Permit

Environmental Protection Act 1994

Environmental authority EPML00897513

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

Environmental authority number: EPML00897513

Environmental authority takes effect on 13 August 2024

Environmental authority holder(s)

Name(s)	Registered address
SOUTH32 CANNINGTON PROPRIETARY LIMITED	108 St Georges Terrace PERTH WA 6000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Resource Activity, Schedule 3, ERA 18: Mining lead, silver of zinc separately or in any combination.	ML90059; ML90060; and ML90077
Ancillary Activity, Schedule 2, ERA 7 – Chemical manufacturing, 3: Manufacturing, in a year, a total of 200t or more of any of the following—, (d) explosives.	
Ancillary Activity, Schedule 2, ERA 8 – Chemical storage, 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a).	
Ancillary Activity, Schedule 2, ERA 8 – 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).	
Ancillary Activity, Schedule 2, ERA 14 – Electricity generation, 1: Generating electricity by using gas at a rated capacity of 10MW electrical or more.	
Ancillary Activity, Schedule 2, ERA 15 – Fuel burning: Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour.	
Ancillary Activity, Schedule 2, ERA 31 – Mineral processing, 2: Processing, in a year the following quantities of mineral products, other than coke—, (b) more than 100,000t.	
Ancillary Activity, Schedule 2, ERA 33 – Crushing, milling, grinding or screening: Crushing, grinding, milling or screening more than 5,000t of material in a year.	

Environmentally relevant activity/activities	Location(s)
Ancillary Activity, Schedule 2, ERA 60 – Waste disposal, 1: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(a)—, (a) less than 50,000t.	
Ancillary Activity, Schedule 2, ERA 61 – Thermal waste reprocessing and treatment, 1: Thermally reprocessing or treating, in a year, the following quantity of general waste, (a) 5,000t or less.	
Ancillary Activity, Schedule 2, ERA 63 – Sewage treatment, 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of—, (b) more than 100 but not more than 1,500EP—, (ii) otherwise.	

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).

Mobile and temporary activities

If you operate a mobile and temporary environmentally relevant activity (ERA), other than regulated waste transport, you are required to maintain a work diary. You must:

- use the approved form for a work diary (ESR/2015/1696);
- keep the work diary records for 2 years after the last entry;
- inform the administering authority within 7 days of the work diary being lost or stolen;
- record the information required in the work diary for each location within 1 day of leaving the location.

Contaminated land

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

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days) that is causing, or is reasonably likely to cause, serious or material environmental harm.

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

Take effect

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

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

b) if the authority states a day or an event for it to take effect – on the stated day or when the stated event happens; or

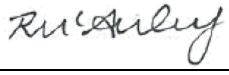
c) otherwise – on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *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 as the effective date. 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.

	13 August 2024
Signature	Date

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

Enquiries:
Minerals Business Centre
Department of Environment, Science and Innovation
PO Box 7230, CAIRNS QLD 4870
Phone: (07) 4222 5352
Email: ESCairns@des.qld.gov.au

Obligations under the *Environmental Protection Act 1994*

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

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

Other permits required

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

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

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

Development Approval

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

This environmental authority consists of the following Schedules:

- Schedule A – General
- Schedule B – Air
- Schedule C – Water
- Schedule D – Sewage Treatment
- Schedule E – Dam and Levee Structures
- Schedule F – Land and Rehabilitation
- Schedule G – Waste
- Schedule H – Noise and Vibration
- Schedule I – Definitions
- Schedule J – Figures/Plans

Conditions of environmental authority

Schedule A – General

Definitions

A1 Words and phrases used throughout this environmental authority are defined in Schedule I – Definitions. Where a definition for a term used in this environmental authority is sought and the term is not defined within this environmental authority, the definitions in the *Environmental Protection Act 199*4, its Regulations and Environmental Protection Policies must be used.

Activity

A2 This environmental authority authorises environmental harm referred to in the conditions herein. Where a condition in this environmental authority refers to environmental harm the condition is taken to authorise the environmental harm occurring in compliance with the condition. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising environmental harm.

A3 In carrying out the mining activity the environmental authority holder must comply with Schedule A -Table 1 (Authorised Mining Activities).

Schedule A – Table 1 (Authorised Mining Activities)

Mine Domain	Mine Feature Name	Mining Lease Location	Location (GDA94) (Zone 54)		Maximum disturbance area (ha)	Constraints
			Easting	Northing		
Mining areas	Underground Mine	ML90059	491886	7582771	2 (at surface)	645m depth
			492521	7582683		
			492328	7580875		
			491630	7581094		
Dams	Tailings Storage Facility (Cells 1 and 2)	ML90059	490406	7584362	169.3	19m depth 20,000,000 m^3 volume
			489811	7583844		
			490685	7582735		
			490809	7582864		
			490832	7582842		
			491326	7583243		
			491288	7583282		
			491267	7583262		
			490432	7584275		
	Tailings Storage Facility (Cell3)	ML90059	490406	7584362		
			489811	7583844		
			489713	7583871		
			489444	7584199		
			489436	7584613		
			489633	7584772		
			490074	7584718		
			490370	7584380		
	Offline Water Storage Facility	ML90059	490754	7584216	9	8m depth 305,000 m3 volume
			491019	7584437		
			491155	7584125		
			491039	7583980		
	TSF Cover Trial	ML90059	489274	7584275	1	n/a
			489174	7584275		
			489174	7584175		
			489274	7584175		
	Effluent Leachate Dam	ML90059	490485	7582996	38	4.5m depth 932,000 m^3 volume
			489801	7583828		
			489618	7583632		
			490276	7582820		

	Grey Water Dam	ML90059	491569	7582715	1	1m depth 5,000 m^3 volume
			491534	7582695		
			491590	7582597		
			491627	7582616		
	Decant Dam (Return Water Dam)	ML90059	491018	7583037	6.1	11m depth 508,000 m^3 volume
			490861	7582910		
			490976	7582753		
			491145	7582890		
	Western Catch Dam	ML90059	491201	7582112	3.0	6.0m depth 65,000 m^3
			491179	7582079		
			491342	7581967		
			491365	7582015		
	Raw Water Dam	ML90059	491128	7582720	1	Depth 5 m
			491172	7582646		
			491094	7582601		
			491053	7582679		
	Eastern Catch Dam	ML90059	491594	7582571	1	Depth 5 m
			491639	7582598		
			491688	7582511		
			491643	7582486		
	Mid Eastern Catch Dam	ML90059	492111	7582151	0.3	Depth 3 m
			492083	7582128		
			492121	7582088		
			492147	7582112		
	Paste Catch Dam	ML90059	492091	7581578	0.1	Depth 1.5 m
			492104	7581606		
			492119	7581595		
			492108	7581575		
	Southern Bund Catch Dam	ML90059	492205	7581581	1.5	Depth 1.5 m
			492250	7581521		
			492152	7581438		
			492111	7581497		
	Southern Catch Dam	ML90059	491945	7581507	1.2	Depth 1.5 m
			492036	7581504		
			492039	7581349		
			491943	7581358		
	South ROM Dam	ML90059	491596	7581662	1	Depth 2.5m
			491530	7581620		
			491613	7581488		
			491679	7581535		
	Yurbi Pond 1 (Cell 1)	ML90077	464110	7706515	1	Depth 6m
			464074	7706516		
			464034	7706505		
			464005	7706489		
			464002	7706470		
			464010	7706452		
			464044	7706428		
			464067	7706426		
			464132	7706458		
			464135	7706476		
	Yurbi Pond 2 (Cells 2, 3 and 4)	ML90077	464048	7706653	4.5	Depth 7m
			463966	7706752		
			463881	7706909		
			463854	7706905		
			463839	7706782		
			464021	7706627		
	Yurbi Sediment Retention Pond	ML90077	463826	7706998	0.3	n/a
			463800	7707029		
			463789	7707011		
			463782	7706915		
			463803	7706929		

Run of Mine (ROM)	ROM Stockpile	ML90059	491135	7582462	25	Max height 30m
			491336	7582269		
			491430	7582315		
			491534	7582240		
			491835	7581715		
			491603	7581670		
			491541	7581652		
			491474	7581662		
			491333	7581851		
			491382	7581959		
			491365	7582040		
			491002	7582307		
Waste Management	Landfill Area	ML90059	490506	7582972	14.4	n/a
			490839	7582609		
			490746	7582573		
			490500	7582573		
			490310	7582794		
Processing Area	Processing plant - Concentrate Processing and Transport Area	ML90059	491209	7582555	11	n/a
			491490	7582706		
			491607	7582512		
			491340	7582246		
			491201	7582365		
	Water Treatment Plant	ML90059	491183	7582647	0.5	n/a
			491177	7582581		
			491115	7582551		
			491091	7582593		
Ancillary Infrastructure	Borefield	ML90060	499690	7581970	30	n/a
			514748	7581564		
			514219	7570234		
			499230	7576968		
	Borefied corridor (Roads, tracks, pipelines and powerlines)	ML90060	Linear		145	n/a
	Accommodation Village	ML90059	491209	7585685	25	n/a
			491172	7585419		
			490883	7585264		
			490562	7585481		
			490671	7585734		
			490863	7585853		
	Explosives Magazine	ML90059	491611	7584591	15	n/a
			491738	7584581		
			491663	7583960		
			491506	7583747		
			491459	7583806		
			491534	7583982		
	Core Yard	ML90059	489708	7585133	17	n/a
			490326	7585155		
			490335	7584883		
			489816	7584837		
	Borrow Area A (Limestone Ridge)	ML90059	496556	7583695	40	n/a
			496685	7582815		
			497068	7582795		
			496979	7583682		
	Borrow Area B (East TSF)	ML90059	490149	7584676	75.9	n/a
			490394	7584750		
			490843	7584957		
			490977	7584489		
			491137	7584127		
			491384	7583752		

			491443	7583771		
			491766	7583265		
			491914	7583210		
			491894	7583010		
			491529	7583020		
			490636	7584318		
			490556	7584426		
			490442	7584346		
	Borrow Area C (West TSF)	ML90059	488808.3	7584275.9	23.1	n/a
			489104.2	7584489.1		
			489241.4	7584489.3		
			489241.2	7584328.2		
			489129.1	7584328.2		
			489129.4	7584146.4		
			489357.1	7584146.6		
			489619.4	7583824.6		
			489459.8	7583693.3		
			489404.8	7583766.2		
			488953.0	7584106.2		
	Borrow Area D (Landfill)	ML90059	490405	7582899	4.5	n/a
			490310	7582794		
			490500	7582573		
			490615	7582686		
	Topsoil Stockpiles	ML90059	490975	7585221	70	n/a
			491125	7584423		
			492521	7584585		
			492234	7583244		
			491767	7583375		
			489566	7584834		
			489024	7584404		
			489566	7583687		
			489791	7583905		
	Paste Plant and Vent Fan Infrastructure areas	ML90059	492031	7582289	27	n/a
			492152	7582291		
			492147	7582201		
			492083	7582128		
			492121	7582086		
			492147	7582112		
			492204	7581620		
			492118	7581512		
			491945	7581507		
			491938	7581336		
			491958	7581153		
			491891	7581154		
			491666	7581477		
			491977	7581705		
			491847	7582078		
	Paste hole (North C) emergency sump	ML90059	492125	7582276	0.014	100m3 spill storage capacity
	Paste hole (North Upper 1) emergency sump	ML90059	491950	7582156	0.014	100m3 spill storage capacity
	Paste hole (South 5) emergency Sump	ML90059	492038	7581549	0.014	100m3 spill storage capacity
	Trepell Airport	ML90059	489028	7585093	50	n/a
			488807	7584963		
			487842	7586324		

			487666	7586213		
			488924	7584496		
			489089	7584624		
			488982	7584772		
			489132	7584901		
	Waste Management Area	ML90059	490836	7582873	3	n/a
			490716	7582788		
			490849	7582617		
			490963	7582712		
	Contractors Yard	ML90059	490951	7582645	3	n/a
			490841	7582526		
			490935	7582403		
			491056	7582549		
	Power Station	ML90059	491466	7582692	3	n/a
			491407	7582795		
			491180	7582680		
			491238	7582573		
	Solar Farm	ML90059	490449	7585332	6	n/a
			490764	7585332		
			490764	7585162		
			490449	7585162		
	Warehouse, Workshop and Administration Area	ML90059	491773	7582516	9	n/a
			491891	7582359		
			491612	7582163		
			491446	7582427		
			491574	7582499		
	Sewage Treatment Plant (Village)	ML90059	489733	7585482	3	n/a
			489786	7585249		
			490345	7585287		
	Sewage Treatment Plant (Mine)	ML90059	491491	7582738		
	Mine Fuel Storage	ML90059	491566	7582319	0.3	n/a
	Mine Perimeter Bund (~5 km)	ML90059	Linear		10	n/a
	Mine hardstand areas	ML90059	Various		10	n/a
	Mine laydown areas	ML90059	Various		40	n/a
	Mine roads and tracks (~200 km)	ML90059	Linear		90	n/a
	Yurbi Concentrate Storage Shed	ML90077	463949	7706570	1.0	n/a
			463976	7706604		
			463875	7706676		
			463853	7706648		
	Yurbi Rock Dump	ML90077	464370	7706872	5	Max 30m high
			464193	7706951		
			464168	7706928		
			464190	7706863		
			464298	7706797		
	Yurbi Office	ML90077	463901	7706555	3.0	n/a
	Yurbi Workshop		463863	7706540		
	Yurbi Vehicle and Wheel Wash		463849	7706660		
	Yurbi Fuel Storage		463881	7706542		
	Yurbi Storage Tanks		463787	7706573		
	Yurbi Train Wagon Wash		463868	7706684		

	Yurbi hardstand areas	ML90059	Various		3.6	n/a
	Yurbi Laydown areas	ML90059	Various		2.2	n/a
	Yurbi roads and tracks (~45 km)	ML90059	Linear		15.5	n/a
	Yurbi rail loop (~4 km)	ML90077	Linear		2	n/a
Cannington Life Extension Project (CLEP) Approved future open pit operations	Open Cut Pit	ML90059	491859	7582800	70	240m depth
			492509	7582802		
			491703	7581649		
	Waste Rock Dump (WRD)	ML90059	492518	7583327	170	Max closure height 95m and overall slope 33%
			492796	7581529		
			493772	7581539		
			493782	7583323		
	Tailings Storage Facility (Extension)	ML90059	490029	7584814	150	19m depth 27,500,000 m3
			490947	7584887		
			490962	7584386		
			491572	7583529		
			491251	7583280		
	New TSF Decant Dam	ML90059	491250	7583277	15	Depth 19m 1,300,000m3
			491571	7583530		
			491044	7583525		
			491402	7583768		
	Northern DSA Pond	ML90059	491917	7583207	18	2.5m
			491243	7582926		
			491817	7582571		
	Trepell Creek Diversion Levee	ML90059	491147	7582890	20	Max height 8.5m
			492662	7583341		
			493713	7582890		
			493649	7581696		
			491903	7581125		
			490271	7582798		
	Northern Retention Pond	ML90059	492054	7582921	16	6m depth 564,000 m3
			491712	7582945		
			491720	7582701		
			492015	7582695		
	Southern Retention Pond	ML90059	492540	7581850	20	8m depth 700,000 m3
			492285	7581713		
			492311	7581497		
			492677	7581556		
	Creek Diversion	ML90059	492292	7583890	45	Max length 5,000m
			492299	7581118		
			494012	7581581		
			493830	7583387		
	Extended ROM Stockpile	ML90059	491013	7582197	41	Max height 30m
			491387	7581879		
			491214	7581737		
			490838	7582035		
	New Explosives Magazine	ML90059	492241	7585420	11	n/a
			492216	7585027		
			492690	7585015		
			492721	7585408		
	New MIA	ML90059	490919	7582272	6	n/a
			490825	7582066		
			490932	7581935		
			491069	7582091		

A4 Dedicated access to the mining project via land authorised for that purpose by the *Mineral Resources Act 1989* is subject to the conditions of this environmental authority.

A5 The environmental authority holder is authorised to receive, store and handle up to 120,000 tonnes per annum of copper concentrate from Capricorn Copper Mine.

Note: Capricorn Copper Mine means the resources tenement areas subject to environmental authority EPML00911413.

Maintenance of measures, plant and equipment

A6 The environmental authority holder must:

(a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;

(b) maintain such measures, plant and equipment in a proper and efficient condition;

(c) operate such measures, plant and equipment in a proper and efficient manner; and

(d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are calibrated, and appropriately operated and maintained.

A7 No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases, or is likely to increase, the risk of environmental harm.

Monitoring

A8 Any management or monitoring plans, systems, programs or reports required to be developed and implemented by a condition of this environmental authority must be reviewed for effectiveness in minimising the likelihood of environmental harm once every two (2) years and amended immediately if required. The review must be documented and completed by an appropriately qualified person.

A9 Monitoring records or reports required under this environmental authority must be maintained and be readily accessible at the place to which this environmental authority relates for a period of not less than seven (7) years.

A10 The environmental authority holder must upon request from the administering authority, supply monitoring records, plans and reports required under this environmental authority, in the form and by the means requested by the administering authority within ten (10) business days.

A11 Where monitoring is a requirement of this environmental authority, ensure that an appropriately qualified person(s) conducts all monitoring.

Access to Monitoring Locations

A12 The environmental authority holder must make reasonable efforts to provide safe and all-weather access to all monitoring locations required under this environmental authority. This must include providing the necessary site infrastructure required to gain safe all-weather access to monitoring locations during reasonably foreseeable events. The environmental authority holder must also develop and implement contingency plans to facilitate sampling during extreme events where provision of site infrastructure is not practical.

Financial assurance

A13 The environmental authority holder must provide to the administering authority a financial assurance of an amount and in a form acceptable to the administering authority in accordance

with the most recent edition of the administering authority's Guideline for calculating financial assurance for mining projects, before the proposed mining activity commences.

A14 The amount of financial assurance may be reviewed by the administering authority at any time including when a plan of operations is amended or replaced, the authority is amended or new information is obtained from an audit.

A15 The financial assurance must remain in force until the administering authority is satisfied that no claim on the assurance will be required.

Risk Management System

A16 By no later than 1 November 2012 the environmental authority holder must develop and implement a risk management system for the mining activity which conforms to the Standard for Risk Management (ISO31000:2009) or the latest edition of the equivalently recognised Standard for Risk Management.

Emergency Response / Contingency

A17 The environmental authority holder must have an implemented emergency response/contingency plan to respond to emergency events and incidents. This plan must be provided to the administering authority on request.

A18 The emergency response/contingency plan required under condition (A17) must address the following matters as a minimum:

(a) Response procedures to be implemented to prevent or minimise the risk of environmental harm arising from emergency events and incidents;

(b) Response procedures to minimise the extent and duration of environmental harm caused by an emergency event or incident;

(c) The practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;

(d) The resources to be used in response to an emergency event or incident;

(e) Procedures to investigate the cause of any emergency events or incidents, including releases, and where necessary, implement remedial actions to reduce the likelihood of recurrence of similar events;

(f) The provision and availability of documented procedures to staff attending any emergency event or incident to enable them to effectively respond;

(g) Training of staff that will be called upon to respond to emergency events or incidents to enable them to effectively respond;

(h) Timely and accurate reporting of the circumstance and nature of emergency events or incidents to the administering authority in accordance with conditions of this environmental authority;

(i) Procedures for accessing monitoring points during emergency events or incidents; and

(j) Procedures to notify any potentially impacted stakeholder who may be affected by the emergency event or incident.

Notification of Emergencies, Incidents, Exceedances and Releases

A19 The environmental authority holder must notify the administering authority by telephone and email as soon as practicable but within twenty-four (24) hours, after becoming aware of any emergency, incident, exceedance or release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority.

A20 The notification in condition (A19) must include, but not be limited to, the following:

(a) The environmental authority number and name of the environmental authority holder;

(b) The name and telephone number of the designated contact person;

(c) The location of the emergency, incident, exceedance or release;

(d) The date and time of the emergency, incident, exceedance or release;

(e) The time the environmental authority holder became aware of the emergency, incident, exceedance or release;

(f) Where known:

i. The estimated quantity and type of substances involved in the emergency, incident, exceedance or release;

ii. The actual or potential cause of the emergency, incident, exceedance or release;

iii. A description of the nature and effects of the emergency, incident, exceedance or release including environmental risks, and any risks to public health or livestock;

(g) Any sampling conducted or proposed, relevant to the emergency, incident, exceedance or release;

(h) Immediate actions taken to prevent or mitigate any further environmental harm caused by the release; and

(i) What notification of stakeholders who may be affected by the emergency, incident, exceedance or release has occurred/is being undertaken.

A21 The environmental authority holder must notify the occupiers or registered owners of affected land and any other potentially impacted stakeholder as soon as reasonably practicable after becoming aware of the event of any emergency, incident, exceedance or release that has the potential to impact on environmental values or breaches any condition of this environmental authority concerning releases of contaminants to the environment.

A22 The notification in condition (A21) must include the following:

(a) The location of the emergency, incident, exceedance or release;

(b) The date and time of the emergency, incident, exceedance or release;

(c) The estimated quantity and type of any substances involved in the emergency, incident, exceedance or release;

(d) The potential impacts to environmental values caused by the emergency, incident, exceedance or release; and

(e) Where there is potential impact on livestock or human health, precautionary measures that should be taken.

