

Permit

Environmental Protection Act 1994

Environmental authority EPML00956913

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

Environmental authority number: EPML00956913

Environmental Authority takes effect on 14 April 2022

Environmental authority holder(s)

Name(s)	Registered address
Mt. Carbine Quarries Pty. Ltd.	Level 4, 96 Albert Road, SOUTH MELBOURNE QLD 3205

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Ancillary 14 - Electricity Generation 2: Generating electricity by using a fuel, other than gas, at a rated capacity of (a) 10MW electrical to 150MW electrical	ML4867, ML4919
Ancillary 08 - Chemical Storage 4: storing 200t or more of chemicals that are solids or gases, other than chemicals mentioned in items 1 to 3, under subsection (1)(d)	
Ancillary 15 - Fuel burning Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	
Ancillary 31 - Mineral processing 2: Processing, in a year, the following quantities of mineral products, other than coke (b) more than 100,000t	
Ancillary 08 - Chemical Storage 3: Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)	
Ancillary 08 - Chemical Storage 5: storing 200 cubic metres or more of chemicals that are liquids, other than chemicals mentioned in items 1 to 3, under subsection (1)(d)	

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Environmentally relevant activity/activities	Location(s)
Ancillary 08 - Chemical Storage 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a)	
Schedule 3 19: Mining metal ore, other than a metal ore mentioned in items 11, 12, 14, 15, 16, 17 or 18	ML4867, ML4919

Additional information for applicantsEnvironmentally 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

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c) otherwise-on 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 *Sustainable Planning Act 2009* 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.



Dean Sharpe

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

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Date issued: 14 April 2022

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Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

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 incorporates the following schedules:

Schedule	Issue	Page
Schedule A	- General	5
Schedule B	- Air	8
Schedule C	- Land and Rehabilitation	9
Schedule D	- Water	12
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Schedule A – General**Activity**

- 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 Schedule H – Figure H1(a) (Project Infrastructure Layout) and Schedule H - Figure H1(b) Product Transfer Pipeline Alignment.
- 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 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 An environmental monitoring program sufficient to demonstrate compliance with the conditions of this environmental authority must be developed by an appropriately qualified person and implemented by 1 November 2013.
- A6 All analyses and tests required to be conducted under this environmental authority must be carried out by an appropriately qualified person and analysed by a laboratory that has NATA accreditation for such analyses and test, except as otherwise authorised by the Administering Authority.
- A7 Monitoring and analyses required by this environmental authority must be undertaken in accordance with the requirements of the administering authority's latest guidelines, unless otherwise agreed by the administering authority in writing.

Financial Assurance

- A8 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 – *Financial Assurance under the Environmental Protection Act 1994*, before the proposed mining activities can commence.
- A9 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

- A10 The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management by 1 October 2013.

Notification of Emergencies, Incidents and Exceptions

- A11 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 to be not in accordance with the conditions of this environmental authority.
- A12 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

- A13 The holder of this environmental authority must record all environmental complaints received about the mining activity including the following details:
- a) Name, address and contact number for 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.
- A14 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.

Environmental authority EPML00956913**Third Party Reporting**

- A15 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 3 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.
- A16 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 subsequent to the issue of this environmental authority the holder of this environmental authority 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, or where the amendment or change relates specifically to regulated structures referred to in Schedule D the time specified in that condition; 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.

Investigation

- A17 If monitoring results indicate an exceedance of any quality objectives specified in a condition of this environmental authority, the holder of this environmental authority must notify the administering authority in accordance with condition A11 and:
- a) complete an investigation to identify the potential cause of the exceedance;
 - b) if the investigation demonstrates that the exceedance is not attributable to the mining activities, then no further action is required; or
 - c) if the cause of the exceedance is inconclusive or attributable to the mining activities, provide a written report to the administering authority within 3 months of the date of receiving the monitoring results showing an exceedance, outlining:
 - i) all pertinent details of the investigation carried out; and
 - ii) actions taken or planned to minimise environmental harm.

Exploration

- A18 All exploration activities carried out at the licensed place must comply with each of the Standard Environmental Conditions contained in the most recent version of the *Eligibility Criteria and Standard Conditions for Exploration and Mineral Development Projects (ESR/2016/1985)*.
- A19 Where a condition of this Environmental Authority refers to a matter addressed in the *Eligibility Criteria and Standard Conditions for Exploration and Mineral Development Projects (ESR/2016/1985)*, the condition of the Environmental Authority prevails.

END OF CONDITIONS FOR SCHEDULE A

Schedule B – Air**General**

- B1 Unless authorised by this environmental authority, the release of noxious or offensive odour, dust or any other airborne contaminant resulting from the mining activity must not cause environmental harm beyond the boundary of the licensed place.

Dust and Particulate Matter Monitoring

- B2 Dust and particulate matter must not exceed the following levels at any sensitive or commercial 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, 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
 - (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.
 - c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres (PM_{2.5}) suspended in the atmosphere of 25 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.10 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM (sub) 2.5(sub) low volume sampler—Gravimetric method.
 - d) 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.

END OF CONDITIONS FOR SCHEDULE B

Schedule C – Land and Rehabilitation

Land and Rehabilitation Objectives

- C1 Unless authorised by this environmental authority, contaminants that will or may cause environmental harm must not be directly or indirectly released to land.
- C2 Land outside the authorised disturbance area specified in condition A2 of this environmental authority must not be disturbed or contaminated.
- C3 When carrying out the mining activity the holder of this environmental authority must:
- a) avoid, minimise or mitigate (in order of preference) any impacts on areas of sensitive vegetation or other areas of ecological value;
 - b) minimise the risk of injury, harm; or entrapment of wildlife and stock;
 - c) minimise disturbance to land that may otherwise result in land degradation; and
 - d) if significant disturbance to land is unavoidable, the holder of this environmental authority must clear vegetation in a way that maintains connectivity.
- C4 Land disturbed by mining must be progressively rehabilitated in accordance with the most recent edition of the administering authority's guideline "*Rehabilitation Requirements for Mining Projects (ESR/2016/1875)*" to ensure areas disturbed by mining are rehabilitated to a state that:
- a) is non-polluting;
 - b) is geo-technically and geochemically stable with no subsidence or erosion gullies for at least 3 years;
 - c) has established groundcover to ensure erosion is minimised;
 - d) has established vegetation of floristic species composition found in analogue sites and which are not weed species;
 - e) maintenance requirements for rehabilitated land is no greater than that required for the land prior to its disturbance caused by carrying out the mining activity(ies); and
 - f) is safe to humans and wildlife.

