period of 20 years unless otherwise approved.

Offset Transfers

- F40** The holder of the environmental authority must comply with the requirements of any agreement under condition F36 and/or F47.

Review of the Biodiversity Offset Plan and Biodiversity Offset Delivery Agreement

- F41** The Biodiversity Offset Plan and the Biodiversity Offset Delivery Agreement must be reviewed by May of every fifth year from the grant of the environmental authority and a report prepared by an appropriately qualified person. The report must:
- (a) assess the area of state significant biodiversity values proposed to be impacted by the mining activities; and
 - (b) identify the actual areas of state significant biodiversity values impacted by the mining activities.
- F42** Where the actual areas of disturbance to state significant biodiversity values is identified as greater than the proposed area of disturbance as per condition F41, the holder of the environmental authority must develop a supplementary Biodiversity Offset Delivery Agreement.

Supplementary Biodiversity Offset Delivery Agreement

- F43** The Supplementary Biodiversity Offset Delivery Agreement must:
- (a) quantify the offset requirements and include a detailed description of the surveyed locations of State Significant Biodiversity Values, having regard to the assessment conducted under condition F27 and the additional actual impact area identified under condition F41 (additional to the proposed impacts identified within the Biodiversity Offset Plan and previously offset under the Biodiversity Offset Delivery Agreement);
 - (b) if the holder of the environmental authority proposes to offset the additional impacts to State Significant Biodiversity Values through:
 - 1. a Legally Secured offset:
 - (i) identify the land, (including the land on which the relevant mining activity is carried out) or on other land in the State which may have the relevant State Significant Biodiversity Values. Preferably the identified land should be located within areas mapped as priority 1 and 2 areas



to provide for long term landscape scale ecosystem function and connectivity consistent with the Galilee Basin Offset Strategy (2012 EHP), however if land within this areas is not able to be utilised for offsets the Biodiversity Offset Delivery Agreement should identify why.

- (ii) Include the completed assessment of the land to be provided for the offset including Ecological Equivalence Assessment; and/or

2. an offset payment:

- (i) Indicate any commitment to make an offset payment in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, including the amount(s) and timing of that payment; and/or

- (ii) indicate the level of offset delivery for which an offset payment(s) may be considered; and/or

3. an offset transfer, indicate the level of offset delivery for which an offset transfer may be considered; and

- (c) include details on the delivery of offsets as per conditions F45, F46 and F47.

- F44** The Supplementary Biodiversity Offset Delivery Agreement must be submitted to the administering authority within 3 months of the completed date of the review report required under condition F41.

Supplementary Offset Delivery

- F45** The holder must provide a Legally Secured offset for any land identified in condition F43 in accordance with the *Queensland Biodiversity Offset Policy*, or an alternative approach approved by the administering authority, within 12 months of the submission of the Supplementary Biodiversity Offset Delivery Agreement.

- F46** The holder must provide any offset payment(s) identified in condition F43 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, within 4 months of the submission of the Supplementary Biodiversity Offset Delivery Agreement.

- F47** The holder must enter into an agreement with the administering authority to provide any offset transfer identified in condition F43 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority within 12 months of the submission of the Supplementary Biodiversity Offset Delivery Agreement.

Schedule G: Regulated Structures

- G1** The hazard category of any structure must be assessed by a suitably qualified and experienced person:
 - (a) in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*; and
 - (b) in any of the following situations:
 - (i) prior to the design and construction of the structure; or
 - (ii) prior to any change in its purpose or the nature of its stored contents; and
 - (iii) in accordance with the *Manual for assessing Hazard Categories and Hydraulic Performance of Dams*.
- G2** A hazard assessment report and certification must be prepared for any structure assessed and the report may include a hazard assessment for more than one structure.
- G3** The holder must, on receipt of a hazard assessment report and certification, provide to the administering authority one paper copy and one electronic copy of the hazard assessment report and certification.

- G4** Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.
- G5** The holder must take reasonable and practical measures so that each dam associated with the mining activity is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.
- G6** All regulated structures must be designed by, and constructed under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.
- G7** Construction of a regulated structure is prohibited unless the holder has:
- (a) submitted a hazard category assessment report and certification to the administering authority;
 - (b) commissioned a suitably qualified and experienced person to prepare a design plan for the structure; and
 - (c) received the certification from a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant condition of this authority.
- G8** Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.
- G9** Regulated structures must:
- (a) be designed and constructed in accordance with and conform to the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*;
 - (b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:
 - (i) floodwaters from entering the regulated dam from any watercourse or drainage line; and
 - (ii) wall failure due to erosion by floodwaters arising from any watercourse or drainage line.
- G10** The design plan for a regulated structure must include, but is not limited to:
- (a) certification that the design plan:
 - (i) is in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, including subsidiary certifications if necessary; and
 - (ii) addresses the requirements in G10(b) to (h)
 - (b) A design report which provides:
 - (i) a description of all the documents which constitute the design plan;
 - (ii) a statement of:
 - A. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory documents, relied upon in preparing the design plan; and
 - B. all relevant facts and data used in preparing the design plan, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the design plan;



- C. the hazard category of the regulated structure; and
- D. setting out the reasoning of the suitably qualified and experienced person who has certified the design plan, as to how the design plan provides the necessary required performance;
- (iii) documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;
- (iv) detailed criteria for the design, operation, maintenance and decommissioning of the regulated structure, including any assumptions;
- (v) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;
- (c) Drawings showing the lines and dimensions, and locations of built structures and land forms associated with the regulated structure;
- (d) Consideration of the interaction of the pit design with the levee or regulated dam design;
- (e) An operational plan that includes:
 - (i) normal operating procedures and rules (including clear documentation and definition of process inputs) used in calculating the Design Storage Allowance (DSA));
 - (ii) contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the regulated structure;
- (f) A plan for the decommissioning and rehabilitation of the regulated structure at the end of its operational life;
- (g) Details of reports on investigations and studies done in support of the design plan;
- (h) Any other matter required by the suitably qualified and experienced person.

G11 Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:

- (a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure;
- (b) construction of the regulated structure is in accordance with the design plan;

G12 Where a regulated dam is to be managed as part of an integrated containment system and the DSA volume is to be shared across the integrated containment system, the design and operating rules for the system as a whole must be documented in a system design plan that is certified by a suitably qualified and experienced person.

G13 The system design plan must contain:

- (a) the design plans, and
- (b) the 'as constructed' plans, and
- (c) the operational rules for each individual regulated dam that forms part of the integrated system, and
- (d) the standards of serviceability and accessibility of water transfer equipment or structures, and
- (e) the operational rules for the system as a whole.

Operation of a Regulated Structure

G14 Operation of a regulated structure is prohibited unless:

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



- (i) one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition G7, and
 - (ii) a set of 'as constructed' drawings and specifications, and
 - (iii) certification of those 'as constructed drawings and specifications' in accordance with condition G8, and
 - (iv) where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan.
- (b) the requirements of this authority relating to the construction of the regulated structure have been met; and
- (c) relevant details for regulated structures have been included in Table 17: Location of Regulated Structures and Table 18: Basic Details of Regulated Dams of this authority.

G15 Each regulated structure must be maintained and operated in a manner that is consistent with the current design plan, the current operational plan, and the associated certified 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.

G16 The holder must take reasonable and practicable control measures to prevent the causing of harm to persons, livestock or wildlife through the construction and operation of a regulated structure. Reasonable and practicable control measures may include, but are not limited to:

- (a) the secure use of fencing, bunding or screening; and
- (b) escape arrangements for trapped livestock and fauna.

Mandatory Reporting Level

G17 The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.

G18 The holder must, as soon as practical and within forty-eight hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the Mandatory Reporting Level.

G19 The holder must, immediately on becoming aware that the Mandatory Reporting Level has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

Annual Inspection Report

G20 Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

G21 At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed:

- (a) against the most recent hazard assessment report and design plan (or system design plan);
- (b) against recommendations contained in previous annual inspections reports;
- (c) against recognised dam safety deficiency indicators;
- (d) for changes in circumstances potentially leading to a change in hazard category;
- (e) for conformance with the conditions of this authority;



- (f) for conformance with the 'as constructed' drawings;
- (g) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);
- (h) for evidence of conformance with the current operational plan.

G22 A suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the regulated structure.

G23 The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*. (Feb 2012)

G24 The holder of this environmental authority must:

- (a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the regulated structure will safely perform its intended function; and
- (b) within twenty (20) business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated structure.

G25 A copy of the annual inspection report must be provided to the administering authority upon request and within ten (10) business days of receiving a request from the administering authority under this condition.

Design Storage Allowance

G26 On 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).

G27 The holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the Design Storage Areas volume on 1 November of any year, notify the administering authority.

G28 The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the Design Storage Area volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

Performance Review

G29 The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

G30 The holder must take action to modify its water management or linked containment system so as to ensure that the regulated dam or linked containment system will perform in accordance with the requirements of this authority, for the subsequent November to May period.

(Note: Action may include seeking the necessary approvals for physical modification of a regulated dam)



Transfer Arrangements

- G31** The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, hazard assessment, design plan and other supporting documentation, to a new holder and the administering authority on transfer of this authority.

Decommissioning and Rehabilitation

- G32** Prior to the cessation of the environmentally relevant activity, each regulated structure must be decommissioned such that:
- (a) ongoing environmental harm is minimised by the regulated structure:
 - (i) becoming a safe site for humans and animals at the completion of rehabilitation; and
 - (ii) becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts; and
 - (iii) not allowing for acid mine drainage; and
 - (iv) being approved or authorised under relevant legislation for a beneficial use; and
 - (v) being a void authorised by the administering authority to remain after decommissioning; and
 - (b) the regulated structure is compliant with all other relevant rehabilitation requirements of this authority.

Regulated Structures Location and Performance

- G33** Each regulated structure named in Column 1, *Table 17: Location of Regulated Structures* must be wholly located within the control points noted in columns 2 and 3 of *Table 17: Location of Regulated Structures*, for that structure.
- G34** Each regulated dam named in Column 1 of *Table 17: Location of Regulated Structures*, must be consistent with the details noted in Column 2 through to and including Column 7 of *Table 18: Basic Details of Regulated Dams*, below, for that dam.
- G35** Spillway Level (mAHD) to be finalised based on final design plans and submitted to the administering authority 20 business days prior to commencement of construction of the regulated structure.
- G36** Each regulated dam named in Column 1 of *Table 17: Location of Regulated Structures*, must meet the hydraulic performance criteria noted in Column 2 through to and including Column 4 of *Table 19: Hydraulic Performance of Regulated Dams*, for that dam.
- G37** Each regulated levee named in Column 1 of *Table 17: Location of Regulated Structures*, must be consistent with the details noted in Columns 2 through to and including Column 6 of *Table 20: Basic Details of Regulated Levees*, for that levee.
- G38** Design Flood Level (mAHD) and minimum Levee Level (mAHD) to be finalised based on final design plans and submitted to the administering authority 20 business days prior to commencement of construction of the regulated structure.



Table 17: Location of Regulated Structures

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure ¹	Latitude (decimal degree GDA 94)	Longitude (decimal degree GDA 94)	Unique Location ID ³
Mine Water Dam 1	-23.0563	146.4087	N/A
	-23.0715	146.4086	
	-23.0715	146.4354	
	-23.0564	146.4354	
Mine Water Dam 2	-23.0715	146.5242	N/A
	-23.0850	146.5241	
	-23.0851	146.5398	
	-23.0715	146.5398	
Mine Water Dam 3	-23.0844	146.5040	N/A
	-23.0928	146.5040	
	-23.0929	146.5165	
	-23.0845	146.5165	
Mine Water Dam 4	-23.0988	146.5097	N/A
	-23.1076	146.5096	
	-23.1076	146.5195	
	-23.0988	146.5195	
Tailings Storage Facility 1	-23.0153	146.4731	N/A
	-23.0071	146.4876	
	-23.0156	146.4931	
	-23.0238	146.4786	
Tailings Storage Facility 2	-23.0243	146.4778	N/A
	-23.0125	146.4987	
	-23.0159	146.5024	
	-23.0219	146.5045	
	-23.0253	146.5045	
	-23.0322	146.5017	
	-23.0431	146.4875	
	-23.0438	146.4840	
Southern Opencut Levee	-23.1172	146.4416	Control Point 1
	-23.1099	146.4419	Control Point 2
	-23.1099	146.4954	Control Point 3
	-23.0698	146.4955	Control Point 4
	-23.0577	146.4968	Control Point 5
	-23.0539	146.4938	Control Point 6
	-23.0527	146.4900	Control Point 7
	-23.0532	146.4844	Control Point 8
	-23.0517	146.4794	Control Point 9
	-23.0496	146.4743	Control Point 10
Northern Opencut Levee	-23.0323	146.4669	Control Point 11
	-23.0384	146.4696	Control Point 12
	-23.0409	146.4735	Control Point 13
	-23.0422	146.4786	Control Point 14
	-23.0451	146.4834	Control Point 15
	-23.0468	146.4858	Control Point 16
	-23.0470	146.4905	Control Point 17

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure ¹	Latitude (decimal degree GDA 94)	Longitude (decimal degree GDA 94)	Unique Location ID3
	-23.0437	146.4986	Control Point 18
	-23.0380	146.5045	Control Point 19
	-23.0304	146.5039	Control Point 20
	-23.0237	146.5054	Control Point 21
	-23.0154	146.5031	Control Point 22
	-23.0125	146.5000	Control Point 23
Stockpile Levee	-23.0585	146.5046	Control Point 24
	-23.0561	146.5057	Control Point 25
	-23.0547	146.5086	Control Point 26
	-23.0609	146.5129	Control Point 27
	-23.0631	146.5154	Control Point 28
Spoil Dam 1	-23.0100	146.5012	N/A
	-23.0100	146.4991	
	-23.0062	146.4991	
	-23.0063	146.5012	
Spoil Dam 2	-23.0437	146.4850	N/A
	-23.0437	146.4889	
	-23.0455	146.4889	
	-23.0455	146.4850	
Spoil Dam 3	-23.0326	146.4683	N/A
	-23.0326	146.4724	
	-23.0346	146.4724	
	-23.0345	146.4683	
Spoil Dam 4	-23.0985	146.4924	N/A
	-23.0985	146.4940	
	-23.0952	146.4940	
	-23.0952	146.4924	
Borefield Dam 1	-23.0986	146.4258	N/A
	-23.1005	146.4258	
	-23.1005	146.4272	
	-23.0986	146.4272	
Borefield Dam 2	-23.1190	146.4257	N/A
	-23.1210	146.4257	
	-23.1210	146.4271	
	-23.1190	146.4271	
Adit/ROM Dam South	-23.1523	146.4391	N/A
	-23.1523	146.4408	
	-23.1490	146.4408	
	-23.1490	146.4392	
	-23.0612	146.4853	
	-23.0625	146.4853	
	-23.0625	146.4874	
TLO Dam	-23.0648	146.5177	N/A
	-23.0671	146.5158	
	-23.0662	146.5145	

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure ¹	Latitude (decimal degree GDA 94)	Longitude (decimal degree GDA 94)	Unique Location ID ³
	-23.0638	146.5164	
CMIA Dam and Overflow Basin	-23.0582	146.4964	N/A
	-23.0549	146.4953	
	-23.0531	146.4917	
	-23.0528	146.4897	
	-23.0540	146.4896	
	-23.0553	146.4945	
	-23.0583	146.4947	
Process Water and Decant Dam	-23.0399	146.4760	N/A
	-23.0398	146.4729	
	-23.0383	146.4729	
	-23.0383	146.4760	
Pit Dewatering Dam North	-23.0369	146.4755	N/A
	-23.0368	146.4724	
	-23.0353	146.4724	
	-23.0353	146.4755	
Pit Dewatering Dam South	-23.0825	146.4612	N/A
	-23.0825	146.4648	
	-23.0809	146.4648	
	-23.0809	146.4612	
Little Sandy & Rocky Creek Diversion	-23.0715	146.4260	N/A
	-23.1169	146.4258	
	-23.1170	146.4364	
	-23.0716	146.4366	

¹ The 'name of the regulated structure' should refer to the name for example, process residue facility and decant dam.

