

Permit

Environmental Protection Act 1994

Environmental authority EPML00979013

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

Environmental authority number: EPML00979013

Environmental authority takes effect on 12 December 2022

Environmental authority holder(s)

Name(s)	Registered address
RAVENSWOOD GOLD PTY. LTD.	Lot 1 Macrossan St RAVENSWOOD QLD 4816

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 16: Mining gold ore	ML1337, ML1338, ML1379, ML1380, ML1394, ML1395, ML1412, ML1416, ML1417, ML1418, ML1435, ML1451, ML1452, ML1532, ML1574, ML1639, ML1640, ML1682, ML1692, ML1736, ML1753, ML10039, ML10040, ML10041, ML10170, ML10237, ML100143, ML100144, ML100145, ML100146, ML100147, ML100148, ML100149, ML100156, ML100172
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)	ML1337, ML1338, ML1379, ML1380, ML1394, ML1395, ML1412, ML1416, ML1417, ML1418, ML1435, ML1451, ML1452, ML1532, ML1574, ML1639, ML1640, ML1682, ML1692, ML1736, ML1753, ML10039, ML10040, ML10041, ML10170, ML10237, ML100143, ML100144, ML100145, ML100146, ML100147, ML100148, ML100149, ML100156, ML100172
Ancillary 30 - Metal smelting and refining 1: Processing in a year (a) 1t to 100t of gold	ML1337, ML1338, ML1379, ML1380, ML1394, ML1395, ML1412, ML1416, ML1417, ML1418, ML1435, ML1451, ML1452, ML1532, ML1574, ML1639, ML1640, ML1682, ML1692, ML1736, ML1753, ML10039, ML10040, ML10041, ML10170, ML10237, ML100143, ML100144, ML100145, ML100146, ML100147, ML100148, ML100149, ML100156, ML100172

Environmentally relevant activity/activities	Location(s)
Ancillary 31 - Mineral processing 2: Processing, in a year, the following quantities of mineral products, other than coke (b) more than 100,000t	ML1337, ML1338, ML1379, ML1380, ML1394, ML1395, ML1412, ML1416, ML1417, ML1418, ML1435, ML1451, ML1452, ML1532, ML1574, ML1639, ML1640, ML1682, ML1692, ML1736, ML1753, ML10039, ML10040, ML10041, ML10170, ML10237, ML100143, ML100144, ML100145, ML100146, ML100147, ML100148, ML100149, ML100156, ML100172
Ancillary 60 - Waste disposal 2: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(b) (a) less than 2000t	ML10170, ML1682
Ancillary 62 - Resource recovery and transfer facility operation 1: Operating a facility for receiving and sorting, dismantling, baling or temporarily storing- (c) category 2 regulated waste	ML10170, ML1682
Ancillary 62 - Resource recovery and transfer facility operation 1: Operating a facility for receiving and sorting, dismantling, baling or temporarily storing- (d) category 1 regulated waste	ML10170, ML1682
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (b-i) more than 100 but not more than 1500EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	ML1395, ML1435, ML1753

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

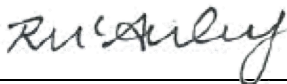
Please note that, in accordance with section 200 of the EP Act, an EA has effect:

- 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-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.



Signature

12 December 2022

Date

Rebecca McAuley

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

Enquiries:

Minerals Business Centre
Department of Environment and Science
Phone: 07 4222 5352
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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 Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Obligations under the *Mining and Quarrying Safety and Health Act 1999*

If you are operating a quarry, other than a sand and gravel quarry where there is no crushing capability, you will be required to comply with the *Mining and Quarrying Safety and Health Act 1999*. For more information on your obligations under this legislation contact Mine Safety and Health at www.resources.qld.gov.au, or phone 13 QGOV (13 74 68) or your local Mines Inspectorate Office.

Development Approval

This permit is not a development approval under the *Planning Act 2016*. The conditions of this environmental authority are separate, and in addition to, any conditions that may be on the development approval. If a copy of this environmental authority is attached to a development approval, it is for information only, and may not be current. Please contact the Department of Environment and Science to ensure that you have the most current version of the environmental authority relating to this site.

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 Contaminants with the potential to cause environmental harm must not be released directly or indirectly to the receiving environment, except as permitted under the conditions of this environmental authority.
- A3 In carrying out the activities the environmental authority holder must comply with 'Table A1 – Authorised Activities and Locations' Domains, depicted in 'Schedule K – Figure 1 (Project Infrastructure Layout)'.

Table A1 – Authorised Activities and Locations

Mine Domain	Mine Feature Name	Tenure Type and Number	Location (GDA94 - Zone 55)		Maximum disturbance area (ha)
			Central Peg Coordinates		
			Easting	Northing	
Infrastructure	Potable water treatment plant	ML1639	489188	7777532	0.2 (constructed within the current authorised footprint of the Acoustic Bund)
	Reverse osmosis treatment plant	ML1574	489169	7776334	0.6
	Sewage treatment plant	ML1753 ML1435	488367	7778318	0.8
	Sarsfield workshop and office area	ML1682 ML10237	490048	7776857	4.6
	Sarsfield plant site & conveyors	ML1682	489857	7776526	38.3
	Mine village	ML1753	488937	7778625	12.2
	Nolans plant site	ML1394 ML1574 ML1682 ML10170	489513	7775782	29.5
	Nolan’s mining support infrastructure	ML1574 ML10170	489084	7775776	19.9
	Buck Reef mining support infrastructure	ML1380 ML100172 ML100148	487976	7776449	53.2
	Buck Reef site	ML1412 ML1574 ML1380 ML1001145 ML100172	488286	7776738	8.2
	Ravenswood roads & tracks	ALL	489939	7775154	39.1
	Mt Wright roads & tracks	ML1338 ML1435	482373	7784161	3.3
	Mt Wright workshop and office area	ML1435	482345	7783744	10

Mine Domain	Mine Feature Name	Tenure Type and Number	Location (GDA94 - Zone 55)		Maximum disturbance area (ha)
			Central Peg Coordinates		
			Easting	Northing	
Tailings	Old Nolans Tailings Storage Facility	ML10170	488623	7774982	104
	Nolans Tailings Storage Facility Expansion	ML10170 ML1682 ML100156	489100	7774500	160
	Dry Stack Tailings Storage Facility	ML1394 ML1574 ML1682	489951	7776323	76 (constructed within the current authorised footprint of the Sarsfield ROM & mineralised waste dumps, Sarsfield waste rock dump, Sarsfield plant site & conveyors, and the Nolan’s Pit)
Overburden and Waste	Landfill facility	ML1682	490588	7775037	11.3
	Existing landfill facility	ML1682 ML10170	489948	7774814	6.5 (within the authorised footprint of Nolans Tailings Storage Facility Expansion)
	Nolans waste rock dump	ML1682	490301	7775388	29.6
	Sarsfield waste rock dump	ML1682	490731	7776203	118.9
	Nolans ROM & mineralised waste dumps	ML1394 ML1574 ML1682 ML10170	489792	7775634	20.6
	Sarsfield ROM & mineralised waste dumps	ML1379 ML1574 ML1682 ML10237	489749	7776866	10.9
	Buck Reef West waste rock dump	ML1574 ML10170 ML100172	488629	7776061	34.8
	Buck Reef West ROM	ML1574 ML10170 ML100172	488806	7775657	20.0
	Mt Wright waste rock dump & ROM	ML1435	482207	7783892	6.4
Water management	Process water pond	ML1574	489321	7775847	1.4
	TSF dam	ML1682	490397	7775859	0.7
	Mt Wright sediment management	ML1435	482172	7783981	0.8
	Sarsfield water management	ML1682	491338	7776061	24.4
	Nolan’s water management	ML1682 ML10170 ML100144	489626	7775386	37.7
	Buck Reef West water management	ML1574 ML100172 ML10170	488280	7775984	2.1

Mine Domain	Mine Feature Name	Tenure Type and Number	Location (GDA94 - Zone 55)		Maximum disturbance area (ha)
			Central Peg Coordinates		
			Easting	Northing	
Water management	Seepage recovery	ML1380 ML1574 ML1640 ML1682 ML1692 ML100172 ML10170 ML100144	489706	7776038	10
	Underground water supply infrastructure	ML10039	492048	7775630	0.3
Pits	Sarsfield Pit	ML1337 ML1379 ML1380 ML1416 ML1417 ML1418 ML1574 ML1639	489249	7776922	65
	Nolans Pit	ML1394 ML1574 ML1682	489762	7776114	32.5
	Buck Reef West Pit	ML1574 ML1380 ML1412 ML1532 ML100145 ML100149 ML100172	488339	7776770	40.0
Historic mining area	Heap leach pads 1 and 2	ML1640	491905	7776993	16.9
	Golf course/ Historic Mellaneur Pit	ML1395 ML1753	488330	7778063	10.5
	Waste rock dump 1 (SYC & OCA)	ML1379 ML1639	489336	7777505	4.7
	Sandy Creek Tailings Storage Facility	ML1640 ML1736	491680	7777581	13.8
	Mt Wright historic workings and exploration	ML1338 ML1435	482610	7784276	6.3
	Sandy Creek plant site	ML1640 ML168 ML1692 ML100143	491589	7777016	26.1
Other	Sarsfield acoustic bund	ML1337 ML1380 ML1379 ML1639	488832	7776986	11.2

Mine Domain	Mine Feature Name	Tenure Type and Number	Location (GDA94 - Zone 55)		Maximum disturbance area (ha)
			Central Peg Coordinates		
			Easting	Northing	
Other	Buck Reef West acoustic bund	ML1380 ML1412 ML1574 ML100172 ML100147 ML100148 ML100145	487959	7776765	13.2
	Helipad	ML10170	488039	7775371	0.2
	Topsoil stockpiles	ML1682 ML10170 ML100172 ML1574	489932	7774790	28.2

- A4 The environmental authority holder must:
- install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; and
 - maintain such measures, plant and equipment in a proper and efficient condition; and
 - operate such measures, plant and equipment in a proper and efficient manner; and
 - ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated
- A5 Except where specified otherwise in another condition of this environmental authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than five years.
- A6 The date and time when the sample was taken must be recorded in relation to all monitoring required under a condition of this environmental authority.
- the date and time when the sample was taken;
 - the location where the sample was taken; and
 - any other pertinent details of relevance to interpreting the sampling results (i.e. stream flow, wind conditions or any unusual observations such as odour or colouration)
- A7 All monitoring data, records and reports required by this environmental authority or related to environmental management of the activities must be carried out by an appropriately qualified person, periodically reviewed and updated as required to reflect operational or environmental changes.
- A8 All monitoring data, records, plans and reports required by this environmental authority or related to environmental management of the activities must be provided to the administering authority in the specified format within 10 business days of a request.
- A9 The environmental authority holder must ensure that an estimated rehabilitation cost decision is in effect for the activity; and
- a contribution has been paid to the scheme fund in the amount and form required; or
 - a surety has been given for the authority in the amount and form required

- A10 Where a change in activities will, or is likely to, increase the maximum amount of disturbance caused by the activity, or the estimated rehabilitation cost for the activity, the holder must re-apply for an estimated rehabilitation cost decision.
- A11 The environmental authority holder must implement and maintain a risk management system for 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.
- A12 The environmental authority holder must notify the administering authority by telephone or email notification within 24 hours, after becoming aware of any event, 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.
- A13 Within 10 business days following the initial notification of an emergency, event 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
- A14 The environmental authority holder must record all environmental complaints received about the activities and provide to the administering authority on request, including:
- a) name, address and contact number 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.
- A15 The environmental authority holder 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.
- A16 The environmental authority holder must:
- a) by 5 March 2024, obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority
 - b) obtain further such reports at regular intervals, not exceeding three (3) yearly intervals, from the completion of the report referred to above; and
 - c) provide each report to the administering authority within 90 days of its completion

- A17 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 two 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 'Table I1 – Hydraulic Performance Criteria', the time specified in that condition.
 - 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
- A18 The environmental authority holder is authorised to receive and process up to 10,000m³ of mineral product from ML10283 between **9 September 2021** and **31 August 2022**.

END OF SCHEDULE A

Schedule B: Air

- B1 The release of noxious or offensive odour, dust or any other airborne contaminant resulting from the activities must not cause environmental harm.
- B2 The environmental authority holder must ensure that avoidance and mitigation measures are employed so that the dust and particulate matter emissions generated by the activities do not cause exceedances of the following levels when measured at any sensitive or commercial place:
- a) Dust deposition of 120 milligrams per square metre per day, averaged over one 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, for no more than five exceedances recorded each year, 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.
 - iii. Standards Australia 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 analyser; or
 - iv. Standards Australia AS3580.9.11 Methods for sampling and analysis of ambient air—Determination of suspended matter PM10 beta attenuation monitors.
 - c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres (PM2.5) 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.
 - e) Use of other equipment is authorised as agreed to by the administering authority.
- B3 The environmental authority holder must implement and maintain a Dust Management Plan that includes details of dust abatement measures to ensure compliance with condition B1 and condition B2.

END OF SCHEDULE B

Schedule C: Waste

- C1 All waste generated must be disposed of in a lawful manner at an off-site facility, with the exception of:
- a) Waste rock and tailings, which must be characterised, handled and disposed of in accordance with condition C10;
 - b) General waste disposed of at the landfill facility in accordance with conditions C3 to C9; and
 - c) Tyres, in accordance with condition C2.
- C2 Waste tyres generated from activities conducted on the licensed place may be disposed of on site in non-acid forming waste rock at the licensed place.
- C3 The environmental authority holder must develop, implement and maintain a waste disposal activity management plan that includes measures to ensure compliance with conditions C4 to C9 and E23 of this authority.
- C4 All reasonable and practicable measures must be taken to contain litter within the waste operations area, and retrieve litter released.
- C5 The landfill unit must be operated and managed to minimise the generation of leachate including a system of suitable diversion drains or embankments to divert surface waters away from any area where contact with wastes or contaminants may occur.
- C6 Only general waste can be received at the landfill facility.
- C7 Deposited waste must be covered as soon as practicable to limit stormwater infiltration, prevent exposure of waste, and prevent issues arising from vectors and pest species.
- C8 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.
- C9 When the deposition of waste to the landfill unit ceases, a final capping system to the landfill unit must be designed by an appropriately qualified person and installed to minimise:
- a) infiltration of water into the landfill unit and water ponding on the surface; and
 - b) the likelihood of any erosion occurring to either the final capping system or the landfilled materials
- A final capping system is not required where the deposition of waste to a landfill unit ceases temporarily for the purpose of using an alternative working face.
- C10 All waste rock and tailings must be:
- a) geochemically characterised and disposed of in a manner that minimises the potential generation and/or release of contaminants to the receiving environment; and
 - b) where the geochemical characteristics of waste rock is uncertain, this material must be treated as potentially acid forming until demonstrated otherwise; and
 - c) details pertaining to meeting the requirements of this condition must be recorded and retained until this environmental authority is surrendered
- C11 The environmental authority holder must prepare, implement and maintain a Waste Rock and Tailings Disposal Plan that includes details of waste rock and tailings management to ensure compliance with condition C10 and C12.