Biodiversity

- C5 Prior to commencement of vegetation clearing, the holder of this environmental authority must:
- a) engage an appropriately qualified person to undertake a comprehensive flora survey in accordance with the latest version of the administering authority's *Guidelines for Flora Survey and Assessment in Northern Queensland*; and
 - b) provide a report, in accordance with the latest version of the administering authority's *Guidelines for Flora Survey and Assessment in Northern Queensland*, to the administering authority.
- C6 If the report required by condition C5 indicates the presence of prescribed native wildlife and breeding places, an appropriately qualified spotter/catcher must be engaged to work ahead of vegetation clearing.

Note: This environmental authority does not authorise the taking of native wildlife or the tampering with a breeding place that is being used by prescribed native wildlife to incubate or rear the animal's offspring.

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- C7 In the event of identification of rare or threatened species on the licensed place, a diagrammatic representation of the species occurrence relative to the mining activity together with a management and monitoring strategy for species conservation must be prepared and implemented and submitted to the administering authority.

Impacts to Prescribed Environmental Matters

- C8 Significant residual impacts to prescribed environmental matters, are not authorised under this environmental authority or the *Environmental Offsets Act 2014*.

Infrastructure

- C9 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.

Waste Management

- C10 All general and regulated waste, other than authorised under condition C11, must be removed from the licensed place to a facility that is lawfully able to accept the waste.
- C11 The only waste that can be disposed of at the licenced place is waste generated at the licensed place and is limited to:
- a) waste rock;
 - b) tailings;
 - c) concrete waste; and
 - d) any by-products of mineral processing.
- C12 Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.
- C13 The holder of this environmental authority may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause environmental harm at any sensitive place or commercial place.

Waste Rock and Tailings Disposal

- C14 By 1 November 2013 the holder of this environmental authority must develop, implement and submit to the administering authority a waste rock and tailings disposal management plan. The management plan must be updated annually and made available on request to the administering authority.
- C15 The waste rock and tailings disposal management plan must be certified by an appropriately qualified person, to ensure the plan has addressed the requirements of this environmental authority in accordance with best practice environmental management.
- C16 The waste rock and tailings disposal management plan must include:
- a) a detailed design of the waste rock dump and tailings storage facility (TSF);
 - b) characterisation of the waste rock to predict the quality of runoff and seepage generated, including salinity, acidity, alkalinity, dissolved metals, metalloids and non-metallic inorganic substances;
 - c) a program of progressive sampling program to validate pre-mine waste rock characterisation metal concentrations of tailings. The sampling program must include validation of acid and alkali

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- producing potential and metal concentration including arsenic, bismuth, boron, fluoride, manganese, selenium and tin;
- d) where the acid rock drainage potential / neutral mine drainage potential of waste rock material has not been conclusively determined, geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies;
 - e) the management of seepage and leachates both during operation and the foreseeable future;
 - f) records must be maintained of all waste rock characterisation and disposal including contingency planning for the management of acid rock / neutral mine drainage;
 - g) maintaining records of the relative locations of any other waste stored within the tailings;
 - h) a materials balance and disposal plan demonstrating how potentially acid forming and acid forming waste rock will be selectively placed and/or encapsulated to minimise the generation of acid mine drainage;
 - i) a materials balance and disposal plan demonstrating how waste rock that has a potential to generate neutral and/or saline mine drainage will be selectively placed and managed to minimise the generation of neutral and/or saline mine drainage;
 - j) a sampling program to verify encapsulation and/or placement of potentially acid forming / acid forming waste rock / waste rock that has a potential to generate neutral mine drainage;
 - k) the control of fugitive emissions to air;
 - l) a rehabilitation strategy which meets the rehabilitation objectives specified in the administering authority's guideline "*Rehabilitation Requirements for Mining Projects (ESR/2016/1875)*"; and
 - m) monitoring or rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of the placed materials, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

Mineral Concentrate Storage and Handling

- C17 Mineral concentrate storage, handling and loading facilities must be constructed, maintained and operated in a manner that prevents any unauthorised release of contaminants to the receiving environment.

Cover System and Rehabilitation Trials

- C18 By 1 October 2014 the environmental authority holder must commence trials to establish a suitable cover system design and methodology and revegetation strategy on the licensed place including but not limited to the tailings storage facility and waste rock dump.
- C19 By 1 October 2015 and once every 2 years thereafter, the environmental authority holder must submit a report to the administering authority detailing the findings of the cover system design and methodology and revegetation trials.
- C20 By 1 October 2019 the environmental authority holder must submit to the administering authority a report nominating the best performing cover system design and methodology and revegetation methodology based on the results from trials required in condition C18.

END OF CONDITIONS FOR SCHEDULE C

Schedule D – Water

Release to Waters

- D1 The release of contaminants to waters must:
- only occur during flow events in the receiving waters;
 - only occur from a release point specified in Schedule D – Table D1 (Release Point Location) and identified in Schedule H – Figure H2 (Monitoring and Release Points); and
 - be monitored at the release point and at the monitoring frequency specified in Schedule D – Table D1 (Release Point Location) for the total daily volume of water released and for each parameter specified in Schedule D – Table D3 (Receiving Waters and Sediment Quality Objectives).

Schedule D – Table D1 (Release Point Location)

Release Point	Description of Release	Receiving Water	Coordinates (GDA94 MGA ZONE 55)		Monitoring frequency
			Easting	Northing	
OW4	TSF 4 Spillway	Manganese Creek	299526	8170822	For all parameters, 1 sample must be taken within 12 hours of a release event commencing and for release events with duration of greater than 24 hours, samples must be taken daily for 1 week and once a week thereafter until the release event ceases.