² A minimum of three control points is required to constrain the location of all activities associated with the regulated structure. Additional infrastructure which forms part of any regulated dam may include appurtenant works consisting of seepage collections systems, runoff diversion bunds, containment systems, pressure relief wells, decant and recycle water systems. Note that details on tailing discharge pipelines would be included in this table only if they have not been included in the design plan required in condition G10.

³ This location reference is the reference for Table 17: Location of Regulated Structures flood level and crest level.

Table 18: Basic Details of Regulated Dams

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of Regulated dam ¹	Hazard Category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (ML)	Max. depth of dam ² at spillway (m)	Spillway Level (mAHD)	Use of dam ³
Mine Water Dam 1	High	204.93 @ FSL	9300 @ FSL	14.5 @ FSL	327	Primary containment of MAW from 3 underground mines, central open-cut pit dewatering dam and spoil dam 4, and pumped transfers from 2 GW dewatering dams. Supply point for distribution of MAW to project consumptive demands
Mine Water Dam 2	High	137.68 @ FSL	7600 @ FSL	13.5 @ FSL	319	Containment of MAW from TLO/ product stockpile and CMIA dams, northern open-cut pit dewatering dam and spoil dam 3. Supply point for distribution of MAW to project consumptive demands
Mine Water Dam 3	High	56.38 @ FSL	2550 @ FSL	11.5 @ FSL	311.9	Auxiliary storage in the event that insufficient storage is available within MWD1 and MWD 2

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of Regulated dam ¹	Hazard Category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (ML)	Max. depth of dam ² at spillway (m)	Spillway Level (mAHD)	Use of dam ³
Mine Water Dam 4	High	27.71 @ FSL	830 @ FSL	9.0 @ FSL	308	Auxiliary storage in the event that insufficient storage is available within MWD1, MWD 2 and MWD3.
Tailings Storage Facility	High	128.17 @ FSL	10850 @ FSL	12.6 @ FSL	306.7	Storage of tailings generated from the mine
Spoil Dam 1	High	5.5 @ FSL	300 @ FSL	6.8 @ FSL	TBD ⁴	Collection of mine affected runoff from northern open-cut pit/ Tailings Storage Facility 1
Spoil Dam 2	High	6.1 @ FSL	350 @ FSL	6.8 @ FSL	TBD ⁴	Collection of mine affected runoff from northern open-cut pit/ Tailings Storage Facility 1
Spoil Dam 3	High	6.9 @ FSL	400 @ FSL	7.0 @ FSL	TBD ⁴	Collection of mine affected runoff from northern open-cut pit/ Tailings Storage Facility 1
Spoil Dam 4	High	17.0 @ FSL	1,200 @ FSL	8.3 @ FSL	TBD ⁴	Collection of mine affected runoff from central open-cut pit
Borefield Dam 1	High	42.8 @ FSL	55 @ FSL	6.0 @ FSL	TBD ⁴	Aggregation of all flows generated from groundwater dewatering
Borefield Dam 2	High	42.8 @ FSL	55 @ FSL	6.0 @ FSL	TBD ⁴	Aggregation of all flows generated from groundwater dewatering and transfer to Mine Water Dam 1 for subsequent re-use.
Adit/ROM Dam south	High	0.9 @ FSL	29 @ FSL	6.4 @ FSL	TBD ⁴	Components of the process area runoff system that diverts all clean runoff around process areas, contains and diverts all process area mine affected runoff into collection dams, and transfers all MAW into MWDs for subsequent reuse
TLO Dam	Significant	1.3 @ FSL	45 @ FSL	4.6 @ FSL	TBD ⁴	Components of the process area runoff system that diverts all clean runoff around process areas, contains and diverts all process area mine affected runoff into collection dams, and transfers all MAW into MWDs for subsequent reuse
CMIA Dam & Overflow Basin	Significant	5.3 @ FSL	280 @ FSL	6.4 @ FSL	TBD ⁴	Components of the process area runoff system that diverts all clean runoff around process areas, contains and diverts all process area mine affected runoff into collection dams, and transfers all MAW into MWDs for subsequent reuse
Process Water and Decant Dam	High	2.9 @ FSL	150 @ FSL	6.8 @ FSL	TBD ⁴	Primary supply dam for CHPP process water (process and tailings), and receipt of tailings decant water from both TSF1 and 2.
Pit Dewatering Dam North	High	7.7 @ FSL	200 @ FSL	7.0 @ FSL	TBD ⁴	Containment of all mine affected runoff within open-cut pits, transfer of MAW from open-pit collection points to open-cut dewatering dams, and transfer of MAW from dewatering dams into one of MWDs for subsequent use
Pit Dewatering Dam South	High	3.7 @ FSL	450 @ FSL	7.0 @ FSL	TBD ⁴	Containment of all mine affected runoff within open-cut pits, transfer of MAW from open-pit collection points to open-cut dewatering dams, and transfer of MAW from dewatering dams into one of MWDs for subsequent use

¹ The name of the regulated dam should refer to the name of the dam, for example, process residue facility and decant dam and should be the same name used in Table 28: Location of Regulated Structures for the dam.

² For regulated dams which do not require a dam wall, input the maximum void depth, for example, where dams are formed by excavating below the land surface or backfilling a residual void.

³ The use or purpose of the regulated dam should outline the designed function, for example, "the permanent containment of tailings resulting from the extraction of nickel, cobalt and other metals at the XYZ refinery".

Table 19: Hydraulic Performance of Regulated Dams

Column 1	Column 2	Column 3	Column 4
Name of Regulated dam	Spillway Capacity AEP	Design Storage Allowance AEP	Mandatory Reporting Level AEP
Mine Water dam 1	1:100,000	1:100 AEP 3 month wet season	323.2m AHD
Mine Water Dam 2	1:100,000	1:100 AEP 3 month wet season	316.3m AHD
Mine Water Dam 3	1:100,000	1:100 AEP 3 month wet season	306.7m AHD
Mine Water Dam 4	1:100,000	1:100 AEP 3 month wet season	305.1m AHD
Tailings Storage Facility 1	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Tailings Storage Facility 2	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 1	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 2	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 3	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 4	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Borefield Dam 1	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Borefield Dam 2	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Adit/ROM dam South	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
TLO dam	1:1,000	1:20 AEP 3 month wet season	1:10 AEP 72 hour storm
CMIA Dam & Overflow Basin	1:1,000	1:20 AEP 3 month wet season	1:10 AEP 72 hour storm
Process Water and Decant Dam	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Pit Dewatering Dam north	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Pit Dewatering Dam South	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm

Table 20: Basic Details of Regulated Levees

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Name of Regulated Levee	Design AEP	Design Flood Level1 (mAHD)	Minimum Levee Level1 (mAHD)	Schedule D Table 1 Location ID1	Use of levee
Southern Opencut Levee	1:1000	TBA ²	TBA ²	Control Point 1	Provides regional flood immunity to the Southern Open-Cut pit and CMIA from Sandy and Well Creeks
				Control Point 2	
				Control Point 3	
				Control Point 4	
				Control Point 5	
				Control Point 6	
				Control Point 7	
				Control Point 8	
				Control Point 9	
				Control Point 10	
Northern Opencut Levee	1:1000	TBA ²	TBA ²	Control Point 11	Provides regional flood immunity to the Northern Open-Cut pit from Sandy and Well Creeks
				Control Point 12	
				Control Point 13	
				Control Point 14	
				Control Point 15	
				Control Point 16	
				Control Point 17	
				Control Point 18	
				Control Point 19	
				Control Point 20	
				Control Point 21	
				Control Point 22	
				Control Point 23	
Stockpile Levee	1:1000	TBA ²	TBA ²	Control Point 24	Provides regional flood immunity to the product stockpile from sandy Creek
				Control Point 25	
				Control Point 26	
				Control Point 27	
				Control Point 28	

¹ Design flood levels, and hence regulated levee levels, are expected to vary along the length of that levee. The location IDs listed (Column 5) must correspond with location IDs listed in *Table 27: Location of Regulated Structures* and, together with Columns 3 and 4, define the minimum design level envelope for the longitudinal crest of the structure.

² To be provided by proponent prior to finalising the draft EA.

Schedule H: Sewage Treatment

- H1** Treated effluent from the sewage treatment plant must only be discharged from the authorised discharge points, as specified in *Table 21: Effluent Discharge Locations* and discharged to the areas shown in *Table 23: Effluent Irrigation Locations* or used for dust suppression, in compliance with the

limits and at the frequency stated in *Table 22: Effluent Release Limits to Land* and the conditions of this authority.

Table 21: Effluent Discharge Locations

Authorised Discharge Point	Sewage Treatment Plant	Location	Effluent Irrigation Area	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)
Effluent Discharge Point 1	Permanent Treatment Plant	Light Industrial Area	Effluent Irrigation Area 1	-23.0593	146.5505
Effluent Discharge Point 2	Temporary Treatment Plant Central Mine Infrastructure Area	Central Mine Infrastructure Area	Effluent Irrigation Area 2	-23.0923	146.4433
Effluent Discharge Point 3	Temporary Treatment Plan Coal Handling and Preparation Area	Coal Handling and Preparation Area	Effluent Irrigation Area 3	-23.0596	146.4903
Effluent Discharge Point 4	Temporary Treatment Plan accommodation Centre	Temporary Accommodation Centre	Effluent Irrigation Area 4	-23.0928	146.5628

Table 22: Effluent Release Limits to Land

Quality Characteristic	Release Limit			Frequency
	Minimum	Median	Maximum	
5 day Biological oxygen demand (mg/L)		20		Monthly
Suspended Solids (mg/L)		5		Monthly
Thermotolerant coliforms (Cfu/100mL ²)		10		Weekly
Total phosphorus (mg/L)			15	Monthly
Total nitrogen (mg/L)			30	Monthly
Electrical Conductivity (μ S/cm)		1600		Monthly
pH (pH units)	6.0		8.5	Monthly

Table 23: Effluent Irrigation Locations

Authorised Discharge Point	Effluent Irrigation Area	Location	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)
Effluent Discharge Point 1	Effluent Irrigation Area 1	East side of Light Industrial Area next to Airport road	-23.0687	146.5670
			-23.0687	146.5726
			-23.0733	146.5726
			-23.0733	146.5670
Effluent Discharge Point 2	Effluent Irrigation Area 1	North side of Central Mine Industrial Area	-23.0913	146.4432
			-23.0913	146.4440
			-23.0918	146.4440
			-23.0917	146.4432
Effluent Discharge Point 3	Effluent Irrigation Area 1	West side of Coal Handling and Preparation Plant Industrial Area	-23.0593	146.4896
			-23.0593	146.4901
			-23.0606	146.4901
			-23.0606	146.4896
Effluent Discharge Point 4	Effluent Irrigation Area 1	West side of temporary accommodation Area	-23.0921	146.5619
			-23.0933	146.5619
			-23.0933	146.5625
			-23.0921	146.5626

- H2** Subject to condition H1, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.
- H3** Treated effluent must not be released from the site to any waters or the bed and banks of any waters.
- H4** Water or storm water contaminated by sewage treatment activities must not be released to any waters or the bed and banks of any waters.
- Land Disposal**
- H5** The application of treated effluent to land must be carried out in a manner such that:
- (a) vegetation is not damaged;
 - (b) there is no surface ponding of effluent; and
 - (c) there is no run-off of effluent.
- H6** If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is in use and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.
- H7** All sewage effluent release to land must be monitored at the frequency and for the parameters specified in *Table 22: Effluent Release Limits to Land*.
- H8** The daily volume of effluent released to land must be measured and records kept of the volumes of effluent released.

- H9** When circumstances prevent the irrigation of treated sewage effluent such as during or following rain events, water must be directed to a wet-weather storage or alternative measures must be taken to store/lawfully dispose of effluent.
- H10** Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty under section 319 of the *Environmental Protection Act 1994* whilst using the treated sewage effluent.

Biosolids

- H11** Biosolids are authorised to be used as a soil conditioner for application to land during rehabilitation activities subject to the conditions of this environmental authority.
- H12** The environmental authority holder must assess the suitability of each proposed application area prior to application of biosolid material to ensure that application will not cause environmental harm.
- H13** Biosolids not used as a soil conditioner must be appropriately disposed of as a regulated waste.
- H14** Biosolids removed from the site must be transported by an authorised regulated waste transporter to a facility that can lawfully accept regulated waste.

Schedule I: Water Treatment

- I1** Brine and any contaminated water generated from the water treatment plant must only be released from the authorised discharge points specified in *Table 24: Brine Water Management Infrastructure* to the water management infrastructure specified in *Table 24: Brine Water Management Infrastructure*.

Table 24: Brine Water Management Infrastructure

Discharge Point	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Water Management Infrastructure
Brine Discharge Point 1	-23.08180	146.55214	MWD 2

END OF CONDITIONS

Schedule J: Definitions

Words and phrases used throughout this environmental authority are defined below. Where a definition for a term used in this environmental authority is not provided within this environmental authority, but is provided in the EP Act 1994 or subordinate legislation, the definition in the EP Act or subordinate legislation must be used.

“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.

“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 Heritage Protection or its successor.

“AEP” means the Annual Exceedance Probability.

“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 (dBL).

“ambient 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 exceedance probability” 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*.

“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.

“artesian bore” includes a shaft, well, gallery, spear or excavation, and any works constructed in connection with the shaft well, gallery, spear or excavation, that taps an aquifer and the water flows, or has flowed, naturally to the surface.

“assessed” or **“assessment”** 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*.

“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.

“bioregion” has the meaning defined in the *Queensland Biodiversity Offset Policy*.

“biosolids” means the treated and stabilised solids from sewage.

“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.

“brine” means saline water with a total dissolved solid concentration greater than 40,000 mg/L, generated through water treatment activities.

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

“broker agreement” has the meaning given to it in the *Queensland Biodiversity Offset Policy*.

“bunded” means within bunding consistent with Australian Standard 1940.



“coal handling and processing plant waste” means coarse reject and tailings.

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

“certifying” “certify” or “certified” have a corresponding meaning as “certification”.

“class 1 pest” has the meaning given to it under the *Land Protection (Pest and Stock Route Management) Act 2002*.

“class 2 pest” has the meaning given to it under the *Land Protection (Pest and Stock Route Management) Act 2002*.

“commencement of mining activities” means the commencement of activities permitted by the issue of a mining lease under the *Mineral Resources Act 1989* for the operational land not including early works.

“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.

“completion criteria” means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The completion criteria indicate the success of the rehabilitation outcome or remediation of areas which have been significantly been disturbed by the mining activities. Completion criteria may include information regarding:

- (a) vegetation establishment, survival and succession;
- (b) vegetation productivity, sustained growth and structure development;
- (c) fauna colonisation and habitat development;
- (d) 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;
- (e) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;
- (f) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;
- (g) resilience of vegetation to disease, insect attack, drought and fire; and
- (h) vegetation water use and effects on ground water levels and catchment yields.

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

“contaminate” means to render impure by contact or mixture.



“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.

“control measure” means any action or activity that can be used to prevent or eliminate a hazard or reduce it to an acceptable level.