- C12 The Buck Reef West waste rock dump must be designed and constructed to ensure that contaminated water originating from the Buck Reef West waste rock dump is not:
- a) released directly or indirectly to any surface waters, except as permitted under the conditions of this environmental authority; or
 - b) released to groundwater

END OF SCHEDULE C

Schedule D: Noise

- D1 The environmental authority holder must ensure that noise generated by the mining activities does not cause environmental harm at any sensitive or commercial place.
- D2 The environmental authority holder must develop and implement a Noise Monitoring and Management Program to monitor and ensure compliance with the noise triggers specified in 'Table D1 – Noise triggers' and the noise limits specified in 'Table D2 – Noise limits' at any sensitive or commercial place.
- D3 If a complaint is received and the noise levels measured at a sensitive or commercial place exceeds the trigger levels specified in 'Table D1 – Noise triggers', the holder of this environmental authority must implement reasonable and practicable noise abatement measures to address the complaint.

Table D1 – Noise triggers

Sensitive place						
Noise level dB(A) measured as:	Trigger level - Monday to Saturday (excluding public holidays)			Trigger level - Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L_{Aeq} , adj, 15 mins	CV = 50 AV = 5	CV = 45 AV = 5	CV = 40 AV = 0	CV = 45 AV = 5	CV = 40 AV = 5	CV = 35 AV = 0
L_{A1} , adj, 15 mins	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5
Commercial place						
Noise level dB(A) measured as:	Trigger level - Monday to Saturday (excluding public holidays)			Trigger level - Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	7am to 6pm	6pm to 10pm	10pm to 7am
L_{Aeq} , adj, 15 mins	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5

Notes:

- CV = Critical Value
- AV = Adjustment Value
- To calculate noise limits in Table D1:
 - If $bg \leq (CV - AV)$: Noise limit = $bg + AV$
 - If $(CV - AV) < bg \leq CV$: Noise limit = CV
 - If $bg > CV$: Noise limit = $bg + 0$
- In the event that measured bg (L_{A90} , adj, 15 mins) is less than 30 dB(A), then 30 dB(A) can be substituted for the measured background level
- bg = background noise level (L_{A90} , adj, 15 mins) measured over 3-5 days at the nearest sensitive receptor
- If the project is unable to meet the noise limits as calculated above alternative limits may be calculated using the processes outlined in the "Planning for Noise Control" guideline

- D4 The environmental authority holder must ensure that noise generated by the mining activities does not cause an exceedance of any noise level criterion specified in 'Table D2 – Noise limits' at any sensitive or commercial place.

Table D2 – Noise limits

Noise level dB(A) measured as:	Noise level criteria			
	Daytime and evening (7am to 10pm)		Night time (10pm to 7am)	
	Sensitive or commercial place (indoor)	Sensitive or commercial place (outdoor)	Sensitive or commercial place (indoor)	Sensitive or commercial place (outdoor)
L_{Aeq} , adj, 1 hour	35 ¹	44 ²	30 ¹	39 ²
L_{Amax}	-	-	42 ²	-
L_{A10} ,adj,1hr	40 ¹	49 ²	35 ¹	44 ²
L_{A1} ,adj,1hr	45 ¹	54 ²	40 ¹	49 ²

Notes:

1. Based on Schedule 1 of the *Environmental Protection (Noise) Policy 2008*
2. Site specific number proposed by the environmental authority holder

- D5 When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, against the noise limits specified in 'Table D2 – Noise limits'.
- D6 The environmental authority holder must implement the mitigation measures proposed in "Appendix B Supportive information to the EA amendment application for the Sarsfield Expansion Project Noise and Vibration" (reference 620.11471-R02-v2.0) prepared by SLR Consulting Australia Pty Ltd dated 19 September 2016 or other mitigation measures deemed reasonable and practicable by the administering authority, prior to commencement of the Sarsfield Expansion Project mining activities.
- D7 The environmental authority holder must ensure that blasting does not cause the limits for peak particle velocity and airblast overpressure in 'Table D3 – Blasting noise limits' to be exceeded at a sensitive place or commercial place.

Table D3 – Blasting noise limits

Blasting noise limits	Sensitive or commercial blasting noise limits place limits					
	Occupied buildings			Unoccupied buildings		
	7am to 6pm Monday to Friday	9am to 6pm Saturday, Sunday and Public Holidays	6pm to 7am Monday to Friday, and 6pm to 9am Saturday, Sunday and Public Holidays	7am to 6pm Monday to Friday	9am to 6pm Saturday, Sunday and Public Holidays	6pm to 7am Monday to Friday, and 6pm to 9am Saturday, Sunday and Public Holidays
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB	No Blasting	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater	No Blasting

	not greater than 120 dB (Linear) Peak at any time	(Linear) Peak at any time		and not greater than 120 dB (Linear) Peak at any time	than 120 dB (Linear) Peak at any time	
Ground vibration peak particle velocity	5mm/second peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time	5mm/second peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time	No Blasting	20mm/second peak particle velocity	20mm/second peak particle velocity	No Blasting

- D8 Noise monitoring and recording must include the following descriptor characteristics and matters:
- a) $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins);
 - b) Background noise LA_{90} ;
 - c) The level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels;
 - d) Atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - e) Effects due to any extraneous factors such as traffic noise;
 - f) Location, date and time of monitoring;
 - g) If the complaint concerns low frequency noise, $Max L_{pLIN,T}$ and one-third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range
- D9 The environmental authority holder must develop and implement a blast monitoring program to monitor compliance with 'Table D3 – Blasting noise limits' for:
- a) At least 90% of all blasts undertaken on this site in each month at the nearest sensitive place or commercial place at the township of Ravenswood; and
 - b) All blasts conducted during any time period specified by the administering authority at the nearest sensitive place or commercial place.

END OF SCHEDULE D

Schedule E: Water

- E1 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.
- E2 The release of contaminants to waters must only take place from a release point specified in 'Table E1 – Authorised contaminant release points'.

Table E1 – Authorised contaminant release points

Release Point (RP)	Location (GDA 94 - Zone 55)		Release source	Monitoring point	Receiving waters description
	Easting	Northing			
RP1	489650	7778179	Reverse Osmosis Treatment Plant	Reverse Osmosis Permeate Tank	Upstream of SW057_SAR, Suhrs Creek
RP2	490765	7774713	Strand Sediment Dam	Dam spillway	Sandy Creek
RP3	490947	7775480	Sediment Dam Waste Rock Dump South	Dam spillway	Sandy Creek
RP5	482138	7783961	Mt Wright Dam	Dam spillway	Tributary of Kirk River
RP6	488183	7775800	Buck Reef West Waste Rock Dump	Dam spillway	Elphinstone Creek

- E3 The release of contaminants to waters must only take place in accordance with all criteria for release specified in 'Table E2 – Contaminant release criteria and recording'.

Table E2 - Contaminant release criteria and recording

Receiving waters description	Release Point (RP)	Gauging station			Recording Frequency	Criteria for release
		Description	Easting (GDA94, Zone 55)	Northing (GDA94, Zone 55)		
Suhrs Creek	RP1	N/A				Maximum release of 4ML/day; and Maximum rate of release 46L/s.
Sandy Creek	RP 2	SW095_SAR	491315	7775390	Continuously in m ³ /sec	Must only occur when there is a continuous record of natural flow at the relevant gauging station.
Sandy Creek	RP 3					
Tributary of Kirk River	RP 5	SW024_MTW	481895	7784160		
Elphinstone Creek	RP 6	SW079_SAR	488347	7777421		

- E4 During the release of contaminants to waters from a release point specified in 'Table E1- Authorised contaminant release points', the environmental authority holder must continuously measure and record the rate of contaminant release in cubic metres per second (m³/sec) at the release point.
- E5 During the release of contaminants to waters from a release point specified in 'Table E1- Authorised contaminant release points', the environmental authority holder must continuously measure and record the relevant receiving waters streamflow at the gauging station specified in 'Table E2 – Contaminant release criteria and recording'.
- E6 The release of contaminants to waters from a location specified in 'Table E1 – Authorised contaminant release points' must not exceed any release limit specified in 'Table E3 – Contaminant release limits'.

Table E3 – Contaminant release limits

Contaminant ^[3]	Release Limits for RP1 ^[15]	Release Limits for all other release points in Table E1 ^{[10][15]}		Monitoring Frequency
		T <=48 hrs	T>48 hrs	
Electrical conductivity (µS/cm)	650 ^[1]	M ^[12,13] x 150 ^[11]		Every 15 minutes during a release
pH (pH Unit)	6.5-8.5 ^[8]	6.5-8.5 ^[8]		
Turbidity (NTU)	7.5 ^[1]	For interpretation purposes		
Total Suspended Solids	N/A	620 ^[2]		For all release points Daily during release (the first sample must be taken within 2 hours of commencement of release) For RP1 only Once a week after seven days consecutive release
Sulfate	TBD ^[1]	TBD ^[1]		
Aluminium	0.055 ^[5]	M ^[12,13] x 0.15 ^[9]	M ^[12,13] x 0.055 ^[5]	
Arsenic	0.013 ^[5]	M ^[12,13] x 0.14 ^[9]	M ^[12,13] x 0.013 ^[5]	
Cobalt	TBD ^[1]	TBD ^[1]	TBD ^[1]	
Copper	0.0014 ^[5]	M ^[12,13] x 0.0025 ^[9]	M ^[12,13] x 0.0014 ^[5]	
Manganese	1.9 ^[5]	M ^[12,13] x 3.6 ^[9]	M ^[12,13] x 1.9 ^[5]	
Molybdenum	0.034 ^[4]	0.034 ^[4]	0.034 ^[4]	
Uranium	TBD ^[1]	TBD ^[1]	TBD ^[1]	
Zinc	0.008 ^[5]	M ^[12,13] x 0.031 ^[9]	M ^[12,13] x 0.008 ^[5]	
Cyanide (as un-ionised HCN, measured as [CN])	0.007 ^[5]	M ^[12,13] x 0.018 ^[9]	M ^[12,13] x 0.007 ^[5]	
Nitrate (as N)	2.4 ^[6]	M ^[12,13] x 6.9 ^[7]	M ^[12,13] x 2.4 ^[6]	
Major ions	For interpretation purposes			
Hardness				

Notes:

- [1] TBD means to be updated by 31 January 2023 based on locally derived reference values via an amendment application.
- [2] WQO 80th percentile for Upper Burdekin sub-basin waters during event flow
- [3] All metals and metalloids must be measured as both 'total' (from analysis of an unfiltered sample) and 'dissolved' (from analysis of a field filtered sample). Contaminant trigger values for metals relate to dissolved concentrations
- [4] Based off ANZECC (2000) low reliability metals and metalloids, Section 8.3.7.1
- [5] Based off ANZECC (2000) value for long-term 95% species protection, Table 3.4.1
- [6] Based off Hickey & Martin (2009) value for long-term 95% species protection
- [7] Based off Hickey & Martin (2009) value for long-term 80% species protection
- [8] WQO for Upper-Burdekin sub-basin waters
- [9] Based off ANZECC (2000) value for long-term 80% species protection, Table 3.4.1
- [10] Based on time since commencement of release from the release point measured in hours (T).
- [11] 80th percentile of site specific reference data during pulse flows (SW066_SAR)
- [12] $M = 0.8 \times (\text{volume of streamflow at the relevant gauging station / volume of release})$.
- [13] The maximum authorised value for $M = 5$
- [14] Successive or intermittent releases occurring within two (2) days of the cessation of any individual release from a release point are considered part of a single release event for the purpose of compliance with Table E3.
- [15] Units are mg/L unless specified otherwise.

E7 The release of contaminants to surface waters from the release points must be monitored at the locations specified in 'Table E1- Authorised contaminant release points'.

E8 The release of contaminants to surface waters from the release points must be monitored at the frequency specified in 'Table E3 – Contaminant release limits'.

- E9 The release of contaminants to surface waters from the release points must be monitored for each contaminant specified in 'Table E3 – Contaminant release limits'.
- E10 Releases to waters must be undertaken so as to not cause erosion of the bed and banks of the receiving waters, or cause a material build-up of sediment in waters.
- E11 The environmental authority holder must monitor water quality within each release source in 'Table E1 – Authorised contaminant release points', other than the Reverse Osmosis Treatment Plant, in a manner sufficient to determine the quality of stored water prior to any release and establish likely compliance with condition E6.
- E12 At any one time the environmental authority holder can only release contaminants from either release point RP2 or RP3 in 'Table E1 – Authorised Contaminant Release Points' and in accordance with the conditions of this environmental authority.
- E13 The administering authority must be notified by telephone or email of any release from release point RP1 at least 2 business days prior to any release commencing, and at least 2 business days prior to the cessation of any release.

Note: Successive or intermittent releases occurring within two (2) days 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 condition E13.

- E14 The environmental authority holder must notify the administering authority via WaTERS before commencing the release of contaminants from release points other than RP1.
- E15 During the release of contaminants from a release point in 'Table E1 – Authorised contaminant release points', other than RP1, all electronic data measured and recorded in accordance with conditions E4 and E5 must be reported to the administering authority daily via WaTERS for time intervals of fifteen minutes.
- E16 The notification required by condition E14 must include the submission of the following information:
- a) Estimated release commencement date/time;
 - b) Expected release cessation date/time;
 - c) Any details (including available data) regarding likely impacts on the receiving water(s);
 - d) Release point/s;
 - e) Release volume (estimated);
 - f) Release pH, Total Suspended Solids and salinity; and
 - g) Receiving water/s including flow rate in m³/sec at the relevant gauging station.

If for unforeseen technical reasons WaTERS is unavailable, please contact the administering authority in writing.

- E17 The environmental authority holder must notify the administering authority via WaTERS no later than 48 hours after cessation of a release event notified under condition E14.
- E18 Within 28 days of cessation of a release event the environmental authority holder must provide the following information via WaTERS to the administering authority:
- a) Release cessation date/time;
 - b) Natural flow rate in receiving water at the time of cessation;
 - c) Volume of water released;

- d) Details regarding the compliance of the release with the conditions of this environmental authority, including calculated release limits, natural flow and discharge volume.
- e) All in-situ water quality monitoring results;
- f) All laboratory analysis of water quality monitoring results; and
- g) Any other matters pertinent to the water release event.

Note: Successive or intermittent releases occurring from a single release point within two days of the cessation of any individual release are considered part of a single release event and do not require individual notification for the purpose of compliance with condition E18.

