

Permit

Environmental Protection Act 1994

Environmental authority P-EA-100119386

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

Environmental authority number: P-EA-100119386

Environmental authority takes effect on 3 February 2023

Environmental authority holder(s)

Name(s)	Registered address
Multicom Resources Ltd	Level 8, 46 Edward Street, Brisbane, QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
19 – Mining metal ore, other than a metal ore mentioned in items 11, 12, 13, 14, 15, 16, 17 or 18	ML100162 ML100244
08 – Chemical Storage (3) storing more than 500m ³ of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)	ML100245 ML100246
14 – Electrical generation (2a) generating electricity by using a fuel, other than gas, at a rated capacity of—10MW electrical to 150MW electrical	
31 - Mineral processing (2a) processing, in a year, the following quantities of mineral products, other than coke—1,000t to 100,000t	
33 – Crushing, grinding, milling or screening more than 5,000t of material in a year	
63 – Sewage treatment (1(b)(i)) operating sewage treatment works, other than no-release works, with a total daily peak design capacity of— 100 to 1500EP—if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	

Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

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

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

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

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

Take effect

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

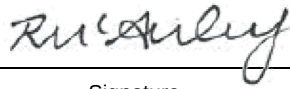
- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority-on the nominated day; or
- b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or
- c) otherwise- one the day the authority is issued.

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

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

The anniversary day of this environmental authority is the same day each year. The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 April.

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

3 February 2023

Date

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

Enquiries:

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Obligations under the *Environmental Protection Act 1994*

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

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

Other permits required

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

Conditions of environmental authority

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 The holder of this environmental authority must ensure that the mining activities carried out in accordance with **Table A1: Authorised mining activities and locations** and the locations detailed in **Schedule L—Figure 1: Project Layout—Mine Domains, Figure 2: Project Layout—Mine Infrastructure Area, Figure 3: Project Layout – Sediment Dams and Figure 4: Project Layout—Offsite Water Storage Facility and Associated Infrastructure.**

Table A1: Authorised mining activities and locations

Mine domain	Mine feature name	Mining lease	Location GDA94, MGA zone 54		Maximum disturbance area (ha)
			Easting	Northing	
Mine Pits	Pit area 1	ML100162	594493	7718020	656
	Pit area 2	ML100162	593414	7723911	1551
	Pit area 3a	ML100162	596086	7719343	845
	Pit area 3b	ML100162	594975	7724118	
	Pit area 4a	ML100162	596968	7718447	1469
	Pit area 4b	ML100162	595572	7722402	
	Pit Area 4c	ML100162	591644	7726678	
	Pit area 5a	ML100162	592753	7717340	2276
	Pit area 5b	ML100162	591605	7721613	
	Pit area 5c	ML100162	590262	7730247	
Water storages	Sediment dam 1	ML100162	593727	7716341	3
	Sediment dam 2	ML100162	592251	7721975	3.7
	Sediment dam 3	ML100162	591908	7724016	16
	Sediment dam 4	ML100162	591909	7725546	5.3
	Sediment dam 5	ML100162	593782	7727331	6.3
	Sediment dam 6	ML100162	593819	7726449	2.3
	Sediment dam 7	ML100162	592838	7719921	2.7
	Sediment dam 8	ML100162	594726	7725578	17.7
	Sediment dam 9	ML100162	595270	7716368	1.7
	Sediment dam 10	ML100162	591108	7723678	11.3
	Sediment dam 11	ML100162	590988	7726827	14.7
	Sediment dam 12	ML100162	592141	7731115	8
	Sediment dam 13	ML100162	590236	7728311	7.3
	Sediment dam 14	ML100162	588883	7732950	24.3
	Sediment dam 15	ML100162	590524	7721396	24
	Sediment dam 16	ML100162	592250	7719821	3.3
	Sediment dam 17	ML100162	592260	7716777	6.3
	Water storage dam	ML100162	592573	7719219	61
Tailings Storage Facility (TSF)	TSF	ML100162	596507	7724263	225
	Evaporation pond	ML100162	595617	7723565	33.5
Mine infrastructure	ROM and process pad	ML100162	596631	7721467	15
	Sedimentation dam	ML100162	596378	7720911	7.5

	Raw water dam	ML100162	596341	7721871	22.5
	Mine water dam	ML100162	596713	7720883	6.5
	Power station	ML100162	597126	7721460	1
	Solar farm	ML100162	596970	7722054	30
	Non-process Infrastructure Pad	ML100162	596995	7721225	1
	Chemical Storage area	ML100162	596648	7721302	0.2
	Dirty water storage	ML100162	597209	7720487	0.2
	Offices	ML100162	596982	7721366	1
	Fuel storage area	ML100162	597126	7721350	0.2
	Gas storage area	ML100162	597074	7720825	0.2
	MIA Pad outline	ML100162	596806	7721187	5
	STP irrigation area	ML100162	597007	7721141	0.5
	Switchroom	ML100162	596973	7721460	0.3
	Waste storage area	ML100162	597001	7721532	0.3
Haul Roads	Haul Roads	ML100162	Refer to Schedule L ¹		14
Offsite water storage facility (OWSF)	OWSF	ML100244	612603	7737967	195.5
	Aqueduct from Flinders River to OWSF Infrastructure Area	ML100246	613761	7737825	2
	Pipeline from OWSF to ML100162	ML100245	Refer to Schedule L ¹		20

Notes:

¹Locations presented in Schedule L - Figures.

A4 The holder of this environmental authority must install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority and:

- (a) Maintain such measures, plant and equipment in a proper and efficient condition; and
- (b) Operate such measures, plant and equipment in a proper and efficient manner; and
- (c) Ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.

Monitoring

A5 Any monitoring data, records and reports required by this environmental authority must be:

- (a) kept for a period of at least five (5) years; and
- (b) provided to a new holder of the environmental authority on transfer of the environmental authority; and
- (c) provided to the administering authority within a timeframe nominated by the administering authority; and
- (d) provided to the administering authority in the format requested.

A6 The following information must be recorded in relation to all monitoring required under the conditions of this environmental authority:

- (a) The date and time at which the sample was taken; and
- (b) The location or monitoring point at which the sample was taken; and
- (c) The results of all monitoring and details of any exceedances of the conditions of this environmental authority; and

- (d) 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).

Risk management

- A7 The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2018), three (3) months prior to the commencement of mining activities.

Notification of emergencies, incidents and exceptions

- A8 The holder of this environmental authority must notify the administering authority by written notification within twenty-four (24) hours after becoming aware of any emergency, incident or exceedance relating to the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this environmental authority.
- A9 Within ten (10) business days following the initial notification of an emergency, incident, exceedance, 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 samples taken and analysed; and
 - (b) outcomes of actions taken to prevent or minimise unlawful environmental harm; and
 - (c) proposed actions to prevent a recurrence of the emergency, incident or exceedance.

Complaints

- A10 The holder of this environmental authority must record all environmental complaints received about mining activities undertaken on the licensed place including:
- (a) Name, address and contact number of the complainant if provided; and
 - (b) Time and date of complaint; and
 - (c) Reasons for the complaint; and
 - (d) Investigations undertaken; and
 - (e) Conclusions formed; and
 - (f) Actions taken to resolve the complaint; and
 - (g) Any abatement measures implemented; and
 - (h) Person responsible for actioning the complaint.
- A11 The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within ten (10) business days of completion of the investigation, or no later than ten (10) business days after the end of the timeframe nominated by the administering authority to undertake the investigation, whichever is the latter.

Third-party reporting

A12 The holder of this environmental authority must:

- (a) Within one (1) year of the effective date of this environmental authority, obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority; and
- (b) Obtain further such reports at regular intervals, no less than once every three (3) years, from the completion of the report referred to in (a) above; and
- (c) Provide each report to the administering authority within ninety (90) days of its completion.

A13 Where a condition of this environmental authority requires compliance with a standard, policy or guideline and the standard, policy or guideline 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 (2) years of the amendment or change being made, unless a different period is specified in the amended standard, policy or guideline, or where the amendment or change relates specifically to regulated structures referred to in this environmental authority, the time specified in that condition; and
- (a) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the standard, policy or guideline that was current immediately prior to the relevant amendment or change.

End of Conditions for Schedule A

Schedule B – Air

- B1 Unless authorised by this environmental authority, the release of contaminants to air must not cause environmental harm.
- B2 The holder of this environmental authority must develop, document and implement an air quality monitoring program that can ensure compliance with the conditions of this environmental authority, within 6 months of the effective date of this environmental authority and prior to commencement of the mining activity.

Point source releases to air

- B3 Point source emissions of contaminants to air must:
- (a) only occur from the release points specified in **Table B1: Release points (air)**; and
 - (b) comply with the Minimum Exit Gas Temperature specified in **Table B1: Release points (air)**; and
 - (c) comply with the Minimum Release Height specified in **Table B1: Release points (air)**; and
 - (d) comply with the Minimum Efflux Velocity specified in **Table B1: Release points (air)**

Table B1: Release points (air)

Release Point	Location (GDA 94 MGA Zone 54)		Source Description	Minimum Release Height (m)	Minimum Exit Gas Temperature (°C)	Minimum Efflux Velocity (m/s)
	Easting	Northing				
RP1	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving Vanadium Rotary Kiln	30	820	3.0
RP2	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving Leach Scrubber	20	80	3.0
RP3	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving AMV flash dryer and Deammoniation Kiln Scrubber	20	50	3.0

RP4	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving Fusion Furnace Dust Collector	20	420	3.0
RP5	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving Vanadium Bagging Plant Dust Collector	10	Ambient	3.0
RP6	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving Crude Alum Deammoniation Kiln Scrubber	10	80	3.0
RP7	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving Stage 2 Alum Deammoniation Kiln Scrubber	10	80	3.0
RP8	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving HPA Calciner	10	1200	3.0
RP9	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving HPA Bagging Plant Dust Collector	10	Ambient	3.0
RP10	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving boiler	20	160	11.9

RP11	Release point location (easting) details are to be advised to the department prior to the commencement of operation	Release point location (northing) details are to be advised to the department prior to the commencement of operation	Stack serving condenser	Minimum release height (m) details are to be advised to the department prior to the commencement of operation.	Minimum exit gas temperature (°C) details are to be advised to the department prior to the commencement of operation.	Minimum Efflux Velocity (m/s) details are to be advised to the department prior to the commencement of operation.
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B4 Point source emissions of contaminants to air must not exceed the contaminant release limit specified in **Table B2: Contaminant release to air**.

Table B2: Contaminant release to air

Release point number	Contaminant release	Maximum concentration release limit	Frequency
RP1	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	All stacks must be monitored within 3 months of commissioning of the plant and annually thereafter.
	Sulphur Dioxide and Sulphur trioxide (SO ₂ equivalent)	200 mg/Nm ³ (dry)	
	Vanadium and its compounds (expressed as V)	0.5 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP2	Sulphur Dioxide and Sulphur trioxide (SO ₂ equivalent)	200 mg/Nm ³ (dry)	
	Total volatile organic compounds (TVOC) as n-propane equivalent	40 mg/Nm ³ (dry)	
RP3	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Ammonia	200 mg/Nm ³ (dry)	
	Vanadium and its compounds (expressed as V)	0.5 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP4	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Vanadium and its compounds (expressed as V)	0.5 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP5	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Vanadium and its compounds (expressed as V)	0.5 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP6	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Ammonia	200 mg/Nm ³ (dry)	
	Sulphur Dioxide and Sulphur trioxide (SO ₂ equivalent)	200 mg/Nm ³ (dry)	

	Total volatile organic compounds (TVOC) as n-propane equivalent	40 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP7	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Ammonia	200 mg/Nm ³ (dry)	
	Sulphur Dioxide and Sulphur trioxide (SO ₂ equivalent)	200 mg/Nm ³ (dry)	
	Total volatile organic compounds (TVOC) as n-propane equivalent	40 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP8	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Sulphur Dioxide and Sulphur trioxide (SO ₂ equivalent)	200 mg/Nm ³ (dry)	
	Total volatile organic compounds (TVOC) as n-propane equivalent	40 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP9	Total Solid Particles (TSP)	50 mg/Nm ³ (dry)	
	Total heavy metals (see Note 1)	1 mg/Nm ³ (dry)	
RP10	Oxides of Nitrogen	350 mg/Nm ³ (dry) at 3% O ₂	
	Carbon monoxide	125 mg/Nm ³ (dry) at 3% O ₂	
RP11	Total volatile organic compounds (TVOC) as n-propane equivalent	40 mg/Nm ³ (dry)	

Notes

Total heavy metals mean a cumulative total of Type 1 and Type 2 substances as described in NSW EPA POEO Regulation 2010.