“costeaning” means the digging of a trench or put across the seam or ore body for exposing, sampling and mapping of the ore body.

“cover material” means any soil or rock suitable as a germination medium or landform armouring.

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

“dam crest volume” means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls, without regard to flows entering or leaving (eg via spillway).

“declared pest” has the meaning given to it under the *Land Protection (Pest and Stock Route Management) Act 2002*.

“deed of agreement” means a legal agreement between the holder of the environmental authority and the administering authority. The deed of agreement governs the obligations of the holder of the environmental authority in relation to the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011). For clarity, the term deed of agreement in this environmental authority includes any subsequent version or amendment of the signed deed of agreement.

“design plan” is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include ‘as constructed’ drawings.

“design storage allowance” means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published by the Department of Environment and Heritage Protection (or its successor), that must be provided in a dam as at 1 November each

year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that manual.

“designer” for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.

“direct offset” has the meaning given to it in the *Queensland Biodiversity Offset Policy*.

“domain” means land management units within a mine site, usually with similar geophysical characteristics.

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

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

“effluent” treated waste water discharged from sewage treatment plants.

“emergency action plan” means documentation forming part of the operational plan held by the holder or a nominated responsible officer, that identifies emergency conditions that sets out procedures and actions that will be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure and ensure timely warning to downstream communities and the implementation of protection measures. The plan must require dam owners to annually update contact details that are part of the plan, and to comprehensively review the plan at least every five years.

“end of pipe” means the location at which water is released to waters or land.

“environmental authority holder” means the holder of this environmental authority.

“factor of safety” means the ratio of resisting forces to driving forces. The resisting force is the friction developed in a material along a potential failure plane under given loading conditions. The driving force is primarily gravity but can also include vibration loading and unbalanced groundwater pressures.

“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.

“financial surety” has the meaning defined in the *Queensland Biodiversity Offset Policy*.

“floodwater” means water overflowing, or that has overflowed, from waters, river, creek, stream, lake, pond, wetland or dam onto or over riparian land that is not submerged when the watercourse or lake flows between or is contained within its bed and banks.

“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 *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.

“holder” means any person who is the holder of, or is acting under the environmental authority.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the *Manual of Assessing Hazard Categories and Hydraulic Performance of Dams*.

“impacts to State significant biodiversity values” means those impacts and State Significant Biodiversity values stated in the Site Based Offsets Plan.

“infrastructure” means water storage dams, roads and tracks, buildings and other structures built for the purpose of mining activities but does not include other facilities required for the long term management of mining impacts or the protection of potential resources. Such other facilities include dams, waste rock dumps, voids, or ore stockpiles and buildings as well as other structures whose ownership can be transferred and which have a residual beneficial use for the next owner of the operational land or the background land owner.

“LA 10, adj, 15 mins” means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10% of any 15-minute measurement period, using Fast response.

“LA 1, adj, 15 mins” means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1% of any 15-minute measurement period, using Fast response.

“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.

“land” in Schedule F: Land of this document means land excluding waters and the atmosphere.

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

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

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

“landfill” means land used as a waste disposal site for lawfully putting solid waste on the land.

“leaf litter” means the uppermost layer of organic material in a soil, consisting of freshly fallen or slightly decomposed organic materials such as leaves, twigs and sticks, which have accumulated on the ground surface.

“legally secured” has the meaning defined in the October 2011 version of the *Queensland Biodiversity Offset Policy*.

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

“low hazard dam” means any dam that is not a high or significant hazard category as assessed using the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.

“lower explosive limit” means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25°C and atmospheric pressure.

“mandatory reporting level” means a warning and reporting level determined in accordance with the criteria in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published by the administering authority.

“mg/L” means milligrams per litre.

“Mining activities” are defined as “prospecting, exploring or mining, processing minerals, a directly associated activity that may cause environmental harm, rehabilitating or remediating environmental harm, and action to prevent environmental harm because these activities, where the activity is authorised under the Mineral Resource Act 1989 to occur on land to which a mining tenement relates” (as defined in the Environmental Protection Act 1994).

A **“Mining project”** is defined as “all mining activities carried out, or proposed to be carried out, under 1 or more mining tenements, in any combination, as a single integrated operation” (as defined in the Environmental Protection Act 1994).

“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 therefrom;

- (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—

- (a) living matter;
- (b) petroleum within the meaning of the *Petroleum Act 1923*;
- (c) 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;
- (d) water.

“mine affected water” means the following types of water:

- (a) pit water, tailings dam water, processing plant water;
- (b) water contaminated by a mining activity which would have been an environmentally relevant activity under Schedule 2 of the *Environmental Protection Regulation 2008* if it had not formed part of the mining activity other than effluent or brine;
- (c) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated, excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an Erosion and Sediment Control Plan to manage runoff containing sediment only, provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water;
- (d) groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated;
- (e) groundwater from the mine's dewatering activities;
- (f) a mix of mine affected water (under any of paragraphs (a)-(e)) and other water.

“mining waste” means waste rock, spoil, overburden, tailings and course reject material.

“modification” or **“modifying”** see construction.

“MRL” means Mandatory Reporting Level.

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

“nature” includes:

ecosystems and their constituent parts; and
all natural and physical resources; and

natural dynamic processes.

“non-artesian exploration drill hole” means an exploration drill hole that does not intersect aquifers of an artesian basin.

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

“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” for a dam 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.

“offset” means either a:

- direct land based offsets:
 - values to be offset using a direct land based offset;
 - an assessment of the offset area to demonstrate how it meets the requirements of the Biodiversity Offset Policy;
 - an assessment of ecological equivalence carried out in accordance with the Ecological Equivalence Methodology.;
 - legally binding mechanism; and
 - offset area management plan.
- offset transfer:
 - values to be offset using an offset transfer
 - evidence that State significant biodiversity values to be impacted can be offset within the landscape;
 - an assessment of ecological equivalence carried out in accordance with the Ecological Equivalence Methodology;
 - Brokers Agreement or applicant letter; and
 - Identification of financial surety amount and calculation method
- offset payment:
 - the values to which the proposed offset payment relates; and
 - offset payment amount and calculation method.

developed in accordance with the *Queensland Biodiversity Offsets Policy* dated [Version 1 dated 3 October 2011].

“offset payment” has the meaning given to it in the Queensland Biodiversity Offset Policy.



“offset transfer” has the meaning given to it in the *Queensland Biodiversity Offset Policy*.

“palletised” means stored on a movable platform on which batteries are placed for storage or transportation.

“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).

“PMF” means probable maximum flood.

“probable maximum flood” means the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area.

“protected area” means:

- (a) a protected area under the *Nature Conservation Act 1992*; or
- (b) a marine park under the *Marine Parks Act 1992*; or
- (c) a World Heritage Area.

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

“public utility works” means:

- (a) the replacement, modification or relocation of public utilities required as a consequence of the project; and
- (b) the construction of new utility infrastructure required for the project.

“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” means an unmined feature against which a mined and rehabilitated feature may be compared. A reference site may reflect the original location or adjacent area of a disturbed area, where representative control plots are established, as nominated by the environmental authority holder. Reference sites must be:

- areas of similar chemical and physical characteristics to the proposed rehabilitated areas;
- established in typical areas of each pre-mining regional ecosystem (vegetation community);
- not impacted by the mining activity;
- acceptable to the administering authority prior to use;
- in a similar ecological setting;
- utilised in a similar capacity as the proposed post mine land use; and
- under a similar fire regime as the proposed rehabilitated areas.



Rehabilitation must be compared with those reference sites that most typically reflect the pre-mining regional ecosystem that the environmental authority holder is seeking to redevelop in the rehabilitation.

“recycled water” means appropriately treated effluent and urban stormwater suitable for further use.

“regulated dam” means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published by the administering authority.

“regulated structure” means either a regulated dam or levee.

“rehabilitation” means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the completion 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” means 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 dwelling, residential allotment, mobile home or caravan park, residential marina; or
- other residential premises; or
- a motel, hotel or hostel; or
- an educational institution; or
- a medical centre or hospital;
- a protected area; or
- a public park or gardens; or
- a workplace 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

except where located on the mining lease subject to this authority.

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

“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.

“stock” has the meaning given to it under the *Stock Act 1915*.

“storm water” means all surface water runoff from rainfall.

“State Significant Biodiversity Values” means the values identified in Appendix A State Significant Biodiversity Values of the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011).

“subartesian bore” includes a shaft, well, gallery, spear or excavation (excluding the mining pits), and any works constructed in connection with the shaft, well, gallery, spear or excavation, that taps an aquifer and the water does not flow and never has flowed naturally to the surface.

“subartesian water” means water that occurs naturally in, or is introduced artificially into, an aquifer, which if tapped by a bore, would not flow naturally to the surface.

“suitably qualified and experienced person” in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, and has demonstrated competency and relevant experience:

- for regulated dams, and RPEQ who is a civil engineer with the required qualifications in dam safety and dam design;
- for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments.

NOTE: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.

“system design plan” means a plan that manages and integrated containment system that shares the required DSA volume across the integrated containment system.

“void” means any constructed, open excavation in the ground.

“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.

“water bore” means an artesian bore or a subartesian bore.



“water monitoring bore” means a water bore used for monitoring impacts on underground water caused by the mining activities.

“water quality” means the chemical, physical and biological condition of water.

“water year” means the 12 month period from 1 July to 30 June.

“watercourse” has the same meaning given in the *Water Act 2000*.

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

“wet season” means the time of year, covering one or more months, when most of the average annual rainfall in a region occurs. For the purposes of DSA determination this time of year is deemed to extend from 1 November in one year to 31 May in the following year inclusive.

“µg/L” means micrograms per litre.

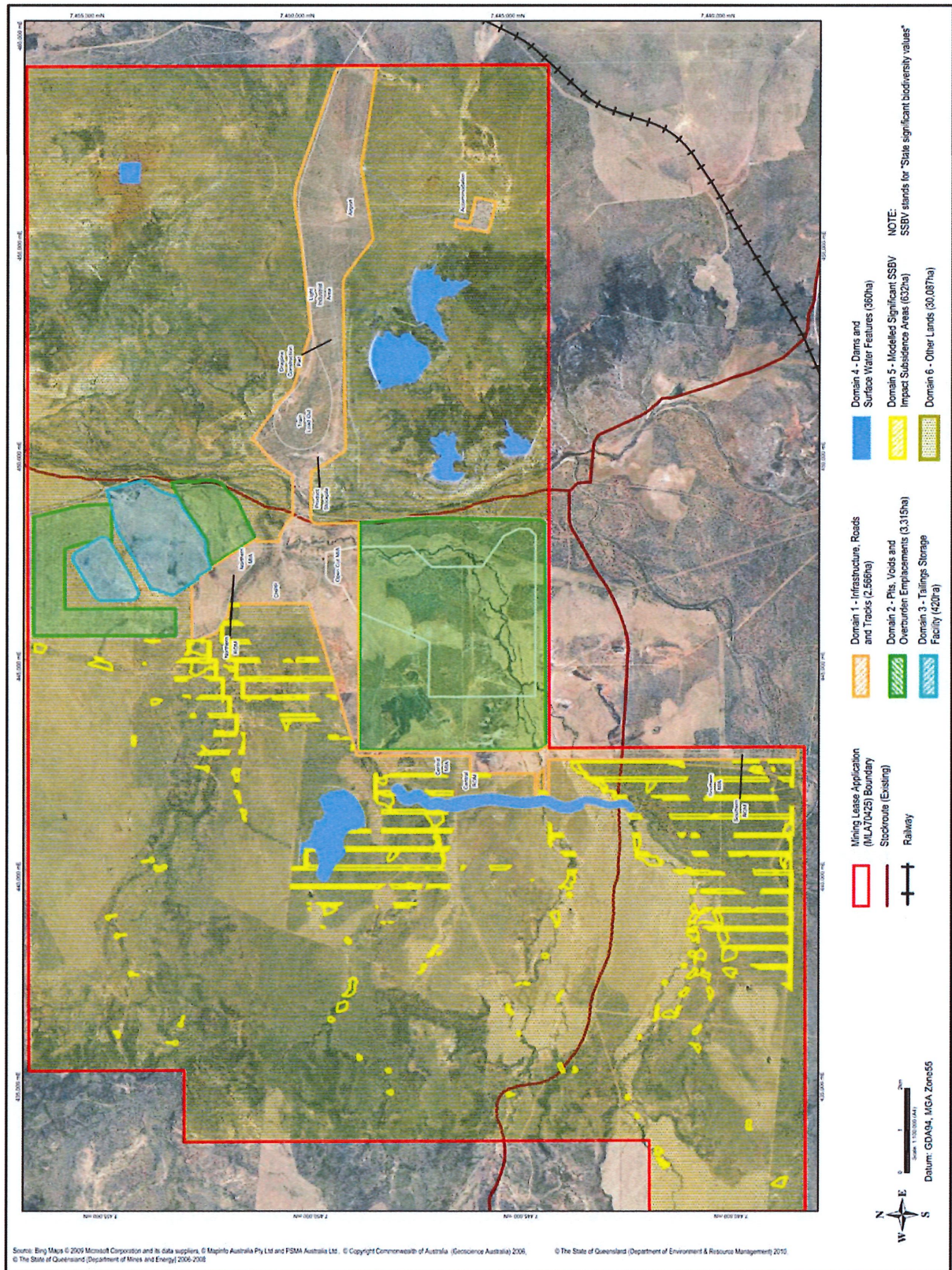
“µs.cm-1” means microsiemens per centimetre.