- E19 The environmental authority holder must implement and maintain a contaminant release management plan, which details how controlled releases are to be managed to ensure compliance with the conditions of this environmental authority.
- E20 The environmental authority holder must notify all potentially affected downstream landholders and other affected parties of a release of contaminants from a release point in 'Table E1 – Authorised contaminant release points'. The notification must provide all relevant information to assist the affected downstream landholders and parties with the effective management of property and services.
- E21 If any of the release limits defined in 'Table E3 – Contaminant release limits' are exceeded, the holder of the environmental authority must notify the administering authority via WaTERS within 24 hours of receiving the results.

If for unforeseen technical reasons WaTERS is unavailable, please contact the Pollution Hotline.

- E22 The environmental authority holder must, within 28 days of a release of contaminants in accordance with condition E2 that is not compliant with the conditions of this environmental authority, provide a report to the administering authority via WaTERS detailing:
- a) the reason for the release; and
 - b) the location of the release; and
 - c) the total volume of the release and which (if any) part of this volume was non-compliant; and
 - d) the total duration of the release and which (if any) part of this period was non-compliant; and
 - e) all water quality monitoring results (including all laboratory analyses); and
 - f) identification of any environmental harm as a result of the non-compliance; and
 - g) all calculations of quality and flow; and
 - h) any other matters pertinent to the water release event.

If for unforeseen technical reasons WaTERS is unavailable, please contact the Pollution Hotline.

- E23 Receiving waters must be monitored at the locations specified in 'Table E4 – Receiving waters and sediment monitoring sites'.

Table E4 - Receiving waters and sediment monitoring sites

Description of waters	Monitoring site name	Monitoring site description	Location* (GDA94, Zone 55)		Monitoring frequency (waters only)	
			Easting	Northing	Monthly during the wet season and every 3 months during the dry season ^[4]	Daily during contaminant release ^{[3][6]}
Sandy Creek Catchment						
Control sites ^[1]						
Sandy Creek	SW019_SC	1.7 km upstream of RP3	492778	7776589	Yes	Yes
	SW015_SC ^[2]	1.5 km upstream of RP3, downstream of Sandy Creek Mine Site	492251	7775999	Yes	No
	SW020_SC	Upstream of Sarsfield Creek and RP2 input	491634	7775540	Yes	Yes
Plumtree Creek	SW050_NOL	Upstream of confluence with Sandy Creek	491172	7773423	Yes	No
Compliance sites						
Sarsfield Creek	SW014_SC	Upstream of RP2	491411	7775987	Yes	No
Sandy Creek	SW087_SAR	Downstream of RP3	490955	7774866	Yes	No
	SW011_NOL	Downstream of RP2, RP3	490446	7774109	Yes	No
	SW007_NOL	Downstream of all Sandy Creek RP's	489044	7772980	Yes	Yes
Plumtree Creek	SW056_NOL	Downstream of Sandy Creek and Plumtree Creek confluence	488900	7772764	Yes	No

Description of waters	Monitoring site name	Monitoring site description	Location* (GDA94, Zone 55)		Monitoring frequency (waters only)	
			Easting	Northing	Monthly during the wet season and every 3 months during the dry season ^[4]	Daily during contaminant release ^{[3][6]}
Interpretation sites						
Sandy Creek	SW095_SAR	Downstream of SW014_SC	491312	7775385	Yes	No
Elphinstone Creek Catchment						
Control sites ^[1]						
Elphinstone Creek	SW066_SAR	Upstream of confluence with Suhrs Creek	489277	7778293	Yes	No
	SW096_SAR	Upstream of golf course drain	488974	7777992	Yes	Yes
	SW098_SAR	Downstream of historic Mabel Mill area	487851	7777298	Yes	No
	SW078_SAR	Downstream of confluence with Suhrs Creek. Downstream from Golf course and historic Mellaneur Pit	488665	7777720	Yes	No
	SW058_SAR	Upstream of confluence with Suhrs Creek and SW066_SAR	490710	7779071	Yes	No
One Mile Creek	SW037_SAR	Upstream of confluence with Elphinstone Creek	487474	7777295	Yes	Yes
Suhrs Creek	SW054_SAR	1km upstream of RP1	490566	7778131	Yes	Yes
	SW099_SAR	Upstream of RP1	489640	7778180	Yes	Yes

Description of waters	Monitoring site name	Monitoring site description	Location* (GDA94, Zone 55)		Monitoring frequency (waters only)	
			Easting	Northing	Monthly during the wet season and every 3 months during the dry season ^[4]	Daily during contaminant release ^{[3][6]}
Compliance sites						
Elphinstone Creek	SW035_SAR	Downstream of the Sarsfield Pit	488391	7777445	Yes	No
	SW067_SAR	Downstream of Jessop's Gully and upstream of One Mile Creek	487401	7776771	Yes	No
	SW092_SAR Buchanan's Gully	Between the Buck Reef Pit and the Sarsfield Pit	488652	7777193	Yes	No
	SW070_SAR	Downstream of confluence of One Mile Creek	487058	7776605	Yes	No
	SW071_SAR Jessop's Gully	Downstream of new Buck Reef WRD	487684	7776715	Yes	No
	SW075_SAR Drainage Line	Downstream of RP6	487256	7775997	Yes	Yes
	SW003_RC	Confluence of Elphinstone and downstream of RP6	486421	7775783	Yes	Yes
Suhrs Creek	SW057_SAR	1km downstream of RP1	489024	7777757	Yes	Yes
Interpretation sites						
Elphinstone Creek	SW079_SAR	Similar location to SW035_SAR	488347	7777421	Yes	No

Description of waters	Monitoring site name	Monitoring site description	Location* (GDA94, Zone 55)		Monitoring frequency (waters only)	
			Easting	Northing	Monthly during the wet season and every 3 months during the dry season ^[4]	Daily during contaminant release ^{[3][6]}
Mount Wright – Kirk River Catchment						
Control sites ^[1]						
Drainage line	SW024 MTW ^[5]	Reports to Kirk River	481895	7784160	Yes	Yes
Compliance sites						
Drainage line	SW012_MTW	Reports to Kirk River	481816	7784359	Yes	Yes

Notes:

- [1] Control sites must:
 - a) be from the same bio-geographic and climatic region; and
 - b) have similar geology, soil types and topography; and
 - c) contain a range of habitats similar to those at the compliance sites; and
 - d) have a similar flow regime; and
 - e) not be so close to the compliance sites that any disturbance at the compliance site also results in a change at the control site
- [2] Where access is not permitted off-lease by the landowner, an alternative monitoring location must be specified in the REMP required under condition E33, to measure in accordance with condition E23.
- [3] The first sample must be collected within two (2) hours of commencement of a release
- [4] To be scheduled to also coincide with three monthly groundwater monitoring
- [5] If SW024_MTW becomes impacted by groundwaters it will no longer be suitable as a control site.
- [6] During an authorised contaminant release event, at a minimum monitoring must occur at all monitoring sites that are relevant to the waters to which a contaminant release is occurring.

* Monitoring locations depicted in *Schedule K, Figure 2b – Surface water monitoring locations*.

E24 Receiving waters must be monitored at the frequencies stated in 'Table E4 – Receiving waters and sediment monitoring sites'.

E25 Receiving waters must be monitored for the contaminants stated in 'Table E5 - Receiving waters ambient trigger levels'

Table E5 - Receiving waters ambient trigger levels

Contaminant (mg/L unless specified otherwise) ^[1]	Trigger levels
Electrical conductivity (µS/cm)	1320 ^[2]
pH (pH units)	6.5 – 8.5 ^[3]
Turbidity (NTU)	25 ^[4]
Sulfate (SO ₄)	125 ^[2]
Aluminium	0.055 ^[5]
Arsenic	0.013 ^[5]
Cobalt	0.0014 ^[6]
Copper	0.0014 ^[5]
Molybdenum	0.034 ^[6]
Manganese	1.9 ^[5]
Uranium	0.0005 ^[6]
Zinc	0.008 ^[5]
Cyanide (as un-ionised HCN, measured as [CN])	0.007 ^[5]
Nitrate (as N)	2.4 ^[7]
Major Ions	For interpretation purposes
Hardness	
Total Suspended Solids	

Notes:

1. All metals and metalloids must be measured as both 'total' (from analysis of an unfiltered sample) and 'dissolved' (from analysis of a field filtered sample). Contaminant limits for metals relate to dissolved concentrations.
2. 80th percentile reference groundwater at NOL_OB129, NOL_OB131 and NOL_OB132
3. Water quality guidelines "Upper Burdekin Sub-basin fresh waters – all sub-basin waters not named below"
4. Water quality guidelines "Upper Burdekin sub-basin fresh waters – all sub-basin waters not named below" 80th percentile baseflow
5. ANZECC DGV freshwater ecosystem 95% species protection
6. Low reliability ANZECC 2000 guideline value
7. Hickey & Martin (2009) 95% species protection

E26 If a contaminant concentration at a compliance site in 'Table E4 - Receiving waters and sediment monitoring sites' exceeds any of the trigger levels specified in 'Table E5 - Receiving waters ambient trigger levels' the environmental authority holder must compare the compliance site results to the control site results for the same receiving waters and:

- a) if the contaminant concentration measured at the compliance site is equal to or less than the contaminant concentration measured at the applicable control sites, no further action is required; or
- b) if the contaminant concentration measured at the compliance site is greater than the contaminant concentration measured at the applicable control site:
 - i. notify the administering authority within 24 hours of becoming aware of the trigger level exceedance; and
 - ii. undertake further sampling of potentially impacted waters at the compliance site in 'Table E4 - Receiving waters and sediment monitoring sites' for all contaminants specified in 'Table E5 - Receiving waters ambient trigger levels'; and
 - iii. complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the administering authority; and
 - iv. within one week of completing the investigation, provide a written report to the administering authority detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with part b) of this condition, no further reporting is required for subsequent trigger events for that contaminant.

Table E6 – Receiving water contaminant limits during a release

Contaminant ^[1]	Contaminant limit ^{[2][3]} (mg/L unless specified otherwise)		Monitoring Frequency
	T <=48 hrs	T>48hrs	
Electrical conductivity (µS/cm)	150 ^[5]		Every 15 minutes during a release
pH (pH Unit)	6.5-8.5 ^[6]		
Turbidity (NTU)	For interpretation purposes		
TSS	620 ^[5]		Daily during release (the first sample must be taken within 2 hours of commencement of release.
Sulfate	TBD ^[7]		
Aluminium	0.15 ^[8]	0.055 ^[9]	
Arsenic	0.14 ^[8]	0.013 ^[9]	
Cobalt	TBD ^[7]	TBD ^[7]	
Copper ^[4]	0.0025 ^[8]	0.0014 ^[9]	
Manganese	3.6 ^[8]	1.9 ^[9]	
Molybdenum	0.034 ^[10]	0.034 ^[10]	
Uranium	TBD ^[7]	TBD ^[7]	
Zinc ^[4]	0.031 ^[8]	0.008 ^[9]	
Cyanide (as un-ionised HCN, measured as [CN])	0.018 ^[8]	0.007 ^[9]	
Nitrate (as N)	6.9 ^[11]	2.4 ^[12]	
Major ions	For interpretation purposes		
Hardness			

Notes:

- All metals and metalloids must be measured as both 'total' (from analysis of an unfiltered sample) and 'dissolved' (from analysis of a field filtered sample). Contaminant limits for metals relate to dissolved concentrations
- Based on time since commencement of release measured in hours (T).
- Where a contaminant limit is exceeded at a compliance site and the applicable control site also exceeds this concentration on the same day of sampling, the value of the control site applies as the contaminant limit for that sampling event.
- For each sampling event, hardness adjustment for selected metals in freshwaters can be undertaken in accordance with Table 3.4.3, Table 3.4.4 and the requirements of ANZECC (2000)
- Water quality guidelines "Upper Burdekin sub-basin fresh waters – all sub-basin waters not named below"
- Water quality guidelines "Upper Burdekin sub-basin fresh waters – all sub-basin waters not named below" 80th percentile event flow
- TBD by 1 March 2021 based on locally derived reference values.
- ANZECC (2000) 80% species protection level
- ANZECC (2000) 95% species protection level
- Low reliability ANZECC 2000 guideline value
- Hickey & Martin 80% species protection
- Hickey & Martin 95% species protection

- E27 The contaminant concentrations in water measured at a compliance site specified in 'Table E4 – Receiving waters and sediment monitoring sites' must not exceed any contaminant limit specified in 'Table E6 – Receiving water contaminant limits during a release'.
- E28 Sediments must be monitored at the locations specified in 'Table E4 – Receiving waters and sediment monitoring sites'.
- E29 Sediments must be monitored for the contaminants stated in 'Table E7 – Sediment quality objectives and trigger levels'.

Table E7 - Sediment quality objectives and trigger levels

Contaminant ¹	Sediment quality (mg/kg) ^{1, 2}		
	Trigger levels (mg/kg) ³	Sediment quality objectives (mg/kg) ⁴	Monitoring Frequency
Antimony	2	25	Twice a year (once at the end of the wet season and once at the end of the dry season)
Arsenic	20	70	
Cadmium	1.5	10	
Chromium	80	370	
Copper	65	270	
Lead	50	220	
Nickel	21	52	
Mercury	0.15	1	
Zinc	200	410	

Notes:

1. Analysis for metals/metalloids concentrations in sediment must be conducted on the <2mm fraction of the sample and measured as a dilute acid extractable concentration in a manner consistent with the Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines, CSIRO (May 2013)
2. For sediment quality, compliance site monitoring results are to be compared:
 - a. Directly to the guideline values from the Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines, CSIRO (May 2013), if insufficient reference site monitoring data is available; or
 - b. The relevant reference site monitoring data, which must be normalised to account for any difference in particle size distribution (i.e. conduct a fractionated sediment analysis based on comparing the metals concentrations of the <63µm sediment fraction with the >63µm to <2mm sediment fraction)
3. ANZECC (2000) Interim Sediment Quality Guidelines – low values based on total sediments
4. ANZECC (2000) Interim Sediment Quality Guidelines – high values based on total sediments

E30 Sediments must be monitored at the monitoring frequency stated in 'Table E7 – Sediment quality objectives and trigger levels'.

E31 The contaminant concentrations measured at a compliance site specified in 'Table E4 – Receiving waters and sediment monitoring sites' must not exceed any sediment quality objective specified in 'Table E7 – Sediment quality objectives and trigger levels'.

E32 If a contaminant concentration measured at a compliance site specified in 'Table E4 - Receiving waters and sediment monitoring sites' exceeds any trigger level specified in 'Table E7 - Sediment quality objectives and trigger levels', the environmental authority holder must compare this result to the applicable control site; and

- a) if the contaminant concentration measured at the compliance site is equal to or less than the contaminant concentration measured at the applicable control site, no further action is required; or
- b) if the contaminant concentration measured at the compliance site is greater than the contaminant concentration measured at the applicable control site:
 - i. notify the administering authority within 24 hours of becoming aware of the trigger level exceedance; and
 - ii. undertake further sampling of potentially impacted sediments at the compliance site specified in 'Table E4 - Receiving waters and sediment monitoring sites' for all contaminants specified in 'Table E7 - Sediment quality objectives and trigger levels'; and
 - iii. complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the administering authority; and
 - iv. within one week of completing the investigation, provide a written report to the administering authority detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with part b) of this condition, no further reporting is required for subsequent trigger events for that contaminant.