Monitoring of contaminant releases to the atmosphere

- B5 An appropriately qualified person(s) must conduct and keep records of a monitoring program of contaminant releases to the atmosphere at the release points, frequency, and for the parameter specified in **Table B2: Contaminant release to air** and which complies with the most recent edition of Australian Standard AS4323.1 – 1995 “Stationary source emissions Method 1: Selection of sampling provisions”, and the most recent edition of the administering authority’s air quality sampling manual.
- B6 Contaminants must be monitored when emissions are expected to be representative of actual operating conditions for the sampling period.
- B7 For all monitoring conducted under condition B5 records must be kept for:
- (a) gas velocity, flow rate, temperature, oxygen content, and water vapour concentration; and
 - (b) the actual test methods and accuracy; and
 - (c) plant throughput rate at the time of sampling; and
 - (d) fuel type and consumption rate (if applicable); and

- (e) any factors that may influence either gaseous or particulate emissions or both.

Receiving environment air quality monitoring

- B8 The holder of this environmental authority must undertake air quality monitoring in the receiving environment:
- (a) at the monitoring location specified in **Table B3: Receiving environment monitoring location**; and
 - (b) at the monitoring frequency specified in **Table B3: Receiving environment monitoring location**; and
 - (c) for the contaminants specified in **Table B4: Receiving environment contaminant limits** and
 - (d) in accordance with the most recent version of Australian Standard AS/NZS 3580.9.9-2006 *Determination of suspended particulate matter – PM10 high volume sampler – Gravimetric method*; Australian Standard 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* and Australian Standard 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*.

Table B3: Receiving environment monitoring location

Monitoring location	Location (GDA 94 MGA Zone 54)		Location Description	Monitoring frequency
	Easting	Northing		
PM10-1	590203	7722982	Saint Elmo homestead	Continuous

Table B4: Receiving environment contaminant limits (air)

Parameter	Monitoring location	Limit Type	Limit ¹	Averaging period
PM ₁₀	PM10-1	Maximum	50 µg/m ³	24 hours
PM _{2.5}	PM10-1	Maximum	25 µg/m ³	24 hours
TSP	PM10-1	Maximum	90 µg/m ³	1 year
Sulphur dioxide	PM10-1	Maximum	57 µg/m ³	1 year
Vanadium (total in PM ₁₀ fraction)	PM10-1	Maximum	1.1 µg/m ³	24 hours

Notes

¹ Air quality objectives health and wellbeing *Environmental Protection (Air) Policy 2019*

Dust and particulate matter monitoring

- B9 The holder of this environmental authority must undertake wind speed and direction monitoring:
- (a) at the monitoring location specified in **Table B3: Receiving environment monitoring location**; and

- (b) at the monitoring frequency specified in **Table B3: Receiving environment monitoring location**; and
- (c) in accordance with the most recent edition of the Australian Standard *AS/NZS 3580.14:2014 - Methods for sampling and analysis of ambient air - Part 14 Meteorological monitoring for ambient air quality monitoring applications*.

B10 The holder of this environmental authority must undertake monitoring of dust deposition:

- (a) at the monitoring locations specified in **Table B5: Dust Deposition Monitoring Locations**; and
- (b) at the monitoring frequency specified in **Table B5: Dust Deposition Monitoring Locations**; and
- (c) in accordance with the method in the most recent version of the relevant Australian Standard *AS/NZS 3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method*.

Table B5: Dust Deposition Monitoring Locations

Monitoring Location	Location (GDA 94 MGA Zone 54)		Monitoring frequency
	Easting	Northing	
DDG1	590440	7722966	Monthly
DDG2	589396	7733165	
DDG3	592200	7731258	
DDG4	590203	7722982	
DDG5	597371	7723069	

B11 The limits of the parameter specified in **Table B6: Dust deposition limits** must not be exceeded at any of the monitoring locations specified in **Table B5: Dust Deposition Monitoring Locations**.

Table B6: Dust deposition limits

Parameter	Monitoring location	Limit Type	Limit ¹	Averaging period
Dust deposition	DDG1	Maximum	120 mg/m ² /day	30 Days
	DDG2			
	DDG3			
	DDG4			
	DDG5			

Notes

¹ Air quality objectives health and wellbeing *Environmental Protection (Air) Policy 2019*

Meteorological monitoring

- B12 The holder of this environmental authority must establish a meteorological station in a spatially fixed location, to continuously measure and record at suitable resolution, wind speed and direction, temperature, relative humidity and rainfall data.
- B13 The meteorological station required by condition B12 must be installed in accordance with the latest edition of the Bureau of Meteorology guideline Observation specifications No.2013.1 *Guidelines for the siting and exposure of meteorological instruments and observing facilities*.

End of Conditions for Schedule B

Schedule C – Waste Management

Waste Disposal

- C1 All waste generated from the mining activities must be disposed of at an off-site facility that is lawfully able to accept the waste, with the exception of:
- (a) waste rock generated at the licenced place, which must be disposed of in the mining pits listed in **Schedule A - Table A1: Authorised mining activities and locations and shown in Schedule L—Figure 1: Project Layout–Mine Domains**; and
 - (b) tailings generated at the licenced place, which must be disposed of in the Tailings Storage Facility listed in **Schedule A - Table A1: Authorised mining activities and locations and shown in Schedule L—Figure 2: Project Layout–Mine Infrastructure Area**; and
 - (c) liquid waste generated at the processing facility at the licensed place, which must be disposed of in the evaporation pond listed in **Schedule A - Table A1: Authorised mining activities and locations and shown in Schedule L—Figure 2: Project Layout–Mine Infrastructure Area**.
- C2 Notwithstanding condition C1 any waste rock which has acid forming potential must be disposed of in the Tailings Storage Facility listed in **Schedule A - Table A1: Authorised mining activities and locations and shown in Schedule L—Figure 2: Project Layout–Mine Infrastructure Area**.
- C3 Waste must not be burnt at the licenced place.

Waste Management Program

- C4 The holder of this environmental authority must develop, document and implement a waste management program for all mining activities at the licenced place in accordance with Part 5 of the *Environmental Management (Waste Management) Policy 2000*.
- C5 The waste management program required under condition **C4** must be regularly reviewed and updated at intervals of no greater than five (5) years. The program must include:
- (a) a description of the mining activity that may generate waste; and
 - (b) waste management control strategies including:
 - (i) recording of the types and amounts of wastes generated by the mining activity;
 - (ii) segregation of the wastes;
 - (iii) storage of the wastes;
 - (iv) transport of the wastes; and
 - (v) monitoring and reporting matters concerning the waste; and
 - (c) the hazard characteristics of the wastes generated including disposal procedures for regulated wastes; and
 - (d) a program for reusing, recycling or disposing of all wastes; and
 - (e) how the waste will be dealt with in accordance with the waste and resource management hierarchy, including a description of the types and amounts of waste that will be dealt with under each of the waste management practices in the waste management hierarchy (i.e. avoidance, reuse, recycling, energy recovery, disposal); and

- (f) how the waste will be stored, handled and transferred in a proper and effective manner; and
- (g) procedures for identifying and implementing opportunities to minimise the amount of waste generated, promote efficiency in the use of resources and improve the waste management practices employed; and
- (h) procedures for dealing with accidents, spills, and other incidents that may impact on waste management; and
- (i) details of any accredited management system employed, or planned to be employed, to deal with the waste; and
- (j) how often the performance of the waste management practices will be assessed; and
- (k) the indicators or other criteria on which the performance of the waste management practices will be assessed; and
- (l) staff training and induction to the waste management program.

Mine Material Management Plan

- C6 Within six (6) months of the effective date of this environmental authority and prior to the commencement of the mining activity, the holder of this environmental authority must develop, document and implement a Mine Material Management Plan, which includes:
- (a) a program of progressive sampling to validate pre-mine waste rock characterisation. The waste rock sampling program must include validation of salinity, acidity, alkalinity, dissolved metals, metalloids and non-metallic inorganic substances; and
 - (b) geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies for acid mine drainage and neutral mine drainage potential; and
 - (c) records must be maintained of all waste rock characterisation and disposal including contingency planning for the management of acid rock/neutral mine drainage; and
 - (d) a materials balance and disposal plan demonstrating how waste rock that has a potential to generate neutral and/or saline mine drainage or is potentially acid forming and acid forming will be selectively placed and/or encapsulated to minimise the generation of acid or neutral mine drainage; and
 - (e) how often the performance of the plan will be assessed; and
 - (f) waste rock characterisation must be undertaken at a minimum rate of eight (8) regularly spaced samples per 100,000 tonnes of waste rock.
- C7 Tailings must be managed in accordance with procedures contained within the Mine Material Management Plan required under condition **C6**. These procedures must include provisions for:
- (a) containment of tailings in accordance with the approved design plan(s); and
 - (b) the management of liquid waste both during operation and post closure; and
 - (c) the control of fugitive emissions to air; and
 - (d) a program of progressive sampling and characterisation to identify non-acid and acid producing potential and metal concentrations of tailings that must include:

- (i) progressive characterisation of all tailings material during disposal for the following contaminants: arsenic, cadmium, chromium, copper, manganese, selenium, manganese, molybdenum, vanadium and zinc; and
 - (ii) tailings characterisation must be undertaken at a minimum rate of eight (8) regularly spaced samples per 100,000 tonnes of tailings material discharged; and
 - (iii) geochemical kinetic testing where the acid and neutral mine drainage producing potential of tailings material has not been conclusively determined to indicate oxidation rates, potential reaction products and effectiveness of control strategies; and
- (e) management of tailings in order to minimise the potential for environmental harm.

End of Conditions for Schedule C

Schedule D - Noise

D1 The holder of this environmental authority must not undertake blasting.

Noise limits

D2 Noise from any mining activity must not cause the limits specified in **Table D1: Noise limits** to be exceeded at a sensitive place or commercial place.

Table D1: Noise limits

Period	Noise Limits $L_{Aeq,adj,1hour}$ dBA Outdoor
Day (7:00 am – 6:00 pm)	45
Evening (6:00 pm – 10:00 pm)	40
Night (10:00 pm – 7:00 am)	35

D3 In the event of a complaint made to the administering authority, considered in the opinion of an authorised officer to be neither frivolous or vexatious, about noise generated in carrying out the mining activity and the noise is considered by the administering authority to be an unreasonable noise, the holder of this environmental authority must take action to ensure that it is no longer an unreasonable noise.

Monitoring and reporting

D4 When requested by the administering authority, noise monitoring and reporting must be undertaken within a timeframe nominated by the administering authority to investigate any complaint, considered in the opinion of an authorised officer to be neither frivolous or vexatious, at any sensitive place or commercial place and the results must be provided to the administering authority within fourteen (14) days following completion of monitoring.

D5 The holder of this environmental authority must develop, document and implement a Noise Management Program, within 6 months of the effective date of this environmental authority and prior to the commencement of the mining activity that will ensure compliance with the conditions of this environmental authority and be compliant with the most recent edition of the administering authority's Noise Measurement Manual or the most recent version of Australian Standard *AS1055 Acoustics – Description and measurement of environmental noise*.

D6 Prior to commencement of the mining activity, the holder of this environmental authority must install a noise monitoring station at the Saint Elmo homestead identified in **Schedule B - Table B2: Receiving environment monitoring location** that will report noise levels in accordance with the Noise Management Program and comply with the requirements of condition **D2**.

D7 Noise monitoring and reporting 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); and
- (b) background noise LA90; and
- (c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels; and

- (d) atmospheric conditions including temperature, relative humidity and wind speed and directions; and
- (e) effects due to any extraneous factors such as traffic noise; and
- (f) location, date and time of monitoring; and
- (g) if a complaint received under condition A10 concerns low frequency noise, Max LpLIN,T and one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range.

End of Conditions for Schedule D

Schedule E – Surface Water

- E1 Contaminants must not be released directly or indirectly to any waters unless otherwise permitted by a condition of this environmental authority.
- E2 All water quality and aquatic ecology monitoring required by this Environmental Authority must be performed by an appropriately qualified person.

Surface water environment monitoring

- E3 Surface waters and sediments must be monitored at the locations specified in **Table E1: Surface waters and sediment monitoring locations** and **Schedule H - Figure 6: Surface Water and Sediment Monitoring Locations**.