A23 Within ten (10) business days following the initial notification of an emergency, incident, exceedance or release, further written advice must be provided to the administering authority, including the following:

(a) Results and interpretation of any samples taken and analysed;

(b) Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm;

(c) Outcome of actions to prevent a recurrence of the emergency, incident, exceedance or release; and

(d) Whether the emergency, incident, exceedance or release resulted in non-compliance with this environmental authority.

Complaints

A25 Records must be kept of all environmental complaints received about the mining activity which must be made available to the administering authority on request including the following details:

(a) Name, address and contact number for complainant (if provided);

(b) Time and date of complaint;

(c) Reasons for the complaint;

(d) Investigations undertaken;

(e) Conclusions formed;

(f) Actions taken to resolve complaint;

(g) Any abatement measures implemented; and

(h) Person responsible for resolving the complaint.

A26 When requested by the administering authority, the environmental authority holder must undertake relevant specified monitoring within a timeframe nominated 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 implemented must be provided to the administering authority within ten (10) business days of completion of the investigation, and no later than ten (10) business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

Community Consultation

A27 The environmental authority holder must establish, promote and maintain easily accessible lines of communication between residents, stakeholders and land owners reasonably expected to be affected by the activities to ensure that environmental impacts are identified and managed. These must include regular meetings with the relevant stakeholders at intervals of not more than six (6) months.

Third party auditing

A28 Compliance with each condition of this environmental authority must be audited by an appropriately qualified third party auditor. The audit must be completed within one (1) year of

the commencement of this environmental authority, and then at regular intervals not exceeding once (1) every three (3) years thereafter.

A29 Within one (1) month of completing the audit, the environmental authority holder must provide the audit report and a written report to the administering authority addressing:

(a) Actions taken by the environmental authority holder to ensure compliance with this environmental authority; and

(b) Actions taken to prevent a recurrence of any non-compliance issues identified.

A30 The third party auditor must certify the independent findings of the audit in the report.

A31 The financial cost of the third party audit is the responsibility of the environmental authority holder.

A32 The environmental authority holder must immediately act upon any recommendations arising from the audit by:

(a) Investigating any non-compliance issues identified; and

(b) As soon as practicable, implementing measures or taking necessary action to ensure compliance with the requirements of this environmental authority.

Transition to New Standards

A33 Where a condition of this environmental authority requires compliance with a standard published externally to this authority and the standard is amended or changed subsequent to the issue of this environmental authority the environmental authority holder must:

(a) Comply with the amended or changed standard within twelve (12) months of the amendment of change being made, unless a different period is specified in the amended standard or relevant legislation; and

(b) Continue to remain in compliance with the previous standard or guideline until compliance is met with the amended or changed standard or guideline is achieved.

Regard for Comment

A34 Where comments are provided by the administering authority with respect to any plans or programs required to be developed by a condition of this environmental authority then the environmental authority holder must have due regard for these comments and incorporate these comments into the plans or programs.

Exploration

A35 All exploration activities carried out at the licensed place must comply with each of the Standard Environmental Conditions contained in the most recent version of the Code of Environmental Compliance for Exploration and Mineral Development Projects.

A36 Disturbance due to exploration activities in areas not scheduled to be mined within two (2) years must be rehabilitated within twelve (12) months in accordance with the provisions detailed in the administering authority's Code of Environmental Compliance for Exploration and Mineral Development Projects.

A37 Where a condition of this environmental authority refers to a matter addressed in the Code of Environmental Compliance for Exploration and Mineral Development Projects, the condition of the environmental authority prevails.

Schedule B – Air

Odour and noxious or offensive airborne contaminant nuisance

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

B2 When requested by the administering authority, monitoring of noxious, offensive odour or any other airborne contaminants must be undertaken to investigate any complaint which in the opinion of an authorised officer is neither frivolous nor vexatious nor based on mistaken belief. Monitoring must be completed within the timeframe stated by the administering authority and the results provided to the administering authority within ten (10) business days following completion of monitoring and analysis. Monitoring must be carried out at a place(s) relevant to the potentially affected sensitive place or commercial place and at upwind control sites.

Transport of Bulk Material

B3 The environmental authority holder must ensure that vehicles (including trains) used for transporting bulk materials, leave the licensed place having undergone appropriate load preparation to prevent the spillage and / or loss of particulate matter and / or windblown dust during transport.

Air Quality Monitoring – Ambient Air Quality (Particulate Matter)

B4 The environmental authority holder must ensure that the mining activity does not cause any exceedance of air quality limits specified in Schedule B – Table 1 (Ambient Air Quality Limits - Particulate Matter) at any sensitive receptor.

Schedule B - Table 1 (Ambient Air Quality Limits - Particulate Matter)

Air Quality Indicator	Averaging Time	Limit[1] (µg/m^3)
Total Suspended Particulates[2]	Calendar year	90
Particulate matter with an aerodynamic diameter of less than 10 microns (PM10)[3,4]	24 hours	50
Arsenic (measured as the total content in PM_{10})[5]	Calendar year	0.006
Cadmium (measured as the total metal content in PM_{10})[5]	Calendar year	0.005
Lead (measured as the total metal content in total suspended particulates)	Calendar year	0.5

1) Air quality limits are from Schedule 1 of the Environmental Protection (Air) Policy 2008.

2) Monitored in accordance with the most recent version of Australian Standard AS/NZS3580.9.3:2003 Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method.

3) The maximum concentration of PM10 is authorised to be exceeded for not more than five (5) days each calendar year.

4) Monitored in accordance with the most recent version of Australian Standard AS3580.9.6 Determination of suspended particulate matter – PM (sub) 10 high volume sampler with size-selective inlet – Gravimetric method.

5) The environmental authority holder may elect to monitor these contaminants as the total metal content in total suspended particulates and meet the same limit.

B5 The environmental authority holder must monitor air quality indicators specified in Schedule B - Table 1 (Ambient Air Quality Limits - Particulate Matter) at the monitoring locations and

at the frequency specified in Schedule B – Table 2 (Ambient Air Quality Monitoring Locations and Frequency – Particulate Matter).

Schedule B – Table 2 (Ambient Air Quality Monitoring Locations and Frequency – Particulate Matter)

Site	Location (GDA94) (Zone 54)		Monitoring Location	Monitoring Frequency
	Easting	Northing		
Cannington Mine – ML90059				
Note[1]	Note[1]	Note[1]	Cannington Homestead	Every 13 days

Note[1]: Based on a letter dated 8 May 2012 from the Cannington Homestead landholder no consent was given to conduct ambient air monitoring on the Cannington Homestead property

B6 Condition (B5) of this environmental authority will only apply if the Cannington Homestead landholder provides written consent for the installation and maintenance of air monitoring equipment on the Cannington Homestead property.

Dust and Particulate Matter Deposition Monitoring Program

B7 A Dust and Particulate Matter Deposition Monitoring Program must be developed and implemented by the holder and made available to the administrating authority on request.

B8 In addition to and/or complementary to condition A8, prior to developing open cut mining operations associated with the Cannington Life Extension Project (CLEP), the Dust and Particulate Matter Deposition Monitoring Program must be reviewed, with appropriate consideration to proposed mining activities, and updated as required. The holder must ensure that details of any additional relevant monitoring locations are provided to the administering authority for consideration and inclusion in Schedule B – Table 3 (Dust and Particulate Deposition Monitoring Locations and Frequency) as appropriate.

Schedule B – Table 3 (Dust and Particulate Deposition Trigger Levels and Limits)

Air Quality Indicators[1,2]	Limit Type/Measurement Period	Trigger Level	Limit
Arsenic and its compounds as arsenic	Annual average	4 µg/m^2/day(3)	-
Cadmium and its compounds as cadmium	Annual average	2 µg/m^2/day(3)	-
Lead and its compounds as lead	Annual average	100 µg/m^2/day(3)	250 µg/m2/day(4)
Copper and its compounds as copper	Annual average	330 µg/m^2/day(5)	-
Total insoluble matter (insoluble analysis and particulate matter deposition rate)[2]	Monthly average	-	120 mg/m^2/day(6)

1) Monitored in accordance with the most recent version of Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method.

2) Particulate matter deposition limit applies in respect of all dust sensitive places beyond the boundary of the licensed place and is calculated over a nominal month as per Australian Standard AS/NZS3580.10.1 of 2003 (or more recent editions).

3) Limits based on First General Administrative Regulation Pertaining to the Federal Emission Control Act (Technical Instructions on Air Quality Control – TA Luft) (Table 6 page 29).

4) World Health Organisation – Air Quality Guidelines for Europe Second Edition, 2000 (Chapter 6 page 152).

5) Determined based on TA Luft lead deposition guidelines and the Health Investigation Level (HIL) - A soil investigation levels from National Environment Protection Measure (NEPM) (1999).

6) Based on the New Zealand Ministry for Environment Good Practice Guide for Assessing and Managing for Environmental Effects of Dust Emissions (Table 7.1).

Air Quality Monitoring – Ambient Air Quality (Dust and Particulate Matter Deposition)

B9 The environmental authority holder must ensure that the mining activity does not cause any exceedance of air quality limits specified in Schedule B – Table 3 (Dust and Particulate Deposition Trigger Levels and Limits) at any compliance monitoring location stated in Schedule B – Table 4 (Dust and Particulate Deposition Monitoring Locations and Frequency).

Schedule B – Table 4 (Dust and Particulate Deposition Monitoring Locations and Frequency)

Site	Location (GDA94)(Zone 54)		Monitoring Location	Monitoring Frequency
	Easting	Northing		
Cannington Mine (ML90059) – Compliance Monitoring Locations				
MN_D004	491347	7578431	Cannington Homestead	Monthly
MN_D039	490818	7585696	Village	Monthly
MN_D040	487963	7587302	Airstrip north	Monthly
MN_D041	495068	7587156	Old Trepell Homestead	Monthly
Cannington Mine (ML90059) – Reference Monitoring Locations				
MN_D042	496292	7580848	Limestone Hills	Monthly
MN_D043	492371	7577779	Lower Hamilton	Monthly
Cannington Mine (ML90059) – Observation Monitoring Locations				
MN D001	490127	7585223	Refer to Schedule J - Figure 1	Monthly
MN D002	492115	7582501		Monthly
MN D003	492422	7581158		Monthly
MN D005	491619	7581205		Monthly
MN D006	491726	7582589		Monthly
MN D007	491503	7582786		Monthly

MN D008	491206	7582784		Monthly
MN D009	491085	7582518		Monthly
MN D010	491219	7582023		Monthly
MN D012	491463	7582445		Monthly
MN D013	491594	7583796		Monthly
MN D014	491557	7582250		Monthly
MN D016	491838	7581186	Western side Sa50 Vent fans	Monthly
MN D017	491986	7581274	North Eastern side Sa50 Vent fans	Monthly
MN D018	491171	7581765	West of the ROM Stockpile	Monthly
MN D019	492023	7581905	Southern side TbC5 vent fans	Monthly
MN D020	492027	7582026	Northern side TbC5 vent fans	Monthly
MN D021	491695	7581445	Southern side Qb80 vent fans	Monthly
MN D022	491753	7581553	Northern side Qb80 vent fans	Monthly
MN D077	491915	7582348	Western side of LVP vent fans	Monthly
MN D078	491882	7582216	Northern side of LVP vent fans	Monthly
MN D079	492134	7582333	South Eastern side of LVP vent fans	Monthly
MN_D080	491358	7581412	Southwest of the ROM Stockpile	Monthly
Yurbi Loading Facility (ML90077) – Compliance Monitoring Locations				
YB D013	463436	7707054	500m NW of concentrate shed	Monthly
YB D014	463481	7706296	500m SW of concentrate shed	Monthly
YB D015	464523	7706618	500m east of concentrate shed	Monthly
YB D016	464241	7707142	500m NE of concentrate shed	Monthly
Yurbi Loading Facility (ML90077) – Reference Monitoring Locations				
YB D001	462481	7706936	Refer to Schedule J – Figure 2	Monthly
YB D017	463700	7705928		Monthly

Yurbi Loading Facility (ML90077) – Observation Monitoring Locations				
YB D002	462559	7707326	Refer to Schedule J – Figure 2	Monthly
YB D003	462906	7707256		Monthly
YB D004	463619	7706796		Monthly
YB D005	464119	7706896		Monthly
YB D006	463751	7706412		Monthly
YB D007	464528	7706696		Monthly
YB D008	464514	7706916		Monthly
YB D009	464241	7706536		Monthly
YB D010	463534	7706921		Monthly
YB D011	464004	7706990		Monthly
YB D012	463541	7706585		Monthly

B10 The environmental authority holder must monitor air quality indicators specified in Schedule B - Table 3 (Dust and Particulate Deposition Trigger Levels and Limits) at the monitoring locations and at the frequency specified in Schedule B – Table 4 (Dust and Particulate Deposition Monitoring Locations and Frequency) and shown in Schedule J – Figure 1 (Cannington Mine Dust Monitoring Locations) and Figure 2 (Yurbi Dust Monitoring Locations).

B11 Dust and particulate deposition samples must be analysed each calendar month to determine:

a) a monthly average dust deposition rate (mg/m2/day); and

b) the concentration of contaminants indicated in Schedule B - Table 3 (Dust and Particulate Deposition Trigger Levels and Limits), reported as an average daily rate (µg/m2/day).

Air Quality Monitoring – Investigation

B12 In the event that monitoring conducted in accordance with condition (B5) identifies an exceedance of a limit specified in Schedule B - Table 1 (Ambient Air Quality Limits - Particulate Matter) or in the event that monitoring conducted in accordance with Conditions (B10) identifies an exceedance of a trigger level or limit specified in Schedule B - Table 4 (Dust and Particulate Deposition Trigger Levels and Limits), the environmental authority holder must:

a) complete an investigation to identify the potential cause of the exceedance and the potential for environmental harm being caused or likely to be caused by the exceedance;

b) if the investigation shows that the exceedance is not attributable to the mining activities then no further action is required and this must be advised to the administering authority;

c) if the investigation shows that the exceedance is attributable to the mining activities provide a written report to the administering authority within three (3) months of the date of the original exceedance, outlining:

i) details of the investigation carried out; and

ii) actions taken to prevent environmental harm.

Concentrate Management

B13 The holder must employ reasonable and feasible controls and measures to ensure that dust and particulate matter emissions generated through concentrate storage and handling activities are minimised and to ensure acceptable environmental performance against compliance monitoring and reporting requirements as conditioned under this environmental authority.

Power Generation

B14 The release of emissions to air from the Cannington power stations must only occur from those release points identified in Schedule B – Table 5 (Power Station Point Source Air Emissions) and must be directed vertically upwards without any impedance or hindrance.

Schedule B – Table 5 (Power Station Point Source Air Emissions)

Location	Source Description	Location (GDA94)(Zone 54)		Monitoring Frequency
		Easting	Northing	
Cannington Power Station	26 natural gas engines 4 backup diesel engines	491177	7582652	Three sets annually

B15 Emissions must be monitored at a frequency not less than that specified in Schedule B - Table 5 (Power Station Point Source Air Emissions).

B16 Monitoring of any releases to the air from the Cannington Power Station required by a condition of this environmental authority must be carried out in accordance with the following requirements:

a) monitoring provisions for the release points listed in Schedule B - Table 5 (Power Station Point Source Air Emissions) must comply with the Australian Standard AS4323.1 – 1995 ‘Stationary source emissions Method 1: Selection of sampling positions’ (or more recent editions).

b) the following tests must be performed for the power station release points specified in Schedule B - Table 5 (Power Station Point Source Air Emissions):

(i) gas velocity and volume flow rate;

(ii) temperature;

(iii) water vapour concentration (moisture content);

(iv) NOx as NO_2;

(c) where practicable, samples must be taken when emissions are expected to be at maximum rates.

(d) during the sampling of the Cannington Power Station release points, the following additional information must be gathered:

(i) power generation rate at the time of sampling;

(ii) fuel type and consumption rate; and

(iii) reference to the actual test methods and accuracy of the methods.

Air Quality Monitoring Requirements

B17 Samples taken for air quality monitoring specified in this environmental authority must be collected and analysed in accordance with the requirements of the administering authority's latest edition of the Air Quality Sampling Manual, or more recent editions or supplements to that document as are published by the administering authority, unless otherwise agreed by the administering authority in writing.

Schedule C – Water

General

C1 Contaminants that will, or have the potential to cause environmental harm, must not be released directly or indirectly to any receiving environment except as permitted under the conditions of this environmental authority.

C2 The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas where contaminants will be released into any waters, roadside gutter or stormwater drainage system that is outside the levee/containment bund.

C3 Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or waters.

C4 Reference site monitoring data used to establish trigger levels and contaminant limits specified in Schedule C of this environmental authority, and the relevant trigger levels and contaminant limits must be provided to the administering authority no later than ten (10) business days after the data becomes available.

C5 By 1 June each year the environmental authority holder must provide the administering authority an update of monitoring data and associated trigger levels and contaminant limits specified in Schedule C of this environmental authority, incorporating monitoring data obtained during the previous twelve (12) months.

C6 All determinations of water quality/sample analysis required under a condition of this environmental authority must be:

(a) performed by a person or body possessing appropriate experience and qualifications to competently perform the required measurements; and
(b) made in accordance with methods prescribed in the latest edition of the Administering Authority's Monitoring and Sampling Manual; and
(c) carried out on representative samples; and
(d) collected from the monitoring locations identified in this environmental authority, within two (2) hours of each other where possible; and
(e) for laboratory testing undertaken using a laboratory accredited (e.g. NATA) for the method of analysis being used.

C7 The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format when requested:

(a) the date and time when the sample was taken;
(b) the monitoring point where the sample was taken;
(c) the measured or estimated daily quantity of the contaminants released from all release points; (d) the release flow rate at the time of sampling for each release point;
(e) the results of all monitoring and details of any exceedances with the conditions of this environmental authority; and
(f) all water quality monitoring data.

C8 The release of contaminants directly or indirectly to waters must not:

(a) produce any slick or other visible or odorous evidence of oil, grease or petrochemicals; nor;

(b) contain visible floating oil or grease; or
(c) cause visible discolouration of the receiving waters.

Contaminant Release to Waters

C9 The release of contaminants to waters must only occur from the release points specified in Schedule C - Table 1 (Contaminant Release Locations) and depicted in Schedule J – Figure 3 (Cannington Mine Release Locations), Figure 4 (CLEP – Future Open Pit Release Locations) and Figure 5 (Yurbi Release Locations).

Schedule C - Table 1 (Contaminant Release Locations)

Release Point	Description of Release Waters	Description of Receiving Waters	Location (Zone 54) (GDA94)	
			Easting	Northing
Cannington Mine – ML90059				
Southern Bund Catch Dam Spillway	Surface runoff from operational area	Trepell Creek	492239	7581473
Southern Retention Pond Spillway (CLEP – future Open Pit)	Waste Rock Dump runoff	Hamilton River	492136	7581147
Yurbi Loading Facility – ML90077				
Yurbi Pond Cell 1 Spillway	Surface runoff	Gum Creek	464115	7706445
Yurbi Pond Cell 4 Spillway	Surface runoff	Yurbi Bore Creek	463846	7706873

C10 The release of contaminants from the authorised release points must be monitored at the locations specified in Schedule C - Table 1 (Contaminant Release Locations), for each quality characteristic and at the frequency specified in Schedule C - Table 2 (Contaminant Release Limits).

Schedule C – Table 2 (Contaminant Release Limits)

Quality Characteristic[1]	Contaminant Limit[2] (mg/L unless specified)	Monitoring Frequency
Physicochemical		
pH (pH units)	6.0 (minimum)[3] 9.0 (maximum)[3]	Event based sampling of release[5] or flow events[6]: • One sample must be taken within twenty-four (24) hours of a release event or flow event commencing. • Where a release[5] or a flow event[6] has a duration of twenty four (24) hours or greater, samples must be taken daily for
Electrical Conductivity @ 25°C (µS/cm)	1000[4]	
Sulphate (SO_4^{2-})	1000[7]	
Turbidity (NTU)	For interpretation purposes	
Suspended Solids	For interpretation purposes	

Ammonia[8]	For interpretation purposes	one (1) week, and once a week thereafter until release[5] or flow event[6] ceases.
Nitrate[8] (NO_3) as N	400[7]	
Phosphate[8] (PO_4) as P	For interpretation purposes	
Total Hardness	For interpretation purposes	
Major Cations and Anions	For interpretation purposes	
Temperature	For interpretation purposes	
Metals and Metalloids		
Aluminium	5[7]	Event based sampling of release[5] or flow events[6]: • One sample must be taken within twenty-four (24) hours of a release event or flow event commencing. • Where a release[5] or a flow event[6] has a duration of twenty four (24) hours or greater, samples must be taken daily for one (1) week, and once a week thereafter until release[5] or flow event[6] ceases.
Antimony	For interpretation purposes	
Arsenic (Total)[9]	0.5[7]	
Bismuth	For interpretation purposes	
Cadmium	0.01[7]	
Chromium (Cr VI)[10]	1[7]	
Cobalt	1[7]	
Copper	1[7]	
Iron	For interpretation purposes	
Lead	0.1[7]	
Manganese	For interpretation purposes	
Mercury (inorganic)	0.002[7]	
Molybdenum	0.15[7]	
Nickel	1[7]	
Silver	For interpretation purposes	
Selenium (Total)	0.02[7]	
Zinc	20[7]	

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

(2) The contaminant limits are based on ANZECC & ARMCANZ (2000) stock water quality guidelines.