END OF DEFINITIONS



Schedule K: Figures

Figure 1: Overall Site Layout Domain Plan



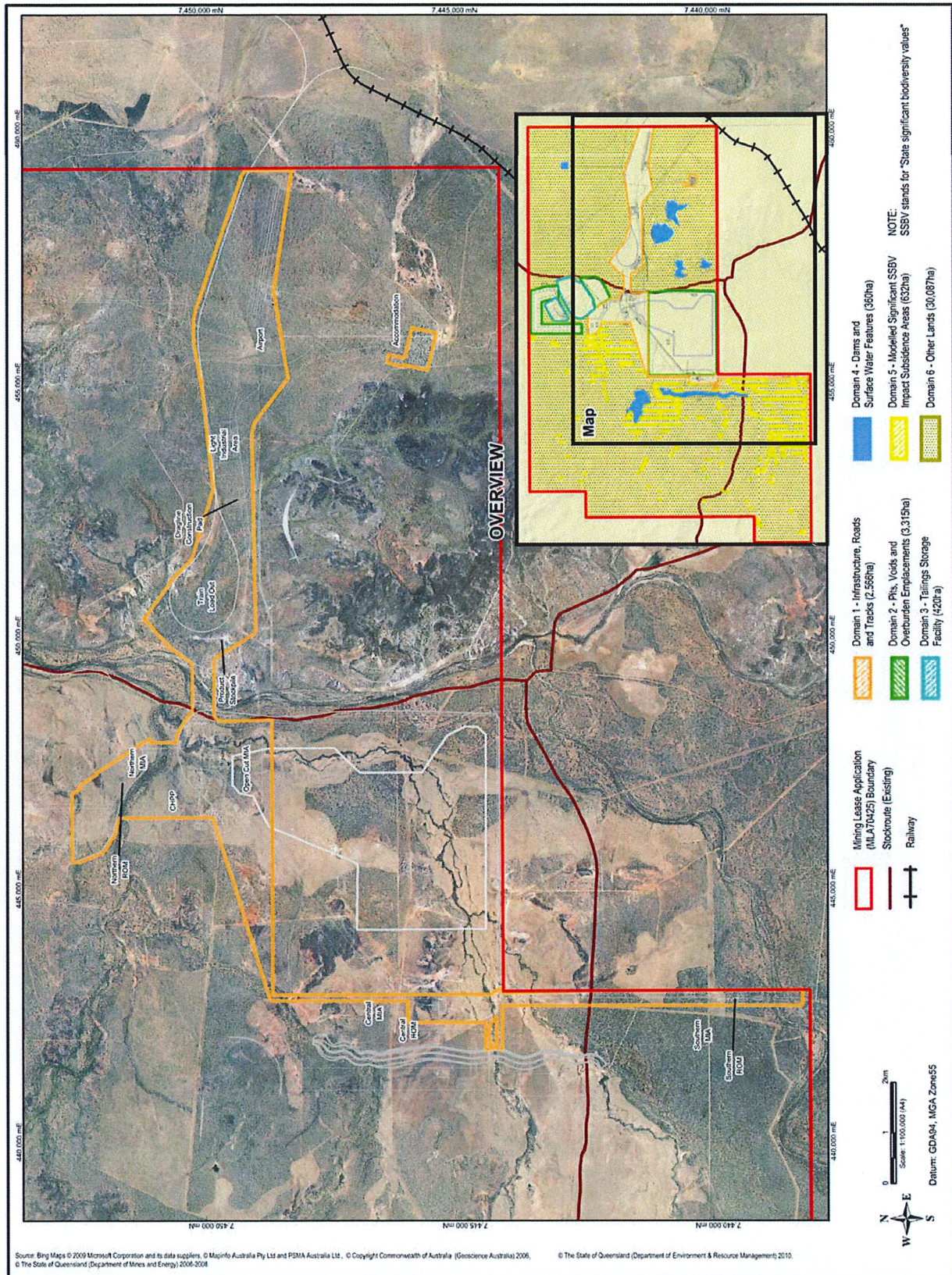
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

OVERALL SITE LAYOUT
DOMAIN PLAN

Handwritten signature

Figure 2: Site Layout Showing Domain 1



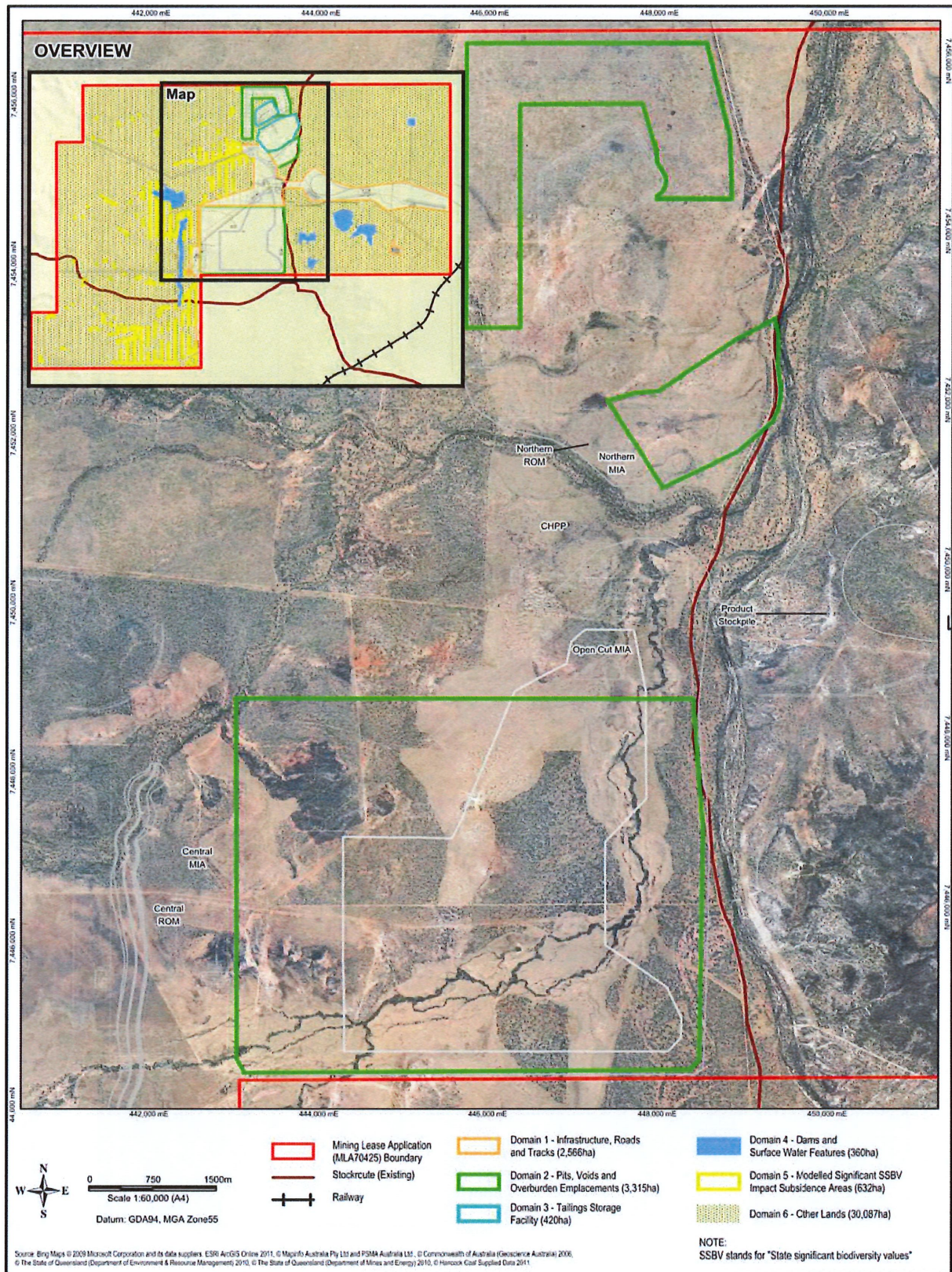
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

SITE LAYOUT
SHOWING DOMAIN 1

Gn

Figure 3: Site Layout Showing Domain 2



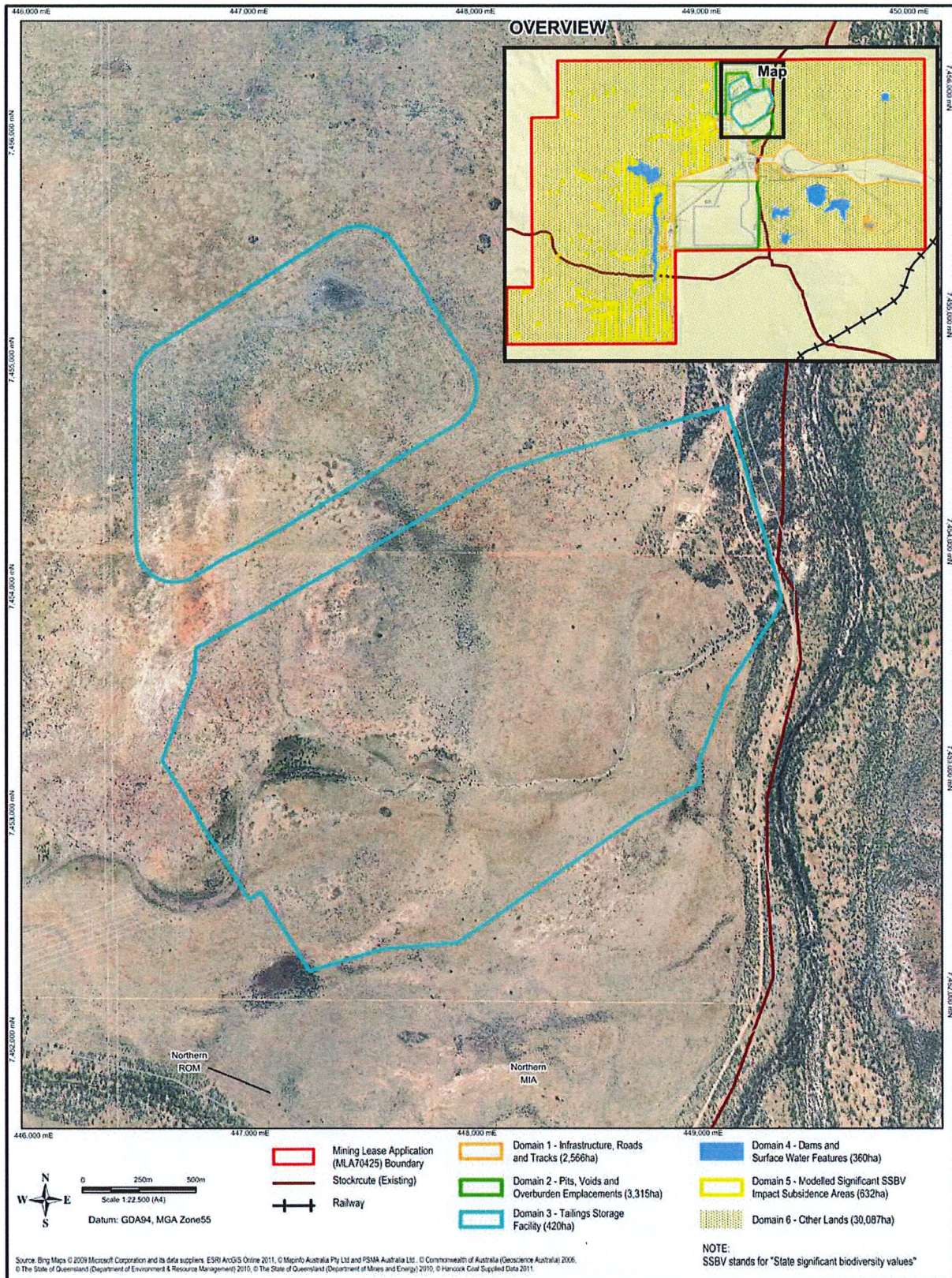
HANCOCK GALILEE
PTY LTD

KEVIN'S CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

SITE LAYOUT
SHOWING DOMAIN 2

Gm

Figure 4: Site Layout Showing Domain 3



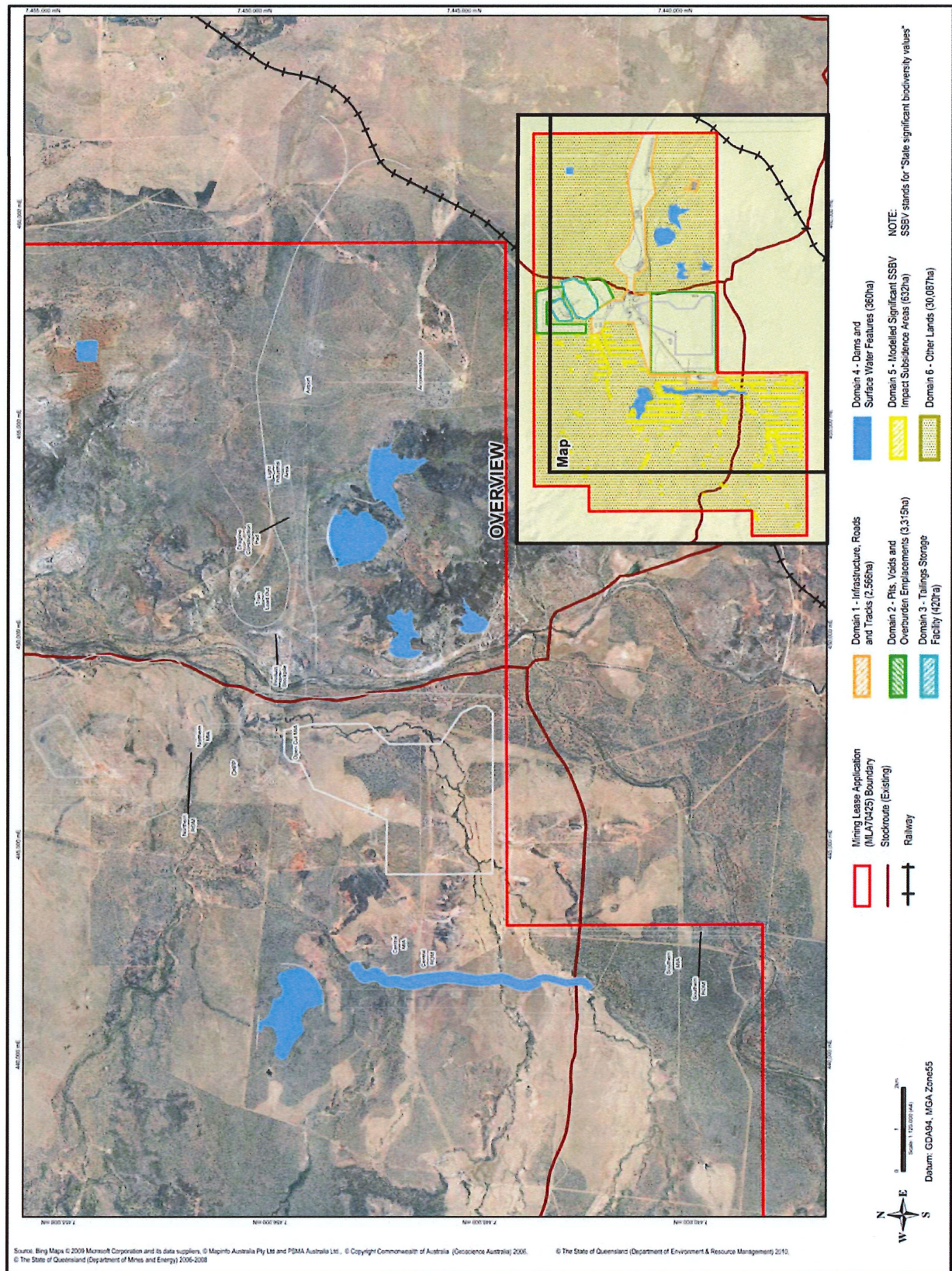
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