Table E1: Surface waters and sediment monitoring locations

Monitoring locations	Monitoring site description	Location	
		Easting (GDA94 – Zone 54)	Northing (GDA94 – Zone 54)
Reference sites			
Julia Creek US	Located at the DNRME gauging station location between the Flinders Highway and Punchbowl Road.	579193	7715681
Flinders River US1	Upstream of Flinders River OWSF.	613957	7737321
Horse Creek US	Upstream of the Flinders Highway and Northern Rail Line.	592928	7715558
Spellary Creek US		610079	7715327
Alick Creek US		620444	7714585
Compliance sites			
Julia Creek DS	Downstream of confluence with Pigeon Creek, off Old Normanton Road	522987	7781963
Flinders River DS	Downstream of confluence with unnamed tributary, north of Old Normanton Road.	551204	7797232
Horse Creek DS	Horse Creek and/or other tributary flowing from the western side of the site to Julia Creek	583517	7722162
Pigeon Creek DS	Pigeon Creek to the north west of the site flowing to Julia Creek	568014	7744274
Tributary of Flinders river DS	Northern tributary flowing eventually to Flinders Creek	590184	7750824

- E4 Surface waters must be monitored at the frequency specified in **Table E2: Surface Water Quality Objectives**.
- E5 Surface waters must be monitored for the quality characteristics listed in **Table E2: Surface Water Quality Objectives**.

Table E2 - Surface Water Quality Objectives

Quality Characteristics ¹	Unit	Water quality objective	Compliance limit	Monitoring Frequency
pH	pH units	-	6-8 ³	Monthly
EC	µS/cm	607 ⁴	1300 ⁶	
Sulfate	mg/L	46 ⁴	250 ⁵	
Aluminium	mg/L	0.06 ⁴	0.2 ⁵	
Arsenic	mg/L	0.01 ²	0.1 ⁶	
Barium	mg/L	0.057 ⁴	2 ⁵	
Boron	mg/L	0.37 ²	4 ⁵	
Cadmium	mg/L	0.0002 ²	0.002 ⁵	
Chromium	mg/L	0.001 ²	0.05 ⁵	
Cobalt	mg/L	0.0014 ²	0.05 ⁶	
Copper	mg/L	0.004 ⁴	2 ⁵	
Iron	mg/L	0.2 ⁶	0.3 ²	
Lead	mg/L	0.0034 ²	0.01 ⁵	
Manganese	mg/L	0.2 ⁶	1.9 ²	
Mercury (inorganic)	mg/L	0.0006 ²	0.001 ⁵	
Molybdenum	mg/L	0.034 ²	0.05 ⁵	
Nickel	mg/L	0.011 ²	0.02 ⁵	
Selenium	mg/L	0.011 ²	0.02 ⁶	
Uranium	mg/L	0.002 ⁴	0.017 ⁵	
Vanadium	mg/L	0.02 ⁴	0.1 ⁶	
Zinc	mg/L	0.008 ²	3 ⁵	
Hydrocarbons	mg/L	no visible film		
Major cations and anions	mg/L	For interpretive purposes		
Stream observation	m³/s	For interpretive purposes		

Notes

¹All metals and metalloids must be measured as 'dissolved' (from analysis of a field filtered sample) and 'total'.

²ANZG (2018) trigger levels for 95% aquatic ecosystem protection for slightly to moderately disturbed ecosystems. Measured as 'dissolved'.

³ANZECC (2000) Table 3.3.5 for lowland rivers.

⁴80th percentile surface water data. Measured as 'dissolved'.

⁵Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy (2011) version 3.6. Measured as 'total'.

⁶ ANZECC (2000) volume 3, chapter 9 Water quality for irrigation and general use long term trigger. Measured as 'dissolved'.

- E6 If a water quality objective measured at a compliance site specified in **Table E1 – surface waters and sediment monitoring locations** exceeds any water quality objective specified in **Table E2 - Surface Water Quality Objectives** during a monitoring event required under condition **E3** the holder of this environmental authority must compare this result to the applicable reference 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 reference 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 reference site complete an investigation into the potential for environmental harm and provide a written report to the administering authority in accordance with condition **A12**, outlining
 - (i) Details of the investigations carried out
 - (ii) Actions taken to prevent environmental harm.

*Note: Where a contaminant level exceedance has occurred and is under investigation in accordance with **E6**, no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation.*

- E7 Water quality at the compliance sites listed in **Table E1 - surface waters and sediment monitoring locations** must not exceed any compliance limit specified in **Table E2 - Surface Water Quality Objectives**.
- E8 Sediments must be monitored at the frequency specified in **Table E3 - Sediment quality objectives**.
- E9 Sediments must be monitored for the quality characteristics listed in **Table E3 - Sediment quality objectives**.
- E10 Sediment quality at the compliance sites listed in **Table E1 – surface waters and sediment monitoring locations** must not exceed any sediment quality objective specified in **Table E3 – Sediment quality objectives**.

Table E3 – Sediment quality objectives

Quality Characteristic	Unit	Sediment quality objective (mg/kg) ¹	Monitoring Frequency
Arsenic	mg/kg dry weight	20	Twice a year (once at the end of the wet season and once at the end of the dry season)
Cadmium	mg/kg dry weight	1.5	
Chromium	mg/kg dry weight	80	
Copper	mg/kg dry weight	65	
Lead	mg/kg dry weight	50	
Mercury (inorganic)	mg/kg dry weight	0.15	
Nickel	mg/kg dry weight	21	
Zinc	mg/kg dry weight	200	
Total petroleum hydrocarbons (TPHs)	mg/kg dry weight	280	

Notes

¹ANZG (2018) recommended toxicant default guideline values for sediment quality

Receiving environment monitoring program

- E11 The holder of this environmental authority must develop, document and implement a Receiving Environment Monitoring Program to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows, within 6 months of the effective date of this environmental authority.
- E12 The Receiving Environment Monitoring Program must include at a minimum:
- (a) The surface water quality and sediment monitoring locations, the monitoring frequency (before and after the activity starts) and the indicators to be monitored in accordance with **Table E1 – Surface waters and sediment monitoring locations**, **Table E2 - Surface Water Quality Objectives** and **Table E3 – Sediment quality objectives**; and
 - (b) Encompassing the waters of Flinders River and Julia Creek catchment and connected or surrounding waterways within 10km downstream of the mining activities, and where possible in tributaries on site; and
 - (c) Identification of all environmental values of receiving waters; and
 - (d) An assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives in accordance with **Table E2 - Surface Water Quality Objectives**; and
 - (e) An aquatic ecosystem health and aquatic flora and fauna assessment within and immediately surrounding the project area that assesses potential impacts to the aquatic ecosystem and proposed appropriate mitigation measures; and
 - (f) The aquatic ecology monitoring locations and frequency; and
 - (g) Measure any adverse impacts on flora and fauna species richness and species abundance.

Note: The environmental values of wetlands are defined under section 81A of the Environmental Protection Regulations 2008.

- E13 A Receiving Environment Monitoring Program report, including all monitoring results and any interpretations or assumptions relied upon, must be prepared by an appropriately qualified person annually and submitted to the Administering Authority annually.
- E14 The following information must be recorded in relation to all surface water, sediment and biological monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format with each annual return or upon request from the administering authority:
- (a) the date on which the sample was taken; and
 - (b) the time at which the sample was taken; and
 - (c) the monitoring point at which the sample was taken; and
 - (d) the observed flow rate of the stream at which the sample was taken; and
 - (e) the results of all monitoring and details of any exceedances of the conditions of this environmental authority.

- E15 Water quality monitoring data required under condition **E14** must be provided to the administering authority in the specified electronic format on the Queensland government's Water Tracking and Electronic Reporting System (WaTERS), or more recent version of the system, where implemented for a site.

Water Management Plan

- E16 A Water Management Plan must be developed by an appropriately qualified person and implemented, within six (6) months of the effective date of this environmental authority.
- E17 The Water Management Plan must include:
- (a) a study of the source of contaminants; and
 - (b) a water balance model; and
 - (c) a water management system; and
 - (d) measures to manage and prevent saline drainage; and
 - (e) measures to manage and prevent acidic drainage; and
 - (f) contingency procedures for emergencies; and
 - (g) a program for monitoring and review of the effectiveness of the water management plan.
- E18 The Water Management Plan must be reviewed by the holder of this environmental authority annually to assess the adequacy of the plan, ensure actual and potential environmental impacts are managed, and identify and undertake any necessary amendments to the plan.

Erosion and Sediment Control Plan

- E19 An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of mining activities to minimise erosion and the release of sediment to waters.
- E20 The Erosion and Sediment Control Plan must:
- (a) demonstrate how erosion and sediment control measures adequately minimise the release of sediment to waters and must include at least the following:
 - (i) assessment of all catchment areas; and
 - (ii) assessment of soil and waste materials; and
 - (iii) specify design criteria for erosion and sediment control structures; and
 - (b) detail the locations and descriptions of all erosion and sediment control measures; and
 - (c) provide an audit schedule to ensure erosion and sediment controls are being maintained.
- E21 A written review of the Erosion and Sediment Control Plan must be undertaken annually and must:
- (a) include a statement that the Erosion and Sediment Control Plan has been prepared by an appropriately qualified person; and
 - (b) assess the plan against the requirements under condition **E20**; and
 - (c) include recommended actions to ensure environmental harm are effectively managed; and

(d) provide details and timelines of the actions to be taken; and

(e) identify any amendments made to the Erosion and Sediment Control Plan.

- E22 A copy of the Erosion and Sediment Control Plan and the annual reviews of the Erosion and Sediment Control Plan must be provided to the administering authority on request.
- E23 Water is permitted to be released to surface waters from erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by conditions **E20** to **E23**.

End of Conditions for Schedule E

Schedule F – Groundwater

- F1 The holder of this environmental authority must not release contaminants to groundwater.
- F2 Groundwater quality and standing water level must be monitored:
- (a) at the locations specified in **Table F1: Groundwater monitoring locations and frequency** and **Schedule H—Figure 4: Groundwater Monitoring Locations**; and
 - (b) at the frequencies specified in **Table F1: Groundwater monitoring locations and frequency**; and
 - (c) for the quality characteristics identified in **Table F2: Groundwater quality limits**.

Table F1: Groundwater monitoring locations and frequency

Monitoring Bore	Co-ordinate (MGA94 Zone 54)		Installation phase	Surface RL (mAHD) ¹	Screened interval RL (mAHD)	Target formation	Monitoring Frequency
	Easting	Northing					Standing Water Level and quality characteristics
	Monitoring bores – Mining areas						
MB01	592595	7718997	Existing	134.7	119.4-118.4	Toolebuc	Quarterly
MB02	594196	7716407	Existing	141.5	127-126	Toolebuc	
MB03	594203	7721968	Existing	141.3	122.8-121.8	Toolebuc	
MB04	593710	7726015	Existing	145.9	130.9-129.9	Toolebuc	
MB05	591600	7728004	Existing	148.7	132.2-131.2	Toolebuc	
MB06	595528	7716231	Within 3 months from environmental authority effective date	140.5	118.5-112.5	Toolebuc	
MB07	592242	7716509	Within 3 months from environmental authority effective date	132.1	102.6-96.6	Toolebuc	
MB08	593431	7719381	Within 3 months from environmental authority effective date	136.2	124.5-118.5	Toolebuc	
MB09	597143	7720351	Within 3 months from environmental authority effective date	139.9	112.9-106.9	Toolebuc	
MB10	591330	7724953	Within 3 months from environmental authority effective date	139.2	115.2-109.2	Toolebuc	
MB11	589017	7729640	Within 3 months from	138.5	121.5-115.5	Toolebuc	

			environmental authority effective date				
MB12	597350	7724818	Within 3 months from environmental authority effective date	145.7	110.7-104.7	Toolebuc	
MB13	597279	7723644	Within 3 months from environmental authority effective date	149.8	107.8-101.8	Toolebuc	
IP-MB01	593100	7717930	within 3 months of the backfilling of the pit	TBA	TBA	Backfilled void	
IP-MB02	595450	7718700	within 3 months of the backfilling of the pit	TBA	TBA	Backfilled void	
	Monitoring bores – Infrastructure areas						
TSF-MB01	596403	7725537	Within 3 months from environmental authority effective date	144.4	120.9-114.9	Toolebuc	Quarterly
TSF-MB02	596810	7723660	3 months prior to commissioning of TSF	TBA	TBA	Toolebuc	
TSF-MB03	596000	7722940	3 months prior to commissioning of TSF	TBA	TBA	Toolebuc	
TSF-MB04	595400	7723571	Within 3 months from environmental authority effective date	147.2	114.2-108.2	Toolebuc	
TSF-MB05	595780	7724300	Within 3 months from environmental authority effective date	145.3	121.3-115.3	Toolebuc	
TSF-MB06	596020	7724990	Within 3 months from environmental authority effective date	145.3	113.3-107.3	Toolebuc	
MIA-MB01	595861	7721749	Within 3 months from environmental authority effective date	142.5	115.5-109.5	Toolebuc	
MIA-MB02	596310	7721590	3 months prior to commissioning of MIA	TBA	TBA	Toolebuc	
MIA-MB03	596659	7721635	Within 3 months from	142.4	107.6-101.6	Toolebuc	

			environmental authority effective date				
MIA-MB04	596600	7721300	3 months prior to commissioning of MIA	TBA	TBA	Toolebuc	
MIA-MB05	597013	7721554	Within 3 months from environmental authority effective date	143.6	113.6-107.6	Toolebuc	
MIA-MB06	597170	7721340	3 months prior to commissioning of MIA	TBA	TBA	Toolebuc	
MIA-MB07	596570	7720880	3 months prior to commissioning of MIA	TBA	TBA	Toolebuc	
MIA-MB08	595892	7720712	Within 3 months from environmental authority effective date	136.7	115.0-109.0	Toolebuc	
MIA-MB09	597269	7721991	3 months prior to commissioning of MIA	144.9	120.9-114.9	Toolebuc	
MIA-MB10	596345	7720395	3 months prior to commissioning of MIA	139.0	117.6-111.6	Toolebuc	
OVSF-MB01	613552	7737719	Within 3 months from environmental authority effective date	140.9	138.4-132.4	Alluvium	
OVSF-MB02	612300	7738850	3 months prior to commissioning of OVSF	TBA	TBA	Alluvium	

Notes:

¹ RL must be measured at the top of the bore casing to the nearest 5cm.