- D2 At the time of release from the authorised release point specified in Schedule D – Table D1 (Release Point Location) the water flow volume in the respective receiving water must be at least 20 times the volume at which respective contaminated waters are released.
- D3 End of pipe quality objectives for water contaminated by mining activities when monitored at the location and frequency defined in Schedule D – Table D1 (Release Point Location) must not exceed the release quality objectives defined in Schedule D – Table D2 (Release Quality Objectives).

Schedule D – Table D2 (Release Quality Objectives)

Parameter ¹	Release Quality Objectives (mg/L unless otherwise specified)
pH (pH units)	6.0 or 20 th percentile of reference site concentration, whichever is lower. 7.5 or 80 th percentile of reference site concentration, whichever is higher.
EC (µS/cm)	5000 ³
Dissolved oxygen	For interpretative purposes only
Sulphate	20 x 80 th percentile of reference site concentration

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Parameter ¹	Release Quality Objectives (mg/L unless otherwise specified)
Fluoride	Default value ⁶ or 20 x 80 th percentile of reference site concentration
Major cations	For interpretive purposes only
Major anions	
Aluminium	1.1 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Antimony	20 x 80 th percentile of reference site concentration
Arsenic ⁴	0.26 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Cadmium	0.004 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Chromium ⁴	0.02 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Cobalt	0.028 ² or 20 x 80 th percentile of reference site concentration
Copper	0.028 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Lead	0.068 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Manganese	38 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Molybdenum	0.68 ² or 20 x 80 th percentile of reference site concentration
Nickel	0.22 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Selenium	0.02 ⁵ or 20 x 80 th percentile of reference site concentration whichever is higher
Tungsten	20 x 80 th percentile of reference site concentration
Zinc	0.16 ² or 20 x 80 th percentile of reference site concentration whichever is higher
Total Hardness	For interpretive purposes only
Total petroleum hydrocarbons	No detectable film or odour

- For water quality objectives parameters, all metals and metalloids must be measured and reported as both total (unfiltered) and dissolved (field filtered) levels.
 - Twenty times higher than ANZECC/ARMCANZ (2000) values for aquatic ecosystems indicative of slightly-to-moderately disturbed tropical Australian upland river ecosystems Tables 3.3.4 and Table 3.4.1 (*high reliability* trigger values) and *moderate* or *low* reliability trigger values (Section 8.3) if no value available in Table 3.4.1.
 - Twenty times higher than ANZECC/ARMCANZ (2000) values for aquatic ecosystems indicative of slightly-to-moderately disturbed tropical Australian upland river ecosystems Table 3.3.5 for EC.
 - Routine analysis for this parameter is based on combined/total species of the element, where the exceedance of the WQO is identified, an additional sample must be taken and analysed as soon as practicable to determine and quantify speciated forms of this element.
 - Based on ANZECC (2000) stock water quality guidelines.
 - A trigger value for Fluoride (for which no default value is provided in Table 3.4.1) derived using the methods described in ANZECC 2000 Section 8.3.4.4.
- D4 The release of contaminants from the authorised activity to surface waters must not exceed the water quality objectives stated in Schedule D – Table D3 (Receiving Water and Sediment Quality Objectives)

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when measured at the compliance point stated in Schedule D – Table D4 (Receiving Waters Monitoring Locations).

Schedule D – Table D3 (Receiving Water and Sediment Quality Objectives)

Parameter ¹	Water Quality Objective (mg/L unless otherwise specified)	Sediment Quality Objective ² (mg/kg dry wt, unless otherwise specified)
pH (pH units)	6.0 ³ or 20 th percentile of reference site concentration, whichever is lower. 7.5 ³ or 80 th percentile of reference site concentration, whichever is higher.	Not applicable
EC (µS/cm)	250 ⁴ or 80 th percentile of reference site concentration whichever is higher	
Dissolved oxygen	For interpretative purposes only	
Sulphate	80 th percentile of reference site concentration	2 x 80 th percentile of reference site concentration
Fluoride	Default Value ⁷ or 80 th percentile of reference site concentration	2 x 80 th percentile of reference site concentration
Major cations	For interpretive purposes only	Not applicable
Major anions		
Aluminium	0.055 ³ or 80 th percentile of reference site concentration whichever is higher	2 x 80 th percentile of reference site concentration
Antimony	80 th percentile of reference site concentration	2 x 80 th percentile of reference site concentration
Arsenic ⁵	0.013 ³ or 80 th percentile of reference site concentration whichever is higher	70 ⁶ or 2 x 80 th percentile of reference site concentration or whichever is higher
Cadmium	0.0002 ³ or 80 th percentile of reference site concentration whichever is higher	106 or 2 x 80 th percentile of reference site concentration whichever is higher
Chromium ⁵	0.001 ³ or 80 th percentile of reference site concentration whichever is higher	370 ⁶ or 2 x 80 th percentile of reference site concentration whichever is higher
Cobalt	80 th percentile of reference site concentration	2 x 80 th percentile of reference site concentration
Copper	0.0014 ³ or 80 th percentile of reference site concentration whichever is higher	270 ⁶ or 2 x 80 th percentile of reference site concentration whichever is higher
Lead	0.0034 ³ or 80 th percentile of reference site concentration whichever is higher	220 ⁶ or 2 x 80 th percentile of reference site concentration whichever is higher
Manganese	1.9 ³ or 80 th percentile of reference site concentration whichever is higher	2 x 80 th percentile of reference site concentration
Molybdenum	80 th percentile of reference site concentration	2 x 80 th percentile of reference site concentration
Nickel	0.011 ³ or 80 th percentile of reference site concentration whichever is higher	52 ⁶ or 2 x 80 th percentile of reference site concentration whichever is higher
Selenium	0.011 ³ or 80 th percentile of reference site concentration whichever is higher	2 x 80 th percentile of reference site concentration
Tungsten	80 th percentile of reference site concentration	2 x 80 th percentile of reference site concentration
Zinc	0.008 ³ or 80 th percentile of reference site concentration whichever is higher	410 ⁶ or 2 x 80 th percentile of reference site concentration whichever is higher
Total Hardness	For interpretive purposes only	Not applicable
Particle size distribution	Not applicable	For interpretive purposes only