SITE LAYOUT
SHOWING DOMAIN 3

Gn

Figure 5: Site Layout Showing Domain 4



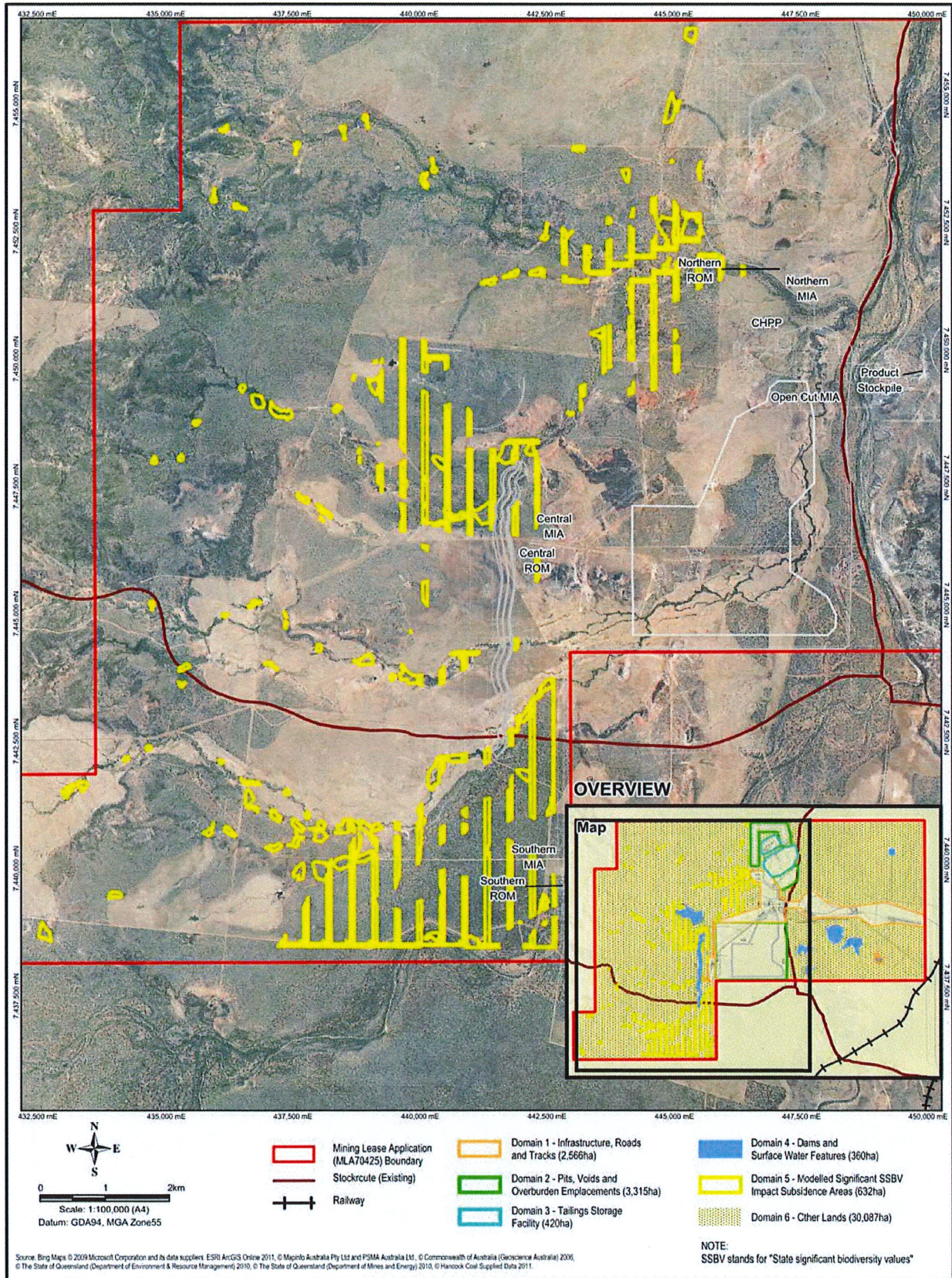
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

SITE LAYOUT
SHOWING DOMAIN 4

Gm

Figure 6: Site Layout Showing Domain 5



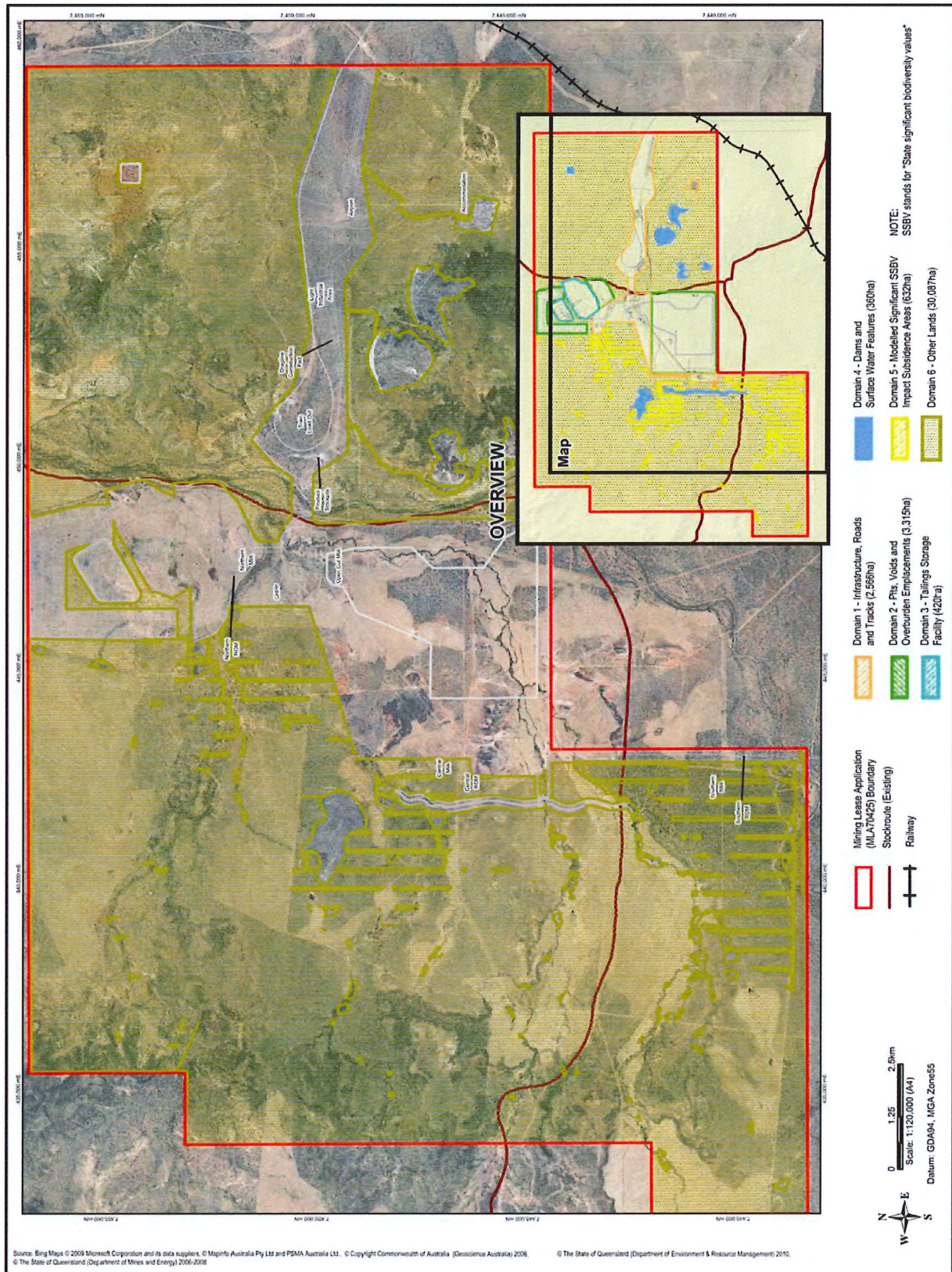
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

SITE LAYOUT
SHOWING DOMAIN 5

Gm

Figure 7: Site Layout Showing Domain 6



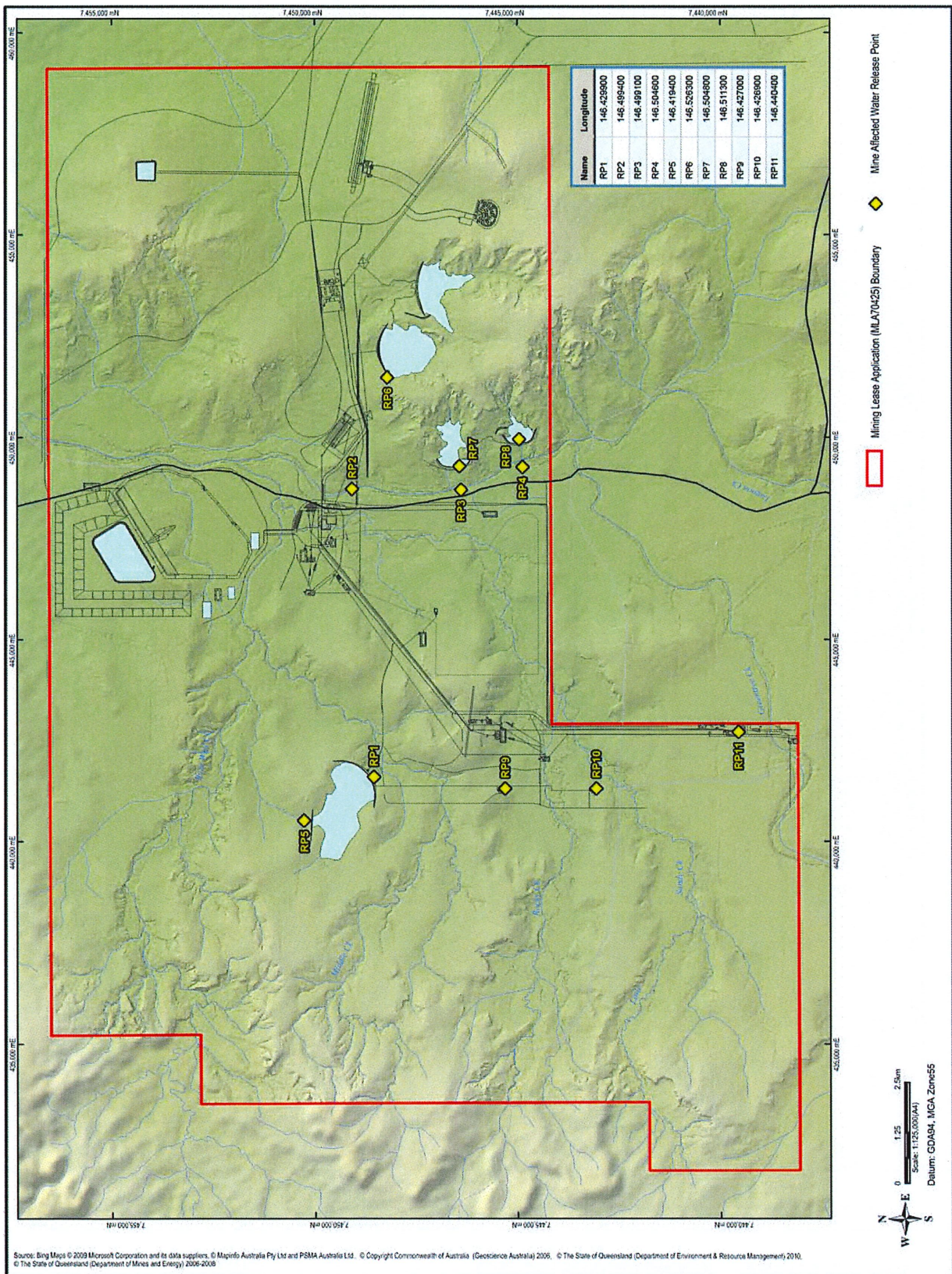
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

SITE LAYOUT
SHOWING DOMAIN 6

Gm

Figure 8: Mine Affected Water Release Points



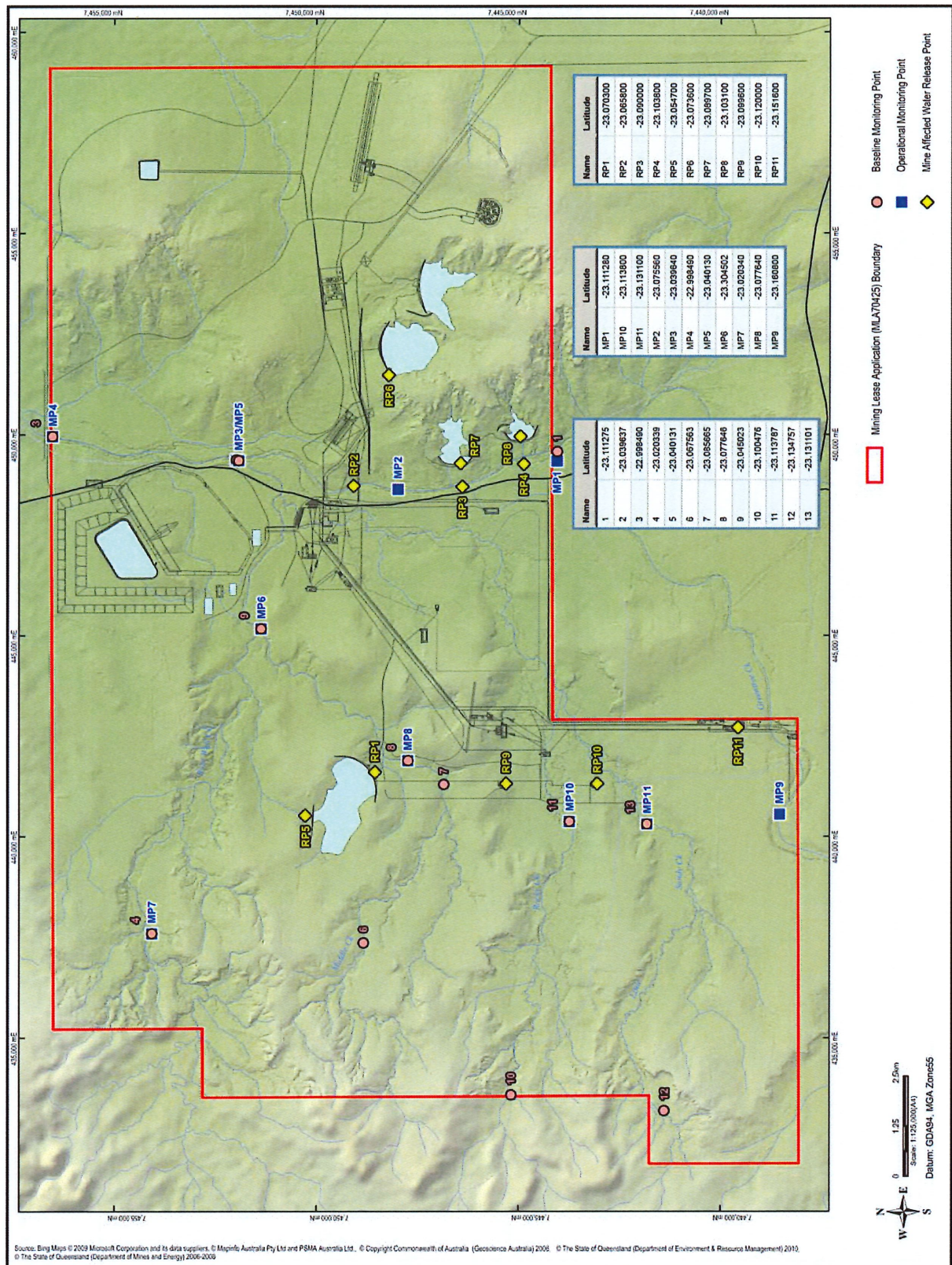
HANCOCK GALILEE
PTY LTD

KEVIN'S CORNER PROJECT
DARFT ENVIRONMENTAL AUTHORITY

MINE AFFECTED
WATER RELEASE
POINTS

Gm

Figure 9: Receiving Water Upstream Background and Downstream Monitoring Locations