Table F2 – Groundwater quality limits

Quality Characteristic ¹	Unit	Limit type	Monitoring bores	
			Limit A	Limit B
pH	pH units	Range	6-8 ³	
EC	µS/cm	Maximum	7,702 ⁴	7,781
Sulfate	mg/L	Maximum	975 ⁴	1045 ⁵
Aluminium	mg/L	Maximum	-	0.055 ²
Arsenic	mg/L	Maximum	-	0.013 ²
Boron	mg/L	Maximum	0.95 ⁴	0.97 ⁵
Cadmium	mg/L	Maximum	0.0014 ⁴	0.0024 ⁵

Chromium	mg/L	Maximum	-	0.001 ²
Cobalt	mg/L	Maximum	0.0046 ⁴	0.0084 ⁵
Copper	mg/L	Maximum	0.0044 ⁴	0.0148 ⁵
Iron	mg/L	Maximum	-	0.3 ²
Lead	mg/L	Maximum	-	0.0034 ²
Manganese	mg/L	Maximum	-	1.9 ²
Mercury (inorganic)	mg/L	Maximum	-	0.0006 ²
Molybdenum	mg/L	Maximum	-	0.034 ²
Nickel	mg/L	Maximum	0.033 ⁴	0.043 ⁵
Selenium	mg/L	Maximum	-	0.011 ²
Uranium	mg/L	Maximum	0.019 ⁴	0.024 ⁵
Vanadium	mg/L	Maximum		0.006 ²
Zinc	mg/L	Maximum	0.035 ⁴	0.052 ⁵
Hydrocarbons	No visible film			
Other major ions	mg/L	For interpretive purpose		
Standing water level	m	For interpretive purpose		

Notes:

¹All metals and metalloids must be measured as 'dissolved' (from analysis of a field filtered sample).

²ANZG (2018) trigger levels for 95% aquatic ecosystem protection for slightly to moderately disturbed ecosystems.

³ANZECC (2000) Table 3.3.4 for lowland rivers.

⁴80th percentile bore data

⁵95th percentile bore data

- F3 The holder of this environmental authority must provide Surface RL and Screened interval RL for **Table F1: Groundwater Monitoring Locations and Frequency** within three (3) months from the installation of the bore.
- F4 Groundwater monitoring bores must be installed within the installation phases specified in **Table F1: Groundwater Monitoring Locations and Frequency**.
- F5 Groundwater samples obtained from monitoring bores specified in **Table F1: Groundwater monitoring locations and frequency** must not exceed Limit A specified in **Table F2: Groundwater quality limits** on any five (5) consecutive sampling occasions.
- F6 Groundwater samples obtained from monitoring bores specified in **Table F1: Groundwater monitoring locations and frequency** must not exceed Limit B specified in **Table F2: Groundwater quality limits** on any three (3) consecutive sampling occasions.
- F7 If groundwater samples from any monitoring bore specified in **Table F1: Groundwater monitoring locations and frequency** exceeds Limit B specified in **Table F2: Groundwater quality limits** on any one sampling occasion the holder of this environmental authority must resample the groundwater within the monitoring bore for all exceeding parameters within ten business days of receipt of results.

Groundwater Management Program

- F8 A Groundwater Management Program must be developed, documented and implemented by an appropriately qualified person, within six (6) months from the effective date of this environmental authority.
- F9 The Groundwater Management Program required by condition **F8** must:
- (a) identify potential sources of contamination to groundwater from the activity; and
 - (b) ensure that all potential groundwater impacts due to the activity are identified, monitored and mitigated; and
 - (c) incorporate sampling and monitoring methodology; and
 - (d) 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;
 - (ii) detect any impacts to groundwater quality due to the activity;
 - (iii) determine compliance with condition **F1**;
 - (iv) determine trends in groundwater quality; and
 - (e) include an appropriate quality assurance and quality control program; and
 - (f) include a conceptual groundwater model; and
 - (g) include a review process to identify improvements to the program that addresses any comments provided by the administering authority.
- F10 The Groundwater Management Program must be reviewed on an annual basis by an appropriately qualified person to determine if it continues to meet the requirements stated in condition **F9**.

Bore construction and maintenance and decommissioning

- F11 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.
- F12 A bore drill log must be kept for each reference, compliance and observation groundwater monitoring bore which includes:
- (a) bore identification reference and geographic coordinate location; and
 - (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; and
 - (c) depth of groundwater ingress; and
 - (d) lithological data and stratigraphic interpretation by an appropriately qualified person to identify important features associated with groundwater monitoring.

Monitoring and reporting

- F13 Groundwater monitoring and sampling must be carried out by an appropriately qualified person 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) the Queensland Government's Monitoring and Sampling Manual 2018 – Environmental Protection (Water & Wetland Biodiversity) Policy 2019
 - (b) 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 Guideline for the Environmental Assessment of Subterranean Aquatic Fauna.
- F14 All groundwater monitoring data, plans, programs, and reports are to be submitted to the administering authority via WaTERS.

End of Conditions for Schedule F

Schedule G – Sewage treatment

- G1 Treated sewage effluent is authorised to be released by irrigation to land in accordance with **Table G1: Treated sewage effluent release limits to land application area**.
- G2 All treated sewage effluent irrigated to land must be monitored at the frequency and for the parameters specified in **Table G1: Treated sewage effluent release limits to land application area**

Table G1: Treated sewage effluent release limits to land application area

Monitoring Point	Quality Characteristic (units)	Maximum	Minimum frequency
Treated sewage effluent discharge from treatment plant	Daily irrigation volume	21,000 L	Daily
	Total suspended Solids	30mg/L	Monthly
	Electrical Conductivity	1,600 µS/cm	Monthly
	Total Nitrogen (mg/L as Nitrogen)	30 mg/L	Monthly
	Total Phosphorus (mg/L as Phosphorus)	15 mg/L	Monthly
	E.coli	1,000 cfu/100 mL	Weekly
	Total Chlorine ¹	5 mg/L	Weekly
	5 day Biochemical oxygen demand (BOD)	20mg/L	Monthly
	pH ¹	6.0 - 9.0	Monthly

Notes:

¹Test must be done on-site

- G3 Treated sewage effluent may only be irrigated to land in accordance with the conditions of this environmental authority within the nominated area(s) identified in **Schedule A -- Table A1: Authorised mining activities and locations** and **Schedule H—Figure 2: Project Layout—Mine Infrastructure Area**.
- G4 Irrigation of treated sewage effluent must not be undertaken within 50 metres of sensitive environmental receptors.
- G5 Treated sewage effluent released to land must be undertaken to ensure that:
- (a) drainage to groundwater is minimised and subsurface flows of contaminants to surface waters are prevented; and
 - (b) the treated sewage effluent must be distributed evenly within the irrigation area; and
 - (c) surface pondage and run-off of treated sewage effluent is prevented; and
 - (d) degradation of soil structure is minimised; and
 - (e) soil sodicity, salinity and the build-up of nutrients and heavy metals in the soil and subsoil are minimised; and
 - (f) spray drift or overspray does not carry beyond treated sewage effluent disposal area; and
 - (g) vegetation is not damaged.

- G6 The holder of this environmental authority must install and maintain an enclosed wet weather storage with a volume of at least 105,000 litres for storage of treated sewage effluent.
- G7 When weather conditions or soil conditions preclude the release of treated sewage effluent to land, treated sewage effluent must be directed to the wet weather storage or be lawfully removed from the licenced place.
- G8 An appropriately qualified person must develop and implement an irrigation area management plan for the release of treated sewage effluent to land. This management plan must include:
- (a) consideration of practices to prevent salinity, sodicity and hydraulic overloading of the land application area in accordance with the matters detailed in condition **G5**; and
 - (b) determination of the ongoing capacity of the land application area to sustainably assimilate nutrient loads, salinity and sodicity from the release of treated sewage effluent.

END OF SCHEDULE G

Schedule H – Land

Contaminated Land

- H1 The holder of this environmental authority must not contaminate land by the release of hazardous contaminants or as otherwise permitted by a condition of this environmental authority.

Chemical and flammable or combustible liquids

- H2 Spillage of all chemicals, waste oils and flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.
- H3 All piping and infrastructure associated with the loading and unloading of all flammable and combustible liquids must be designed, constructed and maintained in accordance with the latest edition of the Australian Standard *AS1940—The storage and handling of flammable and combustible liquids*.
- H4 All waste materials, explosives, hazardous chemicals, corrosive substances, toxic substances, gases and dangerous goods must be stored and handled in accordance with the relevant Australian standard. Where no relevant Australian Standard exists, all materials must be stored within an effective on-site containment system that prevents contamination of land or waters.

Topsoil

- H5 The Environmental Authority holder must ensure that:
- (a) topsoil is removed and stockpiled prior to carrying out any activity; and
 - (b) measures are implemented to ensure that the mixing and erosion of topsoil and overburden stockpiles is prevented; and
 - (c) A topsoil inventory is maintained and provide to the administering authority on request.

Vegetation Clearing

- H6 Prior to commencement of any vegetation clearing a pre-clearance survey must be undertaken by an appropriately qualified person to minimise impacts to flora and fauna species and fauna habitat.
- H7 During any vegetation clearing an appropriately qualified spotter-catcher must be present to identify and relocate significant flora and fauna species and minimise impacts to fauna habitat.

Impacts to Prescribed Environmental Matters

- H8 Significant residual impacts to prescribed environmental matters, are not authorised under this environmental authority or the *Environmental Offsets Act 2014* unless the impact(s) is specified in **Table H1: Significant residual impacts to prescribed environmental matters**.

Table H1: Significant residual impacts to prescribed environmental matters

Prescribed environmental matter	Location of prescribed environmental matter	Co-ordinates (GDA94 – MGA zone 54)	Maximum extent of impact
Waterway providing for fish passage			
Waterways providing for fish passage	Waterways on ML100162.	Coordinates provided in Appendix A	10.04ha
Regulated vegetation (intersecting a watercourse or wetland)¹			
Regional ecosystems within the defined distance from the defining banks of a relevant watercourse on the vegetation management watercourse map: RE 4.3.4f	ML100162	Coordinates provided in Appendix A	5.75ha
Regional ecosystems within the defined distance from the defining banks of a relevant watercourse on the vegetation management watercourse map: RE 2.3.3/2.3.17a and 2.3.17a/2.3.3	ML100245	Coordinates provided in Appendix A	0.68ha
Regional ecosystems within the defined distance from the defining banks of a relevant watercourse on the vegetation management watercourse map: RE 2.3.17a	ML100244 and ML100246	Coordinates provided in Appendix A	1.02ha
Protected wildlife habitat (offset is provided for by the <i>Environmental Protection and Biodiversity Conservation Act 1999</i>)			
Habitat for an animal that is endangered, vulnerable or special least concern wildlife Julia Creek dunnart (vulnerable)	ML100162, ML100244; ML100245 and ML100246	Per Commonwealth Approval (EPBC 2017/8007)	Total terrestrial wildlife habitat impacted: 7,419ha

Notes:

¹The significant residual impact criteria for clearing of vegetation in a regional ecosystem that is within the defined distance of a watercourse is defined in Table 1 of the *Queensland Environmental Offsets Policy Significant Residual Impact Guideline*.

- H9 Records demonstrating that each impact to a prescribed environmental matter not listed in **Table H1 - Significant residual impacts to prescribed environmental matters** will not result in a significant residual impact to that matter must be:
- (a) completed by an appropriately qualified person; and
 - (b) kept until this environmental authority is surrendered.
- H10 An environmental offset made in accordance with the *Environmental Offsets Act 2014* and Queensland Environmental Offsets Policy, must be undertaken for the maximum extent of impact to each prescribed environmental matter authorised in **Table H1: Significant residual impacts to prescribed environmental matters**.