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Parameter ¹	Water Quality Objective (mg/L unless otherwise specified)	Sediment Quality Objective ² (mg/kg dry wt, unless otherwise specified)
Total petroleum hydrocarbons	No detectable film or odour	Not applicable

- For water quality objectives parameters, all metals and metalloids must be measured and reported as both total (unfiltered) and dissolved (field filtered) levels.
- All stream sediment sampling must be undertaken in accordance with AS 5667.12 *Guidance on Sampling of Bottom Sediments of 1998*.
- ANZECC/ARMCANZ (2000) values for aquatic ecosystems indicative of slightly-to-moderately disturbed tropical Australian upland river ecosystems Tables 3.3.4 and Table 3.4.1 (high reliability trigger values) and moderate or low reliability trigger values (Section 8.3) if no value available in Table 3.4.1.
- ANZECC/ARMCANZ (2000) values for upland and lowland rivers Table 3.3.5.
- Routine analysis for this parameter is based on combined/total species of the element, where the exceedance of the WQO is identified, an additional sample must be taken and analysed as soon as practicable to determine and quantify speciated forms of this element. This does not apply to sediment analysis.
- ANZECC (2000) Interim Sediment Quality Guidelines – ISQG – high values based on total sediments (dry weight).
- A trigger value for Fluoride (for which no default value is provided in Table 3.4.1) derived using the methods described in ANZECC 2000 Section 8.3.4.4.

Note: Where the 80th percentile of a water quality objective (WQO)/sediment quality objective (SQO) is exceeded at a receiving water site and the reference site also exceeds this concentration during the release/flow event, the value of the reference site applies as the WQO/SQO for the duration of the event.

Schedule D – Table D4 (Receiving Waters Monitoring Locations)

Monitoring Point	Description	Coordinates (GDA94 MGA ZONE 55)	
		Easting	Northing
Compliance Point			
SW15	TSF4 gully – site release monitoring point at the boundary of the licensed place (approximately 250 metres from OW4 release point) Reports to Manganese Creek.	299920	8170844
Receiving Water Points			
Manganese Creek			
SW7	Manganese Creek(approximately 40 metres upstream of confluence with gully)	300507	8168109
Holmes Creek			
SW17	Unnamed tributary of Holmes Creek (at ML4867 north-east boundary)	299381	8173168
SW4	Holmes Creek (immediately upstream of crossing with Mulligan Highway)	297426	8172386
Reference Points			
Manganese Creek			
SW1	Manganese Creek, upstream of site inputs	301816	8172340
Holmes Creek			
SW16	Reference site – Holmes Creek upstream of site and historic disturbance	299715	8174372

Receiving Environment Monitoring Program (REMP)

- D5 The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) sufficient to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. For the purposes of the REMP, the receiving environment is the waters of Holmes Creek, Manganese Creek and connected or surrounding waterways within 15 kilometres downstream of the licensed place. At minimum, the REMP must include:
- a) monitoring of all parameters specified in Schedule D - Table D2 (Release Quality Objectives) at all locations specified in Schedule D - Table D4 (Receiving Waters Monitoring Locations) and at the following minimum frequency:
 - (i) for receiving waters and sediment quality, biannually (once at the end of the wet season and once at the end of the dry season); and
 - (ii) for water quality of receiving waters during a release or flow event, one sample must be taken within 12 hours of the event commencing. Where release or flow events have duration of greater than 24 hours, samples must be taken daily for 1 week and once a week thereafter until the release or flow event ceases.
 - b) monitoring of suitable biological indicators of aquatic ecosystem health.
- D6 A REMP design document that addresses the requirements of the REMP must be prepared and submitted to the administering authority on or before 31 August 2014.
- D7 A report outlining the findings of the REMP, including all monitoring results and interpretations 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.

Groundwater

- D8 The holder of this environmental authority must not release contaminants to groundwater.
- D9 The construction, maintenance and management of groundwater bores (including 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.
- D10 Groundwater quality and level must be monitored at the locations and frequency specified in Schedule D - Table D5 (Groundwater Monitoring Locations and Frequency) and identified in Schedule H – Figure H2 (Monitoring and Release Points) for all parameters listed in Schedule D - Table D6 (Groundwater Quality Objectives).

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Schedule D – Table D5 (Groundwater Monitoring Locations and Frequency)

Monitoring Point	Description	Coordinates (GDA94 MGA ZONE 55)		Surface RL ¹	Monitoring Frequency
		Easting	Northing		
Compliance Bores ²					
Shallow					
MB4A	Downslope of TSF4 water pond	299994	8170776	353.49	1 sample every 3 months
MB5A	Downstream Holmes Creek	298226	8172597	357.30	
MB6A	Manganese Creek	300597	8171181	357.19	
Deep					
MB4B	Downslope of TSF4 water pond	299994	8170776	353.30	1 sample every 3 months
MB5B	Downstream Holmes Creek	298226	8172597	357.41	
MB6B	Manganese Creek	300597	8171181	357.28	
RFB	Rural Fire Brigade	301144	8171764	360.87	
Reference Bores ²					
Shallow					
MB1A	Upslope of TSF4	299177	8171929	364.54	1 sample every 3 months
MB3A	Upslope of pit	301004	8172643	376.50	
Deep					
MB1B	Upslope of TSF4	299177	8171929	364.91	1 sample every 3 months
MB3B	Upslope of pit	301004	8172643	376.89	

1. RL must be measured to the nearest 0.05 metres from the top of the bore casing in m AHD.
2. All groundwater monitoring bores must be constructed and operated in accordance with methods prescribed in the latest edition of the Agriculture and Resource Management Council of Australia and New Zealand manual titled *Minimum Construction Requirements for Water Bores in Australia*.

D11 Results of monitoring of groundwater from compliance bores identified in Schedule D – Table D5 (Groundwater Monitoring Locations and Frequency), must not exceed any of the Groundwater Quality Objectives defined in Schedule D - Table D6 (Groundwater Quality Objectives).