- E33 The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, quality and flows due to the authorised activity. The REMP must include monitoring of the effects of the mine on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is all underlying groundwaters and the surface waters of Sandy Creek, Plumtree Creek, Elphinstone Creek and Connolly Creek and connected or surrounding waterways within 5km downstream of the activities. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
- E34 A REMP Design Document that addresses the requirements of condition E33 must be prepared and made available to the administering authority upon request.
- E35 A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and provided to the administering authority upon request. The REMP report must include:
- a) an assessment of background reference water quality; and
 - b) the condition of downstream water quality compared against water quality objectives; and
 - c) an assessment of the health of downstream riparian vegetation communities; and
 - d) the suitability of current release limits to protect downstream environmental values; and
 - e) a discussion of any impacts of releases on the receiving environment
- E36 The environmental authority holder must implement and maintain a Water Management Plan developed by an appropriately qualified person.
- E37 The environmental authority holder must implement and maintain a Brine Waste Management Plan (BWMP). The BWMP must include as a minimum:
- a) identification and characterisation of liquid and solid wastes generated by the Reverse Osmosis Water Treatment plant, including volumes measured;
 - b) a program for safe disposal of all wastes generated, including details of waste management control strategies and methods;
 - c) monitoring and reporting of the brine and waste generated from mining activities, including groundwater and surface water monitoring as required under this environmental authority; and
 - d) measures to be implemented to prevent brine waste causing environmental harm in the receiving environment
- E38 All liquid and solid wastes generated by the Reverse Osmosis Water Treatment plant must be disposed of in either the Sarsfield Pit, Buck Reef West Pit, Nolan's Tailings Storage Facility Expansion or off-site to a licensed facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994*.

- E39 Contaminated water may be piped or 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 or a third party (with the consent of the third party).
- E40 An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.
- E41 The environmental authority holder must not release contaminants to groundwater.
- E42 Groundwater quality and standing water levels must be monitored at the locations specified in 'Table E8 – Groundwater monitoring locations and frequency'.

Table E8 – Groundwater monitoring locations and frequency

Monitoring Point ^[1]	Location (GDA94 – Zone55)		Top of Casing RL (m) ^[2]	Screened interval RL (m)	Monitoring Frequency	
	Easting	Northing			Standing Water Level	Groundwater Quality
Aquifer description: Ravenswood Granites and Volcanics						
Compliance bores						
MTW_OB012	481813	7784245	327.15	4 – 37	Every 3 months	Every 3 months
MTW_OB014	482805	7784864	302.50	25 - 37		
NOL_OB129	490178	7772986	241.90	18 - 30		
NOL_OB131	488104	7771438	227.95	14 - 23		
NOL_OB132	487967	7771978	228.15	14 - 31		
NOL_OB133	488215	7773403	242.95	15 - 37		
SAR_OB089	487624	7776813	241.55	5 – 8.3	Every 3 months	Every 3 months
SAR_OB090	487627	7776817	241.55	20 – 23.2		
SAR_OB100	487969	7775688	256.15	18 - 30		
SAR_OB109	491081	7774720	247.60	9 - 30		
SAR_OB108	491852	7775399	256.95	9 - 37		
Operational bores						
MTW_OB002	482841	7784309	373.90	2 - 25	Every 3 months	Every 3 months
MTW_OB005	482036	7784061	331.40	15.6–30.5		
MTW_OB015	482665	7783833	319.70	18-30		
SAR_OB099	490965	7775110	247.50	35 - 50		
SC_OB012	492102	7777001	265.10	1.8-21.1		
SC_OB025	491874	7777772	283.05	16 - 43		
SAR_OB088	487883	7776554	245.10	15-18.4		
NOL_OB138	488769.92	7773569.2	236.722	20 - 26		
NOL_OB139	489370.53	7773581.8	234.993	20 - 26		
NOL_OB140	490262.23	7773624.9	245.237	20 - 26		
Interpretation bores						
NOL_OB143 ³	489290	7773905	236.04	7 – 31	Every 3 months	Every 3 months
NOL_OB096	488670	7772630	230.90	12-18		
NOL_OB0149 ³	488717	7773889	237.64	5 – 15		

NOL_OB124	488672	7772628	230.95	29 - 50
SAR_OB069 ³	490879	7774908	244.65	6 - 14
NOL_OB086	491392	7775896	253.40	4 - 6
NOL_OB126	490605	7775198	258.40	9 - 30
NOL_OB107 ³	489641	7775451	256.30	5 - 13
NOL_OB092	489169	7775716	266.30	2 - 9
NOL_OB093	489169	7775710	266.35	12 - 50
SAR_OB113	488286	7775581	262.70	19 - 25
NOL_OB108	489008	7776006	277.90	19 - 22
SAR_OB119	489005	7776478	268.20	20 - 26
SAR_OB092	487767	7777005	247.20	22 - 25
SAR_OB093	488132	7777268	251.05	6.3-9.3
SAR_OB094	488131	7777273	250.75	22.3-25.3
SAR_OB080	488531	7777499	248.60	2 - 4
SAR_OB048	488363	7777973	263.85	1 – 18.6
SAR_OB057A	489302	7777624	259.00	10 - 27
SAR_OB066	489475	7778287	258.00	4 - 12
SAR_OB067	489472	7778285	257.95	18 - 43
SAR_OB074	490584.5	7778219	265.949	4.5 - 21
SC_OB014A ³	491755	7777496	292.85	25-30.4
SC_OB004A ³	491957	7777174	267.70	7.3-25.8
SC_OB037	492654	7777252	263.35	7 - 37
SC_OB031	492650	7776500	260.30	10 - 18
NOL_OB127 ³	490495	7774580	242.58	18-30

Notes:

1. Compliance bores, interpretation bores and operational bores depicted in *Schedule K - Figure 2a – Groundwater bore network*
2. RL must be measured at the top of the bore casing to the nearest 5cm.
3. Where a groundwater bore is being utilised for seepage recovery via pumping groundwater depth measurements are not required whilst the pump is being operated.

E43 Groundwater quality and standing water levels must be monitored at the frequencies specified in 'Table E8 – Groundwater monitoring locations and frequency'.

E44 Groundwater quality must be monitored for all quality characteristics stated in 'Table E9 – Groundwater quality limits'.

Table E9 - Groundwater quality limits

Bore identifications	Limit Type	Quality Characteristics																					
		Aluminium (mg/L)	Arsenic (mg/L)		Cadmium (mg/L)		Cobalt (mg/L)		Copper (mg/L)		EC (uS/cm)	pH	Free Cyanide (mg/L)	Manganese (mg/L)		Molybdenum (mg/L)		Nitrate as N (NO3) (mg/L)	Sulfate as SO4 (mg/L)	Uranium (mg/L)		Zinc (mg/L)	
		Dissolved	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved			Total	Dissolved	Total	Dissolved			Total	Dissolved	Total	Dissolved
MTW-OB012	Limit A	NA	0.008 ^[2] _[3]	0.007 ^[2] _[3]	NA	NA	0.0030 ^[2] _[3]	0.004 ^[2] _[3]	NA	0.0036 ^[2] _{[2] [3]}	1644 ^[2] _[3]	NA	NA	2.018 ^[2] _[3]	2.430 ^[2] _[3]	0.002 ^[2] _[3]	NA	0.05 ^[2] _[3]	61 ^[2] _[3]	0.0136 ^[2] _[3]	0.0156 ^[2] _[3]	0.0102 ^[2] _[3]	0.0272 ^[2] _[3]
	Limit B	0.055 ^[6] _[2]	0.008 ^[2] _[4]	0.009 ^[2] _[4]	0.0002 ^[2] _[6]	0.002 ^[2] _[5]	0.0036 ^[2] _[4]	0.005 ^[2] _[4]	0.0005 ^[2] _[4]	0.0066 ^[2] _{[2] [4]}	1690 ^[2] _[4]	6.5-8.5	0.004 ^[6]	2.335 ^[2] _[4]	2.496 ^[2] _[4]	0.003 ^[2] _[4]	0.003 ^[2] _{[2] [4]}	0.07 ^[2] _[4]	66 ^[2] _[4]	0.0159 ^[2] _[4]	0.0173 ^[2] _[4]	0.0214 ^[2] _[4]	0.0494 ^[2] _[4]
MTW-OB014	Limit A	NA	0.024 ^[2] _[3]	0.024 ^[2] _[3]	NA	NA	NA	NA	NA	0.0005 ^[2] _{[2] [3]}	1394 ^[2] _[3]	NA	NA	1.378 ^[2] _[3]	1.418 ^[2] _[3]	0.004 ^[2] _[3]	0.005 ^[2] _{[2] [3]}	NA	242 ^[2] _[3]	0.0040 ^[1] _[3]	0.0048 ^[1] _[3]	0.0025 ^[2] _[3]	0.0066 ^[2] _[3]
	Limit B	0.055 ^[6] _[2]	0.041 ^[2] _[4]	0.042 ^[2] _[4]	0.0002 ^[2] _[6]	0.002 ^[2] _[5]	0.0005 ^[2] _[4]	0.0005 ^[2] _[4]	0.0005 ^[2] _[4]	0.0008 ^[2] _{[2] [4]}	1422 ^[2] _[4]	6.5-8.5	0.004 ^[6]	1.819 ^[2] _[4]	1.819 ^[2] _[4]	0.006 ^[2] _[4]	0.006 ^[2] _{[2] [4]}	0.01 ^[2] _[4]	245 ^[2] _[4]	0.0054 ^[1] _[4]	0.0057 ^[1] _[4]	0.0072 ^[2] _[4]	0.0150 ^[2] _[4]
NOL-OB129	Limit A	NA	0.011 ^[2] _[3]	0.013 ^[2] _[3]	NA	NA	0.0005 ^[2] _[3]	0.0012 ^[2] _[3]	0.0005 ^[2] _[3]	0.0044 ^[2] _[3]	656 ^[2] _[3]	NA	NA	3.136 ^[2] _[3]	3.202 ^[2] _[3]	NA	0.004 ^[2] _{[2] [3]}	0.02 ^[2] _[3]	38 ^[2] _[3]	0.0122 ^[2] _[3]	0.0140 ^[2] _[3]	0.0090 ^[2] _[3]	0.0192 ^[2] _[3]
	Limit B	0.055 ^[6] _[2]	0.013 ^[2] _[4]	0.014 ^[2] _[4]	0.0002 ^[2] _[6]	0.002 ^[2] _[5]	0.0008 ^[2] _[4]	0.0031 ^[2] _[4]	0.0008 ^[2] _[4]	0.0076 ^[2] _[4]	728 ^[2] _[4]	6.5-8.5	0.004 ^[6]	3.205 ^[2] _[4]	3.369 ^[2] _[4]	0.004 ^[2] _[4]	0.005 ^[2] _{[2] [4]}	0.06 ^[2] _[4]	44 ^[2] _[4]	0.0169 ^[2] _[4]	0.0193 ^[2] _[4]	0.0101 ^[2] _[4]	0.0222 ^[2] _[4]
NOL-OB131	Limit A	NA	0.003 ^[2] _[3]	NA	NA	NA	0.0024 ^[2] _[3]	0.0030 ^[2] _[3]	NA	NA	896 ^[2] _[3]	NA	NA	0.014 ^[2] _[3]	0.027 ^[2] _[3]	NA	0.003 ^[2] _{[2] [3]}	0.39 ^[2] _[3]	130 ^[2] _[3]	0.0026 ^[2] _[3]	0.0026 ^[2] _[3]	0.0068 ^[2] _[3]	0.0112 ^[2] _[3]
	Limit B	0.055 ^[6] _[2]	0.004 ^[2] _[4]	0.004 ^[2] _[4]	0.0002 ^[2] _[6]	0.002 ^[2] _[5]	0.0030 ^[2] _[4]	0.0048 ^[2] _[4]	0.0005 ^[2] _[4]	0.0005 ^[2] _[4]	960 ^[2] _[4]	6.5-8.5	0.004 ^[6]	0.019 ^[2] _[4]	0.053 ^[2] _[4]	0.003 ^[2] _[4]	0.004 ^[2] _{[2] [4]}	0.40 ^[2] _[4]	164 ^[2] _[4]	0.0030 ^[2] _[4]	0.0030 ^[2] _[4]	0.0116 ^[2] _[4]	0.0346 ^[2] _[4]
NOL-OB132	Limit A	NA	0.014 ^[2] _[3]	0.013 ^[2] _[3]	NA	NA	0.0005 ^[2] _[3]	0.0005 ^[2] _[3]	NA	0.0010 ^[2] _[3]	1491 ^[2] _[3]	NA	NA	0.236 ^[2] _[3]	0.233 ^[2] _[3]	0.016 ^[2] _[3]	0.018 ^[2] _{[2] [3]}	0.04 ^[2] _[3]	53 ^[2] _[3]	0.0096 ^[2] _[3]	0.0106 ^[2] _[3]	0.0080 ^[2] _[3]	0.0170 ^[2] _[3]
	Limit B	0.055 ^[6] _[2]	0.018 ^[2] _[4]	0.018 ^[2] _[4]	0.0002 ^[2] _[6]	0.003 ^[2] _[5]	0.0030 ^[2] _{[4] [4]}	0.0050 ^[2] _[4]	0.0005 ^[2] _[4]	0.0165 ^[2] _[4]	1977 ^[2] _[4]	6.5-8.5	0.004 ^[6]	1.127 ^[2] _[4]	1.140 ^[2] _[4]	0.018 ^[2] _[4]	0.019 ^[2] _{[2] [4]}	0.06 ^[2] _[4]	56 ^[2] _[4]	0.0113 ^[2] _[4]	0.0143 ^[2] _[4]	0.0140 ^[2] _[4]	0.0355 ^[2] _[4]
NOL-OB133	Limit A	NA	0.043 ^[2] _[3]	0.045 ^[2] _[3]	NA	NA	0.0007 ^[2] _[3]	0.0010 ^[2] _[3]	NA	0.0034 ^[2] _[3]	1373 ^[2] _[3]	NA	NA	0.618 ^[2] _[3]	0.679 ^[2] _[3]	0.036 ^[2] _[3]	0.038 ^[2] _{[2] [3]}	0.01 ^[2] _[3]	17 ^[2] _[3]	0.0048 ^[1] _[3]	0.0050 ^[1] _[3]	0.0068 ^[2] _[3]	0.0160 ^[2] _[3]
	Limit B	0.055 ^[6] _[2]	0.046 ^[2] _[4]	0.048 ^[2] _[4]	0.0002 ^[2] _[6]	0.002 ^[2] _[5]	0.0016 ^[2] _{[4] [4]}	0.0016 ^[2] _[4]	0.0005 ^[2] _[4]	0.0058 ^[2] _[4]	1386 ^[2] _[4]	6.5-8.5	0.004 ^[6]	0.694 ^[2] _[4]	0.719 ^[2] _[4]	0.038 ^[2] _[4]	0.040 ^[2] _{[2] [4]}	0.03 ^[2] _[4]	21 ^[2] _[4]	0.0050 ^[1] _[4]	0.0057 ^[1] _[4]	0.0092 ^[2] _[4]	0.0328 ^[2] _[4]
SAR-OB089	Limit A	NA	0.320 ^[3]	0.327 ^[3]	NA	NA	0.0010 ^[3]	NA	0.0010 ^[3]	0.0020 ^[3]	2488 ^[3]	NA	NA	0.810 ^[3]	0.879 ^[3]	0.008 ^[3]	0.011 ^[3]	0.02 ^[3]	911 ^[3]	0.0128 ^[3]	0.0138 ^[3]	0.0100 ^[3]	0.0100 ^[3]
	Limit B	0.055 ^[6] _[2]	0.460 ^[4]	0.505 ^[4]	0.0002 ^[6]	0.002 ^[5]	0.0020 ^[4]	0.0020 ^[4]	0.0020 ^[4]	0.0022 ^[4]	3088 ^[4]	6.5-8.5	0.004 ^[6]	1.330 ^[4]	1.900 ^[6]	0.009 ^[4]	0.383 ^[4]	1.31 ^[4] _[4]	1023 ^[4]	0.0144 ^[4]	0.0158 ^[4]	0.0302 ^[4]	0.0302 ^[4]
SAR-OB090	Limit A	NA	0.007 ^[3]	0.007 ^[3]	NA	NA	0.0020 ^[3]	0.0020 ^[3]	0.0005 ^[3]	0.0020 ^[3]	1720 ^[3]	NA	NA	1.400 ^[3]	1.510 ^[3]	0.007 ^[3]	0.008 ^[3]	0.06 ^[3]	515 ^[3]	0.0098 ^[3]	0.0118 ^[3]	0.0060 ^[3]	0.0170 ^[3]
	Limit B	0.055 ^[6] _[2]	0.008 ^[4]	0.009 ^[4]	0.0002 ^[6]	0.002 ^[5]	0.0025 ^[4]	0.0028 ^[4]	0.0006 ^[4]	0.0065 ^[4]	1884 ^[4]	6.5-8.5	0.004 ^[6]	1.682 ^[4]	1.772 ^[4]	0.010 ^[4]	0.011 ^[4]	0.24 ^[4]	671 ^[4]	0.0114 ^[4]	0.0124 ^[4]	0.0195 ^[4]	0.0292 ^[4]
SAR-OB100	Limit A	NA	0.047 ^[2] _[3]	0.047 ^[2] _[3]	NA	NA	NA	0.0022 ^[2] _[3]	NA	0.0082 ^[2] _[3]	1284 ^[2] _[3]	NA	NA	2.360 ^[2] _[3]	2.776 ^[2] _[3]	0.012 ^[2] _[3]	0.013 ^[2] _{[2] [3]}	0.27 ^[2] _[3]	33 ^[2] _[3]	0.0150 ^[2] _[3]	0.0170 ^[2] _[3]	0.0032 ^[2] _[3]	0.0180 ^[2] _[3]