Non-staged impacts

- H11 Prior to the commencement of any impacts to a prescribed environmental matter for which an environmental offset is required by condition **H10**, 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.
- H12 The notice of election for the environmental offset must be provided to the administering authority no less than three (3) months before the proposed commencement of the significant residual impacts for which the environmental offset is required.

End of Conditions for Schedule H

Schedule I – Watercourse diversions

- I1 The holder of this Environmental Authority must not construct any permanent water course diversions on the licensed place.
- I2 Temporary watercourse diversions must be designed and constructed to:
- (a) maintain the pre-existing hydrologic characteristics of the surface water system; and
 - (b) maintain the hydraulic characteristics of the watercourse diversion that are equivalent to other local watercourses. Where structures that require on-going maintenance are used, they must not compromise the performance of the temporary watercourse diversion and adjoining watercourses; and
 - (c) maintain sediment transport and water quality regimes that minimise any impacts to upstream and downstream water quality, geomorphology or vegetation; and
 - (d) maintain the functionality of the substrate at the location of the diversion.
- I3 In the event that a watercourse diversion application is lodged with the administering authority, a design plan must be submitted to the administering authority at least thirty (30) business days before commencing construction of a temporary watercourse diversion, that:
- (a) has been assessed and certified by a suitably qualified and experienced person; and
 - (b) will achieve the required outcomes stated in condition I2.
- I4 In that event that a design plan is provided to the administering authority in accordance with condition I3, a certified set of 'as constructed' drawings and specifications must be submitted to the administering authority within ninety (90) business days from the completion of construction of the temporary watercourse diversion, or re-establishment of the pre-existing watercourse. These drawings and specifications must include certification from the suitably qualified and experienced person who supervised the construction of the watercourse diversion, or re-establishment of the watercourse, that the 'as constructed' drawings and specifications of the watercourse diversion are in accordance with the design plan.
- I5 The holder of this environmental authority must implement and maintain a Register of Watercourse Diversions that contains details of watercourse diversions planned and constructed at the licensed place.

End of Conditions for Schedule I

Schedule J – Regulated Structures

Assessment of consequence category

- J1 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 the adoption of this schedule; or
 - (c) prior to any change in its purpose or the nature of its stored contents.
- J2 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.
- J3 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 (EM635)*.

Design and construction of a regulated structure

- J4 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 (EM635)*.
- J5 Construction of a regulated structure is prohibited unless:
- (a) The holder has submitted a consequence category assessment report; and
 - (b) Certification to the administering authority has been certified by a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant condition of this environmental authority.
- J6 Consequence category assessment 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.
- J7 Regulated structures must:
- (a) be designed, constructed and operated in accordance with the requirements of the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)*; and
 - (b) be designed and constructed to minimise the risk of flooding and erosion.
- J8 Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that the 'as constructed' drawings and specifications of the regulated structure is in accordance with the design plan.

Operation of a regulated structure

- J9 Tailings water must not be in contact with the dam wall of a tailings dam unless the regulated dam has been specifically designed to allow this and this is detailed in the design plan and operational plan for the regulated dam.

- J10 Operation of a regulated structure, except for an existing structure, is prohibited unless the holder of this environmental authority has submitted to the administering authority:
- (a) one paper copy and one electronic copy of the design plan and certification of the 'design plan', and
 - (b) a set of 'as constructed' drawings and specifications, and
 - (c) certification of those 'as constructed drawings and specifications', and
 - (d) where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan.
 - (e) the requirements of this authority relating to the construction of the regulated structure have been met;
 - (f) the holder has entered the details required under this authority, into a Register of Regulated Dams; and
 - (g) there is a current operational plan for the regulated structures.
- J11 Operation of any regulated structure, is prohibited unless:
- (a) the details of the structure are listed in **Table J1: Hydraulic Performance of Regulated Structures** and **Table J2: Hydraulic Performance Criteria for Levees**; and
 - (b) there is a current operational plan for the regulated structure.
- J12 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.

Mandatory reporting level

- J13 The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.
- J14 The holder of this environmental authority 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 dam reaches the Mandatory Reporting Level.
- J15 The holder of this environmental authority must, immediately on becoming aware that the Mandatory Reporting Level has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated structure.
- J16 The holder of this environmental authority must record any changes to the Mandatory Reporting Level in the Register of Regulated Structures.

Design storage allowance

- J17 The holder of this environmental authority 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 taken prior to 1 July of each year.
- J18 By 1 November of each year, storage capacity must be available in each regulated structure, to meet the Design Storage Allowance (DSA) volume for the dam as listed in **Table J1: Hydraulic Performance of Regulated Structures**.

- J19 The holder of this environmental authority must notify the administering authority, within forty-eight (48) hours of becoming aware that a dam will not meet the Design Storage Allowance by 1 November of any year.
- J20 If the holder of this environmental authority becomes aware that insufficient Design Storage Allowance is available in accordance with condition **J19** you must take action to prevent any unauthorised discharge from the dam.

Annual inspection report

- J21 Each regulated structure must be inspected by 1 November each calendar year by a suitably qualified and experienced person.
- J22 At each annual inspection required under condition **J21**, 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 recommended actions to ensure the integrity of the regulated structure.
- J23 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)*.
- J24 The holder of this environmental authority must:
- (a) Within twenty (20) business days of receipt of the annual inspection report, provide to the administering authority:
 - i. The recommendations section of the annual inspection report; and
 - ii. If applicable, any actions being taken in response to those recommendations; and
 - (b) If, following receipt of the recommendations and (if applicable) actions, the administering authority requests a full copy of the annual inspection report from the holder, provide this to the administering authority within 10 business days of receipt of the request.

Transfer arrangements

- J25 The holder of this environmental authority must provide a copy of any reports, documentation and certifications prepared under this environmental authority, including but not limited to any Register of Regulated Structures, consequence category assessment, design plan and other documentation relating to regulated structures, to any future holder of this environmental authority.

Decommissioning

- J26 The holder of this environmental authority must submit a decommissioning plan to the administering authority prior to decommissioning any regulated structure that has been certified by a suitably qualified and experienced person.

Hydraulic Performance of Regulated Structures

- J27 The holder of this environmental authority must comply with the hydraulic performance criteria specified in **Table J1: Hydraulic Performance Criteria** and **Table J2: Hydraulic Performance Criteria for Levees**.
- J28 Each regulated structure listed in **Table J1: Hydraulic Performance Criteria** and **Table J2: Hydraulic Performance Criteria for Levees** must:
- (a) meet the applicable hydraulic performance criteria listed in **Table J1: Hydraulic Performance Criteria** or **Table J2: Hydraulic Performance Criteria for Levees** for that structure; and

- (b) have the Design Storage Allowance and Mandatory Reporting Level calculated in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933)*.

Table J1: Regulated structures hydraulic performance criteria

Regulated structure	Consequence category	Hydraulic performance criteria		
		Spillway Capacity	Design Storage Allowance (DSA) ¹	Mandatory Reporting Level (MRL)
MIA sediment dam	Significant	1,000 AEP	N/A	N/A
Raw water dam	Significant	1,000 AEP	N/A	N/A
Mine water dam	Significant	1,000 AEP	N/A	N/A
TSF	High	10,000 AEP	1: 100 AEP 2 month wet season	1:100 AEP 72 hr duration
Evaporation Pond	High	10,000 AEP	1: 100 AEP 2 month wet season	1:100 AEP 72 hr duration

Notes:

¹ Must be achieved on 1 November of each year.

Table J2 – Regulated structures hydraulic performance criteria

Regulated structure	Consequence category	Design criteria - flood level for embankment crest levels
Horse Creek levee	Significant	1:1,000 AEP

- J29 The hydraulic performance criteria specified in this environmental authority are the minimum mandatory performance requirements, regulated structures must be managed in a manner that ensures compliance with all conditions of this environmental authority.

End of Conditions for Schedule J

Schedule K – Definitions

Key terms and/or phrases used in this document are defined in this section. 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.

‘Acid rock drainage’ means any contaminated discharge emanating from a mining activity formed through a series of chemical and biological reactions, when geological strata is disturbed and exposed to oxygen and moisture.

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

‘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.

‘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.

‘ANZG (2018)’ means Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018). Published by the Australian and New Zealand Governments and Australian state and territory governments or any equivalent update/replacement guidelines.

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

‘Appropriately qualified person’ means a person who has professional qualifications, training, skills 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.

‘Authorised activity’ for a mining tenement is an activity that its holder is, under this Act or the tenement, entitled to carry out in relation to the tenement.

‘Authority’ means environmental authority (mining activities) under the Environmental Protection Act 1994.

‘Background’, with Reference to the water schedule means the average of samples taken prior to the commencement of vanadium mining activities 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.

‘Certified’ with respect to watercourse diversions, means assessed and approved by a suitably qualified and experienced person. In relation to ‘as constructed’ drawings and specifications, the certification must be by the suitably qualified person who supervised the construction of the watercourse diversion, or re-establishment of the watercourse.

‘Certification, Certifying or Certified’ by an appropriately qualified and experienced person in relation to a design plan or an annual report regarding dams/structures, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- a) exactly what is being certified and the precise nature of that certification
- b) the relevant legislative, regulatory and technical criteria on which the certification has been based
- c) the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts
- d) the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

‘Chemical’ means:

- a) an agricultural chemical product or veterinary chemical product within the meaning of the *Agricultural and Veterinary Chemicals Code Act 1994* (Commonwealth), or
- b) a dangerous good under the Australian Code for the Transport of Dangerous Goods by Road and Rail approved by the Australian Transport Council, or
- c) a lead hazardous substance within the meaning of the Workplace Health and Safety Regulation 1997, or
- d) a drug or poison in the Standard for the Uniform Scheduling of Drugs and Poisons prepared by the Australian Health Ministers’ Advisory Council and published by the Commonwealth, or
- e) any substance used as, or intended for use as:
 - (i) a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product, or
 - (ii) a surface active agent, including, for example, soap or related detergent, or
 - (iii) a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide, or
 - (iv) a fertiliser for agricultural, horticultural or garden use, or

- (v) a substance used for, or intended for use for mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater, or
- (vi) 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.

‘Commissioning’ means all components of the construction of a structure, such as a tailings storage facility or mine infrastructure area, have been completed.

‘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.

‘Construction or constructed’, in relation to watercourse diversions, is the process of building, or modifying an existing diversion, but does not include investigations and testing necessary for the purpose of preparing a design plan.

‘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 (EM635)*. The relevant category is specified in **Table J1 – Regulated structures hydraulic performance criteria**

‘Contaminants’ means any prescribed water contaminants listed under Schedule 9 of the *Environmental Protection Regulations 2008*.

‘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.

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

‘Defined distance’, for a regional ecosystem, means a distance identified in the appendix 3 of the environmental offsets policy as the relevant distance from the defining banks of a relevant watercourse or relevant drainage feature.

‘Design plan’ is a document that contains the design, operation, monitoring and revegetation criteria of a watercourse diversion that addresses the outcomes stated in conditions on the environmental authority relating to the diversion. The document should include, but not be limited to:

- a) required information under a functional design
- b) the location, function and description of geomorphic and riparian vegetation features within the proposed watercourse diversion
- c) results from hydrologic, hydraulic and sediment transportation modelling used in the design of the diversion
- d) a revegetation and vegetation management plan (a revegetation plan) for the diversion
- e) engineering drawings depicting the physical attributes and dimensions of the diversion

- f) (if relevant) the staged development of a permanent watercourse diversion including the proposed use of temporary watercourse diversions with identified lifespans
- g) all investigation and other reports relied on by the design
- h) plans and specifications sufficient to complete construction and revegetation in accordance with the design.

‘Design storage allowance or DSA’ means an available volume, estimated in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)* published by the administering authority, that must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that Manual. The applicable DSA for regulated structures authorised under this environmental authority are detailed in **Table J1 – Regulated structures hydraulic performance criteria** and **Table J2 – Hydraulic Performance Criteria for Levees**

‘Designer’ for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.

‘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.
- g) **EC** means electrical conductivity.

‘Effluent’ treated waste water released from sewage treatment plants.

‘Environmental authority holder’ means the holder of an environmental authority issued under section 195 that approves an environmentally relevant activity applied for in an application or any others works conducted by a another entity on the approved leases.

‘Environmental offset’ has the meaning in section 7 of the *Environmental Offsets Act 2014*.

‘Equilibrium’ means a state where ‘balance’ is achieved despite changing variables.

‘Fish habitat’ is defined under the Fisheries Act 1994 and includes land, waters and plants associated with the life cycle of fish, and includes land and waters not presently occupied by fisheries resources.