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Schedule D – Table D6 (Groundwater Quality Objectives)

Parameter ¹	Shallow Groundwater Quality Objectives (mg/L unless otherwise specified)	Deep Groundwater Quality Objectives (mg/L unless otherwise specified)
pH (pH units)	6.0 ² or 20 th percentile of reference site concentration, whichever is lower. 7.5 ² or 80 th percentile of reference site concentration, whichever is higher.	Reference site concentration
EC (µS/cm)	250 ³ or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Sulphate	80 th percentile of reference site concentration whichever is higher	Reference site concentration
Fluoride	Default value ⁵ or 80 th percentile of reference site concentration	Reference site concentration
Major cations	For interpretive purposes only	
Major anions		
Aluminium	0.055 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Antimony	80 th percentile of reference site concentration	Reference site concentration
Arsenic ⁴	0.013 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Cadmium	0.0002 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Chromium ⁴	0.001 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Cobalt	80 th percentile of reference site concentration	Reference site concentration
Copper	0.0014 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Lead	0.0034 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Manganese	1.9 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Molybdenum	80 th percentile of reference site concentration	Reference site concentration
Nickel	0.011 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Selenium	0.011 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Tungsten	80 th percentile of reference site concentration	Reference site concentration
Zinc	0.008 ² or 80 th percentile of reference site concentration whichever is higher	Reference site concentration
Total Hardness	For interpretive purposes only	
Total petroleum hydrocarbons	No detectable film or odour	

1. All metals and metalloids must be measured and reported as dissolved (field filtered) levels.
2. ANZECC/ARMCANZ (2000) values for aquatic ecosystems indicative of slightly-to-moderately disturbed tropical Australian upland river ecosystems Tables 3.3.4 and Table 3.4.1 (high reliability trigger values) and moderate or low reliability trigger values (Section 8.3) if no value available in Table 3.4.1.
3. ANZECC/ARMCANZ (2000) value for upland and lowland rivers Table 3.3.5.

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4. Routine analysis for this parameter is based on combined/total species of the element, where the exceedance of the WQO is identified, an additional sample must be taken and analysed as soon as practicable to determine and quantify speciated forms of this element. This does not apply to sediment analysis.
5. A trigger value for Fluoride (for which no default value is provided in Table 3.4.1) derived using the methods described in ANZECC 2000 Section 8.3.4.4.

Water Management Plan

- D12 A Water Management Plan must be developed by an appropriately qualified person and implemented before 1 November 2013. The Water Management Plan must be reviewed annually to assess the adequacy of the plan, ensure actual and potential environmental impacts are managed, and identify any necessary amendments to the plan to ensure compliance with this environmental authority.

Erosion and Sediment Control

- D13 An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented before 1 November 2013, to minimise erosion, contamination of stormwater and the release of sediment to receiving waters.

END OF CONDITIONS FOR SCHEDULE D

Schedule E –Structures

Assessment of Consequence Category

- E1 The consequence category of any structure must be assessed by a suitably qualified and experienced person, in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*, at the following times:
- a) prior to the design and construction of the structure, if it is not an existing structure; or
 - b) prior to any change in its purpose or the nature of its stored contents.
- E2 A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.
- E3 The holder must, on receipt of a consequence assessment report and certification, provide to the administering authority one paper copy and one electronic copy of the consequence assessment report and certification.
- E4 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 Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*.
- E5 The holder must take reasonable and practical measures so that each dam associated with the mining activity, regardless of whether it is classified as a regulated structure, is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.

Design and Construction of a Regulated Structure

- E6 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 Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*.
- E7 Construction of a regulated structure is prohibited unless:
- a) the holder has submitted a consequence category assessment report and certification to the administering authority;
 - b) certification for the design, design plan and the associated operating procedures has been certified by a suitably qualified and experienced person in compliance with the relevant condition of this authority.
- E8 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 Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*, and must be recorded in the Register of Regulated Structures.
- E9 Regulated structures must:
- a) be designed and constructed in accordance with and conform to the requirements of the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*; and
 - b) be designed and constructed with due consideration given to ensuring that the design integrity will not be compromised on account of:

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- (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.

E10 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 Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*, including subsidiary certifications if necessary; and
 - (ii) addresses the requirements in condition E10 (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;
 - 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 consequence 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; and
 - (v) design, specification and operational rules for any related regulated 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 regulated dam design;
- e) an operational plan that includes:
 - (i) normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance; and
 - (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; and
- h) any other matter required by the suitably qualified and experienced person.

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- E11 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:
- the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - construction of the regulated structure is in accordance with the design plan.
- E12 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.
- E13 The system design plan must contain:
- the design plans;
 - the 'as constructed' plans;
 - the operational rules for each individual regulated dam that forms part of the integrated system;
 - the standards of serviceability and accessibility of water transfer equipment or structures; and
 - the operational rules for the system as a whole.

Operation of a Regulated Structure

- E14 Operation of a regulated structure is prohibited unless:
- the holder has submitted to the administering authority in respect of the regulated structure, all of the following:
 - one paper copy and one electronic copy of the design plan and certification of the design plan in accordance with condition E10;
 - a set of 'as constructed' drawings and specifications;
 - certification of those 'as constructed drawings and specifications' in accordance with condition E11; and
 - 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.
 - the requirements of this authority relating to the construction of the regulated structure have been met;
 - the holder has entered the details required under this authority, into a Register of Regulated Structures; and
 - there is a current operational plan for the regulated structure.
- E15 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.
- E16 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 measures may include, but are not limited to:
- the secure use of fencing, bunding or screening; and
 - escape arrangements for trapped livestock and fauna.

Mandatory Reporting Level

- E17 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.
- E18 The holder must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated structure reaches the MRL.
- E19 The holder of this environmental authority must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.
- E20 The holder must record any changes to the MRL in the Register of Regulated Structures.

Annual Inspection Report

- E21 Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.
- E22 At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed:
- against the most recent consequence assessment report and design plan (or system design plan);
 - against recommendations contained in previous annual inspection reports;
 - against recognised dam safety deficiency indicators;
 - for changes in circumstances potentially leading to a change in consequence category;
 - for conformance with the conditions of this authority;
 - for conformance with the 'as constructed' drawings;
 - 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); and
 - for evidence of conformance with the current operational plan.
- E23 A suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include recommended actions to ensure the integrity of the regulated structure.
- E24 The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*.
- E25 The holder must:
- 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
 - 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.
- E26 A copy of the annual inspection report must be provided to the administering authority upon request within ten (10) business days.