(3) Contaminant limit based on ANZECC & ARMCANZ (2000) general water uses (refer to Section 4.2.10.1).

(4) Based on administering authority's information resulting from the review of water quality in the Fitzroy Basin.

(5) Release event is a surface water discharge from water storages or contaminated areas on the licensed place.

(6) Flow events is a surface water flow that occurs as a result of rainfall.

(7) Contaminant limit based on ANZECC & ARMCANZ (2000) stock water quality guidelines.

(8) Applies only to Southern Bund Catch Dam Spillway (MN W024).

(9) Speciated arsenic concentrations for As (III) and As (V) only required if 13 µg/L is exceeded - note that the sample bottle requirements for As (total species) and As (speciated) may differ.

(10) Speciated chromium concentrations for Cr (III) and Cr (VI) only required is 1.0 µg/L is exceeded – note that the sample bottle requirements for Cr (total species) and Cr (speciated) may differ.

NOTES:

(a) Where release(s) or flow event(s) occur simultaneously only one (1) set of samples are required to be taken.

(b) Grab sampling is the required method for sample collection.

C11 The release of contaminants to waters must not exceed the contaminant limits for each quality characteristic stated in Schedule C - Table 2 (Contaminant Release Limits).

Receiving Waters Monitoring

C12 Reference and receiving waters must be monitored at the locations specified in Schedule C - Table 3 (Receiving Waters Monitoring Locations) as identified in Schedule J – Figure 6 (Cannington Mine Receiving Water & Sediment Monitoring Locations) and Figure 7 (Yurbi Receiving Water & Sediment Monitoring Locations) for the frequency and quality characteristics stated in Schedule C - Table 4 (Receiving Waters Trigger Levels) and Table 5 (Receiving Waters Contaminant Limits).

Schedule C – Table 3 (Receiving Waters Monitoring Locations)

Monitoring Points	Reference Location	Location (GDA94) (Zone 54)	
		Easting	Northing
Cannington Mine – ML90059 Reference[1]			
MN GSW001	Upstream Hamilton River	488657	7583993
MN GSW003	Upstream Trepell Creek	492515	7584238
Yurbi Loading Facility – ML90077 Reference[1]			
YB GSW001	Upstream Gum Creek	463769	7706103
YB GSW001A[3]	Upstream Gum Creek	463730	7706052
YB GSW008	Upstream Yurbi Bore Creek	463562	7706536
Cannington Mine – ML90059 Compliance			
MN GSW002	Downstream Hamilton River	492017	7580873
MN GSW004	Downstream Trepell Creek	492350	7581058
MN GSW005[2]	Approximately 500m downstream of release points	492585	7580600
Yurbi Loading Facility – ML90077 Compliance			
YB GSW005	Downstream Gum Creek	465517	7706729
YB GSW005A[3]	Downstream Gum Creek	465551	7706840
YB GSW002	Downstream Yurbi Bore Creek	463801	7707030

1. Reference sites must:
   (a) be from the same bio-geographic and climatic region;
   (b) have similar geology, soil types and topography;
   (c) contain a range of habitats similar to those at the test sites;

(d) have a similar flow regime; and

(e) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site.

2. Only applies during release events.
3. Applies if wet weather prevents safe access to YB_GSW001 or YB GSW005.

Schedule C – Table 4 (Receiving Waters Trigger Levels)

Quality Characteristic[1]	Trigger Levels (µg/L unless specified)			Monitoring Frequency
	Initial[2]	Interim[3]	Final[4]	
Physicochemical				
pH (pH units)	6.0[5] (minimum) 7.5[5] (maximum)			Event based sampling of release[9] or flow events[10]: • One sample must be taken within twenty four (24) hours of a release event or flow event commencing. • Where a release[9] or a flow event[10] has a duration of twenty four (24) hours or greater, samples must be taken daily for one (1) week, and once a week thereafter until release[9] or flow event[10] ceases.
Electrical Conductivity @ 25°C (µS/cm)	205[6] or Reference[7] value , whichever is higher	205[6] or 80th percentile[8] of Reference data set[7], whichever is higher	205[6] or 80th percentile[8] of Reference data set[7], whichever is higher	
Sulphate (SO_4^{2-}) (mg/L)	1000[11] or Reference[7] value, whichever is higher	1000[11] or 80th percentile[8] of Reference data set[7], whichever is higher	1000[11] or 80th percentile[8] of Reference data set[7], whichever is higher	
Turbidity (NTU)	Reference[7] value	80th percentile[8] of Reference data set[7]	80th percentile[8] of Reference data set[7]	
Suspended Solids (mg/L)	50[12] or Reference[7] value, whichever is higher	50[12] or 80th percentile[8] of Reference data set[7], whichever is higher	50[12] or 80th percentile[8] of Reference data set[7], whichever is higher	
Ammonia[13] (NH_3)	900[5] or Reference[7] value, whichever is higher	900[5] or 80th percentile[8] of Reference data set[7], whichever is higher	900[5] or 80th percentile[8] of Reference data set, whichever is higher	
Nitrate[13] (NO_3) as N	700[5] or Reference[7] value, whichever is higher	700[5] or 80th percentile[8] of Reference data set[7], whichever is higher	700[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Phosphate[13] (PO_4) as P	5[14] or Reference[7] value, whichever is higher	5[14] or 80th percentile[8] of Reference data set[7], whichever is higher	5[14] or 80th percentile[8] of Reference data set[7], whichever is higher	
Total Hardness	For interpretation purposes only.			
Dissolved Oxygen (mg/L)	For interpretation purposes only.			
Major Cations and Anions	For interpretation purposes only.			
Metals and Metalloids				

Aluminium (pH > 6.5)	55[5] or Reference[7] value, whichever is higher	55[5] or 80th percentile[8] of Reference data set[7], whichever is higher	55[5] or 80th percentile[8] of Reference data set[7], whichever is higher	Event based sampling of release[9] or flow events[10]: • One sample must be taken within twenty four (24) hours of a release event or flow event commencing. • Where a release[9] or a flow event[10] has a duration of twenty four (24) hours or greater, samples must be taken daily for one (1) week, and once a week thereafter until release[9] or flow event[10] ceases.
Aluminium (pH < 6.5)	0.8[5] or Reference[7] value, whichever is higher	0.8[5] or Reference[7] value, whichever is higher	0.8[5] or Reference[7] value, whichever is higher	
Antimony (Sb III)	9[5] or Reference[7] value, whichever is higher	9[5] or 80th percentile[8] of Reference data set[7], whichever is higher	9[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Arsenic (III)[15]	24[5] or Reference[7] value, whichever is higher	24[5] or 80th percentile[8] of Reference data set[7], whichever is higher	24[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Arsenic (V)[15]	13[5] or Reference[7] value, whichever is higher	13[5] or 80th percentile[8] of Reference data set[7], whichever is higher	13[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Bismuth	0.7[5] or Reference[7] data set, whichever is higher	0.7[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.7[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Cadmium	0.2[5] or Reference[7] data set, whichever is higher	0.2[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.2[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Chromium (III)[16]	3.3[5] or Reference[7] data set, whichever is higher	3.3[5] or 80th percentile[8] of Reference data set[7], whichever is higher	3.3[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Chromium (VI)[16]	1.0[5] or Reference[7] data set, whichever is higher	1.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Cobalt	1.4[5] or Reference[7] data set, whichever is higher	1.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Copper	1.4[5] or Reference[7] data set, whichever is higher	1.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Iron	300[15] or Reference[7] data set, whichever is higher	300[15] or 80th percentile[8] of Reference data set[7], whichever is higher	300[15] or 80th percentile[8] of Reference data set[7], whichever is higher	
Lead	3.4[5] or Reference[7] data set,	3.4[5] or 80th percentile[8] of Reference data	3.4[5] or 80th percentile[8] of Reference data	

	whichever is higher	set[7], whichever is higher	set[7], whichever is higher	
Manganese	1900[5] or Reference[7] data set, whichever is higher	1900[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1900[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Molybdenum	34[5] or Reference[7] data set, whichever is higher	34[5] or 80th percentile[8] of Reference data set[7], whichever is higher	34[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Nickel	11[5] or Reference[7] data set, whichever is higher	11[5] or 80th percentile[8] of Reference data set[7], whichever is higher	11[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Silver	0.05[5] or Reference[7] data set, whichever is higher	0.05[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.05[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Selenium (Total)	5[5] or Reference[7] data set, whichever is higher	5[5] or 80th percentile[8] of Reference data set[7], whichever is higher	5[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Zinc	8.0[5] or Reference[7] data set, whichever is higher	8.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	8.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	

(1) All metals and metalloids must be measured as dissolved (filtered).

(2) The initial trigger level is based on ANZECC & ARMCANZ (2000) aquatic ecosystem protection trigger levels. It applies until sufficient data is acquired to develop interim trigger data sets.

(3) The interim trigger levels are based on the results of between eight (8) and seventeen (17) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) and applies until sufficient data is acquired to develop final trigger levels.

(4) The final trigger levels are based on twenty-four (24) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) obtained from the reference location but 18 samples may be used at a minimum.

(5) Based on ANZECC & ARMCANZ (2000) default trigger data sets for aquatic ecosystems indicative of slightly-to-moderately disturbed tropical Australian upland river ecosystems Tables 3.3.4 and Table 3.4.1 (high reliability trigger data sets) and moderate or low reliability trigger data sets (Section 8.3).

(6) Based on the Queensland Water Quality Guidelines - 75th percentile data set for the Lake Eyre catchment (Appendix G – Table G.4).

(7) Reference sites as specified in Schedule C – Table 3 (Receiving Surface Waters Monitoring Locations).

(8) 80th percentiles are calculated using ANZECC & ARMCANZ (2000) methodology (section 7.4.4.1).

(9) Release event is a surface water discharge from water storages or contaminated areas on the licensed place.

(10) Flow events is a surface water flow that occurs as a result of rainfall.

(11) Based on the administering authority's Model Water Conditions for Coal Mines in the Fitzroy Basin.

(12) Based on the administering authority's Guideline *Best Practice Urban Stormwater Management – Erosion and Sediment Control*.

(13) Applies only to Southern Bund Catch Dam Spillway (MN W024).

(14) Based on Queensland Water Quality Guidelines - Wet Tropics upland stream water quality objectives.

(15) Speciated arsenic concentrations for As (III) and As (V) only required if 13µg/L is exceeded - note that the sample bottle requirements for As (total species) and As (speciated) may differ.

(16) Speciated chromium concentrations for Cr (III) and Cr (VI) only required is 1.0µg/L is exceeded – note that the sample bottle requirements for Cr (total species) and Cr (speciated) may differ.

NOTES

(a) Where release(s) or flow event(s) occur simultaneously only one (1) set of samples are required to be taken.

(b) Grab sampling is the required method for sampling collection.

Schedule C – Table 5 (Receiving Waters Contaminant Limits)

Quality Characteristic[1]	Contaminant Limits (mg/L unless specified)			Monitoring Frequency
	Initial[2]	Interim[3]	Final[4]	
Physicochemical				
pH (pH units)	6.0[5] (minimum) 9.0[5] (maximum)			Event based sampling of release[9] or flow events[10]: • One sample must be taken within twenty four (24) hours of a release event or flow event commencing. • Where a release[9] or a flow event[10] has a duration of twenty four (24) hours or greater, samples must be taken daily for one (1) week, and once a week thereafter until release[9] or flow event[10] ceases.
Electrical Conductivity @ 25°C (µS/cm)	1000[6] or Reference[7] data set, whichever is higher	1000[6] or 95th percentile[8] of Reference data set[7], whichever is higher	1000[6] or 95th percentile[8] of Reference data set[7], whichever is higher	
Sulphate (SO_4^{2-}) (mg/L)	1000[11] or Reference[7] data set, whichever is higher	1000[11] or 95th percentile[8] of Reference data set[7], whichever is higher	1000[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Turbidity (NTU)	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Suspended Solids	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Ammonia[12] (NH_3)	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Nitrate[12] (NO_3) as N	400[11] or Reference[7] data set, whichever is higher	400[11] or 95th percentile[8] of Reference data set[7], whichever is higher	400[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Phosphate[12] (PO_4) as P	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Total Hardness	For interpretation purposes only.			
Major Cations and Anions	For interpretation purposes only.			
Metals and Metalloids				

Aluminium	5.6[11] or Reference[7] data set, whichever is higher	5.6[11] or 95th percentile[8] of Reference data set[7], whichever is higher	5.6[11] or 95th percentile[8] of Reference data set[7], whichever is higher	Event based sampling of release[9] or flow events[10]: • One sample must be taken within twenty four (24) hours of a release event or flow event commencing. • Where a release[9] or a flow event[10] has a duration of twenty four (24) hours or greater, samples must be taken daily for one (1) week, and once a week thereafter until release[9] or flow event[10] ceases.
Antimony (Sb III)	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Arsenic	0.5[11] or Reference[7] data set, whichever is higher	0.5[11] or 95th percentile[8] of Reference data set[7], whichever is higher	0.5[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Bismuth	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Cadmium	0.01[11] or Reference[7] data set, whichever is higher	0.01[11] or 95th percentile[8] of Reference data set[7], whichever is higher	0.01[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Chromium	1[11] or Reference[7] data set, whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Cobalt	1[11] or Reference[7] data set, whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Copper	1[11] or Reference[7] data set, whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Iron	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Lead	0.1[11] or Reference[7] data set, whichever is higher	0.1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	0.1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Manganese	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Molybdenum	0.15[11] or Reference[7] data set, whichever is higher	0.15[11] or 95th percentile[8] of Reference data set[7], whichever is higher	0.15[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Nickel	1[11] or Reference[7] data set, whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	1[11] or 95th percentile[8] of Reference data set[7], whichever is higher	
Silver	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Selenium (Total)	0.02[11] or Reference[7]	0.02[11] or 95th percentile[8] of	0.02[11] or 95th percentile[8] of	

	data set, whichever is higher	Reference data set[7], whichever is higher	Reference data set[7], whichever is higher	
Zinc	20[11] or Reference[7] data set, whichever is higher	20[11] or 95th percentile[8] of Reference data set[7], whichever is higher	20[11] or 95th percentile[8] of Reference data set[7], whichever is higher	

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

(2) The initial contaminant limit is based on ANZECC & ARMCANZ (2000) stock water drinking guidelines. It applies until sufficient data is acquired to develop interim contaminant limit data sets.

(3) The interim contaminant limits are based on the results of between eight (8) and seventeen (17) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) and applies until sufficient data is acquired to develop final contaminant limits.

(4) The final contaminant limits are based on twenty-four (24) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) obtained from the reference location but 18 samples may be used as a minimum.

(5) Contaminant limit based on ANZECC &ARMCANZ (2000) general water uses (refer to Section 4.2.10.1).

(6) Based on the administering authority's information resulting from the review of water quality in the Fitzroy Basin.

(7) Reference sites as specified in Schedule C – Table 3 (Receiving Surface Waters Monitoring Locations).

(8) 95th percentiles are calculated using ANZECC & ARMCANZ (2000) methodology (section 7.4.4.1).

(9) Release event is a surface water discharge from water storages or contaminated areas on the licensed place.

(10) Flow events is a surface water flow that occurs as a result of rainfall.

(11) Based on ANZECC & ARMCANZ (2000) stock water quality guidelines (refer to section 3.4.1, Table 4.3.2 and section 9.3.4).

(12) Applies only to Southern Bund Catch Dam Spillway (MN W024).

NOTES

(a) Where release(s) or flow event(s) occur simultaneously only one (1) set of samples are required to be taken.

(b) Grab sampling is the required method for sampling collection.

C13 The release of contaminants to receiving waters must not exceed the contaminant limits for each quality characteristic stated in Schedule C – Table 5 (Receiving Waters Contaminant Limits) at any of the compliance monitoring locations stated in Schedule C – Table 3 (Receiving Waters Monitoring Locations).

C14 If quality characteristics exceeds any of the trigger levels specified in Schedule C – Table 4 (Receiving Waters Trigger Levels) at any of the compliance monitoring locations in Schedule C – Table 3 (Receiving Waters Monitoring Locations), the environmental authority holder must compare the downstream results in the receiving waters during that event to the trigger levels in Schedule C – Table 3 (Receiving Waters Monitoring Locations), and:

a) If the level of contaminants at the downstream site does not exceed the reference site, then no action is to be taken; or

b) If the level of contaminants at the downstream site is greater than the reference monitoring site data, complete an investigation in accordance with the ANZECC & ARMCANZ (2000) methodology into the potential for environmental harm and provide a written report to the administering authority within three (3) months outlining:

i) details of the investigations carried out; and

ii) actions taken to prevent environmental harm

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C14 (b) of this environmental authority, no further reporting is required for subsequent trigger events for that quality characteristic.

Stream Flow Monitoring

C15 The environmental authority holder must not release any waters unless it has installed, operates and maintains a stream flow gauging station to determine and record stream flows at the locations upstream of each release point as specified in Schedule C - Table 6 (Contaminant Release During Flow Events) for any receiving water into which a release occurs.

C16 Notwithstanding any other condition of this environmental authority, the release of contaminants to waters must only take place during periods of natural flow events specified as minimum flow in Schedule C – Table 6 (Contaminant Release During Flow Events) and at the contaminant release point(s) specified in Schedule C - Table 1 (Contaminant Release Locations).

Schedule C – Table 6 (Contaminant Release During Flow Events)

Receiving water description	**Release point**	**Gauging station description**	**Location (GDA94) (Zone 54)**		**Minimum Flow in Receiving Water Required for a Release Event**	**Flow recording Frequency**
			Easting	**Northing**		
Hamilton River	TBA[1]	Gauging station 1	TBA[1]	TBA[1]	As specified in condition C17	Continuous (minimum daily)
Gum Creek	TBA[1]	Gauging station 2	TBA[1]	TBA[1]		
Yurbi Bore Creek	TBA[1]	Gauging station 3	TBA[1]	TBA[1]		
Trepell Creek	TBA[1]	Gauging station 4	TBA[1]	TBA[1]		

1) To be provided to the administering authority within three (3) months of installation.
Note: The volume of flow must be a quantifiable measure, e.g: ≥5m^3/sec

C17 At the time of release from the authorised release points specified in Schedule C - Table 1 (Contaminant Release Locations) the water flow volume in the respective receiving water must be at least twenty (20) times the volume at which respective contaminated waters are released.

C18 The daily quantity of contaminants released from each release point must be accurately measured and recorded at the monitoring points specified in Schedule C - Table 1 (Contaminant Release Locations).

Notification of Release Event

C19 The environmental authority holder must notify the administering authority as soon as practicable of a release event (no later than twenty-four (24) hours of having commenced releasing contaminated water to the receiving environment). Notification must include the submission of written verification to the administering authority of the following information:

(a) release commencement date/time;
(b) expected release cessation date/time;
(c) release point/s;
(d) release volume (estimated);
(e) receiving water/s including the natural flow rate; and
(f) any details (including available data) regarding likely impacts on the receiving water(s).

C20 The environmental authority holder must notify the administering authority as soon as practicable, (within twenty-four (24) hours after cessation of a release) of the cessation of a release notified under Condition (C19) and within 28 days provide the following information in writing:

(a) release cessation date/time;
(b) natural flow volume in receiving water;
(c) volume of water released;
(d) details regarding the compliance of the release with the conditions of Schedule C in this environmental authority (i.e. contamination limits, natural flow, discharge volume);
(e) all water quality monitoring results; and
(f) any other matters pertinent to the water release event.

Onsite Water Storages

C21 Water storages specified in Schedule C - Table 7 (Water Storage Monitoring) must be monitored at the monitoring locations and at the monitoring frequency specified in Schedule C - Table 7 (Water Storage Monitoring) for the water quality characteristics specified in Schedule C - Table 8 (Onsite Storage Contaminant Limits).

For reference: Water storage locations at the Cannington Mine are depicted in Schedule J – Figure 8 (Cannington Mine Onsite Storage Locations)

Schedule C – Table 7 (Water Storage Monitoring)

Water Storage Description	**Monitoring Location (GDA94) (Zone 54)**		**Frequency of Monitoring**
	Easting	**Northing**	
Cannington Mine – ML90059			
Tailings Storage Facility (Cell 1) (MN_W006)	490787	7583265	For the routine monitoring of onsite water locations: - Quarterly
Tailings Storage Facility (Cell 2) (MN_W005)	490512	7583601	
Tailings Storage Facility (Cell 3) (MN_W069)	489772	7584442	
Offline Water Storage Facility. (MN_W070)	491084	7584070	
Western Catch Dam (MN_W014)	491236	7582040	

South ROM Dam (MN_W071)	491597	7581680	
Effluent Dam (MN_W023)	490412	7582943	
Decant Dam (Return Water Dam) (MN_W008)	491034	7583037	
Eastern Catch Dam (Process Plant Stormwater) (MN_W012)	491652	7582562	
Tailings Storage Facility (Expansion) (CLEP – future Open Pit)	490406	7584328	
Northern DSA Bund Pond (CLEP – future Open Pit)	491614	7582577	
New TSF Decant Dam (CLEP – future Open Pit)	491372	7583385	
Process Plant Stormwater Control Pond (CLEP – future Open Pit)	TBA	TBA	
Northern Retention Pond (CLEP – future Open Pit)	492332	7582983	
Southern Retention Pond (CLEP – future Open Pit)	492176	7581511	
Open Cut Pit (CLEP – future Open Pit)	At bottom of ramp / pit		
Yurbi Loading Facility – ML90077			
Yurbi Pond 1 (Cell 1) (YB_CELL1)	464086	7706491	For the routine monitoring of onsite water locations: - Quarterly
Yurbi Pond 2 (Cells 2,3 and 4) (YB_CELL2,YB_CELL3,YB_CELL4)	463868	7706846	

C22 In the event that water storages defined in Schedule C - Table 7 (Water Storage Monitoring) exceed the contaminant limits defined in Schedule C - Table 8 (Onsite Storage Contaminant Limits), the environmental authority holder must implement measures to prevent access to waters by all livestock and minimise access by native fauna.