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

‘Functional design’ is a document that contains ‘conceptual’ information about the design, operation and revegetation criteria of a watercourse diversion that addresses the outcomes stated in the conditions on the environmental authority relating to the diversion. The document should include, but not be limited to:

- a) geomorphic and vegetation assessment of the existing watercourse

- b) hydrologic conditions of the existing watercourse
- c) the proposed watercourse diversion route
- d) results from hydrologic, hydraulic and sediment transportation modelling used in the design of the diversion.

‘Functionality’ means the purpose that something is designed or expected to fulfil.

‘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:

- *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;*
- *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.*

‘Hazard category’ means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.

‘Hazardous waste’ means a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause environmental harm because of—

- a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability; or
- b) its physical, chemical or infectious characteristics.

‘Holder’, for a mining tenement, means a holder of the tenement under the *Mineral Resources Act 1989*, and the holder of the associated environmental authority under the *Environmental Protection Act 1994*.

‘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 (EM635)*.

‘Infrastructure’ means water storage dams, levees, roads and tracks, buildings and other structures built for the purpose of the mining activity.

‘Land’ in the ‘land 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.

‘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 this environmental authority.

‘Low consequence dam’ means any dam that is not a high or significant consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*.

‘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 (EM635)* published by the administering authority.

‘Manual’ means the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)* published by the administering authority.

‘Maximum extent of impact’ means the total maximum, unabated, impact to a prescribed environmental matter that could occur over the whole-of-project life.

‘Maximum’ means that the measured value of the quality characteristic or contaminant must not be greater than the release limit stated.

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

‘Mining activity’ means an activity that is an authorised activity for a mining tenement under the Mineral Resources Act 1989; or another activity that is authorised under an approval under the Mineral Resources Act that grants rights over land and includes:

- a) depositing earth or material; and
- b) disturbing the surface of the ground; and
- c) erecting works; and
- d) sinking a shaft.

‘Mine waste’ includes any waste produced from mining activities and includes but is not limited to spoil, overburden, waste rock and tailings.

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

‘Minimum’ means that the measured value of the quality characteristic or contaminant must not be less than the release limit stated.

‘minimum data requirements’ means the reference data requirements outlined in Table 4.4.2 of the *Queensland Water Quality Guidelines 2009*.

‘Modification or modifying’ (see definition of ‘construction’)

‘Natural flow’ means the flow of water through waters caused by natural processes (*i.e.* rainfall in the catchment area and subsequent runoff into watercourses).

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

‘Notice of election’ has the meaning in section 18(2) *Environmental Offsets Act 2014*.

‘Operational plan’ includes:

- a) Normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance);

- 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.

‘Potentially acid forming (PAF) waste rock’ means potentially acid forming waste rock and includes any mined material with the potential for nett generation of acidity; where there is uncertainty regarding the materials acid-forming potential, it must be treated as PAF waste rock until demonstrated otherwise.

‘Pre-existing watercourse’ is the section of watercourse from which the flow of water will be diverted as a result of the construction and operation of a watercourse diversion.

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

‘Progressive Rehabilitation’ means Rehabilitation (defined below) undertaken progressively or a staged approach to Rehabilitation as mining operations are ongoing.

‘Protected area’ means – a protected area under the *Nature Conservation Act 1992*, or

- a) a marine park under the *Marine Parks Act 1992*, or
- b) a World Heritage Area.

‘Range’ means that the measured value of the quality characteristic or contaminant must not be greater than the higher release limit stated nor lower than the lower release limit stated.

‘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
- c) an area of land that is not specified in **Schedule A – Table A1 (Authorised Mining Activities and Locations)** of this environmental authority.

‘Receiving Waters’ means the waters of the receiving environment.

‘Regulated dam’ means any dam in the significant or high consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)* published by the administering authority.

‘Register of Regulated Dams’ includes:

- (a) Date of entry in the register;
- (b) Name of the dam, its purpose and intended/actual contents;
- (c) The consequence category of the dam as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*;
- (d) Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;
- (e) Name and qualifications of the suitably qualified and experienced person who certified the design plan and ‘as constructed’ drawings;
- (f) For the regulated dam, other than in relation to any levees –
 - i. The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;

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

‘Regulated structure’ includes land-based containment structures, levees, bunds and voids, but not a tank or container designed and constructed to an Australian Standard that deals with strength and structural integrity.

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

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

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

‘Revegetation’ is the re-establishment of vegetation of a species 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.

‘RL’ means reduced level, relative to Australian Height Datum.

‘Saline Drainage’ The movement of waters, contaminated with salts, as a result of the mining activity.

‘Self-sustaining’ means not requiring on-going intervention and maintenance to maintain functional riverine processes and characteristics

‘Sensitive environmental receptor’ means a sensitive receptor under any relevant environmental protection policies and **includes** creeks, rivers, wetlands, high-ecological value areas, drinking water bores, conservation areas or national parks.

‘Sensitive place’ means:

- a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises, or

- b) a motel, hotel or hostel, or
- c) an educational institution, or
- d) a medical centre or hospital, or
- e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area, or
- f) a public park or gardens.

Note: The definition of 'Sensitive place' and 'commercial place' is based on Schedule 1 of EPP Noise. 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 is constructed on land owned by one or more of the companies.

'Significant residual impact' has the meaning in section 8 *Environmental Offsets Act 2014*.

'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.

'Structure' means dam or levee.

'Suitably qualified and experienced person' means a person who is a Registered Professional Engineer of Queensland under the provisions of the *Professional Engineers Act 2002*, who has an **appropriate level of expertise** in the structures, geomechanics, hydrology, hydraulics and environmental impact of watercourse diversions.

An **appropriate level of expertise** includes:

- demonstrable competency, experience and expertise in:
 - investigation, design or construction of watercourses diversions
 - operation and maintenance of watercourse diversions
 - geomechanics with particular emphasis on channel equilibrium, geology and geochemistry
 - hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology
 - hydraulics with particular reference to sediment transport and deposition and erosion control

- hydrogeology with particular reference to seepage and groundwater
 - solute transport processes and monitoring thereof, or
- sufficient knowledge and experience to certify that where the **suitably qualified and experienced person** has relied on advice and information provided by other **persons with relevant expertise**:
 - they consider it reasonable to rely on that advice and information
 - the expert providing the advice and information has knowledge, competency, suitable experience and demonstrated expertise in the matters related to watercourse diversions.

Persons with relevant expertise include:

- Geomorphologist: person who has demonstrated competency and relevant experience in stream geomorphology and watercourse diversions.
- Geotechnical Expert: person who has demonstrated competency and relevant experience in geotechnical assessment of soil characteristics suitable for watercourse diversions.
- Vegetation Expert: person who has demonstrated competency and relevant experience in the identification, role and function of vegetation with watercourses and adjoining floodplains, and has demonstrated competency and relevant experience in revegetation of watercourse diversions and adjoining floodplains. .
- Groundwater Expert: person who has demonstrated competency and relevant experience in groundwater systems.
- Surface Water Expert: person who has demonstrated competency and relevant experience in hydrology.
- Engineer: person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Persons Act 2002* or has similar qualifications under a respected professional registration association, and has demonstrated competency and relevant experience in design and construction of watercourse diversions.
- Soils Expert: person who has demonstrated competency and relevant experience in soil classification including the physical, chemical and hydrologic analysis of soil.

‘Stable’ means geotechnical stability of the rehabilitated landform where instability related to the excessive settlement and subsidence caused by consolidation/settlement of the wastes deposited, and sliding/slumping instability has ceased.

‘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.

‘Temporary watercourse diversion’ is a man-made structure that may incorporate geomorphologic, hydraulic, hydrologic and ecological components of a local watercourse and is designed, constructed, operated and maintained to an engineering standard that ensures the diversion does not compromise the equilibrium and performance of the diversion and adjoining watercourses. A temporary diversion is replaced by a permanent diversion, or the re-establishment of the pre-existing watercourse, within the timeframe specified in the design plan.

‘the Act’ means the *Environmental Protection Act 1994*.

‘μS/cm’ means micro siemens per centimetre.

‘Void’ means any constructed, open excavation in the ground.

‘Water’ is defined under Schedule 4 of the *Water Act 2000*.

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

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

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

“WaTERS” – Water Tracking and Electronic Reporting System or subsequent updated system, used to submit monitoring data and notify the Queensland Government. [<https://waters.des.qld.gov.au/>] or contact

‘Wet season’ means the period commencing on 1 November each year and ending on 30 April of the following year.