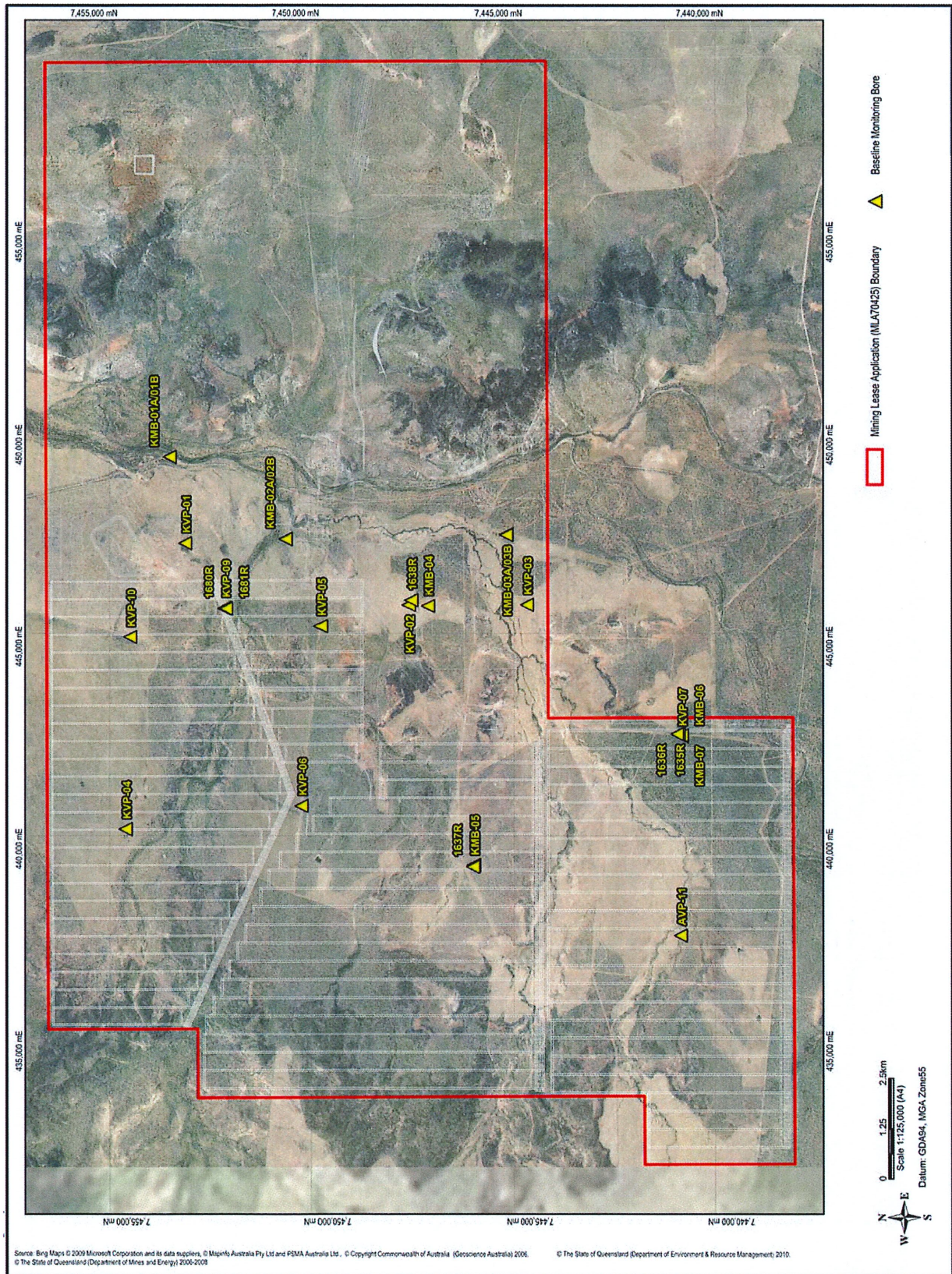
HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DARFT ENVIRONMENTAL AUTHORITY

**BASELINE AND OPERATIONAL
SURFACE WATER QUALITY
MONITORING POINTS**

Gm

Figure 10: Groundwater Monitoring Locations



HANCOCK GALILEE
PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

GROUNDWATER
MONITORING LOCATIONS

Gm

Appendix A: Rehabilitation Requirements

Table A1: Rehabilitation Completion Criteria

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 1 Infrastructure	Long term safety	Rehabilitation or conversion of exploration drill holes and groundwater monitoring bores.	All non-artesian exploration drill holes undertaken on the Mining Lease (MLA 70425) have been rehabilitated or converted to water bores.	Certification by an appropriately qualified person that all non-artesian exploration drill holes not converted to either a water bore or a groundwater monitoring bore have been rehabilitated.
				Certification by an appropriately qualified person, that all sub-artesian aquifers have been isolated where non-artesian exploration drill holes have intersected more than one sub-artesian water bearing strata, in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
			All monitoring bores undertaken on the Mining Lease (MLA 70425) have been rehabilitated.	Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to a water bore have been converted in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
				Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to water bores are compliant with the requirements of the <i>Water Act 2000</i> . Certification by an appropriately qualified person that all monitoring bores have been rehabilitated in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
		Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by an appropriately qualified person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.

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Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
				Landform design meets the design requirements of Table A4: Landform Design Criteria.
		Site is safe for humans and animals now and in the foreseeable future.	Appropriate decommissioning of infrastructure.	Certification by an appropriately qualified person in the site Rehabilitation Report that the infrastructure has been decommissioned and rehabilitated. Buildings, water storage(s), roads (except those used by the public), and other infrastructure have been removed unless stakeholders have entered into formal written agreements for their retention. Areas are readily accessible and conducive to safe cattle management activities.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			All permanent diversion channels will meet approved design criteria.	Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent regulated structures will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
				The regulated structures are certified by a suitably qualified and experienced person.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
		Hazardous materials adequately managed.	Exposure to and availability of heavy metals and other toxic materials.	Certification by a suitably qualified and experienced person, the Rehabilitation Report includes predictions about future changes and that the specified cover thickness is in place.
		Removal of potential sources of contamination.	Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that dust monitoring results at nuisance sensitive receptors have complied, with limits.
		Landform design achieves appropriate erosion rates.	Slope angle and length.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
	Stable landform		Engineered structures to control water flow.	Evidence in the Rehabilitation Report that the rehabilitated slopes have been designed to the specifications outlined in Table A4 Landform Design Criteria.
			Rates of soil loss.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited at the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
				Evidence that the vegetation type and density are of species suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meet the goals set it the site Rehabilitation Management Plan.
				Vegetation types and densities are comparable with the relevant reference site.

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Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m ² in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the <i>Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)</i> and the <i>ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068)</i> .
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <0.6 dS/m. • Soil pH is between 5.5 and 8.5. • Soil Exchange Sodium Percentage (ESP) is <15%. • Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <1.5 dS/m. • Soil pH is between 5.5 and 9.0. • Soil Exchange Sodium Percentage (ESP) is <30%.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. <i>Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining.</i>
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
	Establish self-sustaining natural vegetation or habitat (remnant vegetation areas).		Presence of key plant species.	Certification by an appropriately qualified person that key species identified for each reference site, as identified in Table A5 – Reference Sites are present.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is consistent with that identified for each reference site identified in Table A5 – Reference sites.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure is similar or trending towards that of each reference site identified in Table A5 – Reference Sites.
	Establish self-sustaining natural vegetation or habitat (non-remnant vegetation areas).		Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
			Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person in the site Rehabilitation Report that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 2 Pits, Voids and Overburden Emplacements	Long term safety	Structurally safe with no hazardous materials.	Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
			Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
	Long term safety	Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified person, in the Rehabilitation Report that site slopes are now safe and will remain so. Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected generally in accordance with relevant guidelines and Australian Standards.
			Exposure to and availability of heavy metals and other toxic materials.	Landform design meets the design requirements of Table A2 Void Design Criteria and A4 – Landform Design Criteria. Certification by a suitably qualified person, in Rehabilitation Report that specified cover thickness is in place and predictions about future changes. Evidence in Rehabilitation Report that dust monitoring results at nuisance sensitive receptors have complied, with limits.
			Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Site is safe for humans and animals now and in the foreseeable future.	Stream bank erosion.	Evidence in the Rehabilitation Report that all creek diversions are stable at closure and are likely to remain that way into the foreseeable future.
			Safety assessment of landform stability (geotechnical studies).	The void is certified by a suitably qualified and experienced person as being decommissioned appropriately.
				Geotechnical stability of the highwall, low wall and end walls has been achieved and geotechnical investigations demonstrating this have been undertaken and reported.
				Highwall faces exhibit long-term geotechnical stability and a geotechnical report has been completed.
	Non-polluting	Mine affected water contained on site.		Ramp walls not backfilled exhibit long-term geotechnical stability and a geotechnical report has been completed.
			Adequacy and predicted long-term performance of safety barriers.	Evidence in the Rehabilitation Report that an adequate Safety Plan has been implemented.
			Installation of safety barriers and human/wildlife exclusion fencing of final void.	Fencing or other suitable barrier installed around the perimeter of the final void to restrict access, if required following safety assessment.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			All permanent diversion channels will meet approved design criteria.	Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent regulated structures will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All non-permanent regulated structures decommissioned appropriately.	The regulated structures are certified by a suitably qualified and experienced person.
	Diversion design and maintenance.		Voids protected from flooding.	Regulated structures are decommissioned in accordance with the administering authority requirements.
			The administering authority of the Water Licence under the <i>Water Act 2000</i> has determined that the Water Licence is no longer required.	Certification by a suitably qualified and experienced person in the site Rehabilitation Report that the final voids have an adequate protection system to prevent inundation from a 1:1000 AEP event.
			Acid mine drainage will not cause serious	Confirmation in writing from the administering authority of the Water Licence under the <i>Water Act 2000</i> that the Water Licence is no longer required.
			Technical design of coarse reject cells.	Certification by a suitably qualified and experienced person in the Rehabilitation Report that the coarse reject placement was in accordance with the Mine Waste Management Plan.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		environmental harm.	Pit water quality.	Certification by an appropriately qualified person in the Rehabilitation Report that the water quality within the open cut voids is in compliance with the EA.
	Stable landform	Very low probability of slope slippage or failure with serious environmental consequences	Past record of slope failure.	Evidence in the Rehabilitation Report that the slope failure has been rectified and appropriate control measures are in place to prevent recurrence.
		Landform design achieves appropriate erosion rates	Slope angle and length.	Evidence in the Rehabilitation Report that the rehabilitated slopes have been designed to the specifications outlined in Table A4: Landform Design Criteria.
			Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
			Dimensions and frequency of occurrence of erosion rills and gullies.	Evidence that dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in the corresponding reference sites.
		Vegetation cover to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and density are suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meet the goals set in the Rehabilitation Management Plan. Priority will be given to native species.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m ² in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the <i>Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)</i> and the <i>ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068)</i> .
		Very low probability of rock falls with serious environmental consequences.	Geotechnical studies	Evidence in the Rehabilitation Report that appropriate risk assessment has been undertaken and control measures put in place
	Sustainable land use	Soil properties support the desired land use.	Past record of rock falls. Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Evidence in the Rehabilitation Report that appropriate control measures are in place to prevent recurrence. Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <0.6 dS/m. • Soil pH is between 5.5 and 8.5. • Soil Exchange Sodium Percentage (ESP) is <15%. • Adequate macro and micro-nutrients are present.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <1.5 dS/m. • Soil pH is between 5.5 and 9.0. • Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. <i>Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining.</i>
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Media characterisation studies.	Certification by an appropriately qualified person that planting media characteristics do not pose significant constraints to plant growth following amelioration.
		Establish self-sustaining natural vegetation or habitat (natural system on highly modified environments).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified in the Landscape Planting Plan (to be prepared following the completion of vegetation trials on highly modified environments) occur on site.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is equivalent to the density specified in the Landscape Planting Plan.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure exist in accordance with those specified in the Landscape Planting Plan.
			Vegetation trials.	Certification by an appropriately qualified person that vegetation trials have identified groundcover, shrub and canopy species which will survive and are likely to reproduce on the relevant media.
			Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
		Self-sustaining natural vegetation or habitat.	Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.



Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 3 Tailings Storage Facility			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural Cattle Grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
	Long term safety	Structurally safe with no hazardous materials.	Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
			Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A4 Landform Design Criteria.
		Exposure to and availability of heavy metals and other toxic	Certification by an appropriately qualified person, in Rehabilitation Report that specified cover thickness is in place and predictions about future changes.	

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			materials.	Evidence in Rehabilitation Report that dust monitoring results at nuisance sensitive receptors have complied, with limits.
			Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
			Appropriate decommissioning of regulated structures and other dams.	The Tailings Storage Facility is certified by a suitably qualified and experienced person.
			Safety assessment of landform stability.	Certification in the Rehabilitation Report that site slopes are now safe and are likely to remain that way into the foreseeable future.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.	
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
		Diversion design and maintenance.	The administering authority of the Water Licence under the <i>Water Act 2000</i> has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the <i>Water Act 2000</i> that the Water Licence is no longer required.
		Acid mine drainage will not cause serious environmental harm.	Technical design of Tailings Storage Facility.	Certification by a suitably qualified and experienced person in the Rehabilitation Report that the Tailings placement was in accordance with the Mine Waste Management Plan.
	Stable landform	Hazardous materials adequately managed.	Exposure to and availability of heavy metals and other toxic materials.	Certification by an appropriately qualified person in the Rehabilitation Report that the surface and groundwater quality is in accordance with the EA.
				Evidence that monitoring surface water quality for 5 years post closure has complied with specified guideline values.
		Landform design achieves appropriate erosion rates.	Slope angle and length.	Leaching tests of selected exposed mine waste material meet specified guideline values.
			Engineered structures to control water flow.	Evidence in the Rehabilitation Report that the rehabilitated slopes have been designed to the specifications outlined in Table A4 Landform Design Criteria. Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
			Dimensions and frequency of occurrence of erosion rills and gullies.	Evidence that dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in the corresponding reference sites.
			Vegetation type and density.	Evidence that the vegetation species type and density are suited to the spoil composition, slope, aspect, climate and other factors, and that the visual erosion meet the goals set in the site Rehabilitation Management Plan.
		Vegetation cover for self-sustaining community and to minimise erosion.	Foliage cover.	Vegetation types and densities are comparable with the relevant reference site. Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m ² in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report of how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. Diversions and drainage lines to be designed and constructed in accordance with the <i>Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)</i> and the ACARP report <i>Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068)</i> .