Schedule C – Table 8 (Onsite Storage Contaminant Limits)

Quality Characteristic[1]	**Test data set**	**Contaminant Limit[2]**

pH (pH unit)[3]	Range	4 (minimum) 9 (maximum)
EC (µS/cm)	Maximum	5970
Sulphate(mg/L)	Maximum	1000
Fluoride (mg/L)	Maximum	2
Aluminium (mg/L)	Maximum	5
Arsenic (mg/L)	Maximum	0.5
Cadmium (mg/L)	Maximum	0.01
Chromium (mg/L)	Maximum	1
Cobalt (mg/L)	Maximum	1
Copper (mg/L)	Maximum	1
Lead (mg/L)	Maximum	0.1
Nickel (mg/L)	Maximum	1
Zinc (mg/L)	Maximum	20
Mercury (mg/L)	Maximum	0.002
Selenium (mg/L)	Maximum	0.02

1) All metals and metalloids must be measured as total (unfiltered).
2) Contaminant limit based on ANZECC & ARMCANZ (2000) stock water quality guidelines.
3) Page 4.2-15 of ANZECC & ARMCANZ (2000) "Soil and animal health will not generally be affected by water with pH in the range of 4–9".

Stream Sediment

C23 Sediment quality of the reference and receiving waters must be monitored twice a year (once at the end of the wet season and once at the end of the dry season) at the monitoring locations defined in Schedule C - Table 9 (Stream Sediment Monitoring Locations) and identified in Schedule J – Figure 6 (Cannington Mine Surface Water & Sediment Monitoring Locations) and Schedule J – Figure 7 (Yurbi Surface Water & Sediment Monitoring Locations).

Schedule C – Table 9 (Stream Sediment Monitoring Locations)

Monitoring Points	**Stream Sediment Location Description**	**Location (GDA94) (Zone 54)**	
		Easting	**Northing**
Cannington Mine – ML90059 **Reference[1] / upstream Monitoring Points**			
MN S041	Upstream Hamilton River	488657	7583993
MN S042	Upstream Trepell Creek	492515	7584238
Yurbi Loading Facility – ML90077 **Reference[1] / upstream Monitoring Points**			
YB S010	Gum Creek	463769	7706103

YB S017	Yurbi Bore Creek	463562	7706536
Cannington Mine – ML90059 **Downstream Monitoring Points**			
MN S044	Downstream Hamilton River	492017	7580873
MN S045	Directly below Southern Retention Pond Spillway	492128	7581243
MN S043A	Downstream Trepell Creek	492403	7580884
Yurbi Loading Facility – ML90077 **Downstream Monitoring Points**			
YB S014	Gum Creek	465517	7706729
YB S011	Yurbi Bore Creek	463801	7707030
YB S043	Fisher Creek	464199	7708047
YB S044	Fisher Creek	466335	7707846
YB S045	Yurbi Bore Creek	463779	7707302
YB S046	Yurbi Bore Creek	463851	7707619

1 Reference sites must:

a) be from the same bio-geographic and climatic region;
b) have similar geology, soil types and topography;
c) contain a range of habitats similar to those at the test sites;
d) have a similar flow regime; and
e) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site

C24 The release of contaminants from the licensed place must not result in an exceedance of the sediment contaminant limits specified in Schedule C - Table 10 (Stream Sediment Trigger Levels and Contaminant Limits).

Schedule C – Table 10 (Stream Sediment Trigger Levels and Contaminant Limits)

Parameter	Unit	Trigger Level	Contaminant Limit
Arsenic	mg/kg	Reference[1,2] data set or 20[3], whichever is higher	70[4] or three (3) times the reference[1,2] data set, whichever is higher
Antimony	mg/kg	Reference[1,2] data set or 2[3], whichever is higher	25[4] or three (3) times the reference[1,2] data set, whichever is higher
Cadmium	mg/kg	Reference[1,2] data set or 1.5[3], whichever is higher	10[3] or three (3) times the reference[1,2] data set, whichever is higher
Chromium	mg/kg	Reference[1,2] data set or 80[3], whichever is higher	370[4] or three (3) times the reference[1,2] data set, whichever is higher
Copper	mg/kg	Reference[1,2] data set or 65[3], whichever is higher	270[4] or three (3) times the reference[1,2] data set, whichever is higher

Lead	mg/kg	Reference[1,2] data set or 50[3] whichever is higher	220[4] or three (3) times the reference[1,2] data set, whichever is higher
Manganese	mg/kg	Reference[1,2] data set	three (3) times the reference[1,2] data set
Mercury	mg/kg	Reference[1,2] data set or 0.15[3] whichever is higher	1[4] or three (3) times the reference[1,2] data set, whichever is higher
Nickel	mg/kg	Reference[1,2] data set or 21[3], whichever is higher	52[4] or three (3) times the reference[1,2] data set, whichever is higher
Selenium	mg/kg	Reference[1,2] data set	three (3) times the reference[1,2] data set
Silver	mg/kg	Reference[1,2] data set or 2[3], whichever is higher	3.7[4] or three (3) times the reference[1,2] data set, whichever is higher
Sulphate	mg/kg	Reference[1,2] data set	three (3) times the reference[1,2] data set
Zinc	mg/kg	Reference[1,2] data set or 200[3] or, whichever is higher	410[4] or three (3) times the reference[1,2] data set, whichever is higher
Particle Size Distribution	For interpretation purposes		

1) Reference sites are defined in Schedule C – Table 9 (Stream Sediment Monitoring Locations).
2) Based on results from the Receiving Environment Monitoring Program.
3) ANZECC & ARMCANZ (2000) Interim Sediment Quality Guidelines – low data sets based on total sediments.
4) ANZECC & ARMCANZ (2000) Interim Sediment Quality Guidelines – high data sets based on total sediments.

C25 If the quality characteristics of sediments exceed any of the trigger levels specified in Schedule C – Table 10 (Stream Sediment Trigger Levels and Contaminant Limits), the holder of this environmental authority must compare the results of the downstream site to the data from upstream reference monitoring sites and:

a) If the level of contaminants at the downstream site does not exceed the upstream reference monitoring site data, then no action is to be taken; or

b) If the level of contaminants at the downstream site is greater than the reference monitoring site data, complete an investigation in accordance with the ANZECC & ARMCANZ (2000) methodology, into the potential for environmental harm and provide a written report to the administering authority within three (3) months, outlining:

i) details of the investigations carried out;
ii) details of the environmental impacts observed; and
iii) actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with part (b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic within the three month investigation period.

C26 All stream sediment sampling must be undertaken in accordance with the most recent version of Australian Standard AS 5667.12 Guidance on Sampling of Bottom Sediments.

Receiving Environment Monitoring Program (REMP)

C27 A REMP must be developed, implemented and maintained on an ongoing basis to monitor and record the effects of the release of contaminants on the receiving environment periodically and whilst contaminants are being discharged from the licensed place, with the aims of identifying and describing the extent of any adverse impacts to local environmental data sets, and monitoring any changes in the receiving water.

For the purposes of the REMP, the receiving environment is:

i) the waters of Hamilton River and Trepell Creek and connected waterways within 5km downstream of the release points identified in Schedule C - Table 1 (Contaminant Release Locations).
ii) the waters of Gum Creek and Yurbi Bore Creek and connected waterways within 5km downstream of the release points identified in Schedule C - Table 1 (Contaminant Release Locations).

C28 The REMP must address (but not necessarily be limited to) the following:

(a) Description of potentially affected receiving waters including key communities and background water quality characteristics based on accurate and reliable monitoring data that takes into consideration any temporal variation (e.g. seasonality);

(b) Description of applicable environmental data sets and water quality objectives to be achieved (i.e. as scheduled pursuant to the Environmental Protection (Water) Policy 2009);

(c) Any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment within which the REMP applies;
(d) Water quality targets within the receiving environment to be achieved, and clarification of contaminant concentrations or level indicating adverse environmental impacts during the REMP;

(e) Monitoring for any potential adverse environmental impacts caused by a release of contaminants to any receiving waters, including impacts to the surface waters between the licensed release locations specified in Schedule C - Table 1 (Contaminant Release Locations) and the compliance monitoring locations specified in Schedule C – Table 3 (Receiving Waters Monitoring Locations);

(f) Monitoring of stream flow and hydrology;

(g) Monitoring of toxicants should consider the indicators specified in Schedule C – Table 4 (Receiving Waters Trigger Levels) and Table 5 (Receiving Waters Contaminant Limits) to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ (2000) guidelines for slightly to moderately disturbed ecosystems;

(h) Monitoring as a minimum the parameters specified in Schedule C – Table 4 (Receiving Waters Trigger Levels) and Table 5 (Receiving Waters Contaminant Limits) (in addition to dissolved oxygen saturation and temperature);

(i) Monitoring biological indicators (for macroinvertebrates in accordance with the AusRivas methodology / the latest edition of the Administering Authority's monitoring and sampling manual) and metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ (2000), BATLEY and/or the most recent version of AS5667.1 Guidance on

Sampling of Bottom Sediments) for permanent, semi-permanent water holes and water storages;

(j) The location of monitoring points (including but not limited to the locations specified in Schedule C – Table 3 (Receiving Waters Monitoring Locations) which are reference and downstream impacted sites for each release point, and mixing zones identified in ;

(k) The frequency or scheduling of sampling and analysis sufficient to determine water quality objectives and to derive site specific reference data sets within 2 years (depending on wet season flows) in accordance with the latest edition of the Administering Authority's Queensland Water Quality Guidelines. For ephemeral streams, this should include periods of flow irrespective of mine or other releases;

(l) Specify sampling and analysis methods and quality assurance and control;

(m) Any historical datasets to be relied upon;

(n) Description of the statistical basis on which conclusions are drawn; and

(o) Any spatial and temporal controls to exclude potential confounding factors.

C29 A report outlining the findings of the REMP, including all monitoring results and interpretations in accordance with Condition (C28) must be prepared and submitted in writing to the administering authority by 1 May 2016 and thereafter once every 12 months. This report must include an assessment of background water quality, any assimilative capacity for those contaminants monitored and the suitability of current discharge limits to protect downstream environmental values.

Water Management Plan

C30 A Water Management Plan must be developed and implemented by 1 April 2015 that provides for the proper and effective management of the actual and potential environmental impacts resulting from the mining activity and to ensure compliance with the conditions of this environmental authority.

C31 The Water Management Plan must be developed in accordance with the most recent edition of the administering authority's Guideline for Preparation of a Water Management Plan for Mining Activities and must include at least the following components:

a) Contaminant Source Study;
b) Site Water Balance and Model;
c) Water Management System;
d) Saline Drainage Prevention and Management Measures;
e) Acid Rock Drainage Prevention and Management Measures;
f) Emergency and Contingency Planning; and
g) Monitoring and Review.

C32 In any year that a release event occurs, the environmental authority holder must undertake a review of the Water Management Plan following the wet season (i.e. by 1 May each year) to ensure that proper and effective measures, practices or procedures are in place so that the mine is operated in accordance with the conditions of this environmental authority and that environmental harm is prevented or minimised.

C33 A copy of the Water Management Plan and/or a review of the Water Management Plan must be provided to the administering authority on request.

Groundwater

C34 By no later than six (6) months prior to commencement of open pit mining activities the environmental authority holder must submit a groundwater monitoring program to the administering authority that:

a) Identifies groundwater monitoring locations required for the Cannington Life Extension Project that adequately characterises the potential groundwater impacts;

b) Identifies existing and required groundwater monitoring locations for the existing Cannington Mine operations and the Yurbi Loading Facility;

c) Details the existing monitoring network installed in the Proterozoic rocks and Cretaceous sands surrounding the pit;

d) Provides justification for the location of the proposed groundwater monitoring locations;

e) Provides bore construction details;

f) Incorporates the findings from any resistivity studies undertaken at the licensed place;
g) Incorporates monitoring of both shallow and deep groundwater and includes an adequate number of monitoring bores which provides sufficient spatial coverage to enable scientifically justifiable conclusions in relation to potential environmental impacts from the mining activity; and

h) Incorporates development of baseline groundwater quality, groundwater flow direction and rate and hydraulic conductivity. In addition, consideration must be given to how these parameters may change during the life of the mining project.

C35 The groundwater monitoring program specified in condition (C34) must be independently certified by an appropriately qualified person.

C36 The Groundwater Monitoring Program must be reviewed at least once a year before 1 October to ensure that proper and effective measures, practices or procedures are in place so that the mine is operated in accordance with the conditions of this environmental authority and that environmental harm is prevented or minimised.

C37 Groundwater quality and level must be monitored at the locations and frequencies defined in Schedule C - Table 11 (Groundwater Monitoring Locations and Frequency) and identified in Schedule J –figures 9a (Cannington Groundwater Monitoring Locations A – Deep), 9b (Cannington Groundwater Monitoring Locations A – Shallow), 10 (Cannington Groundwater Monitoring Location B), 11 (Cannington Groundwater Monitoring Location C), and 17 (Yurbi Groundwater Monitoring Locations), for quality characteristics identified in Schedule C - Table 12 (Groundwater Trigger Levels – Deep Bores) and Table 13 (Groundwater Contaminant Limits – Deep Bores).

Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency)

Monitoring Point [2]	Location (GDA94, Zone 54) [2]		Surface RL[1] (m) [2]	Monitoring Frequency [2]
	Easting [2]	Northing [2]		
Cannington Mine – ML90059				
Compliance Bores – Deep Bores				
MN_P057A1	491444	7581535	253.51	Quarterly

MN_P057A2	491451	7581548	253.53	
MN_P058G1	491200	7580504	252.2	
MN_P058G2	491200	7580504	252.1	
MN_P058H1	492230	7580500	251.11	
MN_P058H2	492230	7580500	250.90	
MN_RC03A	493039	7581272	253.51	
MN_RC03B	493037	7581265	253.63	
MN_RC04A	491742	7580498	251.77	
MN_RC04B	491735	7580499	251.61	
Compliance Bores – Shallow Bores				
MN P014A1	491247	7582918	256.33	Quarterly
MN P014A2	491243	7582915	256.33	
MN P014B2	491149	7583430	257.42	
MN P014C2	490888	7583806	258.64	
MN P014D2	490564	7584177	260.39	
MN P014G1	489659	7583901	263.13	
MN P014G2	489661	7583902	263.13	
MN P014H1	489565	7583585	260.82	
MN P014H2	489567	7583586	260.82	
MN P014I1	489770	7583240	259.98	
MN P014I2	489770	7583242	259.98	
MN P014J1	490067	7582928	258.48	
MN P014J2	490067	7582928	258.48	
MN P014K1	490503	7582869	259.01	
MN P014K2	490505	7582870	259.01	
MN_P014L2A	490832	7582709	256.56	
MN P014M1	490193	7584628	262.00	
MN P014M2	490193	7584628	262.00	
MN P014N1	489653	7584802	263.18	
MN P014N2	489653	7584802	263.24	
MN P014P1	489399	7584466	264.95	
MN P014P2	489399	7584466	264.96	
MN P014Q1	489461	7584085	263.68	
MN P014Q2	489461	7584085	263.62	
MN_P055A	491144	7583747	257.5	
MN_P055B	490875	7584102	259.1	
MN_P055C	489912	7583062	258.8	
MN_P055D	490408	7582421	256.8	
MN_P055G	491187	7583103	256.81	
MN_P055L	490651	7584344	260.41	
MN_P055N	490930	7582536	256.21	
MN_P057E	491128	7581845	255.2	
MN_P057F	491276	7581715	254.22	
MN_P057G	491470	7581601	252.91	
MN_P058A	492340	7582388	252.58	
MN_P058B	492295	7581920	252.62	
MN_P058C	492283	7581440	250.76	
Reference Bores [3] – Deep Bores				
MN_P056D2	489144	7584966	265.7	Quarterly
MN_P056E2	490662	7585110	262.2	
Reference Bores[3] – Shallow Bores				
MN_P056A	492111	7585823	257.6	Quarterly
MN_P056B	488553	7584281	262.2	
MN_P056C	487824	7585102	265.6	
MN_P056D1	489147	7584971	265.7	
MN_P056E1	490659	7585106	262.5	
Observation Bores – Shallow Bores				
MN_P057DA	491369	7581996	TBA [4]	Quarterly
MN_P060A	491046	7581738	TBA [4]	

MN_P060B	491278	7581876	TBA [4]	
MN_P060C	491529	7581707	TBA [4]	
MN_P060D	491616	7581513	TBA [4]	
Yurbi Loading Facility – ML90077				
Compliance Bores				
YB_P003	464139	7706943	207.22	Quarterly
YB_P004	464483	7706790	202.85	
YB_P005	463868	7706953	205.73	
Reference Bores[3]				
YB_P001	463515	7706497	210.9	Quarterly
YB_P002	463825	7706053	209.77	

(1) RL must be measured to the nearest 5cm from the top of the bore casing.

(2) Additional monitoring locations to be provided in groundwater monitoring program as per Condition (C34).

(3) Reference sites must:

(a) be from the same bio-geographic and climatic region;

(b) have similar geology, soil types and topography;

(c) contain a range of habitats similar to those at the test sites;

(d) have a similar flow regime; and

(e) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site

(4) To be submitted to the administering authority no later than 1 December 2024.

Schedule C – Table 12 (Groundwater Trigger Levels – Deep Bores)

Quality Characteristic[1]	**Trigger Levels (µg/L unless specified)**			**Monitoring Frequency**
	Initial[2]	**Interim[3]**	**Final[4]**	
Physicochemical				
pH (pH units)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	For the routine monitoring of onsite water locations: • Quarterly
Electrical Conductivity @ 25°C (µS/cm)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Sulphate (SO_4^{2-}) (mg/L)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Ammonia (NH_3)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Nitrate (NO_3) as N	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Phosphate (PO_4) as P	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	

Total Hardness	For interpretation purposes only.			
Metals and Metalloids				
Aluminium	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set For the routine monitoring of onsite water locations: • Quarterly
Antimony (Sb III)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Arsenic (Total)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Bismuth	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Cadmium	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Chromium (Cr VI)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Cobalt	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Copper	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Iron	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Lead	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Manganese	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Mercury (inorganic)	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Molybdenum	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Nickel	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Silver	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	
Selenium (Total)	Reference[5] data set	80th percentile[6] of Reference[5,6] data set	80th percentile[6] of Reference[5] data set	
Zinc	Reference[5] data set	80th percentile[6] of Reference[5] data set	80th percentile[6] of Reference[5] data set	

(1) All metals and metalloids must be measured as dissolved (filtered).

(2) The initial trigger level is based on a single sampling event and is the reference data set obtained at the time of a release and applies until sufficient data is acquired to develop interim trigger data sets.

(3) The interim trigger levels are based on the results of between eight (8) and seventeen (17) consecutive samples (calculated in accordance with ANZECC & ARMCANZ 2000) and applies until sufficient data is acquired to develop final trigger levels.

(4) The final trigger levels are based on twenty-four (24) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) obtained from the reference location (18 at a minimum).

(5) Reference sites as specified in Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency).

(6) 80th percentiles are calculated using ANZECC & ARMCANZ (2000) methodology (section 7.4.4.1).

C38 Monitoring of groundwater from compliance bores identified in Schedule C - Table 11 (Groundwater Monitoring Locations and Frequency), must not exceed any of the contaminant limits defined in Schedule C - Table 13 (Groundwater Contaminant Limits – Deep Bores) and Table 15 (Groundwater Contaminant Limits – Shallow Bores).

Schedule C – Table 13 (Groundwater Contaminant Limits – Deep Bores)

Quality Characteristic[1]	**Contaminant Limits (mg/L unless specified)**			**Monitoring Frequency**
	Initial[2]	**Interim[3]**	**Final[4]**	
Physicochemical				
pH (pH units)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	For routine monitoring: • Quarterly
Electrical Conductivity @ 25°C (µS/cm)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Sulphate (SO_4^{2-}) (mg/L)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Turbidity (NTU)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Suspended Solids	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Ammonia (NH_3)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Nitrate (NO_3) as N	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Phosphate (PO_4) as P	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Total Hardness	For interpretation purposes only.			
Major Cations and Anions	For interpretation purposes only.			
Metals and Metalloids				

Aluminium	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	For routine monitoring: • Quarterly
Antimony (Sb III)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Arsenic (Total)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Bismuth	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Cadmium	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Chromium (Cr VI)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Cobalt	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Copper	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Iron	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Lead	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Manganese	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Mercury (inorganic)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Molybdenum	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Nickel	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Silver	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Selenium (Total)	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	
Zinc	Reference[5] data set	95th percentile[6] of Reference data set[5]	95th percentile[6] of Reference data set[5]	

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

(2) The initial contaminant limits is based on a single sampling event and is the reference data set obtained at the time of a release and applies until sufficient data is acquired to develop interim trigger data sets.