END OF SCHEDULE K

Schedule L – Figures

Figure 1: Project Layout–Mine Domains

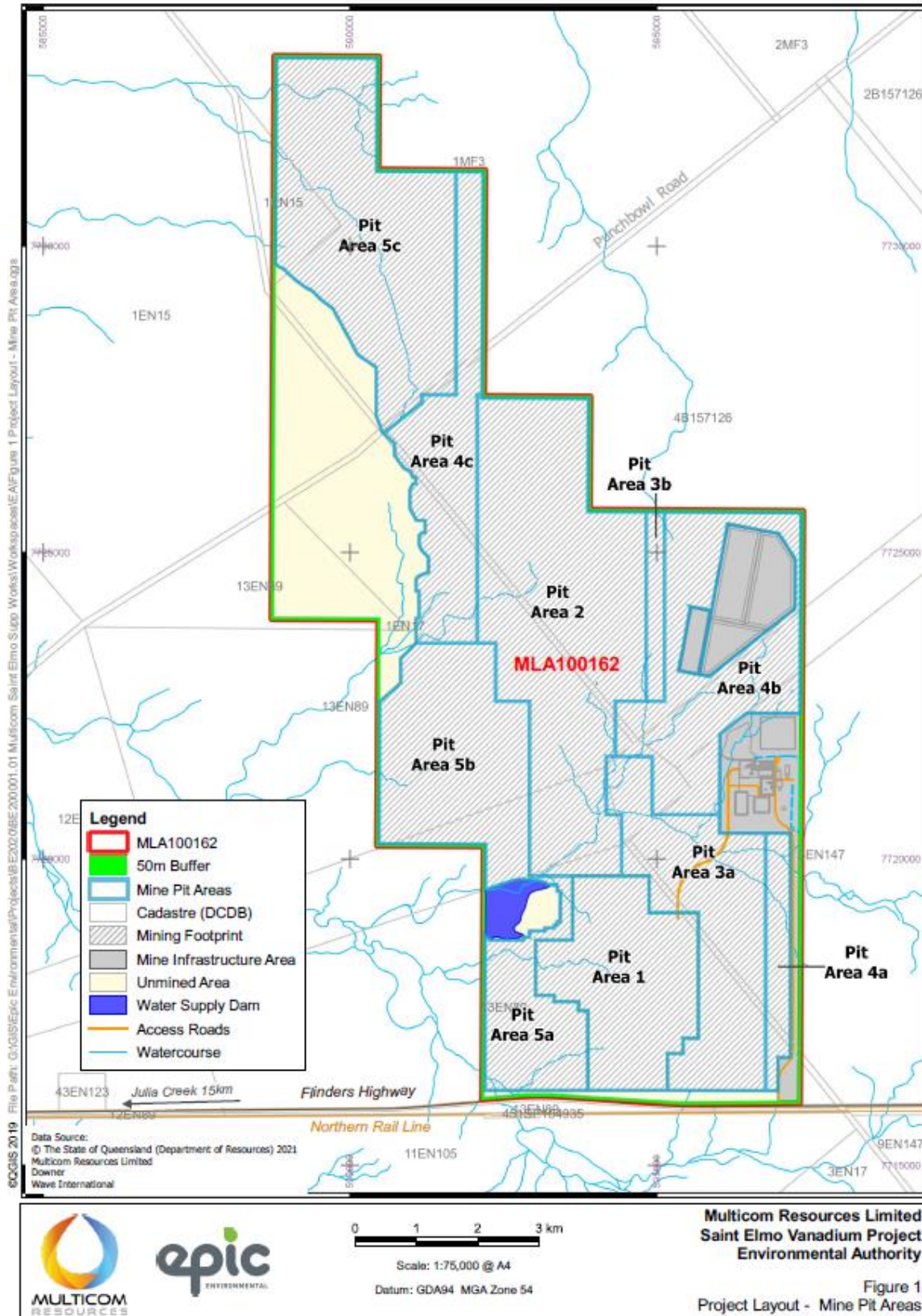


Figure 2: Project Layout–Mine Infrastructure Area

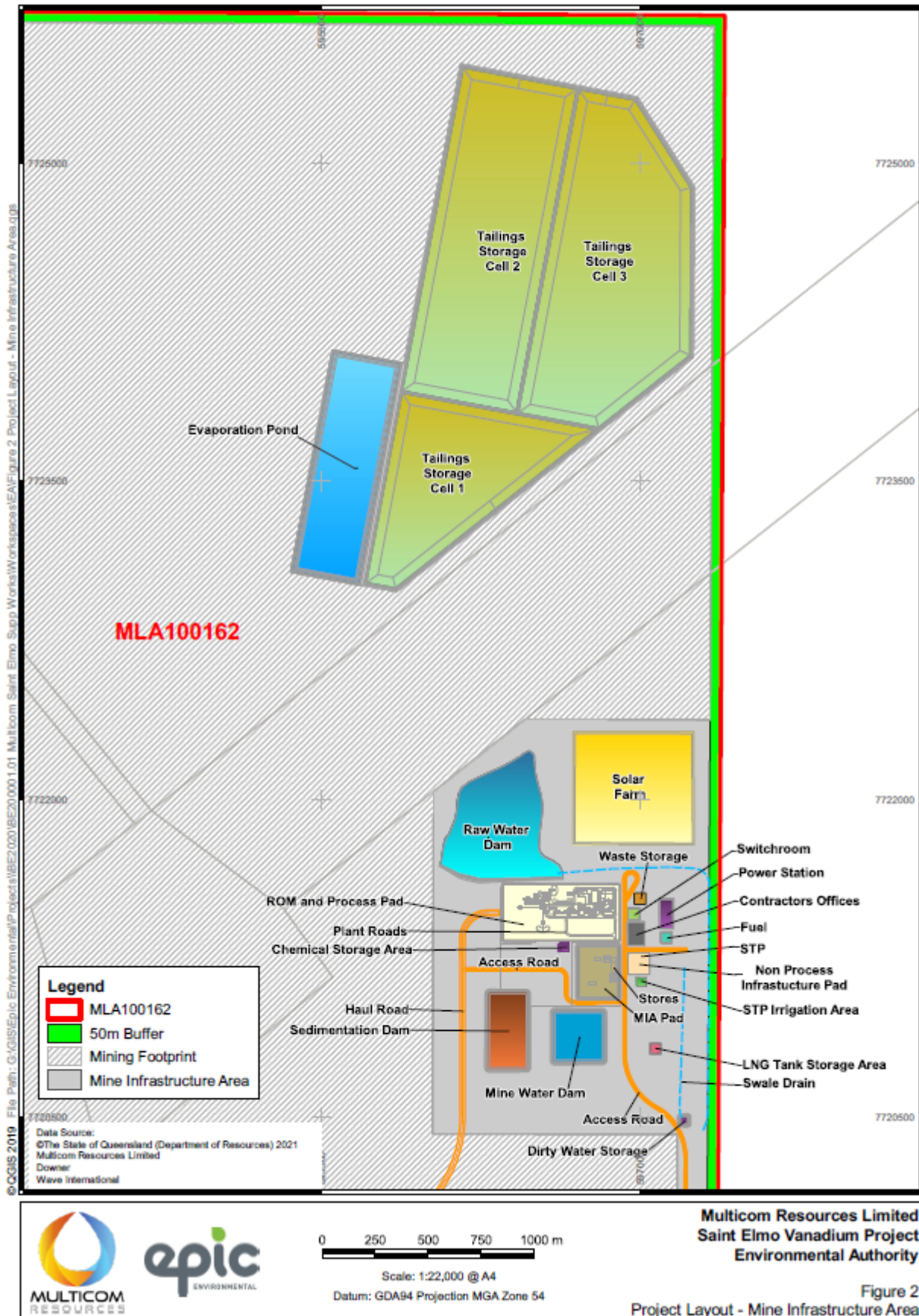


Figure 3: Project Layout – Sediment dams

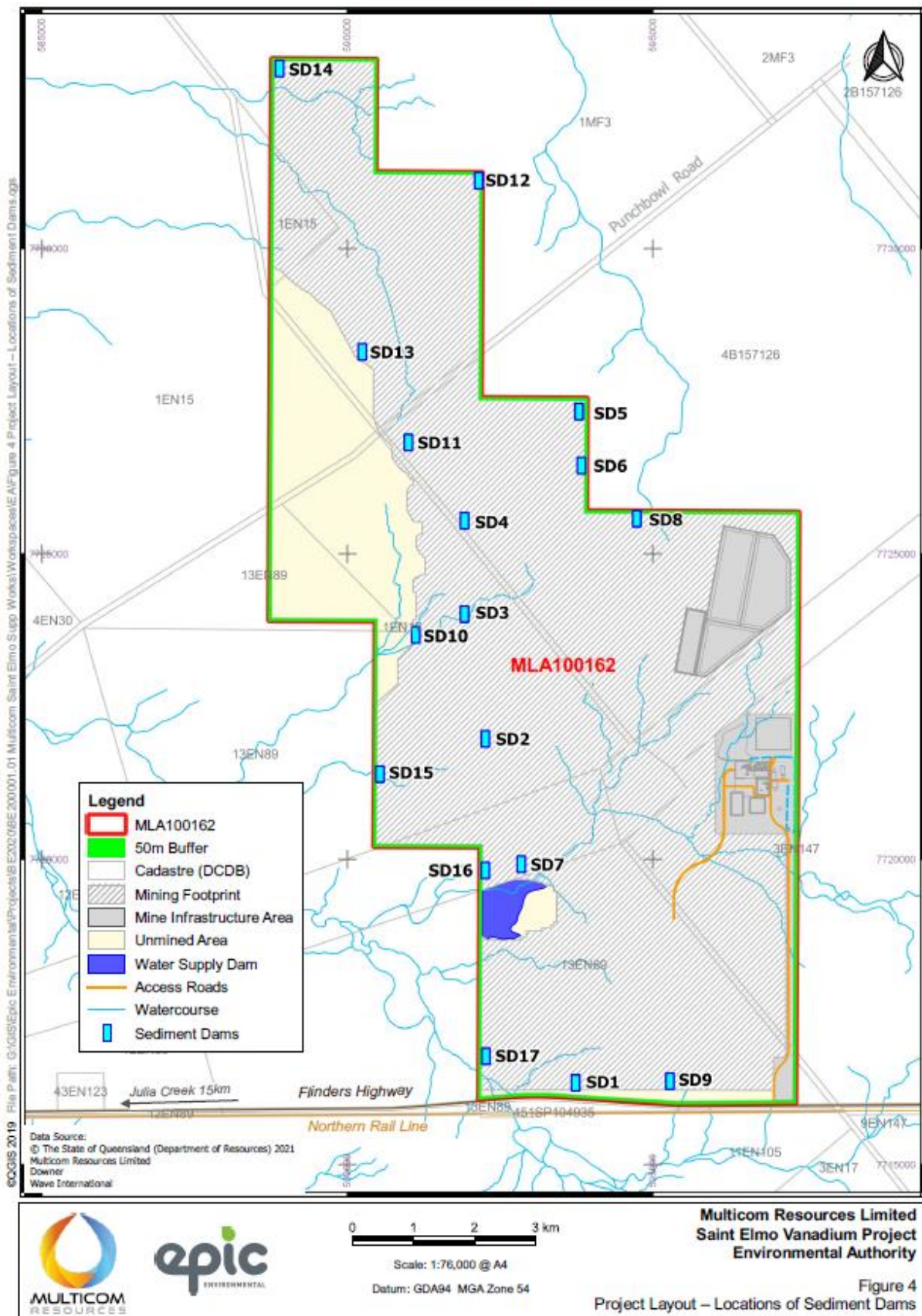


Figure 4: Project Layout–Offsite Water Storage Facility and Associated Infrastructure