	Limit B	0.055 ^[6] [2]	0.080 ^[2] [4]	0.085 ^[2] [4]	0.0002 ^[2] [6]	0.002 ^[2] [5]	0.0005 ^[2] [4]	0.0035 ^[2] [4]	0.0005 ^[2] [4]	0.0106 ^[2] [4]	1298 ^[2] [4]	6.5- 8.5	0.004 [6]	3.224 ^[2] [4]	3.508 ^[2] [4]	0.013 ^[2] [4]	0.176 ^[2] [4]	0.99 ^[2] [4]	42 ^[2] [4]	0.0195 ^[2] [4]	0.0222 ^[2] [4]	0.0065 ^[2] [4]	0.0345 ^[2] [4]
SAR- OB109	Limit A	NA	0.059 ^[2] [3]	0.060 ^[2] [3]	NA	NA	0.0050 ^[2] [3]	0.0082 ^[2] [3]	0.0005 ^[2] [3]	0.0022 ^[2] [3]	2559 ^[2] [3]	NA	NA	0.117 ^[2] [3]	0.152 ^[2] [3]	0.003 ^[2] [3]	0.003 ^[2] [3]	5.43 ^[2] [3]	1094 [2] [3]	0.0106 ^[2] [3]	0.0116 ^[2] [3]	0.0120 ^[3]	0.0120 ^[3]
	Limit B	0.055 ^[6] [2]	0.062 ^[2] [4]	0.062 ^[2] [4]	0.0002 ^[2] [6]	0.002 ^[2] [5]	0.0055 ^[2] [4]	0.0090 ^[2] [4]	0.0013 ^[2] [4]	0.0041 ^[2] [4]	2697 ^[2] [4]	6.5- 8.5	0.004 [6]	0.181 ^[2] [4]	0.184 ^[2] [4]	0.005 ^[2] [4]	0.005 ^[2] [4]	6.04 ^[2] [4]	1160 [2] [4]	0.0116 ^[2] [4]	0.0120 ^[2] [4]	0.0200 ^[4]	0.0200 ^[4]
SAR- OB108	Limit A	NA	0.068 ^[2] [3]	0.070 ^[2] [3]	NA	NA	NA	NA	NA	0.0104 ^[1] [3]	782 ^[1] [7]	TBA	TBA	6.380 ^[1] [3]	6.508 ^[1] [3]	0.006 ^[1] [3]	0.007 ^[1] [3]	TBA	6 ^[1] [3]	0.0048 ^[1] [3]	0.0048 ^[1] [3]	0.0053 ^[1] [3]	0.0228 ^[1] [3]
	Limit B	0.055 ^[1] [6]	0.089 ^[2] [4]	0.092 ^[2] [4]	0.0002 ^[1] [6]	0.002 ^[1] [5]	0.0010 ^[1] [4]	0.0020 ^[1] [4]	0.0005 ^[1] [4]	0.0243 ^[1] [4]	1300 ^[1] [4] [7]	6.5- 8.5	0.004 [6]	7.502 ^[1] [4]	7.611 ^[1] [4]	0.021 ^[1] [4]	0.026 ^[1] [4]	0.01 ^[1] [4]	11 ^[1] [4]	0.0050 ^[1] [4]	0.0057 ^[1] [4]	0.0081 ^[1] [4]	0.0286 ^[1] [4]

^[1] Interim limit (<8 data points) ^[2] Interim limit (8-12 data points) ^[3] 80th %ile bore data ^[4] 95th %ile bore data ^[5] Drinking water ^[6] Aquatic Ecosystem ^[7] Draft WQO

TBA Means to be advised to the administering authority by **31 January 2023** via an amendment application.

NA Limit B to protect EV's

- E45 Groundwater measured at any compliance bore specified in 'Table E8 – Groundwater monitoring locations and frequency' must not exceed the corresponding Limit A specified in 'Table E9 – Groundwater quality limits' on any five consecutive sampling occasions.
- E46 Groundwater measured at any compliance bore specified in 'Table E8 – Groundwater monitoring locations and frequency' must not exceed the corresponding Limit B specified in 'Table E9 – Groundwater quality limits' on any three consecutive sampling occasions.
- E47 If groundwater measured at any compliance bore specified in 'Table E8 – Groundwater monitoring locations and frequency' exceeds the corresponding Limit B specified in 'Table E9 – Groundwater quality limits' on any one sampling occasion the environmental authority holder must resample the groundwater within the compliance bore for all exceeding parameters within ten business days of receipt of results.
- E48 By 24 February 2023, the environmental authority holder must ensure that groundwater quality measured in operational bores specified in 'Table E8 – Groundwater monitoring locations and frequency' is improved.
- E49 The environmental authority holder must install, operate and maintain Seepage Management Systems to prevent seepage from all site infrastructure moving beyond the operational bores specified in 'Table E8 – Groundwater monitoring locations and frequency'.
- E50 The Seepage Management Systems required by condition E49 must, at a minimum:
- a) include effective control measures to minimise seepage from all site infrastructure; and
 - b) include effective control measures to capture and pump-back seepage sufficient to prevent migration into surface waters; and
 - c) include effective control measures to ensure seepage does not report to groundwater in the receiving environment; and
 - d) include effective control measures to ensure compliance with condition E48; and
 - e) include adequate detection measures to analyse and confirm the effectiveness of all control measures required by this condition
- E51 The environmental authority holder must implement a Seepage Management Plan (SMP). The SMP must, at a minimum:
- a) describe the Seepage Management Systems required by condition E49; and
 - b) include adequate control measures to ensure groundwater quality in compliance bores listed in Table 'E8 – Groundwater monitoring locations and frequency' comply with all limits specified in 'Table E9 – Groundwater quality limits'; and
 - c) include all measures necessary to ensure that the management intent for groundwater is achieved in accordance with condition E48; and
 - d) include all measures necessary to ensure compliance with conditions E1 and E41; and
 - e) include adequate measures to intercept seepage sufficient to prevent migration beyond the operational and compliance bores as specified in 'Table E8 – Groundwater monitoring locations and frequency'; and
 - f) include adequate measures to determine if any additional control measures e.g. interception bores or interception trenches are required; and
 - g) include an action plan to implement and/or install any additional control measures that are required; and

- h) include a map or figure that depicts the location and type of seepage control measures installed; and
- i) be reviewed annually for the effectiveness of the components and include details of improvements undertaken in the previous year; and
- j) address any comments made by the administering authority

The SMP must be made available to the administering authority annually from 4 February 2021.

E52 The environmental authority holder must implement a Groundwater Management Program that has been developed by an appropriately qualified person.

E53 The Groundwater Management Program required by Condition E52 must:

- a) identify potential sources of contamination to groundwater from the activity; and
- b) identify the location of groundwater users and the type of use; and
- c) ensure that all potential groundwater impacts due to the activity are identified, monitored and mitigated; and
- d) document sampling and monitoring methodology; and
- e) ensure that adequate groundwater monitoring and data analysis is undertaken to achieve the following objectives:
 - i. detect any impacts to groundwater levels due to the activity; and
 - ii. detect any impacts to groundwater quality due to the activity; and
 - iii. determine trends in groundwater quality
- f) include an appropriate quality assurance and quality control program; and
- g) include a conceptual groundwater model; and
- h) include a review process to identify improvements to the program that includes addressing any comments provided by the administering authority

E54 The Groundwater Management Program required by condition E52 must be reviewed on an annual basis by an appropriately qualified person to determine if it continues to meet the requirements of condition E53.

E55 The environmental authority holder must implement a Subterranean Fauna Monitoring and Management Program that has been developed by an appropriately qualified person.

E56 The Subterranean Fauna Monitoring and Management Program required by condition E55 must include adequate monitoring of subterranean species of stygofauna and troglafauna in all groundwaters and hyporheic waters potentially impacted by the mining activities and must achieve the following objectives:

- a) identify and describe all subterranean fauna species present; and
- b) assess and describe predicted impacts to all subterranean fauna identified; and
- c) recommend impact mitigation and minimisation measures for the fauna identified; and
- d) monitor and record the effects of the mining activity on the subterranean fauna species; and
- e) recommend actions, including timeframes for implementation, to ensure that potential impacts to subterranean fauna are prevented

E57 The environmental authority holder must implement recommendations from the Subterranean Fauna Monitoring and Management Program developed under condition E55 within the recommended timeframes.

- E57 The environmental authority holder must implement recommendations from the Subterranean Fauna Monitoring and Management Program developed under condition E55 within the recommended timeframes.
- E58 The construction, maintenance and decommissioning of groundwater monitoring bores must be undertaken in a manner that:
- a) prevents contaminants entering the groundwater; and
 - b) ensures the integrity of the bores to obtain representative groundwater samples from the target aquifer; and
 - c) maintains the hydrogeological environment within the aquifer
- E59 A bore drill log must be kept for each operational, compliance and observation groundwater monitoring bore which includes:
- a) bore identification reference and geographic coordinate location;
 - b) specific construction information including but not limited to depth of bore, depth and length of casing, depth and length of screening and bore sealing details;
 - c) standing groundwater level and water quality parameters including physical parameters and results of laboratory analysis for the possible trigger parameters;
 - d) lithological data and stratigraphic interpretation by an appropriately qualified person to identify important features associated with groundwater monitoring; and
 - e) target aquifer formation of the bore
- E60 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:
- 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 contaminated water released from all release points;
 - e) the release flow rate at the time of sampling for each release point;
 - f) the results of all monitoring and details of any exceedances of the conditions of this environmental authority;
 - g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request
- E61 The environmental authority holder must complete an annual analysis of groundwater data for all locations in 'Table E8 – Groundwater monitoring locations and frequency' and any further groundwater monitoring locations monitored under the Receiving Environment Monitoring Program as required under condition E33.
- E62 Monitoring and sampling must be carried out in accordance with written procedures and must address the requirements of the latest version of the following documents unless otherwise approved by the administering authority:
- a) for waters and aquatic environments, the latest version of the Queensland Government's Monitoring and Sampling Manual;

- b) for groundwater, Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat#6890.1) and Australian Standard AS/NZS 5667.11:1998 Water Quality – Sampling – Guidance on sampling of groundwaters;
- c) for subterranean aquatic fauna, the Queensland Government's Guideline for the Environmental Assessment of Subterranean Aquatic Fauna

END OF SCHEDULE E

Schedule F: Sewage Treatment

- F1 Treated sewage effluent from the sewage treatment plant must comply with the release limits stated in 'Table F1 – Treated sewage effluent contaminant release limits'.
- F2 The only contaminants permitted to be released to land is treated sewage effluent in compliance with the release limits stated in 'Table F1 – Treated sewage effluent contaminant release limits'.

Table F1 - Treated sewage effluent contaminant release limits

Contaminant (mg/L unless specified otherwise)	Release limit	Limit type	Frequency
5 day Biochemical oxygen demand	20	Maximum	Monthly
Total suspended solids	30	Maximum	Monthly
Nitrogen	30	Maximum	Monthly
Phosphorus	15	Maximum	Monthly
E-coli (Organisms/100ml)	1000	Maximum	Monthly
pH (pH units)	6.0 – 9.0	Range	Monthly

- F3 Treated sewage effluent may only be released to land in accordance with the conditions of this environmental approval within the nominated area(s) at Mt Wright and Ravenswood Golf Course (as identified in 'Table A1 - Authorised activities and locations'.
- F4 The application of treated sewage effluent to land must be carried out in a manner such that:
- a) vegetation is not damaged; and
 - b) there is no surface ponding of effluent; and
 - c) there is no run-off or over-spray of effluent
- F5 If areas irrigated with sewage effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is present and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.
- F6 All sewage effluent releases must be monitored at the frequency and for the parameters specified in 'Table F1 – Treated sewage effluent contaminant release limits'.
- F7 The daily volume of effluent release to land must be measured and records kept of the volumes of effluent released.
- F8 When circumstances prevent the irrigation or beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to a wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent.
- F9 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.