Design Storage Allowance

- E27 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).
- E28 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 DSA volume on 1 November of any year, notify the administering authority.
- E29 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 DSA 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

- E30 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.
- E31 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 environmental 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

- E32 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, consequence assessment, design plan and other supporting documentation, to a new holder of this environmental authority and the administering authority on transfer of this authority.

Decommissioning and Rehabilitation

- E33 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 by:
 - (i) becoming a safe site for humans and animals at the completion of rehabilitation; or
 - (ii) becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts; or
 - (iii) not allowing for acid mine drainage; or
 - (iv) being approved or authorised under relevant legislation for a beneficial use; or
 - (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.

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Register of Regulated Structures

- E34 A Register of Regulated Structures must be established and maintained by the holder for each regulated structure.
- E35 The holder must provisionally enter the required information in the Register of Regulated Structures when a design plan for a regulated dam is submitted to the administering authority.
- E36 The holder must make a final entry of the required information in the Register of Regulated Structures once compliance with condition E12 and E14 has been achieved.
- E37 The holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.
- E38 All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.
- E39 The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format required by the administering authority.

END OF CONDITIONS FOR SCHEDULE E

Schedule F – Noise and Vibration**General**

- F1 The holder of this environmental authority must ensure that noise and vibration from the mining activity does not cause environmental harm beyond the boundary of the licensed place.

Monitoring

- F2 The holder of the environmental authority must ensure that noise and vibration generated by mining activities does not cause the criteria in Schedule F – Table F1 (Acoustic Quality Objectives) to be exceeded beyond the boundary of the licensed place.

Schedule F – Table F1 (Acoustic Quality Objectives)

Noise Level dB(A) measured as:	Monday to Saturday			Sundays and Public Holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L_{A10} , adj, 10 mins	BG+5	BG+5	BG+3	BG+5	BG+5	BG+0
L_{A1} , adj, 10 mins	BG+10	BG+10	BG+5	BG+10	BG+10	BG+5

Note: In the event that the measured background noise level (BG) is less than 25 dB(A), then 25 dB(A) can be substituted for the measured background level.

END OF CONDITIONS FOR SCHEDULE F

Schedule G – Definitions

Key terms and/or phrases used in this document are defined in this section. Applicants should note that where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

“80th percentile of reference” must be determined in accordance with QWQG (2009) and ANZECC (2000) methodology. Reference sites are specified in Schedule D - Table D4 (Receiving Waters Monitoring Locations).

“administering authority” means:

- a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 - the local government; or
- b) for another matter - the chief executive.

“AHD” means ‘Australian Height Datum’ which is the Australian national standard of geodetic datum for altitude measurements and is measured in meters (m). The level of 0.0 meters (m) AHD approximates the mean sea level (as previously measured for the period 1966-1968).

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

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

“ANZECC (2000)” means the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)* published by the *Australian and New Zealand Environment and Conservation Council* and the *Agriculture and Resource Management Council of Australia and New Zealand* or any equivalent update/replacement guidelines.

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

“assessed” and **“assessment”** by a suitably qualified and experienced person in relation to a consequence 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 of the assessment:

- (a) exactly what has been assessed and the precise nature of that determination;
- (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*.

“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 Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*, including design plans, ‘as constructed’ drawings and specifications, construction, operation or an annual report regarding regulated structures,

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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'.

"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.

"chief executive" means the chief executive of the Department of Environment and Heritage Protection or its successor.

"commercial place" means a place used as an office or for business or commercial purposes, other than a place within the boundaries of the operational land.

"consequence" in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.

"consequence 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 Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*.

"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. 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).

"Design Storage Allowance" or "DSA" means an available volume, estimated in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)* published by the Department of Environment and Heritage Protection, 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 exceedence 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.

"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.

"environmental authority" means a licence or approval issued pursuant to the *Environmental Protection Act 1994*.

"flow event" means a surface water flow in a drainage feature or watercourse that occurs as a result of rainfall.

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

"hazard" in relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

"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 consequence category in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*.

"in situ" in relation to water quality monitoring, means sampling a population variable (e.g., the concentration of an aquifer groundwater quality parameter) as close as possible to its origin. Unless otherwise specified under a condition of this environmental authority, in situ water quality parameters must include pH, electrical conductivity, dissolved oxygen (% saturation) and total suspended solids.

"infrastructure" means dams, roads and tracks, buildings and other structures built for the purpose of mining activities but does not include facilities required for the long-term management of mining impacts or the protection of potential resources. Such facilities include dams containing hazardous waste, waste rock dumps, voids, or ore stockpiles and buildings or 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.

"land" in the "land schedule" of this document means land excluding waters and the atmosphere.

"leachate" means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of at the operational land which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

"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 consequence dam" means any dam that is not a high or significant consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*; and

"major anions" in regards to water quality monitoring, includes at minimum the carbonate ion (CO_3^{2-}), bicarbonate ion (HCO_3^-) and chloride ion (Cl^-).

"major cations" in regards to water quality monitoring, includes at minimum the sodium ion (Na^+), potassium ion (K^+), magnesium ion (Mg^{2+}) and calcium ion (Ca^{2+}).

"Mandatory Reporting Level" or "MRL" means a warning and reporting level determined in accordance with the criteria in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)* published by the administering authority.

"modification" or "modifying" (see definition of "construction").

"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) magnetite;
- (c) metal or metalloid compounds, including but not limited to compounds containing gold, copper, silver, lead, nickel, and zinc.
- (d) foundry sand;

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- (e) 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;
 - (f) limestone if mined for use for its chemical properties;
 - (g) marble;
 - (h) mineral oil or gas extracted or produced from shale or coal by in situ processes;
 - (i) peat;
 - (j) salt including brine;
 - (k) shale from which mineral oil may be extracted or produced;
 - (l) silica, including silica sand, if mined for use for its chemical properties;
 - (m) rock mined in block or slab form for building or monumental purposes;
- but does not include—
- (n) living matter;
 - (o) petroleum within the meaning of the *Petroleum Act 1923*;
 - (p) 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;
 - (q) water.