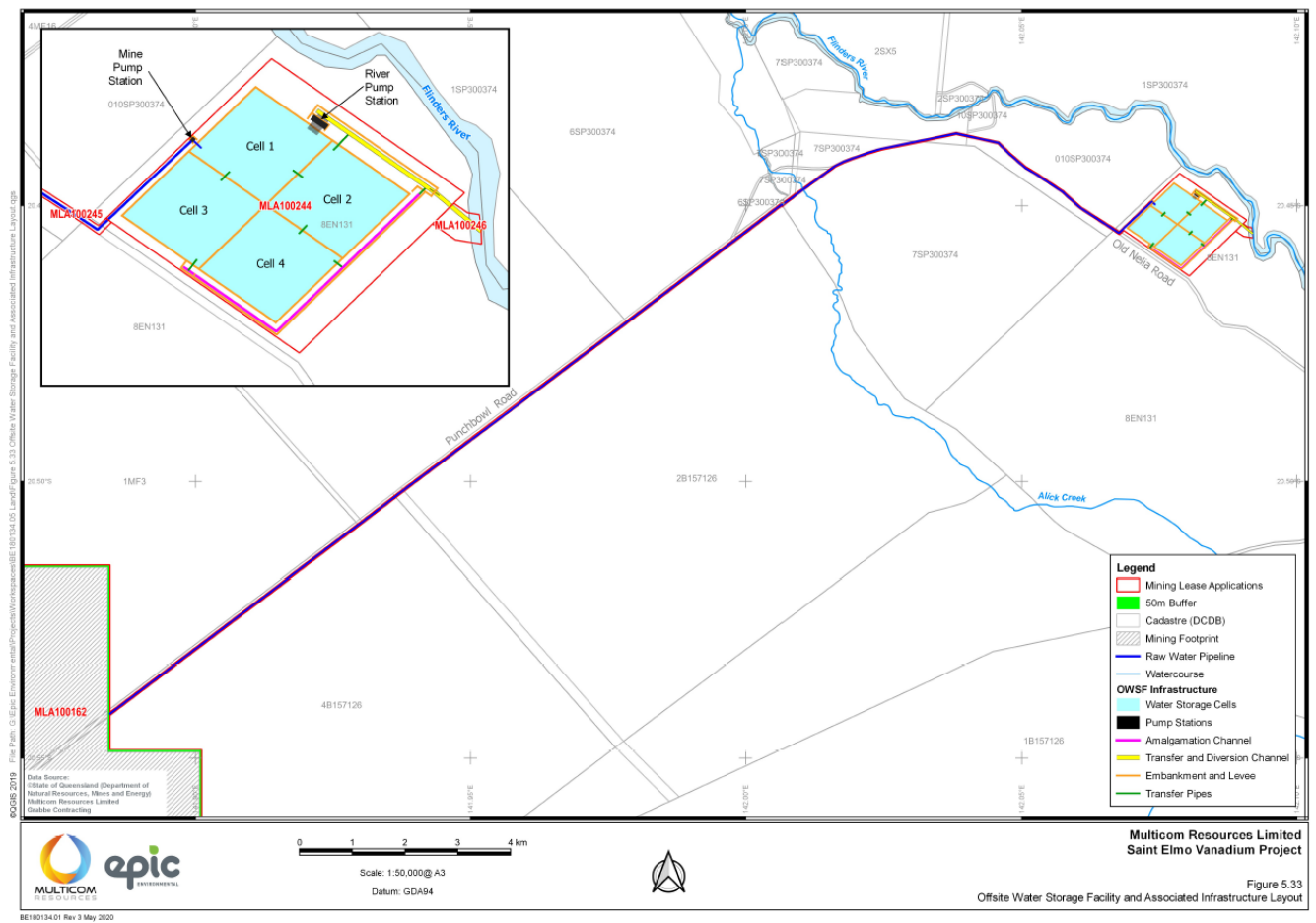


Figure 5: Groundwater Monitoring Locations

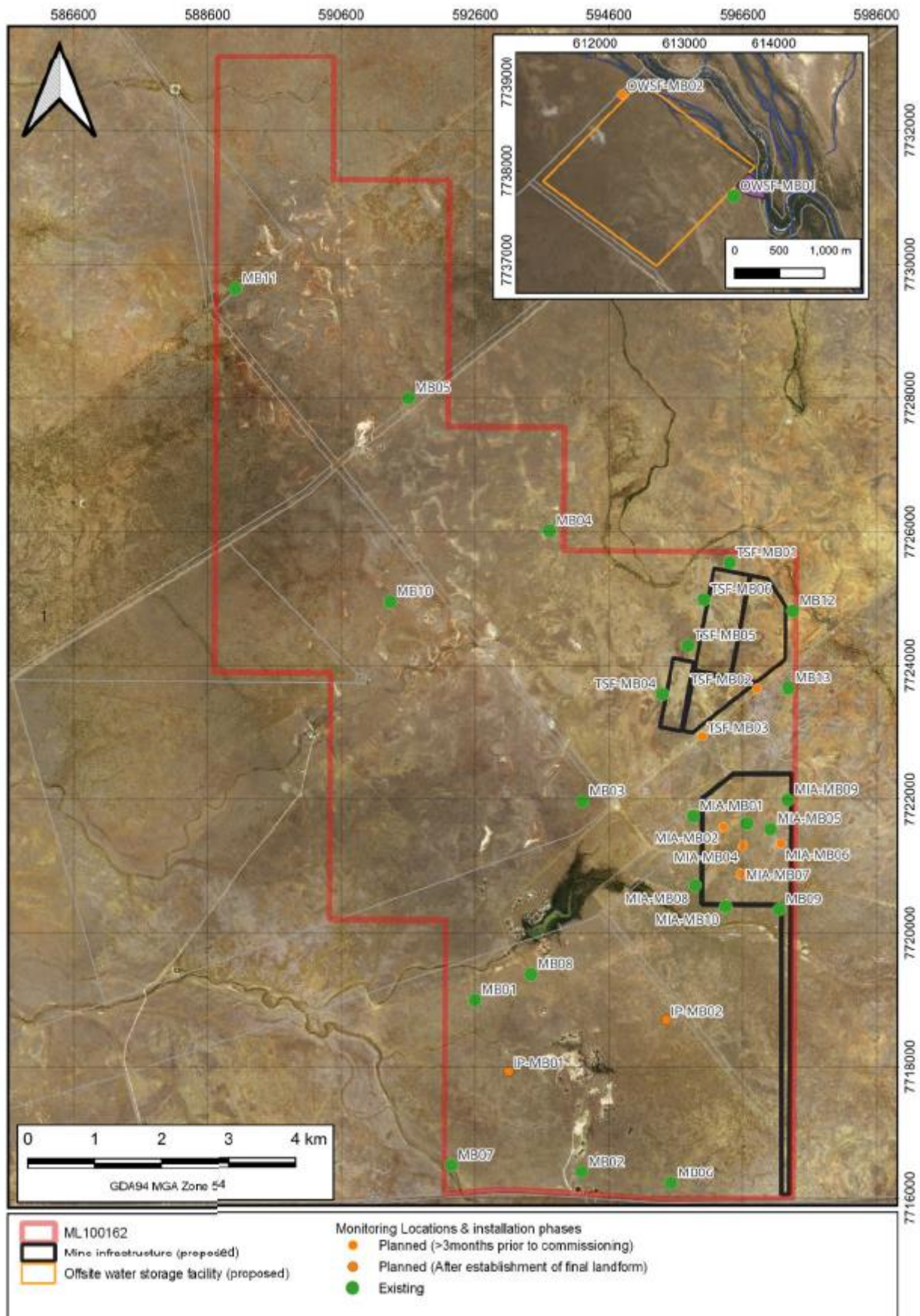
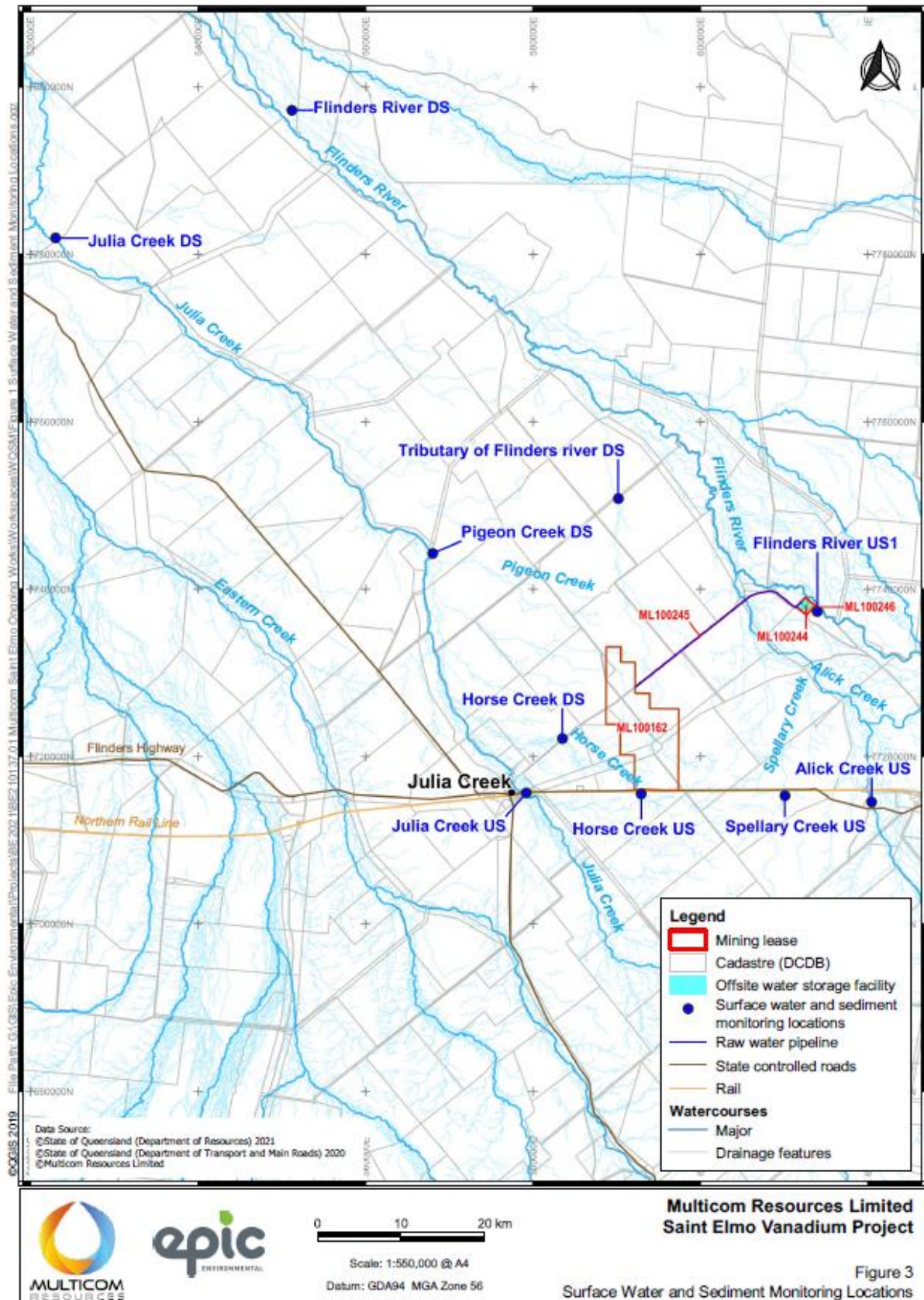


Figure 6: Surface Water and Sediment Monitoring Locations



END OF SCHEDULE L

END OF ENVIRONMENTAL AUTHORITY

Appendix A

Detailed Coordinates – Significant residual impacts to prescribed environmental matters

Waterways providing for fish passage		Regional ecosystems within the defined distance from the defining banks of a relevant watercourse RE 4.3.4f		Regional ecosystems within the defined distance from the defining banks of a relevant watercourse RE 2.3.3/2.3.17a and 2.3.17a/2.3.3		Regional ecosystems within the defined distance from the defining banks of a relevant watercourse RE 2.3.17a	
Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)
592205.3152	7719474.9890	592331.2736	7716224.688	605664.9083	7738941.881	613846.3557	7737771.714
592702.8294	7719459.7320	592329.7295	7716230.609	605669.5418	7738935.35	613842.4738	7737788.829
592870.8268	7719624.4660	592326.3981	7716300.785	605563.4173	7738853.559	613825.2781	7737809.412
593145.4385	7719757.5120	592293.3868	7716377.275	605561.1193	7738853.303	613828.5902	7737825.183
593505.3463	7720216.5440	592198.4719	7716454.105	605555.9127	7738857.875	613804.5808	7737911.875
593637.3746	7720253.2840	592188.8847	7716461.984			613806.8063	7737910.212
593723.3906	7720363.2450	592189.0995	7716501.378			613812.6431	7737909.17
593978.0586	7720417.0540	592296.0575	7716412.956			613892.1982	7737838.04
594032.0243	7720773.7000	592350.1361	7716340.042			613896.5379	7737803.823
594095.6774	7720868.0070	592372.201	7716224.696			613898.4105	7737725.172
594300.1132	7720902.3690	593266.3626	7719870.355				
594986.4253	7720778.2420	593157.6378	7719725.389				
595605.9654	7720338.9300	593146.0076	7719733.707				
595809.6221	7720071.5490	593132.5852	7719724.917				
596265.8568	7720144.8900	593120.6082	7719708.733				
596882.3641	7720159.1270	593119.8758	7719688.593				
597316.9335	7719755.0610	593109.2362	7719679.727				
597044.3630	7720008.5050	593065.4372	7719643.228				
597225.4245	7720245.9080	593002.0183	7719656.833				
597320.7489	7720417.1360	593018.5884	7719667.19				
595603.2770	7720354.4410	593043.9552	7719686.256				
595815.1560	7720722.3060	593076.7965	7719713.405				
596032.5993	7721085.9120	593113.4015	7719749.398				
596071.2937	7721197.1150	593166.4945	7719811.151				
596102.2754	7721421.7580	593201.6342	7719850.845				
596265.0466	7721801.4470	593227.4931	7719875.213				
596287.3848	7721974.8640	593065.4367	7719643.227				
596566.9411	7722317.4040	593041.7678	7719623.502				
596598.1132	7722737.2810	592983.332	7719606.076				
596648.0347	7722862.2240	592933.4836	7719593.792				
596630.1444	7722981.6370	592902.1611	7719572.543				
596574.9742	7723076.6110	592870.875	7719557.943				
596575.4004	7723151.5470	592812.8824	7719550.873				

596689.2709	7723255.4200	592801.5559	7719517.696
596678.0236	7723563.1290	592801.4345	7719495.538
590478.1491	7721249.9470	592796.1124	7719473.409
590713.8336	7721261.1230	592788.8438	7719452.525
591000.2017	7721253.1800	592669.4641	7719432.629
591073.5118	7721419.9190	592610.9108	7719432.629
590810.8418	7721692.9770	592572.3607	7719453.212
590484.1263	7722366.1440	592528.6222	7719471.178
591077.1549	7723561.3100	592484.0963	7719481.023
591208.5192	7723673.5750	592421.7228	7719488.01
591452.9653	7723697.0830	592363.0079	7719484.638
591520.0514	7723740.1070	592332.5098	7719478.156
591521.6879	7724043.7940	592280.4776	7719474.008
591611.0603	7724086.6980	592232.9757	7719483.129
591792.6893	7724018.6670	592205.3706	7719485.152
591915.2545	7724018.0050	592205.457	7719500.998
591989.7073	7724049.1540	592205.5943	7719526.188
592061.2585	7724230.1960	592241.3534	7719520.754
592128.6478	7724328.4340	592306.6868	7719511.536
592325.6272	7724351.0290	592346.1087	7719519.446
592415.0248	7724397.8720	592403.3821	7719530.951
592838.3773	7724383.7320	592465.7597	7719524.702
592905.5130	7724434.6380	592525.117	7719509.605
592965.5444	7724544.7450	592583.0527	7719506.335
593099.3860	7724567.6770	592617.9161	7719495.803
593273.7598	7724531.2240	592639.3533	7719475.743
591160.2674	7725055.3170	592663.0113	7719454.194
591210.9100	7725135.0250	592697.9027	7719448.832
591221.1801	7725318.3710	592717.9912	7719453.893
591295.8384	7725386.9920	592758.3057	7719489.127
592199.1652	7718346.8890	592769.62	7719520.088
592305.2071	7718380.7150	592791.3605	7719555.423
592521.3180	7718519.5530	592809.3213	7719578.962
592825.5738	7718368.7090	592848.0895	7719603.123
593025.4656	7718369.8720	592915.0387	7719617.53
593130.9772	7718216.5740	592977.5826	7719641.563
593288.5472	7718271.7940	593002.0181	7719656.833
593397.8914	7718237.6660		
593551.4764	7718314.7160		
593655.2294	7718276.6730		
593834.0035	7718376.2590		

594133.8294	7718376.5680
594255.1025	7718317.7170
594294.5438	7718232.6980
594306.2593	7718169.5260
594397.7069	7718089.1480
594488.8139	7718114.2770
594571.2647	7718085.2210
594819.1065	7718085.8080
595264.8581	7717956.1070
591058.1666	7727305.0970
591091.2631	7727762.4340
591034.2200	7727863.3140
590989.9659	7728271.7640
590771.4810	7729101.1880
590503.4775	7729747.5010
590499.4248	7729992.0250
590407.2517	7730126.6130
590244.2957	7730226.0790
590109.8062	7730381.9630
590032.4295	7730562.4460
589743.7104	7730771.0320
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589403.3590	7731054.8220
589271.1036	7730988.4660
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589180.1019	7731349.8230
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588795.8342	7731673.0380
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596946.3628	7726031.0930
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597429.2297	7725165.7400
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595011.4495	7725730.1910
597385.7928	7719691.4880
591118.6196	7723694.3230
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590422.7257	7721253.3280
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597393.2222	7720531.8440
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588720.2501	7732629.3960
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