(3) The interim contaminant limits are based on the results of between eight (8) and seventeen (17) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) and applies until sufficient data is acquired to develop final trigger levels.

(4) The final contaminant limits are based on twenty-four (24) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) obtained from the reference location (18 at a minimum).

(5) Reference sites as specified in Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency).

(6) 95th percentiles are calculated using ANZECC & ARMCANZ (2000) methodology (section 7.4.4.1).

Schedule C – Table 14 (Groundwater Trigger Levels – Shallow Bores)

Quality Characteristic[1]	Trigger Levels (µg/L unless specified)			Monitoring Frequency
	Initial[2]	Interim[3]	Final[4]	
Physicochemical				
pH (pH units)	6.0[5] (minimum) 7.5[5] (maximum)			For routine monitoring: • Quarterly
Electrical Conductivity @ 25°C (µS/cm)	205[6] or Reference[7] value, whichever is higher	205[6] or 80th percentile[8] of Reference data set[7], whichever is higher	205[6] or 80th percentile[8] of Reference data set[7], whichever is higher	
Sulphate (SO_4^{2-}) (mg/L)	1000[9] or Reference[7] value, whichever is higher	1000[9] or 80th percentile[8] of Reference data set[7], whichever is higher	1000[9] or 80th percentile[8] of Reference data set[7], whichever is higher	
Turbidity (NTU)	Reference[7] value	80th percentile[8] of Reference data set[7]	80th percentile[8] of Reference data set[7]	
Suspended Solids	Reference[7] value	80th percentile[8] of Reference data set[7]	80th percentile[8] of Reference data set[7]	
Ammonia[11] (NH_3)	900[5] or Reference[7] value, whichever is higher	900[5] or 80th percentile[8] of Reference data set[7], whichever is higher	900[5] or 80th percentile[8] of Reference data set, whichever is higher	
Nitrate[11] (NO_3) as N	700[5] or Reference[7] value, whichever is higher	700[5] or 80th percentile[8] of Reference data set[7], whichever is higher	700[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Phosphate[11] (PO_4) as P	5[12] or Reference[7] value, whichever is higher	5[12] or 80th percentile[8] of Reference data set[7], whichever is higher	5[12] or 80th percentile[8] of Reference data set[7], whichever is higher	
Total Hardness	For interpretation purposes only.			
Dissolved Oxygen (mg/L)	For interpretation purposes only.			
Major Cations and Anions	For interpretation purposes only.			
Metals and Metalloids				
Aluminium (pH > 6.5)	55[5] or Reference[7] value, whichever is higher	55[5] or 80th percentile[8] of Reference data set[7], whichever is higher	55[5] or 80th percentile[8] of Reference data set[7], whichever is higher	For routine monitoring: • Quarterly

Aluminium (pH < 6.5)	0.8 or Reference[7] value, whichever is higher	0.8 or Reference[7] value, whichever is higher	0.8 or Reference[7] value, whichever is higher	
Antimony (Sb III)	9[5] or Reference[7] value, whichever is higher	9[5] or 80th percentile[8] of Reference data set[7], whichever is higher	9[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Arsenic (III)[14]	24[5] or Reference[7] value, whichever is higher	24[5] or 80th percentile[8] of Reference data set[7], whichever is higher	24[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Arsenic (V)[14]	13[5] or Reference[7] value, whichever is higher	13[5] or 80th percentile[8] of Reference data set[7], whichever is higher	13[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Bismuth	0.7[5] or Reference[7] data set, whichever is higher	0.7[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.7[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Cadmium	0.2[5] or Reference[7] data set, whichever is higher	0.2[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.2[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Chromium (III)[15]	3.3[5] or Reference[7] data set, whichever is higher	3.3[5] or 80th percentile[8] of Reference data set[7], whichever is higher	3.3[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Chromium (VI)[15]	1.0[5] or Reference[7] data set, whichever is higher	1.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Cobalt	1.4[13] or Reference[7] data set, whichever is higher	1.4[13] or 80th percentile[8] of Reference data set[7], whichever is higher	1.4[13] or 80th percentile[8] of Reference data set[7], whichever is higher	
Copper	1.4[5] or Reference[7] data set, whichever is higher	1.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Iron	300[13] or Reference[7] data set, whichever is higher	300[13] or 80th percentile[8] of Reference data set[7], whichever is higher	300[13] or 80th percentile[8] of Reference data set[7], whichever is higher	
Lead	3.4[5] or Reference[7] data set, whichever is higher	3.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	3.4[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Manganese	1900[5] or Reference[7] data set, whichever is higher	1900[5] or 80th percentile[8] of Reference data set[7], whichever is higher	1900[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Mercury (inorganic)	0.06[5] or Reference[7] data set, whichever is higher	0.06[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.06[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Molybdenum	34[5] or Reference[7] data set, whichever is higher	34[5] or 80th percentile[8] of Reference data set[7], whichever is higher	34[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Nickel	11[5] or Reference[7] data set, whichever is higher	11[5] or 80th percentile[8] of Reference data set[7], whichever is higher	11[5] or 80th percentile[8] of Reference data set[7], whichever is higher	

Silver	0.05[5] or Reference[7] data set, whichever is higher	0.05[5] or 80th percentile[8] of Reference data set[7], whichever is higher	0.05[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Selenium (Total)	11[5] or Reference[7] data set, whichever is higher	11[5] or 80th percentile[8] of Reference data set[7], whichever is higher	11[5] or 80th percentile[8] of Reference data set[7], whichever is higher	
Zinc	8.0[5] or Reference[7] data set, whichever is higher	8.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	8.0[5] or 80th percentile[8] of Reference data set[7], whichever is higher	

(1) All metals and metalloids must be measured as dissolved (filtered).

(2) The initial trigger level is based on ANZECC & ARMCANZ (2000) aquatic ecosystem protection trigger levels or on a single sampling event and is the reference data set obtained at the time of a release and applies until sufficient data is acquired to develop interim trigger data sets.

(3) The interim trigger levels are based on the results of between eight (8) and seventeen (17) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) and applies until sufficient data is acquired to develop final trigger levels.

(4) The final trigger levels are based on twenty-four (24) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) obtained from the reference location (18 at a minimum).

(5) Based on ANZECC & ARMCANZ (2000) default trigger data sets for aquatic ecosystems indicative of slightly-to-moderately disturbed tropical Australian upland river ecosystems Tables 3.3.4 and Table 3.4.1 (high reliability trigger data sets) and moderate or low reliability trigger data sets (Section 8.3).

(6) Based on the Queensland Water Quality Guidelines - 75th percentile data set for the Lake Eyre catchment (Appendix G – Table G.4).

(7) Reference sites as specified in Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency).

(8) 80th percentiles are calculated using ANZECC & ARMCANZ (2000) methodology (section 7.4.4.1).

(9) Based on the administering authority's Model Water Conditions for Coal Mines in the Fitzroy Basin.

(10) Nil.

(11) Applies to bores located at Cannington only.

(12) Based on Queensland Water Quality Guidelines - Wet Tropics upland stream water quality objectives.

(13) Moderate or low Reliability Trigger data set from Section 8.3 of the ANZECC & ANCANZ (2000) guidelines.

(14) Speciated arsenic concentrations for As (III) and As (V) only required if 13µg/L is exceeded - note that the sample bottle requirements for As (total species) and As (speciated) may differ.

(15) Speciated chromium concentrations for Cr (III) and Cr (VI) only required is 1.0µg/L is exceeded – note that the sample bottle requirements for Cr (total species) and Cr (speciated) may differ.

Schedule C – Table 15 (Groundwater Contaminant Limits – Shallow Bores)

Quality Characteristic[1]	**Contaminant Limits (mg/L unless specified)**			**Monitoring Frequency**
	Initial[2]	**Interim[3]**	**Final[4]**	
Physicochemical				
pH (pH units)	6.0[5] (minimum) 9.0[5] (maximum)			For routine monitoring: • Quarterly
Electrical Conductivity @ 25°C (µS/cm)	1000[6] or Reference[7] data set, whichever is higher	1000[6] or 95th percentile[8] of Reference data set[7], whichever is higher	1000[6] or 95th percentile[8] of Reference data set[7], whichever is higher	

Sulphate (SO_4^{2-}) (mg/L)	1000[9] or Reference[7] data set, whichever is higher	1000[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	1000[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	
Turbidity (NTU)	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	
Suspended Solids	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	
Ammonia[10] (NH_3)	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	
Nitrate[10] (NO_3) as N	400[9] or Reference[7] data set, whichever is higher	400[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	400[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	
Phosphate[10] (PO_4) as P	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	
Total Hardness	For interpretation purposes only.			
Major Cations and Anions	For interpretation purposes only.			
Metals and Metalloids				
Aluminium	5.6[9] or Reference[7] data set, whichever is higher	5.6[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	5.6[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	For routine monitoring: • Quarterly
Antimony (Sb III)	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	
Arsenic	0.5[9] or Reference[7] data set, whichever is higher	0.5[9] or 95th percentile[8] of Reference data set[7], whichever is higher	0.5[9] or 95th percentile[8] of Reference data set[7], whichever is higher	
Bismuth	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	
Cadmium	0.01[9] or Reference[7] data set, whichever is higher	0.01[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	0.01[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	
Chromium	1[9] or Reference[7] data set, whichever is higher	1[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	1[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	
Cobalt	1[9] or Reference[7] data set, whichever is higher	1[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	1[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	
Copper	1[9] or Reference[7] data set, whichever is higher	1[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	1[9] or 95[th] percentile[8] of Reference data set[7], whichever is higher	
Iron	Reference[7] data set plus 10%	95[th] percentile[8] of Reference data set[7]	95[th] percentile[8] of Reference data set[7]	

Lead	0.1[9] or Reference[7] data set, whichever is higher	0.1[9] or 95th percentile[8] of Reference data set[7], whichever is higher	0.1[9] or 95th percentile[8] of Reference data set[7], whichever is higher	
Manganese	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Mercury (inorganic)	0.002[9] or Reference[7] data set, whichever is higher	0.002[9] or 95th percentile[8] of Reference data set[7], whichever is higher	0.002[9] or 95th percentile[8] of Reference data set[7], whichever is higher	
Molybdenum	0.15[9] or Reference[7] data set, whichever is higher	0.15[9] or 95th percentile[8] of Reference data set[7], whichever is higher	0.15[9] or 95th percentile[8] of Reference data set[7], whichever is higher	
Nickel	1[9] or Reference[7] data set, whichever is higher	1[9] or 95th percentile[8] of Reference data set[7], whichever is higher	1[9] or 95th percentile[8] of Reference data set[7], whichever is higher	
Silver	Reference[7] data set plus 10%	95th percentile[8] of Reference data set[7]	95th percentile[8] of Reference data set[7]	
Selenium (Total)	0.02[9] or Reference[7] data set, whichever is higher	0.02[9] or 95th percentile[8] of Reference data set[7], whichever is higher	0.02[9] or 95th percentile[8] of Reference data set[7], whichever is higher	
Zinc	20[9] or Reference[7] data set, whichever is higher	20[9] or 95th percentile[8] of Reference data set[7], whichever is higher	20[9] or 95th percentile[8] of Reference data set[7], whichever is higher	

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

(2) The initial contaminant limits is based on ANZECC & ARMCANZ (2000) stock water quality guidelines or on a single sampling event and is the reference data set plus 10% obtained at the time of a release and applies until sufficient data is acquired to develop interim contaminant data sets.

(3) The interim contaminant limits are based on the results of between eight (8) and seventeen (17) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) and applies until sufficient data is acquired to develop final contaminant levels.

(4) The final contaminant limits are based on twenty-four (24) consecutive samples (calculated in accordance with ANZECC & ARMCANZ (2000)) obtained from the reference location (18 at a minimum).

(5) Contaminant limit based on ANZECC & ARMCANZ (2000) general water uses (refer to Section 4.2.10.1).

(6) Based on the administering authority's information resulting from the review of water quality in the Fitzroy Basin.

(7) Reference sites as specified in Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency).

(8) 95th percentiles are calculated using ANZECC & ARMCANZ (2000) methodology (section 7.4.4.1).

(9) Based on ANZECC & ARMCANZ (2000) stock water quality guidelines (refer to section 3.4.1, Table 4.3.2 and section 9.3.4).

(10) Applies only to bores located at Cannington.

C39 If quality characteristics of groundwater from compliance bores identified in Schedule C - Table 11 (Groundwater Monitoring Locations and Frequency) exceed any of the trigger levels stated in Schedule C - Table 12 (Groundwater Trigger Levels – Deep Bores) and Table 14 (Groundwater Trigger Levels – Shallow Bores), the environmental authority holder must compare the compliance monitoring bore results to the reference bore results and:

(a) if the level of contaminants at the compliance monitoring bore does not exceed the reference bore results, then no action is to be taken; and

(b) if the level of contaminants at the compliance monitoring bore is greater than the reference bore results, complete an investigation in accordance with the ANZECC & ARMCANZ (2000), into the potential for environmental harm and provide a written report to the administering authority within 3 months, outlining:

(i) details of the investigations carried out; and

(ii) actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with Condition (C38) (b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic within the three month investigation period.

Monitoring bore construction, maintenance and decommissioning

C40 Groundwater monitoring bores must be constructed and operated in accordance with methods prescribed in the latest edition of the Agriculture and Resource Management Council of Australia and New Zealand manual titled Minimum Construction Requirements for Water Bores in Australia.

C41 Oil-based drilling fluids, oil-based additives, synthetic based drilling fluids or synthetic based additives must not be used in the construction of groundwater monitoring bores.

C42 Current Material Safety Data Sheets for all substances used for the drilling of groundwater monitoring bores must be made available to the administering authority promptly upon request.

C43 Remedial measures must be taken immediately if the holder of this environmental authority becomes aware that either monitoring bore construction, maintenance or decommissioning have resulted in a change in groundwater quality, groundwater levels or have caused the interconnection of aquifers.

Groundwater monitoring report

C44 The environmental authority holder must complete a groundwater monitoring report within three (3) months following the end of every two (2) years and submit this report to the administering authority within one (1) week of completion. The report must address the following requirements as a minimum:

a) Analyses of groundwater chemistry and hydrogeological data for all groundwater monitoring bores listed in Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency) of this Authority;

b) Identify exceedance of any contaminant trigger levels or limits listed in Schedule C – Table 12 (Groundwater Trigger Levels – Deep Bores), Table 13 (Groundwater Contaminant Limits – Deep Bores), Table 14 (Groundwater Trigger Levels – Shallow Bores) or Schedule C – Table 15 (Groundwater Contaminant Limits – Shallow Bores);

c) Discuss effectiveness of the current groundwater monitoring regime and any improvements that could be made to ensure early detection of impacts to groundwater;

d) Detail proposed actions and timeframes to undertake further investigation of potential environmental impacts for any exceedance identified;

e) Detail proposed mitigation measures for any detected impact to groundwater resulting from mining activity;

f) Changes in groundwater levels plotted as a function of time to identify seasonal patterns and possible draw-down effects;

g) Groundwater elevation contours and flow direction; and

h) Interpretation and discussion of exceedance of any contaminant trigger levels or limits listed in Schedule C – Table 12 (Groundwater Trigger Levels – Deep Bores), Table 13 (Groundwater Contaminant Limits – Deep Bores), Table 14 (Groundwater Trigger Levels – Shallow Bores) or Schedule C – Table 15 (Groundwater Contaminant Limits – Shallow Bores) and the implications for compliance with this environmental authority.

C45 The method of sampling of groundwater must comply with that set out in the latest edition of the Administering Authority's Monitoring and Sampling Manual.

TSF Monitoring

C46 Groundwater must be monitored for the parameters at the locations and frequencies defined in Schedule C – Table 16 (TSF Monitoring Program) for the quality characteristics specified in Schedule C – Table 14 (Groundwater Trigger Levels – Shallow Bores), Table 15 (Groundwater Contaminant Limits – Shallow Bores) and as identified in Schedule J – figures 9a (Cannington Groundwater Monitoring Locations A – Deep), 9b (Cannington Groundwater Monitoring Locations A – Shallow), 12 (TSF Seepage Monitoring Locations A), 13 (TSF Seepage Monitoring Locations B) and 14 (TSF Seepage Compliance Bores).

Schedule C – Table 16 (TSF Monitoring Program)

Monitoring Location	Location (GDA94) (Zone 54)		Parameters	Frequency
	Easting	Northing		
Interception Bores				
IN01	490428	7584265	Water Quality[1,2] Flow Rate[1,2]	Once every three (3) months
IN02	490456	7584232		
IN03	490486	7584196		
IN04	490520	7584155		
IN05	490550	7584118		
IN06	490580	7584083		
IN07	490611	7584045		
IN08	490641	7584009		
IN09	490674	7583968		
IN10	490699	7583940		
IN11	490731	7583904		
IN12	490761	7583868		
IN13	490796	7583831		
Piezometers				

MN_P019A	490757	7583805	Water Levels	Once every two (2) months
MN_P019B	490783	7583831		
MN_P019C	490783	7583831		
MN_P020A	490658	7583924		
MN_P020B	490689	7583948		
MN_P020C	490689	7583948		
MN_P021A	490563	7584039		
MN_P021B	490588	7584059		
MN_P021C	490588	7584059		
MN_P022A	490468	7584155		
MN_P022B	490492	7584174		
MN_P022C	490492	7584174		
MN_P023A	490374	7584272		
MN_P023B	490398	7584291		
MN_P023C	490398	7584291		
MN_P024A	490254	7584199		
MN_P024B	490233	7584224		
MN_P024C	490233	7584224		
MN_P025A	490098	7584074		
MN_P025B	490080	7584096		
MN_P025C	490080	7584096		
MN_P026A	489943	7583947		
MN_P026B	489924	7583970		
MN_P026C	489924	7583970		
MN_P027A	489942	7583761		
MN_P027B	489917	7583741		
MN_P027C	489917	7583741		
MN_P028A	490069	7583607		
MN_P028B	490045	7583587		
MN_P028C	490045	7583587		
MN_P029A	490196	7583453		
MN_P029B	490173	7583433		
MN_P029C	490173	7583433		
Monitoring Bores				

OB01	490451	7584284	Water Quality[1] Water Level	Once every twelve (12) months Once every three (3) months
OB02	490440	7584274		
OB03	490479	7584251		
OB04	490469	7584243		
OB05	490508	7584217		
OB06	490498	7584206		
OB07	490544	7584177		
OB08	490532	7584167		
OB09	490575	7584145		
OB010	490562	7584129		
OB011	490603	7584106		
OB012	490591	7584092		
OB013	490633	7584068		
OB014	490707	7583989		
OB015	490694	7583972		
OB016	490724	7583963		
OB017	490711	7583950		
OB018	490748	7583917		
Compliance Bores				
MN TBA3	TBA3	TBA3	Water Quality[1] Water Level	Once every two (2) months
MN TBA3	TBA3	TBA3		
MN TBA3	TBA3	TBA3		
MN TBA3	TBA3	TBA3		
MN TBA3	TBA3	TBA3		
MN TBA3	TBA3	TBA3		

1 Refers to the Quality Characteristics specified in Schedule C – Table 14 (Groundwater Trigger Levels – Shallow Bores) and Table 15 (Groundwater Contaminant Limits – Shallow Bores).
2 Seepage in bores IN01 to IN13 to be determined as an aggregate as these bores are interconnected.
3 To be advised by the environmental authority holder by no later than 1 November 2014.

C47 The environmental authority holder must develop, implement and maintain on an ongoing basis a groundwater monitoring program that:

a) Identifies groundwater monitoring locations required to delineate the extent of seepage from TSF Cell 2 and that adequately characterises the potential groundwater impacts;
b) Provides justification for the location of the proposed groundwater compliance bore monitoring locations;
c) Provides bore construction details; and
d) Incorporates monitoring of both shallow and deep groundwater and includes an

adequate number of monitoring bores which provides sufficient spatial coverage to enable scientifically justifiable conclusions in relation to potential environmental impacts from TSF Cell 2.

C48 The groundwater monitoring program specified in condition (C46) must be independently certified by an appropriately qualified person.

C49 If quality characteristics of groundwater from compliance bores identified in Schedule C - Table 16 (TSF Monitoring Program) exceed any of the trigger levels stated in Schedule C – Table 14 (Groundwater Trigger Levels – Shallow Bores) the holder of this environmental authority must compare the monitoring bore results to the reference bore1 results and:

(a) if the level of contaminants at a compliance bore does not exceed the reference bore results, then no action is to be taken; and
(b) if the level of contaminants at a compliance bore is greater than the reference bore results, complete an investigation in accordance with the ANZECC & ARMCANZ (2000), into the potential for environmental harm and provide a written report to the administering authority within 3 months, outlining:

(i) details of the investigations carried out; and
(ii) actions taken to prevent environmental harm.

[1] Reference bores identified in Schedule C – Table 11 (Groundwater Monitoring Locations and Frequency)

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C48 (b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic within the three month investigation period.