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <0.6 dS/m. • Soil pH is between 5.5 and 8.5. • Soil Exchange Sodium Percentage (ESP) is <15%. • Adequate macro and micro-nutrients are present. Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <1.5 dS/m. • Soil pH is between 5.5 and 9.0. • Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. <i>Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining.</i>
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Media characterisation studies.	Certification by an appropriately qualified person that planting media characteristics do not pose significant constraints to plant growth following amelioration.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Establish self-sustaining natural vegetation or habitat (natural system on highly modified environments).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified in the Landscape Planting Plan occur on site.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is equivalent to the density specified in the Landscape Planting Plan.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure exist in accordance with those specified in the Landscape Planting Plan.
			Vegetation trials.	Certification by an appropriately qualified person that vegetation trials have identified groundcover, shrub and canopy species which will survive and are likely to reproduce on the relevant media.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
		Self-sustaining natural vegetation or habitat.	Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 4 Dams and Surface Water Features			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
			Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
		Agricultural cattle grazing.	Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
	Long term safety	Structurally safe with no hazardous materials.	Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
			Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A4 Landform Design Criteria.
			Exposure to and availability of heavy metals and other toxic	Certification by a suitably qualified person, in Rehabilitation Report that includes predictions about future changes and that specified cover thickness is in place.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			materials.	Evidence in Rehabilitation Report that dust monitoring results at sensitive receptors have complied, with limits.
			Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			All permanent diversion channels will meet approved design criteria.	Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent regulated structures will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All non-permanent regulated structures decommissioned appropriately.	The regulated structures are certified by a suitably qualified and experienced person.
				Regulated structures are decommissioned in accordance with the administering authority requirements.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Voids protected from flooding.	Certification by a suitably qualified and experienced person in the site Rehabilitation Report that the final voids have an adequate protection system to prevent inundation from a 1:1000 AEP event.
		Diversion design and maintenance.	The administering authority of the Water Licence under the <i>Water Act 2000</i> has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the <i>Water Act 2000</i> that the Water Licence is no longer required.
		Site is safe for humans and animals now and in the foreseeable future.	Appropriate decommissioning of regulated structures and other dams.	Certification by a suitably qualified and experienced person, in the site Rehabilitation Report that the all regulated structures (dams and levees) have been decommissioned and rehabilitated.
	Stable landform	Landform design achieves appropriate erosion rates.	Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited at the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
			Dimensions and frequency of occurrence of erosion rills and gullies.	Evidence that dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in the corresponding reference sites.
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and density are suited to the spoil composition, slope, aspect, climate and other factors, and that the visual erosion meet the goals set in the site Rehabilitation Management Plan.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
				Vegetation types and density are comparable with the relevant reference site.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m ² in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the <i>Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)</i> and the ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <0.6 dS/m. • Soil pH is between 5.5 and 8.5. • Soil Exchange Sodium Percentage (ESP) is <15%. • Adequate macro and micro-nutrients are present. Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <1.5 dS/m. • Soil pH is between 5.5 and 9.0. • Soil Exchange Sodium Percentage (ESP) is <30%.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. <i>Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining.</i>
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
		Establish self-sustaining natural vegetation or habitat (non-remnant vegetation areas). Establish self-sustaining natural vegetation or habitat (natural system on highly modified environments).	Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.
			Presence of key plant species.	Certification by an appropriately qualified person that key species identified in the Landscape Planting Plan occur on site.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is equivalent to the density specified in the Landscape Planting Plan.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure exist in accordance with those specified in the Landscape Planting Plan.
			Vegetation trials.	Certification by an appropriately qualified person that vegetation trials have identified groundcover, shrub and canopy species which will survive and are likely to reproduce on the relevant media.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 5 Modelled Significant SSBV Impact Subsidence Areas		Agricultural cattle grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
	Long term safety	Rehabilitation or conversion of exploration drill holes and groundwater monitoring bores.	All non-artesian exploration drill holes undertaken on the Mining Lease (MLA 70425) have been rehabilitated or converted to water bores.	Certification by an appropriately qualified person that all non-artesian exploration drill holes not converted to either a water bore or a groundwater monitoring bore have been rehabilitated. Certification by an appropriately qualified person, that all sub-artesian aquifers have been isolated where non-artesian exploration drill holes have intersected more than one sub-artesian water bearing strata, in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition. Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to a water bore have been converted in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
			All monitoring bores undertaken on the Mining Lease (MLA 70425) have been rehabilitated.	Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to water bores are compliant with the requirements of the <i>Water Act 2000</i>. Certification by an appropriately qualified person that all monitoring bores have been rehabilitated in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies)	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so. Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected generally in accordance with relevant guidelines and Australian Standards. Landform design meets the design requirements of Table A4 Landform Design Criteria.
			Stream bank erosion.	Evidence in the Rehabilitation Report that all creek diversions are stable at closure and are likely to remain that way into the foreseeable future.
			Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
	Non-polluting	Mine affected water contained on site.	Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.	Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
			Voids protected from flooding.	Certification by a suitably qualified and experienced person in the site Rehabilitation Report that the final voids have an adequate protection system to prevent inundation from a 1:1000 AEP event.
	Diversion design and maintenance.		The administering authority of the Water Licence under the <i>Water Act 2000</i> has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the <i>Water Act 2000</i> that the Water Licence is no longer required.
			Exposure to and availability of heavy metals and other toxic materials.	Certification by a suitably qualified person, in Rehabilitation Report that includes predictions about future changes and that specified cover thickness is in place
	Removal of potential sources of contamination.		Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that dust monitoring results at sensitive receptors have complied, with limits.
				Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
	Stable landform	Landform design achieves appropriate	Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		erosion rates.	Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and densities are suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meets the goals set it the site Rehabilitation Management Plan.
			Foliage cover.	Vegetation types and density are comparable with the relevant reference site.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20 m ² in area or >10 m in length down slope.
		Surface water drainage.	Stable drainage works.	Documentation in the Rehabilitation Report of how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: <i>Watercourse Diversions-Central Queensland Mining Industry, (2008)</i> and the ACARP report <i>Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068)</i> .
				Certification by a suitably qualified and experienced person that local drainage works (e.g. small diversion bunds, engineered rock chute structures, etc.) have been properly designed and constructed.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		No significant changes to hydrological conditions.	Ponding.	Evidence in the Rehabilitation Report that no ponding occurs and that excavation of pillar zones from creek channels to facilitate natural drainage of ponded areas has been undertaken.
			Cracking.	Evidence in the Rehabilitation Report that no subsidence cracks greater than 25 mm occur (that are attributable to subsidence) and that ripping and seeding of all subsidence cracks greater than this threshold have been undertaken.
		Stable geomorphic system.	Geomorphic environment survey.	A geomorphic environment survey report (at the end of the mine life) stating that a stable geomorphic system is able to continue to evolve into the future.
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <0.6 dS/m. • Soil pH is between 5.5 and 8.5. • Soil Exchange Sodium Percentage (ESP) is <15%. • Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <1.5 dS/m. • Soil pH is between 5.5 and 9.0. • Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. <i>Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining.</i>

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths present prior to disturbance.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Presence of key plant species.	Certification by an appropriately qualified person that key species identified for each reference site are present, as identified in Table A5– Reference Sites.
		Establish self-sustaining natural vegetation or habitat (remnant vegetation areas).	Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is consistent with that identified for each reference site identified in Table A5– Reference Sites.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure is similar or trending towards that of each reference site identified in Table A5– Reference Sites.
			Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
		Self-sustaining natural vegetation or habitat.	Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.
			Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
	Agricultural Cattle Grazing.		Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
			Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 6 Other Lands	Long term safety	Rehabilitation or conversion of exploration drill holes and groundwater monitoring bores.	Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
			All non-artesian exploration drill holes undertaken on the Mining Lease (MLA 70425) have been rehabilitated or converted to water bores.	Certification by an appropriately qualified person that all non-artesian exploration drill holes not converted to either a water bore or a groundwater monitoring bore have been rehabilitated.
				Certification by an appropriately qualified person, that all sub-artesian aquifers have been isolated where non-artesian exploration drill holes have intersected more than one sub-artesian water bearing strata, in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
				Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to a water bore have been converted in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
		Structurally safe with no hazardous materials.	All monitoring bores undertaken on the Mining Lease (MLA 70425) have been rehabilitated.	Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to water bores are compliant with the requirements of the <i>Water Act 2000</i> . Certification by an appropriately qualified person that all monitoring bores have been rehabilitated in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
			Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			All permanent diversion channels will meet approved design criteria.	Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent regulated structures will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
		Removal of potential pollution sources.	Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Diversion design and maintenance.	The administering authority of the Water Licence under the <i>Water Act 2000</i> has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the <i>Water Act 2000</i> that the Water Licence is no longer required.
		Landform design achieves appropriate erosion rates.	Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
	Stable landform	Vegetation cover for self-sustaining community and to minimise erosion.	Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
			Vegetation type and density.	Evidence that the vegetation type and density are of species suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meets the goals set it the site Rehabilitation Management Plan.
			Foliage cover.	Vegetation types and density are comparable with the relevant reference site. Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m ² in area or >10m in length down slope.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the <i>Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)</i> and the ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <0.6 dS/m. • Soil pH is between 5.5 and 8.5. • Soil Exchange Sodium Percentage (ESP) is <15%. • Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: • Soil salinity content is <1.5 dS/m. • Soil pH is between 5.5 and 9.0. • Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. <i>Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining.</i>

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Presence of key plant species.	Certification by an appropriately qualified person that key species identified for each reference site are present, as identified in Table A5– Reference Sites.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is consistent with that identified for each reference site identified in Table A5– Reference Sites.
		Establish self-sustaining natural vegetation or habitat (remnant vegetation areas).	Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure is similar or trending towards that of each reference site identified in Table A5– Reference Sites.
			Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
			Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.
			Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
		Self-sustaining natural vegetation or habitat.	Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural cattle grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.

NOTE: It is an offence under the *Land Protection (Pest and Stock Route Management Act) 2002* to fail to control Class 1 or Class 2 pests on a Mining Lease or to move or transport a vehicle containing the reproductive material of a declared pest plant.

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Table A2: Void Design Criteria

Mine Domain	Feature	Slope Range (degrees)	Approximate Surface Area (ha)
2	Voids – Pit 1 and Pit 2	Final void batter slopes will be designed and excavated to exhibit permanent geotechnical stability. Prior to closure, further investigations will be undertaken to specify design criteria and appropriate action will be taken to ensure effective long term safety, stability and management of the void	897

Table A3: Subsidence Design Criteria

Mine Domain	Feature	Subsidence panel slope (degrees)	Approximate Surface Area (ha)
5	Modelled significant SSBV impacted subsidence areas	To be confirmed	632
6	Underground mining areas.	To be confirmed	To be confirmed

Table A4: Landform Design Criteria

Mine Domain	Feature	Slope Range (degrees)	Approximate Surface Area (ha)
1	Infrastructure including CHPP, workshops, landfill, administration areas.	No less than 75% of the rehabilitated area has slopes of less than 5° and up to 25% of the rehabilitated area has slopes greater than 5°.	2,566
2	Mine waste – borrow pit and overburden	No less than 75% of the rehabilitated area has slopes of less than 10° and up to 25% of the rehabilitated area has slopes greater than 10°	2,418
3	Tailings dam	No less than 75% of the rehabilitated area has slopes of less than 5°	420

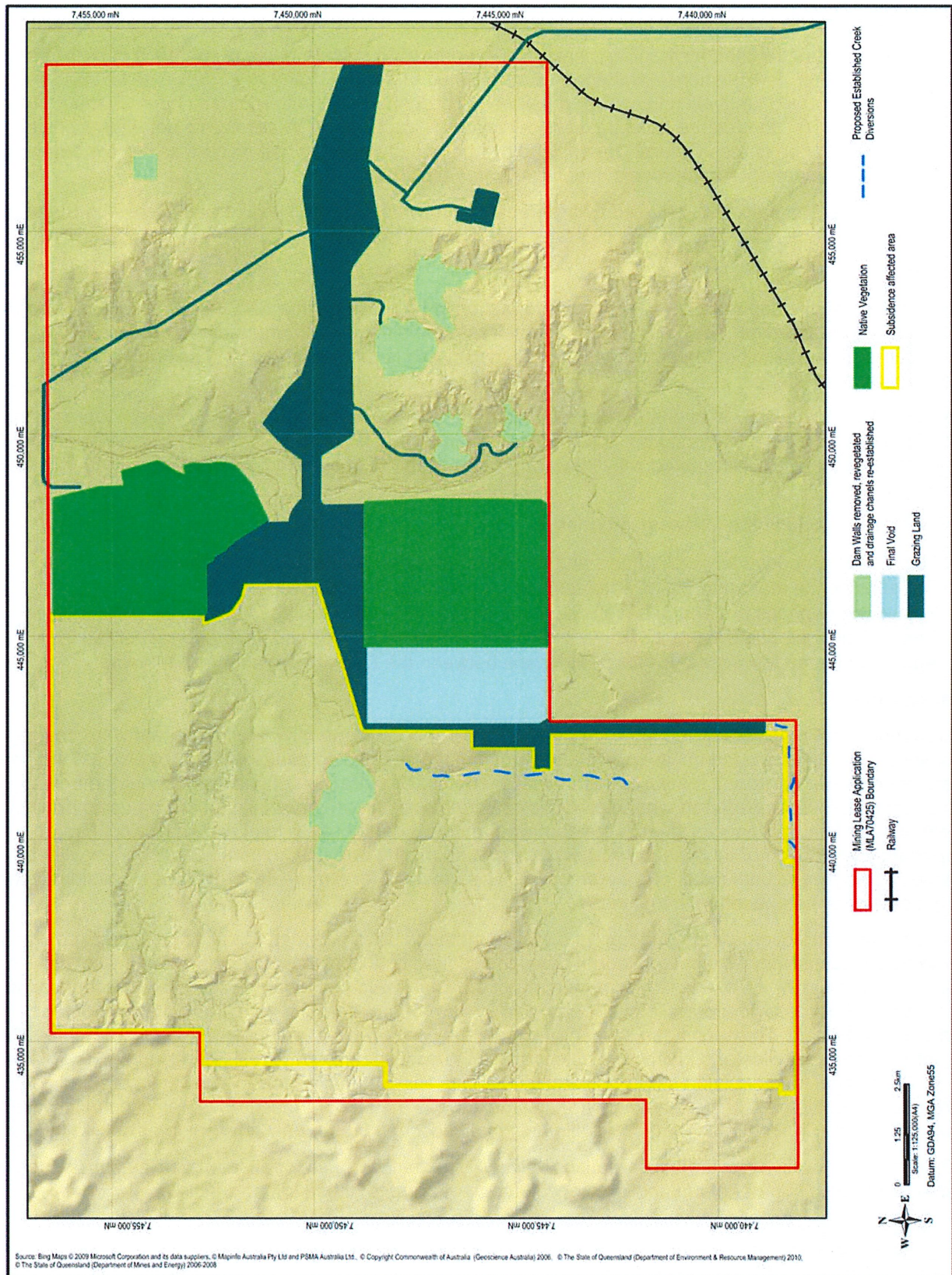
Gn

		and up to 25% of the rehabilitated area has slopes greater than 5°.	
4	Dams and surface water features	To be confirmed	360
5	Modelled significant SSBV impacted subsidence areas	To be confirmed	632
6	Other lands	To be confirmed	30,087

Table A5: Reference Sites

Reference Site	Mine Domain	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Description
1	1,5	146.3232	-23.0081	10.3.27a
2	1,5	146.4148	-22.9769	10.3.27a
3	1,5	146.406	-22.9466	10.3.27a
4	1,5,6	146.33	-22.9421	10.5.12
5	1,5,6	146.4172	-22.953	10.5.12
6	1,5,6	146.3452	-22.9631	10.5.12
7	1,5	146.3982	-22.9514	10.3.13a
8	1,5	146.2879	-22.9378	10.3.13a
9	1,5	146.3277	-22.9353	10.3.13a
10	1,5	146.4069	-22.9647	10.3.28a
11	1,5	146.2882	-23.0274	10.3.28a
12	1,5	146.2999	-22.8676	10.3.28a
13	1,5,6	146.3277	-23.0109	10.3.3a
14	1,5,6	146.34	-23.0032	10.3.3a
15	1,5,6	146.295	-23.027	10.3.3a
16	1,5	146.5266	-23.0922	10.7.7
17	1,5	146.562	-23.103	10.7.7
18	1,5	146.5198	-23.0728	10.7.7
19	1,5,6	146.3657	-22.9483	10.7.3b
20	1,5,6	146.3469	-22.9332	10.7.3b
21	1,5,6	146.3329	-22.9482	10.7.3b
22	1,5,6	146.3273	-22.8714	10.5.5a
23	1,5,6	146.3003	-22.8507	10.5.5a
24	1,5,6	146.3278	-22.9467	10.5.5a
25	1	146.595	-23.1039	10.5.1c
26	1	146.536	-23.0957	10.5.1c
27	1	146.576	-23.0208	10.5.1c
28	1,6	146.3426	-22.9472	10.7.5
29	1,6	146.2866	-22.8468	10.7.5
30	1,6	146.3086	-23.0194	10.7.5
31	1	146.371	-22.9422	10.3.12a
32	1	146.3972	-22.9459	10.3.12a
33	1	146.4149	-22.9457	10.3.12a
34	5	146.3457	-22.8877	10.10.1b
35	5	146.3421	-22.9285	10.10.1b
36	5	146.2953	-23.0869	10.10.1b

Figure A1: Rehabilitated Final Landform



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DRAFT ENVIRONMENTAL AUTHORITY

REHABILITATION
LOCATIONS

Appendix B: Watercourse Subsidence

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When to use

This appendix is to be used by the Environmental Authority (EA) holders in the preparation of a Subsidence Management Plan (SMP) where a watercourse, as defined under the *Water Act 2000*, is to be impacted as a result of underground longwall mining. For a feature to be defined as a watercourse under Chapter 1, Part 2 of the *Water Act 2000*, the feature must possess particular characteristics. Watercourse determinations are regularly undertaken across Central Queensland by authorised departmental officers as it is the determining factor in the requirement for approvals under the *Water Act 2000*.