END OF SCHEDULE F

Schedule G: Land and Rehabilitation

G1 The environmental authority holder must rehabilitate all land disturbed by the activities in accordance with 'Table G1 - Final Land Use and Rehabilitation Approval Schedule', in a manner that ensures rehabilitated areas achieve the following rehabilitation objectives:

- a) safe for humans and wildlife;
- b) non-polluting;
- c) stable;
- d) able to sustain an agreed post-mining land-use;
- e) re-vegetated with species endemic to the area with no declared pest species; and
- f) compliant with all conditions of this environmental authority

Table G1 - Final Land Use and Rehabilitation Approval Schedule

Mine Domain	Mine Feature Name	Post-mine land description	Indicator	Completion criteria
Infrastructure	Potable water treatment plant	Native Ecosystem	TBA ¹	TBA ¹
	Reverse osmosis treatment plant	Native Ecosystem	TBA ¹	TBA ¹
	Sewage treatment plant	Sewage Treatment Plant	TBA ¹	TBA ¹
	Sarsfield workshop and office area	Native Ecosystem	TBA ¹	TBA ¹
	Sarsfield plant site & conveyors	Native Ecosystem	TBA ¹	TBA ¹
	Mine village	Native Ecosystem	TBA ¹	TBA ¹
	Nolans plant site	Native Ecosystem	TBA ¹	TBA ¹
	Nolan's support infrastructure	Native Ecosystem	TBA ¹	TBA ¹
	Buck Reef site	Native Ecosystem	TBA ¹	TBA ¹
	Buck Reef West mining support infrastructure	Native Ecosystem	TBA ¹	TBA ¹
	Ravenswood roads & tracks	Native Ecosystem	TBA ¹	TBA ¹
	Mt Wright roads & tracks	Native Ecosystem	TBA ¹	TBA ¹
	Mt Wright workshop and office area	Native Ecosystem/Low Intensity Grazing	TBA ¹	TBA ¹
	Buck Reef West roads	Native Ecosystem	TBA ¹	TBA ¹

Mine Domain	Mine Feature Name	Post-mine land description	Indicator	Completion criteria
Tailings	Old Nolans Tailings Storage Facility	Native Ecosystem	TBA ¹	TBA ¹
	Nolans Tailings Storage Facility Expansions	Native Ecosystem	TBA ¹	TBA ¹
	Dry Stack Tailings Storage Facility	Revegetated Tailings Dam	TBA ¹	TBA ¹
Overburden and Waste	Landfill area	Native Ecosystem	TBA ¹	TBA ¹
	Nolans waste rock dump	Revegetated Waste Rock Dump	TBA ¹	TBA ¹
	Sarsfield waste rock dump	Revegetated Waste Rock Dump	TBA ¹	TBA ¹
	Nolans ROM & mineralised waste dumps	Revegetated Waste Rock Dump	TBA ¹	TBA ¹
	Sarsfield ROM & mineralised waste dumps	Native Ecosystem	TBA ¹	TBA ¹
	Mt Wright waste rock dump & ROM	Revegetated Waste Rock Dump and Sealed Portal	TBA ¹	TBA ¹
	Back Reef West waste rock dump	Revegetated Waste Rock Dump	TBA ¹	TBA ¹
Water management	Process water pond	Water Dams	TBA ¹	TBA ¹
	TSF dam	Water Dams	TBA ¹	TBA ¹
	Mt Wright sediment management	Sediment Dams	TBA ¹	TBA ¹
	Sarsfield water management	Sediment Dams	TBA ¹	TBA ¹
	Nolan's water management	Sediment Dams	TBA ¹	TBA ¹
	Underground water supply infrastructure	Native Ecosystem	TBA ¹	TBA ¹
	Buck Reef West Water management	Native Ecosystem	TBA ¹	TBA ¹
	Seepage recovery	Native Ecosystem	TBA ¹	TBA ¹
Pits	Sarsfield Pit	Open Void	TBA ¹	TBA ¹
	Nolans Pit	Open Void	TBA ¹	TBA ¹
	Buck Reef West Pit	Open Void	TBA ¹	TBA ¹
Historic mining area	Heap leach pads 1 and 2	Revegetated Leach Pads	TBA ¹	TBA ¹

Mine Domain	Mine Feature Name	Post-mine land description	Indicator	Completion criteria
	Golf course/ Historic Mellaneur Pit	Golf Course	TBA ¹	TBA ¹
	Waste rock dump 1 (SYC & OCA)	Revegetated Waste Rock Dump	TBA ¹	TBA ¹
	Waste rock dump 2 & ROM (Buck Reef)	Revegetated Waste Rock Dump	TBA ¹	TBA ¹
	Sandy Creek Tailings Storage Facility	Native Ecosystem	TBA ¹	TBA ¹
	Mt Wright historic workings and exploration	Native Ecosystem/Low Intensity Grazing	TBA ¹	TBA ¹
	Sandy Creek plant site	Native Ecosystem	TBA ¹	TBA ¹
Other	Sarsfield acoustic bund	Native Ecosystem	TBA ¹	TBA ¹
	Buck Reef West acoustic bund	Native Ecosystem	TBA ¹	TBA ¹
	Helipad	Native Ecosystem	TBA ¹	TBA ¹
	Topsoil stockpiles	Native Ecosystem	TBA ¹	TBA ¹

Notes:

1. TBA fields to be provided to the administering authority **5 March 2018** and in accordance with the administering authorities' rehabilitation guideline 'Rehabilitation requirements for mining resource activities (EM1122)'

G2 A Post Mine Land Use Plan ('PMLUP') that describes how the rehabilitation objectives in condition G1 will be achieved must be developed, documented and implemented for all stages of the activity by 5 March 2018. The PMLUP must at minimum include:

- a) schematic representation of the proposed final land form inclusive of site drainage features;
- b) details of proposed slope design and erosion and sediment controls;
- c) proposed cover designs for encapsulation of waste material, including performance criteria;
- d) proposed re-vegetation methods inclusive of plant species selection, propagation methods and establishment of suitable plant growth medium (i.e. top soil);
- e) materials balance for all rehabilitation requirements including available top soil and material suitable for encapsulating waste in accordance with the proposed encapsulation methodology;
- f) geotechnical, geochemical and hydrological studies necessary to demonstrate likely success of proposed rehabilitation methodology to achieve the required rehabilitation outcomes;
- g) an investigation of proposed residual voids including potential for generation/mobilisation of contaminants, potential pathways for release of contaminants to waters (including groundwater) and a long-term void water balance model; and
- h) a rehabilitation-monitoring program sufficient to identify if required rehabilitation outcomes have been achieved.

- G3 Rehabilitation in accordance with condition G2 must commence progressively, and within 6 months (or longer period agreed in writing with the administering authority) of completion of activities causing significant disturbance to land.
- G4 All explosives, flammable or corrosive substances, hazardous chemicals, toxic substances, gases and dangerous goods must be stored and handled in accordance with:
- the current Australian Standard where applicable; or
 - where no relevant Australian Standard exists, store such materials within an on-site containment system sufficient to prevent release to the receiving environment.
- G5 Significant residual impacts to prescribed environmental matters, other than if the impacts were authorised by an existing authority issued before the commencement of the *Environmental Offsets Act 2014*, are not authorised under this environmental authority or the *Environmental Offsets Act 2014* unless the impact is specified in 'Table G2 – Significant residual impacts to prescribed environmental matters'.

Table G2 – Significant residual impacts to prescribed environmental matters

Prescribed environmental matter	Location of impact GDA94 (Zone 55)	Maximum extent of impact
Prescribed Regional Ecosystem (RE) within defined distance of the defining banks of a watercourse		
RE 9.12.1a <i>Eucalyptus crebra</i> and/or <i>E. xanthoclada</i> and/or <i>E. drepanophylla</i> low open woodland on igneous rocks	Easting 489143, Northing 7774174	29.05ha
RE 9.3.1 <i>Eucalyptus camaldulensis</i> and/or <i>E. tereticornis</i> +/- <i>Melaleuca</i> spp. +/- <i>Casuarina cunninghamiana</i> fringing woodland on channels and levees	Easting 488693, Northing 7774020	1.84ha

- G6 Records demonstrating that each impact to a prescribed environmental matter not listed in 'Table G2 – Significant residual impacts to prescribed environmental matters' did not, or is not likely to, result in a significant residual impact to that matter must be:
- completed by an appropriately qualified person; and
 - kept for the life of the environmental authority.
- G7 An environmental offset made in accordance with the *Environmental Offsets Act 2014* and Queensland Environmental Offsets Policy, as amended from time to time, must be undertaken for the maximum extent of impact to each prescribed environmental matter authorised in 'Table G2 – Significant residual impacts to prescribed environmental matters', unless a lesser extent of the impact has been approved in accordance with condition G9.
- G8 Prior to the commencement of any impacts to a prescribed environmental matter for which an environmental offset is required by condition G7, a report completed by an appropriately qualified person that contains an analysis of the estimated maximum extent of impact to each prescribed environmental matter must be provided to the administering authority.
- G9 The report required by condition G8 must be approved by the administering authority before the notice of election, if applicable, is given to the administering authority.

- G10 The notice of election for the environmental offset required by condition G9, if applicable, must be provided to the administering authority no less than three months before the proposed commencement of the significant residual impacts for which the environmental offset is required.
- G11 All previous disturbance on mining lease ML1722, as depicted in 'Schedule K, Figure 3' must be rehabilitated in accordance with conditions G1 and G2 of this environmental authority.
- Note: ML1722 was replaced by ML100172.
- G12 All previous disturbance on the area covered by mining lease ML100156, as depicted in 'Schedule K, Figure 3' must be rehabilitated in accordance with conditions G1 and G2 of this environmental authority.

END OF SCHEDULE G

Schedule H: Heritage

H1 The environmental authority holder must implement and maintain a Historic Heritage Management Plan.

END OF SCHEDULE H

Schedule I: Regulated Structures

- I1 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) if it is an existing structure prior to any change in its purpose or the nature of its stored contents.
- I2 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.
- I3 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).
- I4 Conditions I5 to I9 inclusive do not apply to existing structures.
- I5 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).
- I6 Construction of a regulated structure is prohibited unless the environmental authority holder has submitted to the administering authority and 28 days have elapsed, the following:
- a) a consequence category assessment report, as required by condition I2, and
 - b) the suitably qualified and experienced person certified design and design plan; and
 - c) the associated operating procedures produced by a suitably qualified and experienced person.
- I7 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 Regulated Structures register.
- I8 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);
 - 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 structure from any watercourse or drainage line; and
 - ii. wall failure due to erosion by floodwaters arising from any watercourse or drainage line.
 - c) have the floor and sides of the structure designed and constructed to prevent or minimise the passage of the wetting front and any entrained contaminants through either the floor or sides of the structure during the operational life of the structure and for any period of decommissioning and rehabilitation of the structure.
- I9 Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority within 10 days of the completion of construction of the regulated structure (or a timeframe agreed to by the administering authority), and state that:
- a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - b) construction of the regulated structure is in accordance with the design plan.

- I10 All affected persons must be provided with a copy of the emergency action plan in place for each regulated structure:
- a) for existing structures that are regulated structures, within ten (10) business days of this condition taking effect;
 - b) prior to the operation of the new regulated structure; and
 - c) if the emergency action plan is amended, within five (5) business days of it being amended.
- I11 Operation of a regulated structure, except for an existing structure, must not commence unless the environmental authority holder has submitted to the administering authority all of the following:
- a) one electronic copy of the design plan and certification of the 'design plan' in accordance with condition I6;
 - b) a set of 'as constructed' drawings and specifications;
 - c) certification of the 'as constructed drawings and specifications' in accordance with condition I9;
 - d) where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the design storage allowance (DSA) volume across the system, a copy of the certified system design plan;
 - e) the requirements of this authority relating to the construction of the regulated structure have been met;
 - f) the environmental authority holder has entered the details required under this authority, into a Register of Regulated Structures; and
 - g) there is a current operational plan for the regulated structure.
- I12 For existing structures that are regulated structures:
- a) where the existing structure that is a regulated structure is managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, the environmental authority holder must submit to the administering authority within three (3) months of the commencement of this condition a copy of the certified system design plan including that structure; and
 - b) there must be a current operational plan for the existing structures.
- I13 Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in a manner that is consistent with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.
- I14 Conditions I15 to I17 inclusive apply to all Regulated Structures other than those certified as low consequence category for 'failure to contain – overtopping'.
- I15 The Mandatory Reporting Level (the MRL) specified in 'Table I1 – Hydraulic Performance Criteria' must be marked on a regulated structure in such a way that during routine inspections of that structure, it is clearly observable.
- I16 The environmental authority 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.
- I17 The environmental authority holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated structure.