C50 Monitoring of groundwater from compliance bores identified in Schedule C - Table 16 (TSF Monitoring Program), must not exceed any of the contaminant limits defined in Schedule C – Table 15 (Groundwater Contaminant Limits – Shallow Bores).

Saline, acid and metalliferous drainage

C51 The environmental authority holder must ensure proper and effective measures are taken to avoid or otherwise minimise the generation of saline, acid and/or metalliferous mine drainage as a result of the mining activity.

Erosion and Sediment Control

C52 By no later than six (6) months prior to commencement of open pit mining activities an Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activity on the licensed place to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.

C53 The Erosion and Sediment Control Plan must include the following stormwater management functions:

(a) Prevent or minimise the contamination of receiving waters and stormwater;
(b) Divert uncontaminated stormwater run-off around areas disturbed by mining activity or where contaminants or wastes are stored or handled;
(c) Contaminated stormwater runoff, incident rainfall and leachate is collected; and treated, reused, or released in accordance with the conditions of this environmental authority;
(d) Roofing or minimising the size of areas where contaminants or wastes are stored or handled;
(e) Using alternate materials and or processes (such as dry absorbents) to clean up

spills that will minimise the generation of contaminated waters;
(f) Erosion and sediment control structures are placed to minimise erosion of disturbed areas and prevent the contamination of any waters;
(g) Procedures to ensure that erosion and sediment control structures are maintained and adequate storage is available in sediment dams in accordance with design criteria; and
(h) Training of staff that will be responsible for maintenance and operations of sediment and erosion control structures.

C54 Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment and contamination of storm water.

C55 Releases to waters from the mining activity must be undertaken so as not to cause erosion of the bed and banks of the receiving waters or cause a material build-up of sediment in such waters.

Schedule D – Sewage Treatment

Sewage Treatment

D1 Sewage effluent from sewage treatment facilities must be reused by the processing plant, used for dust suppression or evaporated and must not be directly released to the receiving environment.

Schedule E – Dam and Levee Structures

Assessment of Consequence Category

E1 The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635) at the following times:

a) prior to the design and construction of the structure, if it is not an existing structure; or

b) prior to the adoption of this schedule, if is an existing structure; or

c) prior to any change in its purpose or the nature of its stored contents.

E2 A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.

E3 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

E4 Conditions E5 to E9 inclusive do not apply to existing structures.

E5 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).

E6 Construction of a regulated structure is prohibited unless the holder has submitted a consequence category assessment report and 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 authority.

E7 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 (EM635) and must be recorded in the Regulated Dams/Levees register.

E8 Regulated structures must:

a) be designed and constructed in accordance with and conform to the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635).

b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:

c) floodwaters from entering the regulated dam from any watercourse or drainage line; and

d) wall failure due to erosion by floodwaters arising from any watercourse or drainage line.

E9 Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:

a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and

b) construction of the regulated structure is in accordance with the design plan.

Operation of a Regulated Structure

E10 Operation of a regulated structure, except for an existing structure, is prohibited unless the holder has submitted to the administering authority:

a) A copy of the design plan and certification of the 'design plan' in accordance with condition E7;

b) a set of 'as constructed' drawings and specifications;

c) certification of those 'as constructed drawings and specifications' in accordance with condition E9; 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; and

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.

E11 For existing structures that are regulated structures:

a) where the existing structure that is a regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, the holder must submit to the administering authority within 12 months of the commencement of this condition a copy of the certified system design plan including that structure; and

b) There must be a current operational plan for the existing structures.

E12 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

E13 Conditions E14 to E15 inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.

E14 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.

E15 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 MRL.

E16 The holder of this environmental authority must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

E17 The holder of this environmental must record any changes to the MRL in the Register of Regulated Structures.

Design Storage Allowance

E18 The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

E19 By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).

E20 The holder of this environmental authority must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

E21 The holder of this environmental authority must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

Annual Inspection Report

E22 Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

E23 At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include recommended actions to ensure the integrity of the regulated structure.

E24 The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635).

E25 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 recommendation 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

E26 The holder of this environmental authority must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.

Register of Regulated Dams

E27 A Register of Regulated Dams must be established and maintained by the holder for each regulated dam.

E28 The holder must provisionally enter the required information in the Register of Regulated Dams when a design plan for a regulated dam is submitted to the administering authority.

E29 The holder must make a final entry of the required information in the Register of Regulated Dams once compliance with condition E9 and E10 has been achieved.

E30 The holder must ensure that the information contained in the Register of Regulated Dams is current and complete on any given day.

E31 All entries in the Register of Regulated Dams must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.

E32 The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Dams, in the electronic format required by the administering authority.

Transitional arrangements

E33 All existing structures that have not been assessed in accordance with either the Manual or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Dams must be assessed and certified in accordance with the Manual within 6 months of amendment of the authority adopting this schedule.

E34 All existing structures must subsequently comply with the timetable for any further assessments in accordance with the Manual specified in Schedule E – Table 1 (Transitional requirements for existing structures), depending on the consequence category for each existing structure assessed in the most recent previous certification for that structure.

Schedule E – Table 1 (Transitional hydraulic performance requirements for existing structures)

Transition period required for existing structures to achieve the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Dams			
Compliance with criteria	**High**	**Significant**	**Low**
>90% and a history of good compliance performance in last 5 years	No transition required	No transition required	No transitional conditions apply. Review consequence assessment every 7 years.

>70%-≤90%	Within 7 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 10 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	No transitional conditions apply. Review consequence assessment every 7 years.
>50-≤70%	Within 5 years unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 7 years unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Review consequence assessment every 7 years.
≤50%	Within 5 years or as per compliance requirements (e.g. TEP timing)	Within 5 years or as per compliance requirements (e.g. TEP timing)	Review consequence assessment every 5 years.

E35 Table 1 ceases to apply for a structure once any of the following events has occurred:

a) It has been brought into compliance with the hydraulic performance criteria applicable to the structure under the Manual; or
b) It has been decommissioned; or
c) It has been certified as no longer being assessed as a regulated structure.

E36 Certification of the transitional assessment required by E33 and E34 (as applicable) must be provided to the administering authority within 6 months of amendment of the authority adopting this schedule.

Hydraulic performance of regulated dams

E37 Regulated dams must meet the hydraulic performance criteria specified in Schedule E - Table 2 (Hydraulic performance criteria for Regulated Dams).

Schedule E - Table 2 (Hydraulic performance criteria for Regulated Dams)

Name of dam	Consequence category	Hydraulic performance criteria	
		Design Storage Allowance (DSA)	**Mandatory Reporting Level (MRL) [1]**
Tailings Storage Facility (Cell 1) [4]	High	373ML	274.19m
Tailings Storage Facility (Cell 2) [3]	High	303ML	274.85m
Tailings Storage Facility (Cell 3) [2,5]	High	380ML	269.99m
Offline Water Storage Facility[6]	Significant	35ML	259.12m
Effluent Leachate Dam [7]	High	388ML	261.12m
Decant Dam (Return Water Dam) [2]	High	37ML	261.21m
Tailings Storage Facility (Expansion)	Prior to the construction of corresponding structures commencing, a consequence category assessment report, certified by a suitably qualified and experienced person, must be provided to the administering authority in accordance with condition E6.		
New Tailings Decant Dam			
Northern DSA Bund Pond			
Northern Retention Pond			
Southern Retention Pond			
Trepell Creek Levee			

[1] Recorded MRL values reference the Australian Height Datum (AHD).

[2] DSA and MRL details as provided in SRK Consulting (Australasia) Pty Ltd (2020) report titled *'Cannington Mine Cell 3 Raise to RL271.1m: Detailed Design Report'* (revision 1) which includes certifications by Seumas Robertson-Patterson (RPEQ 08202) and Brendon Bolt (RPEQ 11523).

[3] Consequence category, DSA and MRL details as provided in Xstract Mining Consultants report titled '*South 32 Cannington: Cell 2 TSFE3 Raise Design: Prepared for: South32 Cannington Proprietary Limited: Effective date: April 2018: Final'* which includes certification by Andrew McPhail (RPEQ 6921).

[4] Consequence category, DSA and MRL details as provided in SRK Consulting (Australasia) Pty Ltd (2021) report titled '*Final: TSFE5 Cell 1 Raise to RL 275.7m Feasibility Study Report: STH074, Cannington Mine, Australia:South32 Cannington Pty Ltd'* (Rev 1, October 2021) which includes certification by Seumas Robertson-Patterson (RPEQ 08202).

[5] Consequence category detail as provided in SRK Consulting (Australasia) Pty Ltd (2020) report titled '*Cannington Mine TSF Dam Breach and Consequence Category Assessment*' (Rev. No. 3, 02/04/2020) which includes certification by Heather Thompson (RPEQ 19202).

[6] Consequence category, DSA and MRL details as provided in Engeny Water Management (2022) report titled '*South32 Detailed Design Report Cannington Water Storage Project*' (Rev 1, June 2022) which includes certification by Raymond Lau (RPEQ 23131). Note: Revision of reported MRL/ESS assumption and MRL level (from RL 259.30m to RL 259.14m) is advised via Engeny Water Management (2022) correspondence '*RE: Cannington Water Storage Project – Proposed Revision To MRL*' signed by Raymond Yau (RPEQ #23131), confirming the Design Plan will be updated accordingly.

[7] DSA and MRL details as provided in Engeny Water Management (2021) report titled '*Cannington Mine Effluent and Decant Dams Spillway Upgrades – Design Plan'* (Rev 2, January 2024), which includes certification by Raymond Lau (RPEQ 23131).

Tailing Storage Facility (TSF) embankment stability

E38 The environmental authority holder must assess embankment stability associated with the TSF on a monthly basis in accordance with the SRK Consulting (2018) report titled '*Cannington TSF, Cell1, Cell 2 and Cell 3 VW Piezometer Monitoring, 2018 Update*', dated 21/02/2018 (South32 Cannington Pty Ltd reference: REPORT086515).

E39 Where an assessment undertaken in accordance with condition E38 identifies a factor of safety (FoS) measure of between 1.5 to 1.3 (potential stability condition requiring review), as defined in the South32 Cannington Pty Ltd (2018) manual titled '*CAN-PROCESSING-MANUAL-TAILINGS & WATER-TSF Operation, Maintenance and Surveillance*' (South32 Cannington Pty Ltd reference: MAN-cd4090, version 9.0), the environmental authority holder must:

a) engage a suitably qualified and experienced person (RPEQ) to undertake a detailed review to determine if the TSF embankment satisfies ANCOLD requirements for stability during operation;

b) ensure the detailed review is completed within four (4) weeks of the reduced FOS being identified;

c) in the case where modification to the TSF is required, submit a report to the administering authority outlining the following:

i) the results of the detailed geotechnical analysis undertaken, including the cause of the reduced FoS;

ii) the details and extents of any required modification/s to the TSF;

iii) details of any immediate actions undertaken or required to address the reduced FoS and maintain TSF embankment stability; and

iv) details of any subsequent actions intended or required to ensure compliance with ANCOLD requirements.

E40 Where an assessment undertaken in accordance with condition E38 identifies a factor of safety (FoS) measure of 1.3 or lower (potential stability condition requiring urgent review), as defined in the South32 Cannington Pty Ltd (2018) manual titled '*CAN-PROCESSING-MANUAL-TAILINGS & WATER-TSF Operation, Maintenance and Surveillance*' (South32 Cannington Pty Ltd reference: MAN-cd4090, version 9.0), or where the phreatic level in at least one VW piezometer exceeds ground level (requires immediate review), the environmental authority holder must:

a) undertake required notification and advice action in accordance with conditions A19 to A23;

b) engage a suitably qualified and experienced person (RPEQ) to undertake an initial review the situation and advise on any immediate actions required to address the reduced FoS and maintain embankment stability;

c) engage a suitably qualified and experienced person (RPEQ) to undertake a detailed review to determine if the TSF embankment satisfies ANCOLD requirements for stability during operation;

d) ensure a report is completed and provided to the administrating authority within four (4) weeks of the reduced FOS being identified. The provided report is to include:

i) the results of the detailed geotechnical analysis undertaken, including the cause of the reduced FoS;

i) the details and extents of any required modification/s to the TSF;

ii) details of any immediate actions undertaken or required to address the reduced FoS and maintain TSF embankment stability; and

iii) details of any subsequent actions intended or required to ensure compliance with ANCOLD requirements.

E41 An Emergency Action Plan to address risks associated with geotechnical stability of the tailings storage facility must be developed and implemented by the authority holder and made available to the administrating authority on request. The program must include but not be limited to the following:

a) operational areas to be evacuated;

b) stakeholders to be notified;

c) contingency measures to minimise environmental harm;

d) description of areas likely to be impacted.

Flood Levee

E42 By no later than six (6) months after completion of the Trepell Creek Flood Levee the environmental authority holder must submit to the administering authority a Trepell Creek Flood Levee Monitoring Program.

E43 The Monitoring Program specified in condition (E42) must include but is not limited to the following:

a) Methodology for assessing the structural integrity of the levee (including sediment and erosion control);

b) Methodology for assessing the designed environmental performance of the levee; and

c) Monitoring frequency and trigger(s) for additional monitoring.

E44 Monitoring and evaluation of the performance of the levee must be carried out in accordance with the Monitoring Program referred to in condition E42.

E45 The Monitoring Program specified in condition E42 must be prepared and independently certified by an appropriately qualified person.

E46 By 30 July each year the environmental authority holder must submit a Trepell Creek Flood Levee Monitoring Report to the administering authority. The monitoring report must detail but is not limited to the following:

(a) The performance of the levee by way of comparison with the Detailed Design Report and specifications;

(b) Detail any remedial works to be undertaken including a timetable for completion of proposed works; and

(c) Any recommendations on measures to be taken to ensure the physical integrity of the levee.

E47 The Trepell Creek Flood Levee Monitoring Report specified in condition E46 must be prepared by an appropriately qualified person and independently certified by a registered professional engineer (RPEQ).

Foundation Integrity

E48 Six (6) months prior to commencing construction of the tailings storage facility expansion the environmental authority holder must submit to the administering authority a report detailing findings from the geophysical study of the continuity of the mudstones underlying the proposed tailings storage facility expansion.

E49 Where discontinuities of the underlying mudstone are identified, the environmental authority holder must:

a) replace the material with compacted clay with a permeability of no less than 1 x 10 -9 m/s;

b) replace the material with compacted clay of a depth that provides appropriate hydraulic conductivity;

c) have the works independently certified by a registered professional engineer (RPEQ).

Operational Simulation Water Balance Model

E50 The environmental authority holder must develop a site specific operational simulation water balance model three (3) months prior to commencement of open cut pre-strip mining at Cannington.

E51 The operational simulation water balance model must be run for a simulation period of the following nine (9) months:

a) weekly during the period November to March;

b) monthly during other periods;

c) promptly after each rainfall event greater than fifty (50) millimetres within a twenty four (24) hour period within the relevant surface water containment area.

d) with documentation of inputs and outputs from each run being stored and retrievable for a minimum period of one (1) year.

E52 The operational simulation water balance model must incorporate provisions for:

a) simulation of observed containment system storage volumes;

b) reporting on the simulated storage volumes and discharges;

c) determining and describing the probability of discharges overflowing from the containment system by ranking model results;

d) starting a simulation of containment system from any day of a year using the configuration of the components within the system on that day;

e) running the simulation using:

i) all relevant available historical daily rainfall data;

ii) operating rules for transfer within and between containment systems;

iii) Expected water inputs and outputs and solid inputs that affect storage capacity;

f) recording and substantiation of model inputs, assumptions, methods and schematic diagrams, to enable independent replication by an appropriately qualified person;

g) representation of differences in hydrological characteristics of modified catchment surfaces and conditions that occur in the surface water containment areas with reasoned and conservative assumptions;

h) representation of operation of the surface water containment systems, including limitations to the operability of active transfer systems and any contingency arrangements during rare rainfall events, lack of access and other adverse operational scenarios;

i) ability to simulate failure scenarios (such as failure of a pump, storage, or blockage of sub-surface drainage or transfer systems);

j) production of graphical outputs that can be interpreted by persons other than specialist hydrologists; and

k) calibration and/or validation with available monitoring data.

E53 Monitoring to operate and validate the operational simulation water balance model must include:

a) Sufficient monitoring data from on-site weather stations to adequately record rainfall input to contributing catchments and storages across the licensed place;

b) Recording of volumes and water quality in storages within the containment system over time at a frequency not greater than that used in the water balance model;

c) Up to date storage elevation relationships to be maintained;

d) Water volumes actively transferred within the containment system by pumping or gravity;

e) Additional sources of water (other than rainfall runoff) into the containment system;

f) Extractions of water out of from the containment system;

g) Mapping of landforms, topography, drainage routes, and catchment conditions relevant to the hydrology of the contributing catchments within the surface water containment areas.

E54 The extent, scope, and detail of the monitoring in condition E53 shall be sufficient to demonstrate actual system performance and operational simulation water balance model validation.

E55 Containment systems must be designed, assessed and documented as whole systems that include all relevant catchments, infrastructure and operations that have potential to influence the probability of overflow discharges at the authorised release points specified in Schedule C - Table 1 (Contaminant Release Locations).

E56 Assessments utilising the operational simulation water balance model to evaluate containment performance in response to rainfall must be undertaken by an appropriately qualified person.

E57 Assessments using the operational simulation water balance model must use a minimum of 100 years of historical rainfall data.

Pit Water Storage

E58 The environmental authority holder must submit a certified design for an additional permanent water storage structure, as discussed in section 2.10.5 of the Environmental Management Plan dated 21 February 2012, three (3) months prior to the cessation of the TSF Decant Dam being used as a water storage structure.

E59 At 1 November each year the Cannington central pit must not contain more than 200 ML volume of surface water.

E60 If the Cannington central pit ceases operating due to excessive storage of water the environmental authority holder must construct the contingency water storage structure in accordance with the certified design required by condition E59 within six (6) months of the pit ceasing to operate.

Schedule F – Land and Rehabilitation

F1 Unless authorised by this environmental authority, contaminants must not be released to land in a manner which constitutes environmental nuisance, or material or serious environmental harm.

F2 Any spillage of wastes, contaminants or other materials must be cleaned up immediately. Such spillages must be cleaned up using methods that minimise the release of wastes, contaminants or materials to land.

Rehabilitation Landform Criteria

F3 All areas significantly disturbed by the mining activity must be rehabilitated in accordance with Schedule F - Table 1 (Cannington Mine Rehabilitation Requirements) and Schedule F - Table 2 (Yurbi Rail Loading Rehabilitation Requirements).

Schedule F – Table 1 (Cannington Mine Rehabilitation Requirements)

Mine Domain & Tenure	Mine Feature	Rehabilitation Goal	Rehabilitation Objectives[2]	Indicators	Completion Criteria
Residual Void	Central Pit	All land subject to the mining activity must be rehabilitated to meet the requirements of the administering authorities Guideline - Rehabilitation requirements for Mining Projects and will be defined in the Post Mine Land Use Plan	Land capability: VIII	TBD[1]	TBD[1]
Run of Mine (ROM)	ROM Pad		Land capability: VIII	TBD[1]	TBD[1]
Processing Area	Processing Plant		Land capability: VII	TBD[1]	TBD[1]
Regulated Dams and Diversions	Tailings Storage Facility (Cells 1 & 2)		Land capability: VIII	TBD[1]	TBD[1]
	Tailings Storage Facility (Expansion)		Land capability: VIII	TBD[1]	TBD[1]
	Offline Water Storage Facility		Land capability: VII	TBD[1]	TBD[1]
	Effluent Dam		Land capability: VIII	TBD[1]	TBD[1]
	Decant Dam		Land capability: VIII	TBD[1]	TBD[1]
	Process Plant Stormwater Control Pond		Land capability: VII	TBD[1]	TBD[1]
	Western Catch Dam		Land capability: VII	TBD[1]	TBD[1]
	Southern Retention Pond		Land capability: VII	TBD[1]	TBD[1]
	Southern Retention Pond		Land capability: VII	TBD[1]	TBD[1]

	Trepell Creek Levee		Land capability: VII	TBD[1]	TBD[1]
Non Regulated Water Storages	Non Regulated Water Storages		Land capability: VII	TBD[1]	TBD[1]
Waste Disposal	Waste Rock Dump		Land capability: VIII	TBD[1]	TBD[1]
	Landfill		Land capability: VII	TBA[1]	TBA[1]
Ancillary Infrastructure	Workshop and Offices		Land capability: VII	TBA[1]	TBA[1]
	Sewage Treatment Plant		Land capability: VII	TBA[1]	TBA[1]
	General/Regulated Waste Storage		Land capability: VII	TBA[1]	TBA[1]
	Power Station		Land capability: VII	TBA[1]	TBA[1]
	Fuel & Chemical Storage		Land capability: VII	TBA[1]	TBA[1]
	Accommodation Village		Land capability: VII	TBA[1]	TBA[1]
Stockpiles	Topsoil		Land capability: VII	TBA[1]	TBA[1]
	Borrow Pits		Land capability: VII	TBA[1]	TBA[1]
Transport Corridors	Roads & Tracks		Land capability: VII	TBA[1]	TBA[1]
Exploration	Pads		Land capability: VII	TBA[1]	TBA[1]
Borefield	Borefield and access corridor		Land capability: VII	TBA[1]	TBA[1]
Airport	Airstrip		Land capability: VII	TBA[1]	TBA[1]

1 Post mine land use, rehabilitation indicators and completion criteria are to be nominated in accordance with Condition (F11).