"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.

"prescribed environmental matters" has the meaning in section 10 of the *Environmental Offsets Act 2014*, limited to the matters of State environmental significance listed in schedule 2 of the Environmental Offsets Regulation 2014.

"prescribed native wildlife" for the purposes of this environmental authority, means native wildlife (including plants) listed as near threatened, vulnerable or endangered, under the *Nature Conservation (Wildlife) Regulation 2006*.

"QWQG (2009)" means the *Queensland Water Quality Guidelines 2009* published by the *Queensland Government* or any equivalent update/replacement guidelines.

"receiving environment" in relation to an activity that causes or may cause environmental harm, means the part of the environment to which the harm is, or may be, caused. In relation to releases as defined in this environmental authority, the receiving environment can be further defined as any waters beyond the boundary of ML4867 AND/OR ML4919.

"reference site" specified in Schedule D - Table D4 (Receiving Waters Monitoring Locations).

"Register of Regulated Structures" includes:

- (a) Date of entry in the register;
- (b) Name of the structure, its purpose and intended/actual contents;
- (c) The consequence category of the dam as assessed using the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*;
- (d) Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;
- (e) Name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings;
- (f) For the regulated dam, other than in relation to any levees –
 - i. The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;

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- ii. Coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area
- iii. Dam crest volume (megalitres);
- iv. Spillway crest level (metres AHD).
- v. Maximum operating level (metres AHD);
- vi. Storage rating table of stored volume versus level (metres AHD);
- vii. Design storage allowance (megalitres) and associated level of the dam (metres AHD);
- viii. Mandatory reporting level (metres AHD);
- (g) The design plan title and reference relevant to the dam;
- (h) The date construction was certified as compliant with the design plan;
- (i) The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan;
- (j) Details of the composition and construction of any liner;
- (k) The system for the detection of any leakage through the floor and sides of the dam;
- (l) Dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;
- (m) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority;
- (n) Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.

"regulated dam" means any dam in the significant or high consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)* published by the administering authority.

"regulated structure" means any structure in the significant or high consequence category as assessed using the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)* published by the administering authority. A regulated structure does not include:

- 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;
- a sump or earthen pit used to store residual drilling material and drilling fluid only for the duration of drilling and well completion activities.

"rehabilitation" the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

"release" means the discharge of water (whether intentional or due to failure to prevent) to the receiving environment from any area, structure or feature located on a mining lease listed on this environmental 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; or
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
- a public park or gardens; or
- a place used as a workplace, 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.

"significant residual impact" has the meaning in section 8 *Environmental Offsets Act 2014*.

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“spotter/catcher” means a person who holds a rehabilitation permit in accordance with section 207 of the *Nature Conservation (Wildlife Management) Regulation 2006* for the purpose of care and rehabilitation of a sick, injured or orphaned protected animal, or a protected animal whose habitat has been, or will be, destroyed by human activity or a natural disaster.

“stable” 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 (traffic ability), erosion resistance and geochemical stability with respect to seepage and contaminant generation.

“structure” means dam or levee.

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

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 an integrated containment system that shares the required DSA volume across the integrated containment system.

“tolerable limits” means that a range of values could be accepted to achieve an overall environmental management objective (eg a range of settlement of a tailing capping could still meet the objective of draining the cap quickly, preventing pondage and limiting infiltration and percolation).

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

“waters” includes a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea) or any part thereof.

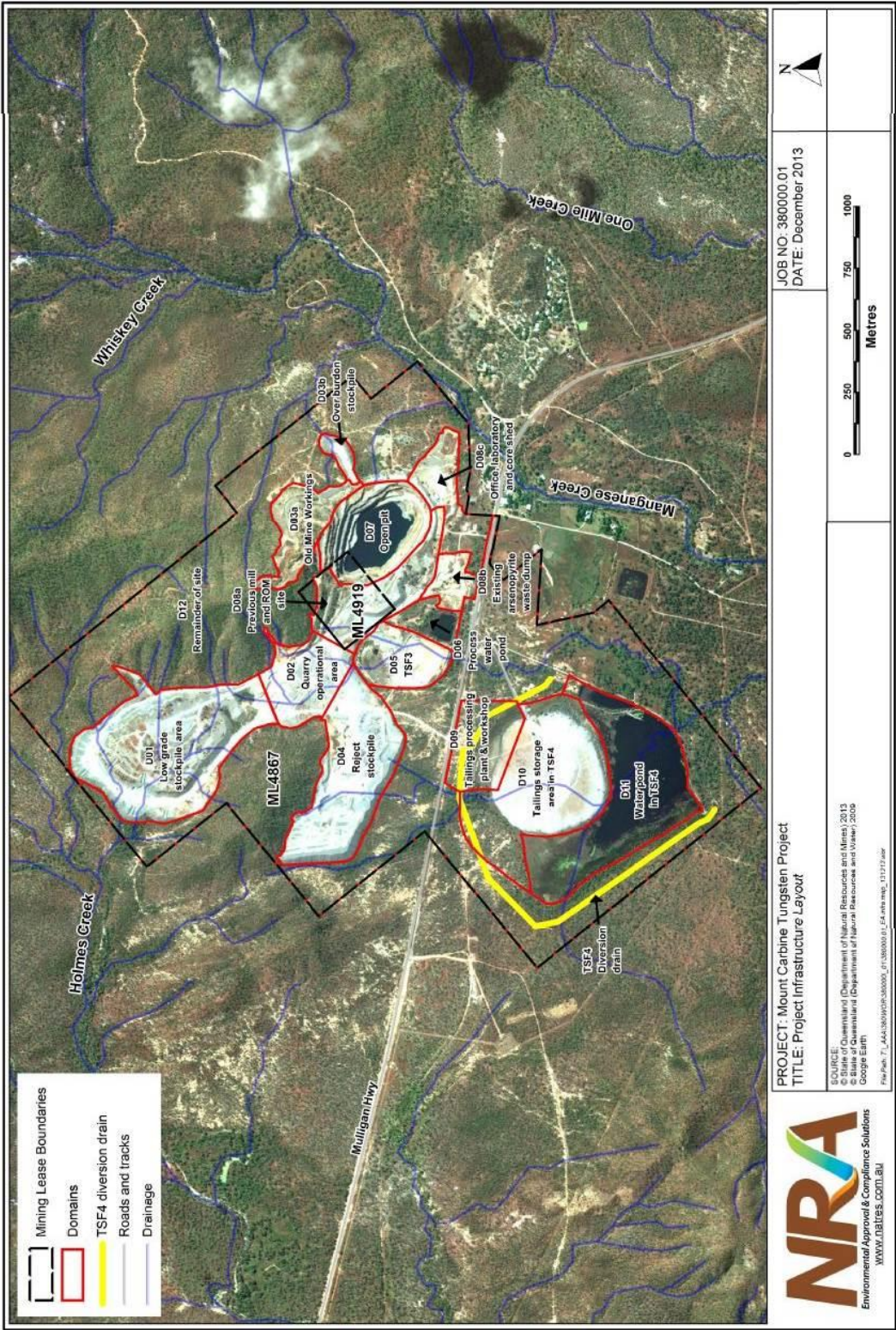
“water table level” means the top of the saturated zone of an unconfined aquifer (in m AHD), the standing water level.