- I18 The environmental authority holder must assess the performance of each regulated structure or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated structure or linked containment system taken prior to 1 July of each year.
- I19 By 1 November of each year, storage capacity must be available in each regulated structure (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the structure (or network of linked containment systems), as specified in 'Table I1- Hydraulic performance criteria'.
- I20 The environmental authority holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated structure (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.
- I21 The environmental authority holder must, immediately on becoming aware that a regulated structure (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 structure or linked containment systems.
- I22 Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.
- I23 At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include a recommendations section, with any recommended actions to ensure the integrity of the regulated structure or a positive statement that no recommendations are required.
- I24 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).
- I25 The environmental authority holder must within twenty (20) business days of receipt of the annual inspection report, provide to the administering authority:
- a) the recommendations section of the annual inspection report; and
 - b) if applicable, any details of any actions being taken in response to those recommendations

Table I1 – Hydraulic performance criteria

Name of Regulated Structure	Design Consequence Category	Spillway Capacity		Design Storage Allowance (DSA)		Mandatory Reporting Level (MRL)		Purpose of structure
		Design Criteria	m RL	Design Criteria	m RL	Design Criteria	m RL	
Old Nolan's Tailings Storage Facility	Non-operational							
Nolan's Tailings Storage Facility Expansion Stage 1A (RL260.0m)	High	1:100,000 AEP	RL 259.0	1:100 AEP 3 month wet season + process inputs	RL 257.3 (1,660ML)	Greater of 1:100 AEP 72 hour storm; or 1:100 AEP wind event	RL 258.4	Permanent containment of gold processing tailings and RO plant brine waste
Nolan's Tailings Storage Facility Expansion Stage 1B (RL270.0m)	High	1:100,000 AEP	RL 269.0	1:100 AEP 3 month wet season + process inputs	RL 267.5 (1,660ML)	Greater of 1:100 AEP 72 hour storm; or 1:100 AEP wind event	RL 268.5	Permanent containment of gold processing tailings and RO plant brine waste
Nolan's Tailings Storage Facility Expansion Stage 1C (RL280.0m)	High	1:100,000 AEP	RL 279.0	1:100 AEP 3 month wet season + process inputs	RL 277.6 (1,660ML)	Greater of 1:100 AEP 72 hour storm; or 1:100 AEP wind event	RL 278.5	Permanent containment of gold processing tailings and RO plant brine waste
Nolan's Tailings Storage Facility Expansion Stage 2 (RL286.0m)	High	1:100,000 AEP	RL 285.0	1:100 AEP 3 month wet season + process inputs	RL 283.7 (805ML)	Greater of 1:100 AEP 72 hour storm; or 1:100 AEP wind event	RL 284.5	Permanent containment of gold processing tailings and RO plant brine waste
Nolan's Tailings Storage Facility Expansion Stage 3 (RL305.5m)	High	1:100,000 AEP	RL 304.5	1:100 AEP 3 month wet season + process inputs	RL 297.6 (1,660ML)	Greater of 1:100 AEP 72 hour storm; or 1:100 AEP wind event	RL 303.75	Permanent containment of gold processing tailings and RO plant brine waste
Nolan's Tailings Storage Facility Expansion Stage 6 (RL313.0m)	High	1:100,000 AEP	RL 312.0	1:100 AEP 3 month wet season + process inputs	RL 308.5 (805ML)	Greater of 1:100 AEP 72 hour storm; or 1:100 AEP wind event	RL 311.25	Permanent containment of gold processing tailings and RO plant brine waste

Name of Regulated Structure	Design Consequence Category	Spillway Capacity		Design Storage Allowance (DSA)		Mandatory Reporting Level (MRL)		Purpose of structure
		Design Criteria	m RL	Design Criteria	m RL	Design Criteria	m RL	
Dry Stack Tailings Storage Facility	High	TBD	TBD	1: 100 AEP 3 month wet season + process inputs	TBD	TBD	TBD	Permanent containment of gold processing tailings
Sandy Creek Tailings Storage Facility	Non-operational							
Nolan's / Sarsfield Pit	Significant	N/A	N/A	1:10 AEP 3 month wet season + process inputs	RL 235.6 (1,516 ML)	1:100 AEP	RL 235.8	Tailings and mine affected water
Buck Reef West Pit ⁽¹⁾	Significant	N/A	Spill RL 259.0	1:20 AEP 3 month wet season + process inputs	RL 223.5	1:10 AEP 72 hour storm	RL 226.7	Permanent containment of gold processing tailings
Sandy Creek ROW 1 & 2 Dam	Non-operational							
Sandy Creek ROW 3 Dam	Non-operational							
Process Water Pond	Significant	1:100 AEP	RL 271.9	N/A	N/A	N/A	N/A	Recycling and supply of process water to the processing plant.
Sarsfield Sediment Dam	Significant	1:100 AEP	RL 247.7	N/A	N/A	N/A	N/A	Containing surface runoff from the Nolans and Sarsfield waste rock dumps.
Strand Sediment Dam	Significant	1:1,000 AEP	RL 248.5	N/A	N/A	N/A	N/A	Containing surface runoff and management of sediment from the Nolan's operational areas.

Notes:

TBD means to be determined based on the risk classification and the final certified design plans

(1) Buck Reef West Pit is not a regulated structure for the purposes of the conditions of this environmental authority until deposition of mine tailings into the pit commences

126 The environmental authority 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 on transfer of this authority.

- I27 Regulated structures must not be abandoned but be either:
- a) decommissioned and rehabilitated to achieve compliance with condition I28; or
 - b) be left in-situ for a use by the landholder provided that:
 - i. it no longer contains contaminants that will migrate into the environment; and
 - ii. it contains water of a quality that is demonstrated to be suitable for its intended use(s); and
 - iii. the holder of the environmental authority and the landholder agree in writing that the;
 - a. dam will be used by the landholder following the cessation of the environmentally relevant activity(ies); and
 - b. landholder is responsible for the dam on and from an agreed date
- I28 Before surrendering this environmental authority, the site must be rehabilitated to achieve a safe, stable, non-polluting landform and rehabilitated in accordance with 'Table G1- Final Land Use and Rehabilitation Approval Schedule'.
- I29 A Register of Regulated Structures must be established and maintained by the environmental authority holder for each regulated structure.
- I30 The environmental authority holder must provisionally enter the required information in the Register of Regulated Structures when a design plan for a regulated structure is submitted to the administering authority.
- I31 The environmental authority holder must make a final entry of the required information in the Register of Regulated Structures once compliance with condition I11 and I12 has been achieved.
- I32 The environmental authority holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.
- I33 All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this environmental authority, or their delegate, as being accurate and correct.
- I34 All existing structures that have not been assessed in accordance with either the Manual or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Dams must be assessed and certified in accordance with the Manual within six (6) months of amendment of the authority adopting this schedule.
- I35 All regulated structures must be specified in 'Table I1- Hydraulic performance criteria'.
- I36 Each regulated structure authorised by this environmental authority as specified in 'Table A1 Authorised Disturbance', must meet the hydraulic performance criteria listed in 'Table I1 – Hydraulic performance criteria' for that structure.
- I37 The hydraulic performance criteria specified in 'Table I1 – Hydraulic performance criteria' are the minimum mandatory performance requirements; regulated structures must be managed in a manner that ensures compliance with all conditions of this environmental authority.
- I38 Closure plans must be in place for each of the following structures listed in 'Table I1 – Hydraulic performance criteria':
- a) Old Nolan's Tailings Storage Facility;
 - b) Sandy Creek Tailings Storage Facility;
 - c) Sandy Creek ROW 3 Dam;
 - d) Sandy Creek ROW 1 & 2 Dam.
- I39 The closure plans required by condition I38 must address each of the closure considerations of the guideline: ANCOLD Guidelines on Tailings Dams, Planning, Design, Construction, Operation and Closure – Revision 1 (July 2019).

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- I40 Once tailings deposition commences, the standing water level within Buck Reef West Pit must not exceed RL 228.7.
- I41 Once tailings deposition commences, the RL must be visibly marked on the internal pit wall of the Buck Reef West Pit and the standing water level within Buck Reef West Pit must be measured at least monthly and recorded.
- I42 The deposition of tailings in Buck Reef West Pit must not cause a release of contaminants to groundwater.
- I43 The standing water level within Buck Reef West Pit must be modelled using a suitably complex water balance model and the water balance model must be validated annually using all relevant data including groundwater monitoring data, climatic data and the measured standing water level in the Buck Reef West Pit.
- I44 The environmental authority holder must ensure that tailings stored within Buck Reef West Pit are submerged beneath a minimum one (1) metre water cover at all times.

END OF SCHEDULE I

Schedule J: 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.

Acceptance criteria means the measures by which actions implemented are deemed to be complete. The acceptance criteria indicate the success of the decommissioning and rehabilitation outcomes or remediation of areas which have been significantly been disturbed by the mining activities. Acceptance criteria may include information regarding:

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

Administering authority is the agency that administers the environmental authority provisions under the *Environmental Protection Act 1994*.

Affected person means someone whose drinking water can potentially be impacted because of discharges from a dam or their life or property can be put at risk due to dwellings or workplaces being in the path of a dam break flood.

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 (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** means the probability that at least one event in excess of a particular magnitude will occur in any given year.

Annual inspection report means an assessment prepared by a suitably qualified and experienced person containing details of the assessment against the most recent consequence assessment report and design plan (or system design plan);

- a) against recommendations contained in previous annual inspections reports;
- b) against recognised dam safety deficiency indicators;
- c) for changes in circumstances potentially leading to a change in consequence category;
- d) for conformance with the conditions of this authority;

- e) for conformance with the 'as constructed' drawings;
- f) 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);
- g) for evidence of conformance with the current operational plan

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 relating to the subject matter using the relevant protocols, standards, methods or literature.

Assessed or 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 an environmental authority or a development approval.

Background with reference to the water schedule means the average of samples taken prior to the commencement of mining from the same waterway that the current sample has been taken.

Blasting means the use of explosive materials to fracture:

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

Certification means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this manual, 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 has a corresponding meaning as 'certification'.

Chemical means:

- a) an agricultural chemical product or veterinary chemical product within the meaning of the *Agricultural and Veterinary Chemicals Code Act 1994* (Commonwealth); or
- b) a dangerous good under the dangerous goods code; or
- c) a lead hazardous substance within the meaning of the *Work Health and Safety Regulation 2011*; or
- d) a drug or poison in the standard for the uniform scheduling of drugs and poisons prepared by the Australian Health Ministers' Advisory Council and published by the Commonwealth; or

- e) any substance used as, or intended for use as –
 - i. a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product; or
 - ii. a surface active agent, including, for example, soap or related detergent; or
 - iii. a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide; or
 - iv. a fertiliser for agricultural, horticultural or garden use; or
- f) a substance used for, or intended for use for –
 - i. mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater; or
 - ii. manufacture of plastic or synthetic rubber

Commercial place means a 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.

Consecutive sampling occasions means successive sampling events and includes resampling of groundwaters that is required under condition E30.

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).

Construction or **constructed** in relation to a regulated structure includes building a new regulated structure and lifting or otherwise modifying an existing regulated structure, but does not include investigations and testing necessary for the purpose of preparing a design plan.

Contaminants includes any prescribed water contaminants listed under Schedule 10 of the *Environmental Protection Regulations 2019*.

Contaminated water has the same meaning as “**contaminants**”

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.

Design plan is a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.

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 administering authority, 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.

Development approval means a development approval under the *Integrated Planning Act 1997*, the *Sustainable Planning Act 2009*, or the *Planning Act 2016* in relation to a matter that involves an environmentally relevant activity under the *Environmental Protection Act 1994*.

Disturbance of land includes:

- a) compacting, removing, covering, exposing or stockpiling of earth;

- b) removal or destruction of vegetation or topsoil or both to an extent where the land has been made susceptible to erosion;
- c) carrying out mining within a watercourse, waterway, wetland or lake;
- d) the submersion of areas by tailings or hazardous contaminant storage and dam/structure walls;
- e) temporary infrastructure, including any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc.) which is to be removed after the mining activity has ceased;
- f) releasing of contaminants into the soil, or underlying geological strata

However, the following areas are not included when calculating areas of '**disturbance**':

- a) areas off lease (e.g. Roads or tracks which provide access to the mining lease);
- b) areas previously disturbed which have achieved the rehabilitation outcomes;
- c) by agreement with the administering authority, areas previously disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
- d) areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc.) which is to be left by agreement with the landowner;
- e) disturbance that pre-existed the grant of the tenure

Dry season means May to December each calendar year

EC means electrical conductivity.

Effluent means treated wastewater released 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 affected persons and the implementation of protection measures. The plan must require dam owners to annually review and update contact information where required.

Environmental authority holder means the holder of this environmental authority or any other works conducted by another entity on the approved leases.

Existing structure means a structure that prior to 3 March 2017 meets any or both of the following, a structure:

- a) with a design that is in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) and that is considerably in progress;
- b) that is under considerable construction or that is constructed

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 in suspension.

Foreseeable future is the period used for assessing the total risk 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 risk of failure before that time.

General waste means:

- a) construction wastes and demolition waste;
- b) solid inert waste;
- c) putrescible wastes and domestic garbage;
- d) green wastes; and
- e) general recyclable wastes, consisting of paper, cardboard, recyclable plastics, glass, aluminium, and steel cans

Note 1: Paper covered plasterboard must only be received at the approved place if it is generated by construction and demolition activities and delivered to the approved place as part of a mixed load of materials;

Note 2: Drums containing any residual regulated wastes are themselves a regulated waste and must not be accepted for disposal at the approved place unless they have been triple rinsed or thoroughly cleaned.

Holder means:

- a) where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or
- b) where this document is a development approval, any person who is the registered operator for that development approval

Hydraulic performance means the capacity of a regulated dam to contain or safely pass flowable substances based on the design criteria specified for the relevant consequence category in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).

Hyporheic means the waters in the saturated sediment and porous space adjacent to surface waters where exchange between groundwater and surface water can occur.

Improved means a statistically significant difference that demonstrates that the quality has become or been made better over time.

Infrastructure means water storage dams, roads and tracks, buildings and other structures built for the purpose of mining activities.

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.

La, max adj, t means the average maximum a-weighted sound pressure level, adjusted for noise character and measured over any 15-minute period, using fast response.

Land in the 'land and rehabilitation schedule' of this document means land excluding waters and the atmosphere, that is, the term has a different meaning from the term as defined in the *Environmental Protection Act 1994*. For the purposes of the *Acts Interpretation Act 1954*, it is expressly noted that the term 'land' in this environmental authority relates to physical land and not to interests in land.

Land use means the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

Landfill unit means a discrete area of land or an excavation that receives solid waste.

Landfill facility means land and structures at the site approved used for the disposal of solid waste.

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.

Licensed place means the mining activities carried out at the mining tenements detailed in 'Table A1 – Authorised activities and location' of this environmental authority.

m means metres.

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.

Manual means the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority.

Measures includes any measures to prevent or minimise environmental impacts of the activity such as bunds, silt fences, diversion drains, capping, and containment systems.

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 2019* if it had not formed part of the mining activity;
- 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 such runoff, 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) to f) and other water
- g) does not include surface water runoff which, to the extent that it has been in contact with areas disturbed by mining activities that have not yet been completely rehabilitated, has only been in contact with:
 - i. land that has been rehabilitated to a stable landform and either capped or revegetated in accordance with the acceptance criteria set out in the environmental authority but only still awaiting maintenance and monitoring of the rehabilitation over a specified period of time to demonstrate rehabilitation success; or
 - ii. land that has partially been rehabilitated and monitoring demonstrates the relevant part of the landform with which the water has been in contact does not cause environmental harm to waters or groundwater, for example:
 - a. areas that are been capped and have monitoring data demonstrating hazardous material adequately contained with the site;

- b. evidence provided through monitoring that the relevant surface water would have met the water quality parameters for mine affected water release limits in this environmental authority, if those parameters had been applicable to the surface water runoff; or
- c. both

Minimise is to reduce to the smallest possible amount or degree.

Modifying see definition of '**construction**'.

Natural flow means flow in the receiving environment that is caused by precipitation and/or groundwater in their natural state, not as a result of human activity.

Non-polluting means having no adverse impacts upon the receiving environment.

Noxious means harmful or injurious to health or physical wellbeing, other than trivial harm.

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

Operational plan includes:

- a) normal operating procedures and rules (including clear documentation and definition of process inputs in the **DSA**);
- b) 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

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).

Potentially acid forming (PAF) means any ore or rock with either a net acid producing potential of greater than 5 kg of H₂SO₄/tonne or a net acid generation oxidation pH of less than 4.5 (pH unit).