2 Table 2 of the Land Suitability Techniques - Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).

Schedule F – Table 2 (Yurbi Rail Loading Rehabilitation Requirements)

Mine Domain & Tenure	Mine Feature	Rehabilitation Goal	Rehabilitation Objectives[2]	Indicators	Completion Criteria
Water Storages	North West Catch Dam	All land subject to the mining activity must be rehabilitated	Land capability: VII	TBA[1]	TBA[1]

	South Eastern Catch Dam	to meet the requirements of the administering authorities Guideline - Rehabilitation requirements for Mining Projects and will be defined in the Post Mine Land Use Plan	Land capability: VII	TBA[1]	TBA[1]
Ancillary Infrastructure	Workshop and Offices		Land capability: VII	TBA[1]	TBA[1]
	Fuel & Chemical Storage		Land capability: VII	TBA[1]	TBA[1]
Concentrate Shed	Storage Shed		Land capability: VII	TBA[1]	TBA[1]
Rail siding and track	Rail line and loop		Land capability: VIII	TBA[1]	TBA[1]

1 Post mine land use, rehabilitation indicators and completion criteria are to be nominated in accordance with Condition (F11).
2 Table 2 of the Land Suitability Techniques - Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).

F4 Progressive rehabilitation must commence within twelve (12) months of when areas become available within the operational land, and must be in accordance with the current plan of operations.

Capping System

F5 By 15 April 2019 the environmental authority holder must commence trials to establish suitable capping systems for infrastructure on the licensed place including but not limited to the tailings storage capacity and waste rock dump.

F6 By 15 April 2023 and once every (2) years thereafter the environmental authority holder must submit a report to the administering authority detailing the success and findings from the capping system trials.

F7 By 15 April 2026 the environmental authority holder must submit to the administrative authority a report nominating the most appropriate capping system based on results from trials required in condition (F5).

Topsoil

F8 Topsoil and subsoils in disturbed areas must be stripped and stockpiled ahead of mining to a depth determined from soil surveys to ensure that useable soil resources are preserved for rehabilitation.

F9 Topsoil and subsoil stockpiles must be managed to ensure stability and minimise the release contaminants. Measures must include:

(a) Vegetating stockpiles;
(b) Minimising the height of stockpiles: and
(c) Re-using stockpiles as soon as possible.

F10 A topsoil inventory which identifies the topsoil requirements for the mining project and availability of suitable topsoil on the licensed place must be detailed in the Plan of Operations.

Post Mine Land Use Plan

F11 By 1 August 2019 the environmental authority holder must develop and submit to the administering authority a Post Mine Land Use Plan (PMLUP) and update and resubmit the plan with each subsequent Plan of Operations. The PMLUP must be developed by an appropriately qualified person and include:

a) Schematic representation of final land form inclusive of drainage features;
b) Slope designs;
c) Cover design (not limited to store and release covers);
d) Drainage design;
e) Erosion controls;
f) Description of experimental design for monitoring of analogue and rehabilitated areas inclusive of statistical design;
g) Proposed revegetation methods inclusive of plant species selection, re-profiling, respreading soil, soil ameliorants/amendments, surface preparation and method of propagation;
h) Materials balance including available top soil and low permeability capping material;
i) Geotechnical, geochemical and hydrological studies;
j) Chemical, physical and biological properties of soil and water;
k) A rehabilitation monitoring program as required by Schedule F – Condition (F12); and
l) The development of rehabilitation objectives required in Schedule F – Table 1 (Cannington Mine Rehabilitation Requirements) and Table 2 (Yurbi Rail Loading Rehabilitation Requirements).

Rehabilitation Monitoring Program

F12 The environmental authority holder must appoint an appropriately qualified person in the field of mine site rehabilitation, to develop and implement a rehabilitation monitoring program for which must be implemented upon commencement of any rehabilitation.

F13 The environmental authority holder must conduct rehabilitation monitoring in accordance with the program developed in the PMLUP at least once per year is to include sufficient spatial and temporal replication to enable scientifically justifiable conclusions to be made as established in the rehabilitation program or other methodology to the satisfaction of the administering authority.

Post Closure Management Plan

F14 By 1 August 2019 the environmental authority holder must provide to the administering authority a Post Closure Management Plan for the licensed place. The plan must be for a nominal period of:

a) At least thirty (30) years following cessation of mining activity (excluding rehabilitation) on the licensed place; or
b) A shorter period if the licensed place is proven to be geo-technically and geo-chemically stable and it can be demonstrated to the satisfaction of the administering authority that no release of contaminants from the licensed place will result in environmental harm.

F15 The Post Closure Management Plan must be developed by an appropriately qualified person and include the following elements:

a) Operation and maintenance of:

i) Contaminated water collection and reticulation systems;
ii) Contaminated water treatment systems;
iii) The groundwater monitoring network;

iv) Regulated Structures;
v) Trepell Creek Levee;
vi) Final cover systems; and
vii) Vegetative cover.

b) Monitoring of:

i) Surface water quality;
ii) Groundwater quality;
iii) Seepage rates;
iv) Erosion rates;
v) The integrity and effectiveness of final cover systems;
vi) The health and resilience of vegetative cover.

Infrastructure

F16 All buildings, structures, mining equipment and plant erected and/or used for the mining activity must be removed from the licensed place prior to surrender, except where agreed to in writing by:

a) the administering authority, and
b) the landowner.

Chemicals and Flammable or Combustible Liquids

F17 All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, flammable or combustible liquids and dangerous goods must be stored and handled in accordance with the current, relevant Australian Standard where such is applicable.

F18 Notwithstanding the requirements of any Australian Standard, any liquids stored on the licensed place that have the potential to cause environmental harm must be stored in and serviced by an effective containment system that is impervious to the materials stored within and managed to prevent the release of liquids to waters or land.

F19 Where no relevant Australian Standard is available, the following must be applied:

a) storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas; and
b) drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund.

F20 All containment systems must be designed to minimise rainfall collection within the system.

Contaminated Land

F21 Prior to making an application for Surrender or approval for Progressive Rehabilitation the environmental authority holder must undertake a contaminated land assessment / investigation of the relevant areas of the licensed place in accordance with the administering authority's Guideline for the Assessment & Management of Contaminated Land in Queensland.

Soil Monitoring

F22 Soil monitoring must be undertaken at the Yurbi rail loop locations identified in Schedule F - Table 3 (Yurbi Rail Loop Soil Monitoring Locations) and depicted in Schedule J – Figure 16 (Yurbi Rail Loop Soil Monitoring Locations) twice per year and in the event of a spill.

Schedule F – Table 3 (Yurbi Rail Loop Soil Monitoring Locations)

Monitoring Points	Location Description	Location (GDA94) (Zone 54)	
		Easting	Northing
Yurbi Loading Facility – ML90077			
YB_S050	Inbound rail loop [1,3]	464491	7706744
YB_S051[4]	Outbound rail loop[2,3]	463900	7707010

1 Soil samples to be collected from the inbound rail loop between the south eastern end of the Concentrate Storage Shed and a point 600m back along the inbound rail loop.
2 Soil samples to be collected from the outbound rail loop between the north western end of the Concentrate Storage Shed and a point 400m along the outbound rail loop.
3 Soil samples to be collected at depths of 0-5cm along both sides of the inbound and outbound rail loop.

F23 If soil monitoring at the Outbound rail loop monitoring location specified in Schedule F – Table 3 (Yurbi Rail Loop Soil Monitoring Locations) exceeds any of the trigger levels in Schedule F – Table 4 (Yurbi Soil Monitoring Trigger Levels), the environmental authority holder must complete an investigation into the potential for environmental harm and provide a written report to the administering authority within three (3) months outlining:

i) details of the investigations carried out; and
ii) actions taken to prevent environmental harm

Schedule F – Table 4 (Yurbi Soil Monitoring Trigger Levels)

Parameter	Unit	Trigger Level
Copper	mg/kg	60[1]
Lead	mg/kg	300[1]
Zinc	mg/kg	200[1]
Particle Size Distribution	For interpretation purposes	

1 Based on the administering authority's Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland.

F24 All determinations of soil sampling must be:

(a) Performed by an appropriately qualified person;
(b) Made in accordance with methods prescribed in the latest edition of AS4482.1 – 2005 Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds; and
(c) Collected from the monitoring locations identified in Schedule F - Table 3 (Yurbi Rail Loop Soil Monitoring Locations), within one-day of each other.

Residual Void Studies

F25 By no later than two (2) years after commencing open pit mining activities the environmental authority holder must complete an investigation into residual voids and submit a report to the administering authority proposing acceptance criteria to meet the outcomes specified in condition (F3) and landform design criteria. The investigation must at a minimum include the following:

a) a study of options available for minimising final void area and volume;
b) develop design criteria for rehabilitation of final voids;
c) a void hydrology study, addressing the long-term water balance in the voids, connections to groundwater and water quality parameters in the long term;
d) a study of the measures to protect the residual voids, un-compacted overburden and workings from the "probable maximum flood" level based on the Bureau of Meteorology's "probable maximum precipitation" forecast for the locality;
e) a pit wall stability study, considering the effects of long-term erosion and weathering of the pit wall and the effects of significant hydrological events;
f) a proposal/s for end of mine void rehabilitation success criteria and final void areas and volumes; and
g) consideration of pit water levels during the wet season and the potential for seasonal discharges to surrounding groundwater.

Subsidence

F26 By no later than three (3) months prior to commencing open pit mining activities the environmental authority holder must develop and implement a subsidence monitoring plan which must be updated with each subsequent plan of operations.

F27 The subsidence monitoring program must include at least the following:

a) description of the areas at greatest subsidence risk;
b) monitoring program to detect any failures or subsidence in or adjacent to the pit;
c) monitoring program to detect any failures or subsidence in or adjacent to the waste rock stockpiles; and
d) monitoring of surface infrastructure to detect structural damage.

Biodiversity Offsets Policy

F28 An assessment must be undertaken to identify the presence of any potential state significant biodiversity values as identified by the Queensland Biodiversity Offset Policy. The assessment report must be provided to the administering authority at least two (2) months prior to the commencement of any new mining activity.

F29 If the assessment required by condition (F28) shows that mining activities are found to potentially impact on a state significant biodiversity value, the holder of this environmental authority must demonstrate to the administering authority that it has met the requirements of the Queensland Biodiversity Offset Policy through provision of a site specific Biodiversity Offset Strategy.

F30 The Biodiversity Offset Strategy must include at a minimum:

a) demonstration that the mining activity has avoided or minimised impacts to state significant biodiversity values;
b) where impacts cannot be avoided, a detailed description and mapping of the surveyed locations of the state significant biodiversity values at the licensed place;

c) a flora and fauna assessment of the affected area to determine if the operations will directly impact on any state significant biodiversity values detailed in Appendix 1 of the Queensland Biodiversity Offset Policy;
d) the proposed offset delivery mechanism; and
e) an ecological equivalence assessment where required by the Queensland Biodiversity Offset Policy.

F31 Impacts on state significant biodiversity values must not occur until the holder of this environmental authority has in accordance with the Queensland Biodiversity Offset Policy:

a) provided a legally secured offset; or
b) entered into a Deed of Agreement (Offset Transfer) with the administering authority; or
c)provided an offset payment.

Schedule G – Waste

Waste Management Program

G1 A waste management program must be developed, implemented and maintained for the licensed place. The waste management program must include:

a) A description of the mining activity that may generate waste;

b) The types and amounts of wastes generated by the mining activity;

c) A program for reusing, recycling or disposing of all wastes;

d) 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 resource management practices in the waste management hierarchy (i.e. avoidance, reuse, recycling, energy recovery, disposal);

e) 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;

f) Procedures for dealing with accidents, spills and other incidents;

g) Details of any accredited management system employed, or planned to be employed, to deal with waste;

h) How often the performance of the waste management program will be assessed;

i) The indicators or other criteria on which the performance of the waste management program will be assessed; and

j) Staff training and induction to the waste management program.

Waste Disposal

G2 All general and regulated waste, other than waste authorised under condition (G3), must be removed from the licensed place to a facility that is lawfully able to accept the waste.

G3 The only waste that can be disposed at the licensed place is waste generated from the Cannington operations and is limited to:

1) Waste rock and mine spoil;
2) Lead/zinc contaminated material;
3) General waste including construction and demolition waste, green waste, putrescible and domestic wastes;
4) Tyres;
5) Tailings; and
6) Incineration of pallets (for fire emergency response training only).

G4 General waste must only be disposed of into the landfill identified in Schedule J – Figure 15 (Cannington Landfill Area).

G5 General waste deposited in the landfill must be compacted and covered with a layer of inert material following placement of the waste into the trench.

G6 Litter control methods must be effectively implemented at the landfill.

G7 The landfill cells must be constructed and operated to minimise the generation of leachate by the use of diversion drains or embankments to divert surface waters away from any area where contact with wastes or sources of contamination may occur.

G8 Completed landfill cells must be capped with a low permeability material and compacted and contoured to effectively minimise water infiltration.

G9 Unless otherwise permitted by the conditions of this authority, waste must not be burnt or taken from the licensed place and burnt.

G10 The environmental authority holder must not commence construction of any new landfill unless the location of that landfill is specifically referenced in accordance with this environmental authority as identified in Schedule J – Figure 15 (Cannington Landfill Area).

Regulated Waste

G11 Regulated waste, other than that authorised to be disposed at the licensed place under this authority, must only be removed and transported from the licensed place by a person who holds a current authority to transport such wastes to a facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994*.

G12 Regulated waste generated by the mining activity can be temporarily stored at the licensed place awaiting removal provided it is stored to ensure there is minimal risk of causing fire or contamination to land or waters.

G13 Each container of regulated waste stored awaiting movement from the licensed place must be clearly marked to identify the contents.

Tyre Storage and Disposal

G14 Tyres stored awaiting disposal or transport for take-back and recycling or waste-to-energy options – must be stockpiled in volumes less than 3m in height and 200m^2 in area and at least 10m from any other tyre storage area.

G15 Fire Prevention measures must be implemented including the removal of all combustible materials, including grass and vegetation, within a 10m radius of any tyre storage area.

G16 Subject to demonstrating to the administering authority that no other use higher in the waste and resource management hierarchy can be practicably implemented, waste tyres generated at the licensed place from mining activity may be disposed at the licensed place in non-acid forming waste rock dumps.

G17 The storage of scrap tyres in underground stopes must not cause an unacceptable fire risk or compromise mine safety.

Tailings Disposal

G18 The management of tailings disposal must be in accordance with the following:

a) All tailings material must be progressively characterised during disposal for net acid producing potential and the metals and metalloids listed in column 1 in Schedule C – Table 4 (Receiving Waters Trigger Levels).
b) Tailings characterisation must be undertaken at a minimum rate of one (1) per month of tailings material discharged to the tailings storage facility.
c) Records must be kept of the tailings disposal to indicate locations and characteristics of tailings stored within the tailings storage facility.
d) Manage disposal of tailings in order to minimise the potential for environmental harm.

Waste Rock Disposal

G19 By no later than six (6) months prior to the commencement of open pit mining activities the environmental authority holder must develop, implement and submit to the administering authority a Waste Rock Management Plan.

G20 Waste rock disposal must not occur on the licensed place unless the environmental authority holder has submitted to the administering authority a Waste Rock Management Plan.

G21 The Waste Rock Management Plan required in Condition (G19) must be independently certified by a Registered Professional Engineer of Queensland (RPEQ) who has a minimum of ten (10) years of demonstrated expertise in the design and rehabilitation of waste rock dumps in Queensland.

G22 The Waste Rock Management Plan must include, at least:

a) Detailed design of the waste rock dump;
b) Characterisation of the waste rock to predict the quality of runoff and seepage generated, including salinity, acidity, alkalinity, dissolved metals, metalloids and non-metallic inorganic substances;
c) A program of progressive sampling program to validate pre-mine waste rock characterisation.
d) The waste rock sampling program must include validation of salinity, acid and alkali producing potential and metal concentrations including Ag, As, Bi, Cd, Cu, In, Mn, Mo, Pb, Sb, Se, Te, W, Zn;
e) Where the acid rock drainage potential / neutral mine drainage potential of waste rock material has not been conclusively determined, geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies;
f) Records must be maintained of all waste rock characterisation and disposal including contingency planning for the management of acid rock / neutral mine drainage / saline mine drainage;
g) A materials balance and disposal plan demonstrating how potentially acid forming and acid forming waste rock will be selectively placed and/or encapsulated to minimise the generation of acid mine drainage;
h) A materials balance and disposal plan demonstrating how waste rock that has a potential to generate neutral and/or saline mine drainage will be selectively placed and managed to minimise the generation of neutral and/or saline mine drainage;
i) A sampling program to verify encapsulation and/or placement of potentially acid forming / acid forming waste rock / waste rock that has a potential to generate neutral mine drainage;
j) A Rehabilitation strategy which meets the rehabilitation objectives specified in Schedule F

of this environmental authority; and
k) Monitoring or rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of the placed materials, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

G23 The waste rock dump must be designed, constructed and maintained in accordance with the Waste Rock Management Plan required by Condition (G19).

G24 The waste rock dump must be designed, constructed and maintained to prevent any water other than incidental rainfall from entering the waste rock dump.

G25 Any seepage from the waste rock dump must be captured and directed to an appropriately engineered and maintained storage authorised to receive seepage in accordance with Schedule E – Regulated Dams of this environmental authority.

G26 By no later than six (6) years after the commencement of open pit mining activities the environmental authority holder must develop and implement a waste rock dump rehabilitation trial program, which:

a) is developed and certified by an appropriately qualified person;

b) considers the closure and rehabilitation requirements detailed in Schedule F of this environmental authority;

c) trials a variety of different cover systems and rehabilitation techniques in accordance with Schedule F – Condition (F5);

d) includes, at a minimum, monitoring of:

i) water retention and infiltration rates;

ii) water quality of leachate;

iii) vegetation health, density, type and cover;

iv) rainfall, evaporation, climatic data and evapo-transpiration rates.

G27 The waste rock dump rehabilitation trial program must be reviewed on an annual basis for appropriateness, with summary reports to be provided to the administering authority every two (2) years after implementation of the program.

G28 All waste rock characterised as having acid forming potential must be returned to the open pit at end of mine life or be encapsulated in a suitably designed waste rock dump approved by the administering authority.

Acid Rock Drainage Management

G29 Subject to the release limits defined in Schedule – C of this environmental authority, all reasonable and practicable measures must be implemented to prevent hazardous leachate being directly or indirectly released or likely to be released as a result of the activity to any groundwater or watercourse.

Schedule H – Noise and Vibration

General

H1 Noise or vibration from the mining activity must not cause environmental harm at any sensitive place or commercial place.

H2 In the event of a complaint made to the administering authority (which is neither frivolous or vexatious) about noise or vibration generated in carrying out the licensed activity and the noise or vibration is considered by the administering authority to be an unreasonable noise or vibration, the environmental authority holder must take action to ensure that it is no longer an unreasonable noise or vibration.

Noise Monitoring

H3 The environmental authority holder must ensure that noise generated by the mining activity does not cause the criteria in Schedule H – Table 1 (Noise Limits) and Table 2 (Blasting Noise Limits) to be exceeded at a sensitive or commercial place.

Schedule H – Table 1 (Noise Limits)

Location of Place	**Noise level dB(A) measured as $L_{eq, 15\ mins}$**		
	7am - 6pm	**6pm - 10pm**	**10pm - 7am**
	Noise measured at a 'Noise sensitive place'		
Any other noise sensitive place	Background plus 5 dB(A)	Background plus 5 dB(A)	Background plus 3 dB(A)
Cannington Homestead	33	30	30
Cannington Homestead (Adverse conditions)	37	37	37

H4 The adverse noise limit applies only during adverse meteorological conditions as defined in Schedule I of this environmental authority.

Schedule H – Table 2 (Blasting Noise Limits)

Blasting noise limits	Sensitive or commercial place limits	
	7am to 6pm	6pm to 7am
Airblast overpressure	115 dB (Linear) peak for four (4) out of five (5) consecutive blasts initiated and not greater than 120 dB (Linear) peak at any time.	No Blasting
Ground vibration peak particle velocity	5mm/second peak particle velocity for four (4) out of five (5) consecutive blasts and not greater than 10 mm/second peak particle velocity at any time.	No Blasting

H5 When requested by the administering authority, noise monitoring and recording must be undertaken within a reasonable timeframe nominated by the administering authority to investigate any complaint of environmental nuisance at any sensitive place or commercial place, and the results must be notified within ten (10) business days to the administering authority following completion of monitoring.

H6 The noise monitoring and recording required in Condition (H5) must include the following descriptor characteristics and matters:

(i) $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins);

(ii) Background noise L_{A90};

(iii) The level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels;

(iv) Atmospheric conditions including temperature, relative humidity and wind speed and directions;

(v) Effects due to any extraneous factors such as traffic noise;

(vi) Location, date and time of monitoring;

(vii) If the complaint concerns low frequency noise, Max $L_{pLIN,T}$; and

i)If the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range.