In addition, this appendix is to be used by the Department when providing advice and assessing Subsidence Management Plans submitted by EA holders or proposed EA holders.

Purpose

The purpose of this appendix is to detail the information to be provided in a SMP and the legislative basis of the requirement for approval. The SMP forms the major reference document regarding subsidence impacts on watercourses as a result of underground longwall mining and is required to accompany proposals for watercourse subsidence.

The objective of the SMP is to ensure that the impacts of subsidence are properly managed. Where surface subsidence intersects a watercourse, it is important for the situation to be managed effectively to ensure no long-term maintenance is required within the watercourse, and to ensure that naturally occurring processes are not impaired.

A SMP should include the following information:

- Location of proposed longwall panels and modelled subsidence effects on the watercourse;
- Pre-subsidence management of watercourses proposed to be subsidised;
- Monitoring methods pre and post-subsidence to detect and document any impacts on watercourses;
- Post-subsidence management of impacted watercourses through remediation and rehabilitation;
- Agreed outcome for proposed future landscape between the Department and the EA holder.

Background

Throughout the Bowen Basin, economically viable coal deposits frequently extend beneath watercourses. Consequently, underground mining operations targeting the associated coal seams often also extend beneath watercourses. Underground mining is not a new concept in the extraction of coal throughout the Bowen Basin. This form of mining is preferred when economic constraints reduce the feasibility of mining using open cut methods. Whilst coal deposits located beneath watercourses contribute to total extractable coal, more importantly, extraction of this coal facilitates underground mining activities to continue along a coal seam uninterrupted across both sides of a watercourse. This provides for a more cost effective extraction of coal that might otherwise be uneconomic to mine.

Technological improvements in underground mining methods have provided the ability to extract coal in areas previously inaccessible for mining. Modern day underground coal mining operations commonly utilise longwall mining techniques which allow extraction of more of the coal seam. Longwall mining allows access to the coal seam via a shaft, a decline or a highwall portal and system of underground workings, without the need to remove overburden. This technique is used to extract the coal seam via a series of “panels”, which can be hundreds of metres wide and kilometres in length. As the coal shearer removes the coal in the seam along the length of a panel, the overlying strata is collapsed behind, filling the void (goaf) left by the extracted coal. The collapse and settlement of the overlying strata can extend to the land surface above, resulting in localised lowering of the surface profile, and depressions in the landscape (commonly referred to as subsidence troughs).

Where a watercourse is located above a longwall panel, extraction of the coal seam causes subsidence of the panel can have a number of impacts on the watercourse. Some of these impacts include:

- Lowering of bed and banks
- Creation of in-stream waterholes
- Changes to local drainage patterns
- Incision processes
- Stream widening
- Erosion
- Increased overbank flows due to lowering of the high banks



- Tension cracking through both shallow and deeper underlying strata (including aquifers)
- Root shear and loss of riparian vegetation
- Changes to water quality (surface water and groundwater).

The degree of subsidence is generally a function of thickness of coal extracted, depth of overburden, strata type and panel width. The point of maximum subsidence generally occurs along the centreline of an extracted panel, whilst the pillar zones located between panels remain at natural surface level. Experience gained through widespread adoption of longwall mining processes in the Bowen Basin has seen advancement in the modelling and ability to predict the likely impacts of a subsidence event. This technology has also facilitated improved design and implementation of mitigation measures (engineered structures and associated earthworks) and highlighted potential short and long term maintenance issues which may require specific management intervention.

Subsidence Management Plan

The objective of the SMP is to ensure that the impacts of subsidence are properly managed. Where surface subsidence intersects a watercourse, effective management is required to ensure no long-term maintenance is required within the watercourse, and to ensure that naturally occurring processes are not unduly impaired. Consideration must be given for potential impacts on erosion, groundwater and surface water as a result of a proposed subsidence event.

A Subsidence Management Plan must address the following issues:

- (1) Description of Pre Subsidence Situation & Survey
 - (a) A general description of the area pre subsidence including photographic record should be provided.
 - (b) Survey of cross-section and longitudinal profiles should be undertaken on all watercourses with potential to be impacted through subsidence. Permanent transects should be detailed within the proposed Subsidence Management Plan. Surveys should include the confluence with any other watercourses in the impacted area as well as any infrastructure spanning the watercourse. Surface drainage patterns should be investigated to determine current paths of water movement through the landscape. This path of water movement should be maintained where possible post-subsidence.

Predicted Subsidence

The degree of anticipated subsidence should be provided, including the length of watercourse to be impacted and the average depth of subsidence across individual panels. The predicted subsidence should be modelled to indicate the change in surface elevations expected. The volumes of water expected to be captured within the bed of the watercourse due to creation of waterholes should be provided. Consequences of any lowering of the high banks of the watercourse should be discussed, including impacts associated with greater floodplain interaction and potential for creation of new channels.

Infrastructure

Prior to mining, the anticipated impacts from subsidence should be determined on all infrastructure located within or above the watercourse to be subsided along with measures to be implemented to mitigate any impacts. Priority should be given to infrastructure which provides services to external parties (other mines, towns, industry). Measures for dealing with any interruption to such services should be outlined. Relocation of infrastructure may be necessary should the proposed subsidence pose sufficient risk.

Preventative Works

Where preventative measures are required to ensure the stability of the bed and banks of the watercourse (establishment of pile fields, exclusion of cattle, bentonite treatment) these should be discussed in the Subsidence Management Plan, including supporting evidence outlining the legitimacy of such works. These works may be required where self-repair by natural processes will not provide adequate remediation of impacted areas. Where there is potential for root shear to result in significant loss of riparian vegetation, mitigation measures may be required.

Engineered Structures

Engineered works may be required to maintain the stability and function of a watercourse impacted by subsidence. These works are often constructed prior to subsidence occurring within the watercourse. Such works can include timber pile fields, rock revetment, reshaping of existing stream banks, and river



bed treatment to prevent increased ingress of surface water into underground aquifers. Where subsidence mitigation measures require engineered structures be installed, the design, monitoring and maintenance of these structures should be detailed in the Subsidence Management Plan. The plan should detail the purpose of each structure and any consequences should the structure fail to be installed. Appropriate design plans including the location of each structure will be required. As a minimum, fourth and fifth order watercourse will require the installation of engineered structures. Works undertaken within the bed and banks of a watercourse aimed at mitigating or remediating any physical impacts pre or post-subsidence are authorised under the conditions of the Environmental Authority. Where a separate report has been produced for engineered structures, this should be included as an appendix to the Subsidence Management Plan.

Erosion

The Subsidence Management Plan should detail the current watercourse condition to be impacted by subsidence. Identification of erosion zones which are likely to be exacerbated through tension cracking should be stabilised using appropriate methods. Such areas may include reaches with elevated rates of bed and bank erosion, access tracks and areas with poor quality, sparsely populated riparian vegetation. Sufficient riparian vegetation should be established prior to subsidence to assist with initial stabilisation of the bed and banks. Removal of grazing animals to allow establishment or recovery of riparian vegetation may be required for an extended period prior to subsidence.

Groundwater

Where groundwater aquifers exist beneath the mine plan area, investigations should be undertaken regarding the potential for impacts on these aquifers as a result of subsidence. The Subsidence Management Plan should discuss these aquifers, any anticipated impacts on each aquifer and proposed measures for mitigating these impacts. Any anticipated movement of surface water into underlying aquifers should be discussed, as this can result in loss of surface water from the system and impacts on water quality in these aquifers. Geotechnical assessment across the bed and banks of the watercourse should be undertaken to provide an indication of potential permeability issues related to sub-surface cracking and interaction with local groundwater tables. Monitoring bores should be established in each aquifer prior to subsidence and monitored for a period of time sufficient for obtaining background water levels and trends. Monitoring of these bores should continue post-subsidence to aid the detection of impacted aquifers.

Surface Water

(c) Baseline Monitoring

The Subsidence Management Plan should detail baseline condition monitoring of all watercourses likely to be impacted through subsidence. The preferred monitoring assessment technique for stream condition in the Bowen Basin is the Index of Diversion Condition. This methodology was established as a result of the Australian Coal Association Research Program (ACARP) Project C9068. Monitoring of watercourses should extend a minimum of 1km upstream and downstream of the proposed area to be impacted and should include a geomorphic assessment of the entire reach. Where a baseline monitoring assessment has been undertaken as part of an Environmental Impact Statement (EIS) process, this may be considered sufficient provided there has been no subsequent modification or interference to the watercourse. The condition of riparian vegetation should also be detailed.

Cumulative Impacts on Watercourses

- (d) With an increasing number of mines being established in close proximity to watercourses, an EA holder utilising longwall mining methods may be requested to investigate the cumulative impact of these activities on the watercourse.

Monitoring and Reporting Requirements

The following criteria have been developed to provide detailed direction regarding monitoring and reporting requirements associated with subsidence of watercourses.

These criteria are outlined in a four step approach:

- Monitoring
- Assessment
- Reporting
- Mitigation



Monitoring

- Representative sites need to be identified that allow the impacts of subsidence to be assessed in a particular watercourse with particular attention to the following:
 - Sites must be located at all pillar zones intersecting a watercourse or tributary.
 - Sites must include representative locations at the interface of natural ground level and observed changes in surface elevation from subsidence within a watercourse.
- Control sites beyond proposed mining extents should be established to verify pre-mining conditions. In watercourses, the sites should extend a minimum of 1km both upstream and downstream of the subsidence reach.
- Assessment of watercourse condition: Specific monitoring assessment techniques for watercourse condition should include but not be limited to the Index of Diversion Condition, as outlined in the ACARP Project C9068.
- Vegetation and ecological condition assessments should form part of the baseline dataset.
- Rainfall monitoring should be undertaken within areas proposed to be impacted by subsidence. In addition, flow event monitoring should occur in watercourses proposed to be impacted by subsidence. The type of monitoring devices and locations to be installed should be detailed in the Subsidence Management Plan.
- Where preventative works are undertaken pre-subsidence, subsequent monitoring assessments should include the integrity and effectiveness of these works in reducing the impact of subsidence within the watercourse.
- Surveys must include cross-sectional area and bed slope throughout all monitored reaches of impacted watercourses.
- Annual aerial photography and Digital Terrain Mapping is required to verify predicted subsidence surface profiles, and to identify potential short and long term erosion issues resulting from subsidence of watercourses.
- Surveys pre-subsidence should quantify the following features within watercourses:
 - pool/riffle sequences
 - bed controls
 - entry points of other watercourses and localised tributaries
 - existing bed and bank scour points
 - infrastructure located within the watercourse.
- Surveys post-subsidence should quantify any changes to the pre-mining conditions including:
 - erosion or deposition processes that have occurred as a result of subsidence,
 - migration of head cut erosion within watercourses and tributaries,
 - localised changes to stream bed slope,
 - localised widening of channels,
 - destabilisation of stream bed and banks including fracturing and incision,
 - localised changes to bank heights
 - size of subsidence void created within the watercourse.
- The subsidence monitoring program for groundwater must include the following information:
 - Sites must include representative locations at the interface of natural ground surface and observed changes in surface elevation from subsidence.
 - Monitoring bores should be established in each aquifer at each monitoring site.
 - Monitoring must include both water level measurements and water quality sampling in accordance with the following:
 - water level measurement to be taken quarterly
 - water quality field conductivity measurement to be taken 6 monthly
 - full chemical analysis of water samples to be taken annually.

Frequency of Monitoring

A proposed timeframe should be provided by the EA holder in relation to the monitoring outlined in the Subsidence Management Plan. The Department, upon review of the proposed Subsidence Management Plan will determine a suitable monitoring timeframe based on the information provided. Monitoring requirements will depend on a number of factors, including the stream order of the watercourse proposed to be impacted. As a guide:

Stream Order 1, 2 and 3

Monitoring must be undertaken at the following intervals:



- immediately prior to subsidence,
- within two (2) months of the initial subsidence,
- following a rainfall event of **1 in 2 year** ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence.
- following a peak flow event of greater than a **1 in 2 year** ARI and
- annually.

Stream Order 4 and higher

Monitoring (including surveys) must be undertaken at the following intervals:

- immediately prior to subsidence,
- within two (2) months of the initial subsidence,
- following a rainfall event of **1 in 5 year** ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence.
- following a peak flow event of greater than a **1 in 5 year** ARI, and
- annually.

Cumulative Impacts

Where subsidence is proposed in a Subsidence Management Plan, and the watercourse has already been subsided upstream or downstream, the monitoring assessment must determine not only the localised impacts on the watercourse resulting from the proposed subsidence, but also any cumulative impacts on the watercourse as a result of all other subsidence events.

Assessment

The design and assessment of engineered structures should be performed by a Registered Professional Engineer of Queensland (RPEQ). All other assessments should be performed by suitably qualified and experienced persons in the fields that they are assessing.

- The results of all monitoring activities should be reviewed by an appropriately qualified person and detailed in the associated monitoring report.
- Recommendations should be made after assessment of the results regarding any specific treatment, remediation works, or engineered structures required post-subsidence to achieve stability in the watercourse.

Reporting

An annual report will be requested by the administering authority post-subsidence. The report should detail mining activities and all monitoring and rehabilitation activities as outlined within the Subsidence Management Plan. The reporting date will be determined in consultation with the administering authority.

- A monitoring report should contain the results of all monitoring activities, the assessment of these results, and recommendations for any remedial works required. The report should comment on the following:
 - Watercourse condition and geomorphic processes;
 - The condition of vegetation in riparian zones;
 - Examination of pillar zones in watercourses with particular attention to potential for tension cracking;
 - The creation of in-stream waterholes;
 - Any impacts on groundwater.
- Where preventative works were undertaken pre-subsidence, subsequent monitoring assessments should include assessment of the integrity and effectiveness of these works in mitigating the impacts of subsidence.
- An annual report in the form of two (2) hard copies and one electronic copy shall be furnished to the administering authority. The report should in addition to addressing specific monitoring requirements provide comment on:
 - The current state of the groundwater and surface water resources;
 - Any impacts on these features;
 - Any remedial works required to be undertaken including a timetable for implementation.
 - Commitment from the EA holder to addressing the recommendations in the report.

Mitigation

Where recommendations are made regarding specific treatment, remediation works, or engineered structures required post-subsidence to achieve stability in the watercourse, the EA holder must ensure this work is undertaken.



Rehabilitation

The holder of the EA, if directed by the administering authority, will carry out additional remedial works deemed necessary to minimise the impacts of subsidence on the physical integrity of the watercourse.

Relinquishment

Relinquishment of monitoring and rehabilitation responsibilities conditional under a EA holder's EA can only occur after the subsidence and approved mitigation and rehabilitation measures have been subjected to a suitable range of rainfall and flow events, and are deemed by the administering authority to be in a stable and functional condition. Any request for relinquishment will be negotiated with the administering authority and will require a submission containing monitoring data demonstrating stability and functionally in the watercourse over a suitable range of rainfall and flow events.

Acknowledgement

In 2007, BMA and Anglo Coal instigated discussions with the Department into a proposed assessment on the cumulative impacts of longwall mining beneath the Isaac River in Central Queensland. A final report was produced by Alluvium Consulting in July 2009 documenting the outcomes of the study. The Department greatly acknowledges the findings from this report and the assistance provided in the development of this guideline.

R Lucas, J Crerar, R Hardie, J Merritt and B Kirsch, 2009. Isaac River Cumulative Impact Assessment of Mining Developments. Report by Alluvium Consulting. ACARP for Diversion assessment guideline ex C9068.

END OF ENVIRONMENTAL AUTHORITY