Protected area means:

- a) a protected area under the *Nature Conservation Act 1992*; or
- b) a marine park under the *Marine Parks Act 2004*; or
- c) a world heritage area

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. The receiving environment includes (but is not limited to):

- a) a watercourse or surface waters;
- b) groundwater

Receiving waters has the same meaning as **receiving environment**.

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

Rehabilitation means 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 event means a surface water discharge from mine affected water storages or contaminated areas on the licensed place.

Representative means a sample set that covers the variance in monitoring or other data either due to natural changes or due to operational phases of the mining activities.

Residual drilling material means waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.

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

Revegetated means the re-establishment of vegetation of a species¹ and density of cover similar to surrounding undisturbed areas or the landform that existed before mining activities on soil surfaces associated with the construction or rehabilitation of a watercourse diversion.

¹Not including a species declared under the *Stock Route Management Regulation 2003* as a category class 1 pest, category class 2 pest or category class 3 pest.

RL means reduced level, relative to mean sea level as distinct from depths to water.

Sensitive place means:

- a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- b) a motel, hotel or hostel; or
- c) an educational institution; or
- d) a medical centre or hospital; or
- e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area; or
- f) a public park or gardens; or
- g) a sensitive receptor

Note: The definition of 'sensitive place' and 'commercial place' is based on Schedule 1 of *Environmental Protection (Noise) Policy 2019*. That is, a sensitive place is inside or outside on a dwelling, library and educational institution, childcare or kindergarten, school or playground, hospital, surgery or other medical institution, commercial & retail activity, protected area or an area identified under a conservation plan under *Nature Conservation Act 1992* as a critical habitat or an area of major interest, marine park under *Marine Parks Act 2004*, park or garden that is outside of the mining lease and open to the public for the use other than for sport or organised entertainment. A commercial place is inside or outside a commercial or retail activity.

A mining camp (i.e., accommodation and ancillary facilities for mine employees or contractors or both, associated with the mine the subject of the environmental authority) is not a sensitive place for that mine or mining project, whether or not the mining camp is located within a mining tenement that is part of the mining project the subject of the environmental authority. For example, the mining camp might be located on neighbouring land owned or leased by the same company as one of the holders of the environmental authority for the mining project, or a related company. Accommodation for mine employees or contractors is a sensitive place if the land is held by a mining company or related company, and if occupation is restricted to the employees, contractors and their families for the particular mine or mines which are held by the same company or a related company.

For example, a township (occupied by the mine employees, contractors and their families for multiple mines that are held by different companies) would be a sensitive place, even if part or all of the township were constructed on land owned by one or more of the companies.

Sensitive receptor has the meaning in schedule 2 of the *Environmental Protection (Noise) Policy 2019*.

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 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.

Structure means any 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:

- a) for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design;
- b) 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 and/or ESS volume across the integrated containment system.

Void means any constructed, open excavation in the ground.

Water is defined under schedule 4 of the *Water Act 2000*.

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

Watercourse has the same meaning given in the *Water Act 2000*.

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater or any part thereof.

WaTERS means Water Tracking and Electronic Reporting System or subsequent updated system, used to submit monitoring data and notify the Queensland Government. [<https://waters.ehp.qld.gov.au/>] or contact psd.help@qld.gov.au

Wet season means January, February, March and April each calendar year.

µs/cm means micro siemens per centimetre.

END OF SCHEDULE J

Figure 2a (Groundwater monitoring locations)

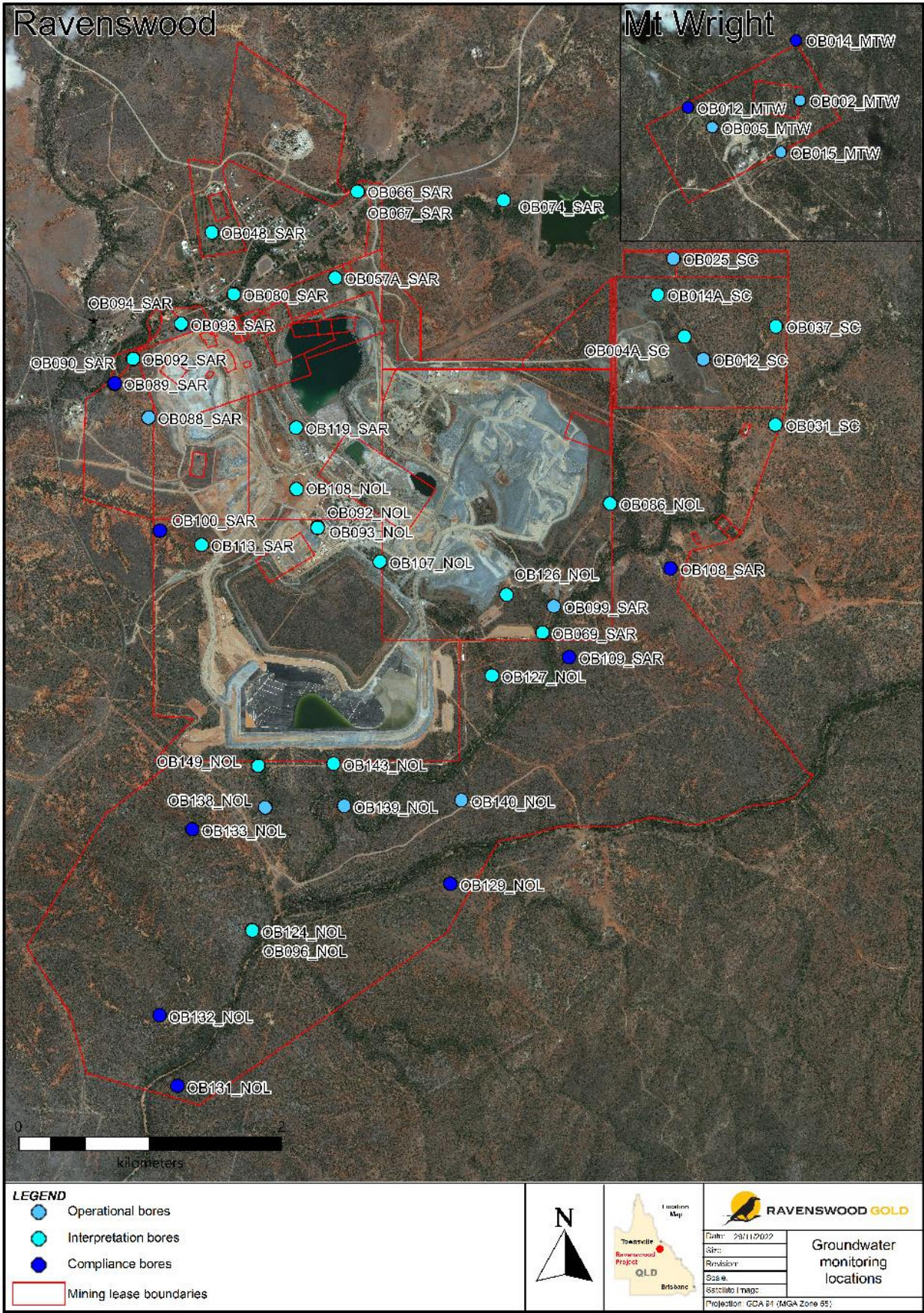


Figure 2b (Surface water monitoring locations)

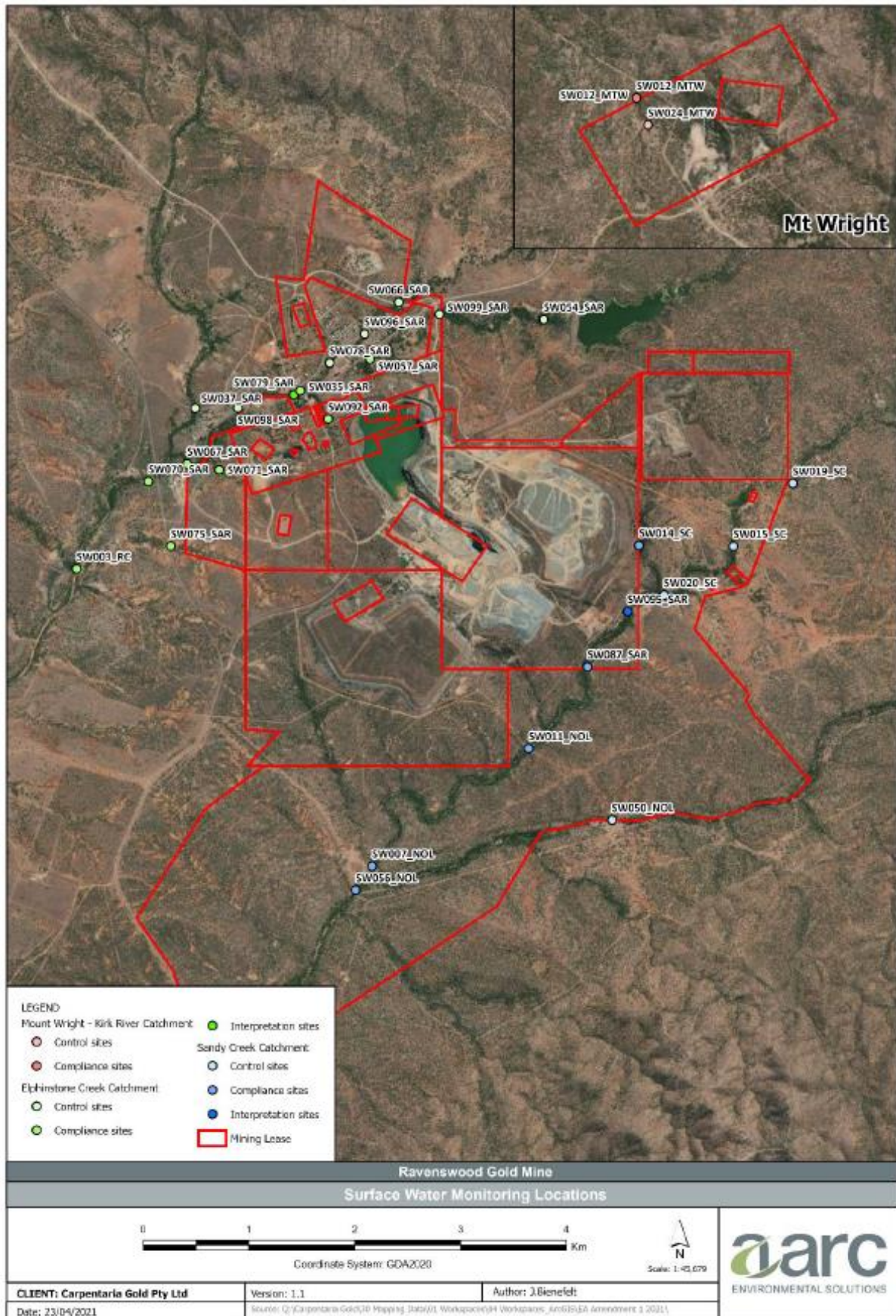


Figure 3 (Mining lease ML1722, ML100172 and ML10056 locations)

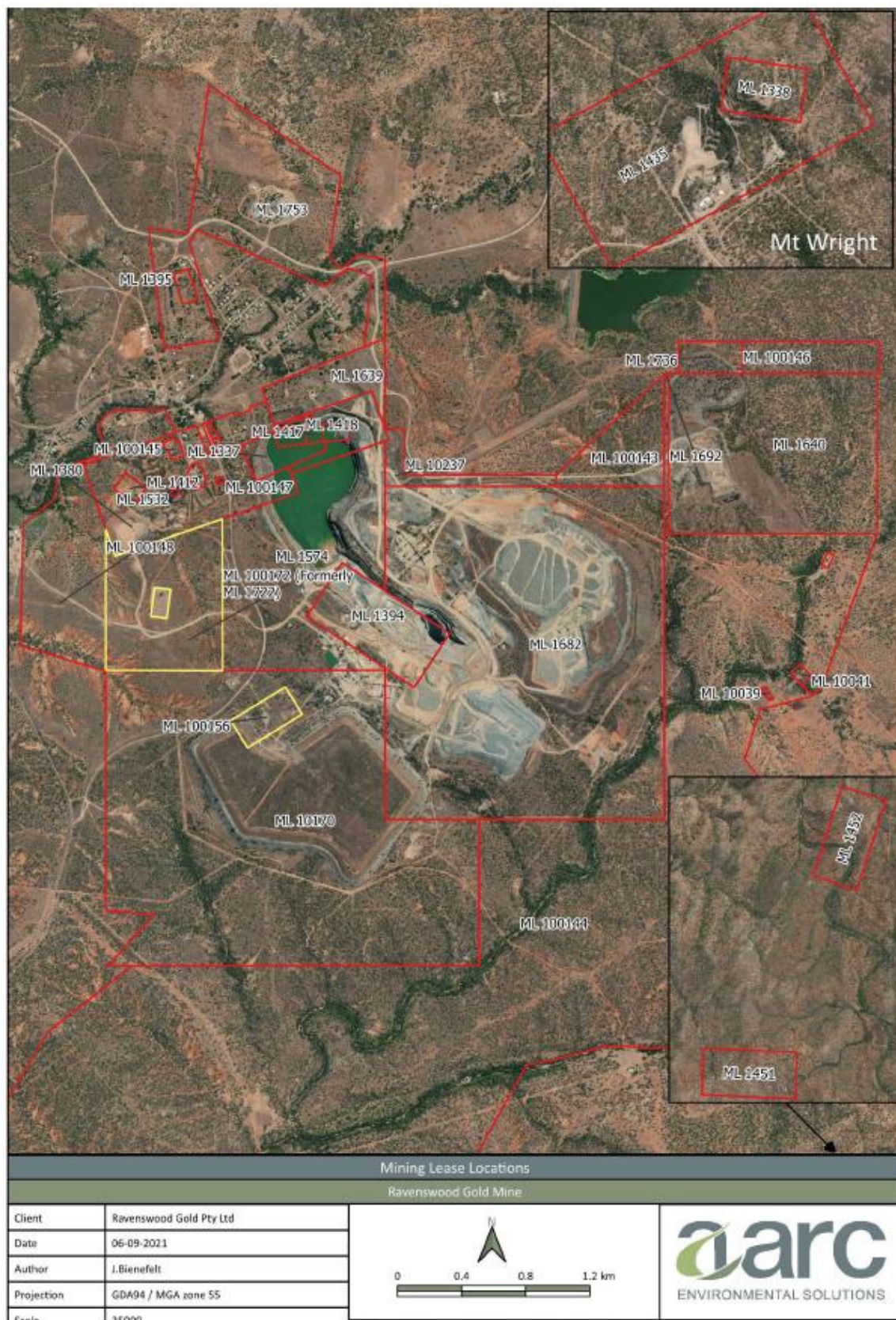


Figure 4 Seepage Recovery



END OF SCHEDULE K

END OF ENVIRONMENTAL AUTHORITY