“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.

END OF CONDITIONS FOR SCHEDULE G

Schedule H – Maps / Plans

Schedule H – Figure H1(a) (Project Infrastructure Layout)



Product Transfer Pipeline

MT Carbine Tungsten Project general arrangements
 Project: Supporting Information for an Application to Amend EA EPML0095913

Legend:

- Mining lease boundary
- Mining domain EA
- Quarry EA boundary
- Mining Disturbance (FA 2016)
- 2021 ERC
- T5F4 diversion dam - mining
- Proposed pipeline

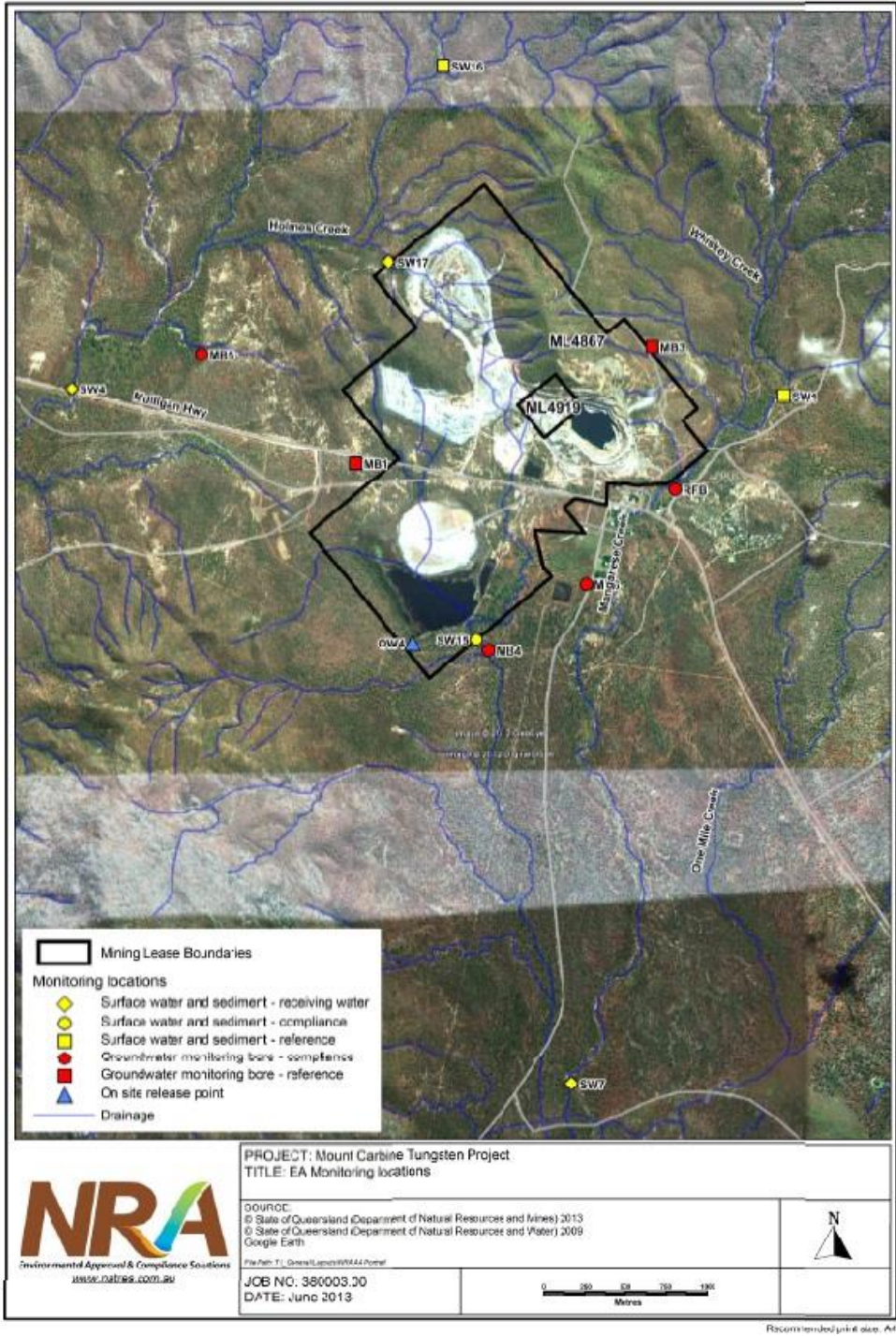
Scale: 0 to 200 Metres

Source: EQ Resources 2011, AIRSTUD 2011, Airmap 3D 2013

NRA Ref: 380013.01
 Date: February 2022

NRA

Schedule H – Figure H2 (Monitoring and Release Points)



END OF CONDITIONS FOR SCHEDULE H

END OF PERMIT