H7 The method of measurement and reporting of noise levels must comply with the most recent edition of the administering authority's Noise Measurement Manual or the most recent version of AS1055 Acoustics – Description and measurement of environmental noise.

Vibration Nuisance

H8 Vibration from the mining activity must not cause an environmental nuisance, at any sensitive place or commercial place.

H9 The environmental authority holder must ensure that blasting does not cause the limits for peak particle velocity in Schedule H - Table 2 (Blasting Noise Limits) to be exceeded at a sensitive place or commercial place.

H10 When requested by the administering authority, vibration monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place, and the results must be notified within ten (10) business days to the administering authority following completion of monitoring.

H11 The method of measurement and reporting of airblast overpressure levels must comply with the most recent Australian standard Explosives – Storage and use guidelines.

H12 The method of measurement and reporting of vibration levels must comply with the most recent edition of the administering authority's guideline Noise and vibration from blasting.

Schedule I – Definitions

Words and phrases used throughout this licence are defined below except where identified in the *Environmental Protection Act 1994* or subordinate legislation. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

Interpretation – Word definitions

"acceptance criteria" means the measures by which the actions implemented to rehabilitate the land are deemed to be complete (same as completion criteria). The acceptance criteria indicate the success of the decommissioning and rehabilitation outcomes or remediation of areas which have been significantly disturbed by the environmentally relevant activities. Acceptance criteria may include information regarding:

a) stability of final land forms in terms of settlement, erosion, weathering, pondage and drainage;

b) control of geochemical and contaminant transport processes;

c) quality of runoff waters and potential impact on receiving environment;

d) vegetation establishment, survival and succession;

e) vegetation productivity, sustained growth and structure development;

f) fauna colonisation and habitat development;

g) ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes;

h) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;

i) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;

j) resilience of vegetation to disease, insect attack, drought and fire;

k) vegetation water use and effects on ground water levels and catchment yields.

"acid mine drainage (AMD)" means any low pH contaminated discharge emanating from a mining operation formed through a series of chemical and biological reaction, when geological strata is disturbed and exposed to oxygen and moisture as a result of mining operations.

"administering authority" means the Department of Environment and Heritage Protection (formally Department of Environment and Resource Management).

"adverse meteorological conditions" means either (i) atmospheric stability conditions as described in the Pasquil Stability Class 'F', namely still or light winds less than or equal to one (1) metre per second and clear skies during the night time period; or (ii) light winds less than or equal to one (1) metre per second blowing from the mining activity towards the sensitive receiver during the daytime or evening periods.

"annual exceedance probability" or **"AEP"** means the probability that at least one event in excess of a particular magnitude will occur in any given year.

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

a) against recommendations contained in previous annual inspections reports;

b) against recognised dam safety deficiency indicators;

c) for changes in circumstances potentially leading to a change in consequence category;

d) for conformance with the conditions of this authority;

e) for conformance with the 'as constructed' drawings;

f) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);

g) for evidence of conformance with the current operational plan.

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

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

"ARD" means acid rock drainage and refers to the low pH, high heavy metal pollutant typical of sulphidic mine wastes, and most commonly associated with the production of ferrous iron and sulphuric acid through the oxidation of sulphide minerals.

"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.

"auditor" in relation to third party audits refers to a person independent to the environmental authority holder who has professional qualifications, training, skills or experience in conducting audits and can give authoritative assessment, advice and analysis on performance relative audits using the relevant protocols, standards, methods or literature.

"authority" means an environmental authority or a development approval.

"background noise level" means LA90,T being the A-weighted sound pressure level exceeded for 90 percent of the time period of not less than 15 minutes, using Fast response measured in the absence of the noise under investigation during a representative time period of not less than 15 minutes, using Fast response.

"blasting" means the use of explosive materials to fracture-

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

"capping" means the covering of a landfill with impervious material to inhibit penetration by liquids.

"Cannington operations" in relation to regulated waste refers to the Cannington Minesite, Yurbi Rail Loading Facility, BHP Billiton Minerals Pty Ltd Townsville Port Facility and also includes spillage resulting from transport of concentrate between these locations.

"certification" means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*, including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).

"certifying, certify or certified" have a corresponding meaning as 'certification'.

"concentrate" means the lead-copper-zinc ore that is mined at the Cannington Mine.

"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)*.

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

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

"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).

"dB" means decibel. The unit used to measure sound level.

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

"design storage allowance" or **"DSA"** means an available volume, estimated in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)* published by the administering authority, must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that Manual.

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

"emergency action plan" means documentation forming part of the operational plan held by the holder or a nominated responsible officer, that identifies emergency conditions that sets out procedures and actions that will

be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure, and ensure timely warning to downstream communities and the implementation of protection measures. The plan must require dam owners to annually update contact.

"environmental authority" means an environmental authority granted in relation to an environmentally relevant activity under the *Environmental Protection Act 1994*.

"environmental harm" is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental data set, and includes environmental nuisance.

"environmental nuisance" is unreasonable interference or likely interference with an environmental data set caused by –

a) aerosols, fumes, light, noise, odour, particles or smoke;

b) an unhealthy, offensive or unsightly condition because of contamination; or

c) another way prescribed by regulation.

"emergency" refers to an unforeseen occurrence that results in a sudden and urgent occasion for action.

"existing structure" means a structure that was in existence prior to the adoption of this schedule of conditions under the authority.

"factor of safety" is the ratio of structural capacity to actual applied load and relates to heave and increased risk of piping. The factor of safety is determined by the following calculation:

$$\text{Factor of Safety} = \gamma_s D_c / P_w \gamma_w$$

Where

γ_s = *Saturated unit weight of Clay Layer (10 kN/m^3)*

D_c = *Depth of Clay Layer (m)*

P_w = *Water head on top of Sand Layer (m)*

γ_w = *Unit weight of water (10 kN/m^3)*

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

"foreseeable future" is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year period

"holder" means:

a) where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or

b) where this document is a development approval, any person who is the registered operator for that development approval.

"hydraulic performance" means the capacity of a regulated dam to contain or safely pass flowable substances based on the design criteria specified for the relevant consequence category in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (EM635).

“incident” refers to an situation that has caused, or has the potential for causing environmental harm and/or exceedance of this environmental authority.

“integrated containment system” means a network of dams, pipes, pumps and other facilities that are used for the containment and management of potential environmental impacts from an environmentally relevant activity, where the design storage allowance is available within the elements of the network. Functionally each integrated containment system is considered to be a regulated dam.

"land" in the 'land schedule' of this document means land excluding waters and the atmosphere "noise sensitive place" or a "commercial place"

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

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

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

"*$L_{A90,T}$*" means the equivalent continuous A-weighted sound pressure level, obtained using time-weighting ‘F’, that is exceeded for 90% of the measuring period (T).

"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.

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

“metalliferous mine drainage” means any waters, contaminated with metals / metalloids or other contaminants as a result of the mining activity.

“mining related infrastructure” The facilities, structures and installations needed for mining including but not limited to mining transportation networks, processing plant, communications systems and tailings storage facilities.

“modification” or **“modifying”** (see definition of ‘construction’)

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

“NAF” means non-acid forming waste rock.

“noise sensitive place” means any of the following places:

a) a dwelling;

b) a library, childcare centre, kindergarten, school, college, university or other educational institution;

c) a hospital, surgery or other medical institution;

d) a protected area, or an area identified under a conservation plan as a critical habitat or an area of major interest, under the *Nature Conservation Act 1992*;

e) a marine park under the *Marine Parks Act 1982*;

f) a park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment.

"non polluting" means having no adverse impacts upon the receiving environment.

"noxious" means harmful or injurious to health or physical well being, other than trivial harm.

"noxious" means harmful or injurious to health or physical well being.

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

"open pit mining activities" refers to, but is not limited to vegetation clearing, soil stripping, extraction of rock, blasting or preparation of any surfaces required to commence open cut mining on mining lease 90059.

"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.

"PAF" means potentially acid forming waste rock.

"peak particle velocity (ppv)" means a measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second (mms).

"progressive rehabilitation" means rehabilitation (defined below) undertaken progressively OR a staged approach to rehabilitation as mining operations are ongoing.

"receiving environment" means all groundwater, surface water, land, and sediments that are not disturbed areas authorised by this environmental authority.

"receiving waters" means all groundwater and surface water that are not disturbed areas authorised by this environmental authority.

"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 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.

"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" means release of any waters that are or maybe contaminated by the mining activity.

"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 activity.

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

"saline mine drainage" The movement of waters, contaminated with salt(s), as a result of the mining activity.

"self sustaining" means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

"sensitive receptors" 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; or
g) A place used as a workplace, an office or for business or commercial purposes which is not part of the mining activity and does not include employees' accommodation or public roads.

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

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

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

"stable" in relation to land, means land form dimensions are and will remain within tolerable limits now and in the foreseeable future. Issues to be properly considered in regard to whether or not the landform is stable include geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

"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.

"tailings storage facility expansion" refers to the tailings storage facility detailed in the Cannington Life Extension Project Environmental Management Plan, Revision 5.1, dated February 2012.

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

"Trepell Creek Flood Levee" refers to the flood levee detailed in the Cannington Life Extension Project Environmental Management Plan, Revision 5.1, dated February 2012.

"μS/cm" means micro Siemens per centimetre.

"void" means any constructed, open excavation in the ground.

"watercourse" has the meaning in Schedule 4 of the Environmental Protection Act 1994 and means a river, creek or stream in which water flows permanently or intermittently—

a) in a natural channel, whether artificially improved or not; or

b) in an artificial channel that has changed the course of the watercourse.

Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.

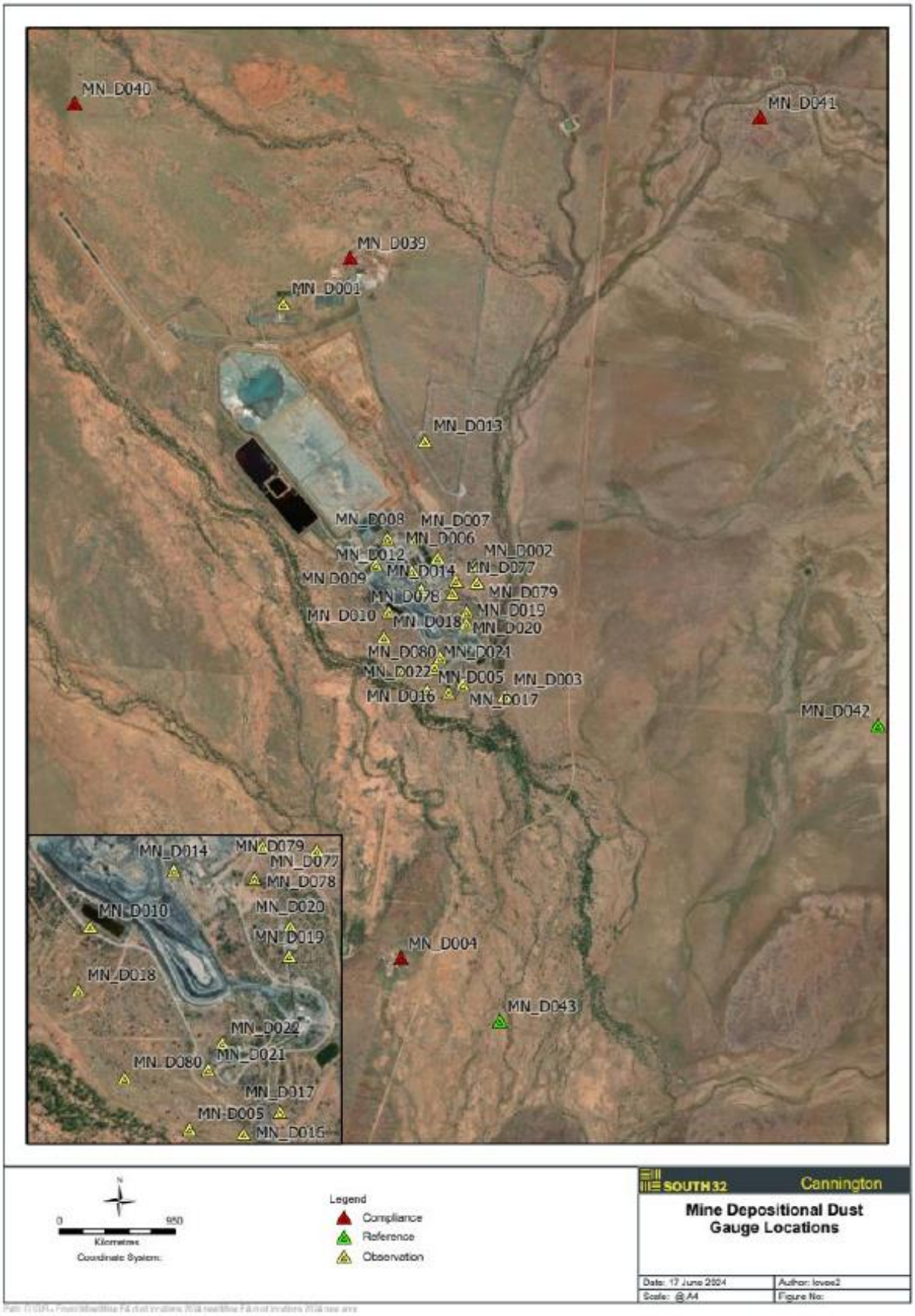
"waters" includes all or any part of a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and banks of a watercourse, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside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

"**water release event**" means release of any waters that are or maybe contaminated by the mining activity.

"water storage structure" refers to a dam designed to store water only.

Schedule J – Figures/Plans

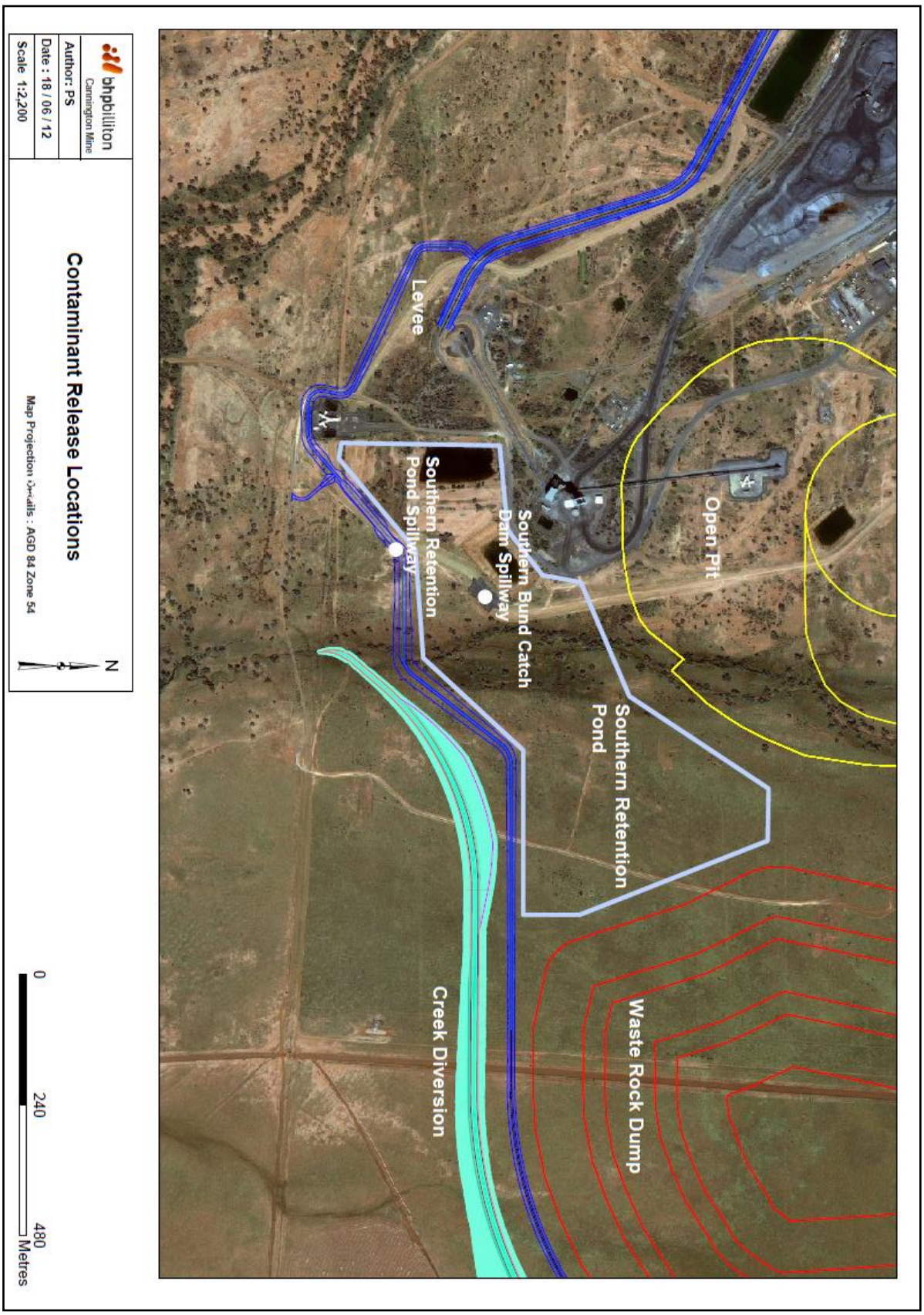
Schedule J – Figure 1 (Cannington Mine Dust Monitoring Locations)



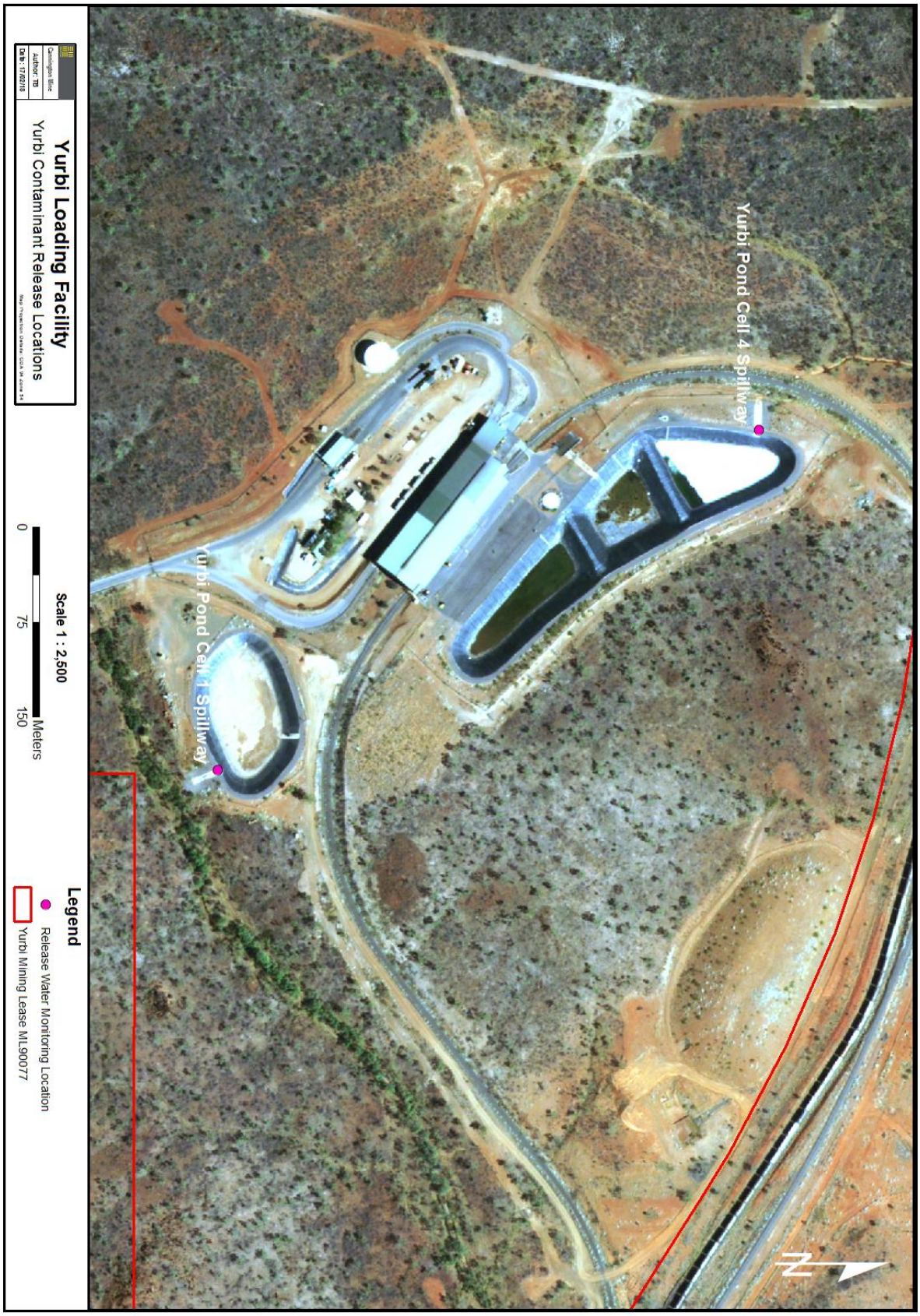
Schedule J – Figure 2 (Yurbi Dust Monitoring Locations)

Schedule J – Figure 3 (Cannington Mine Release Locations)

Schedule J – Figure 4 (CLEP – Future Open Pit Release Locations)

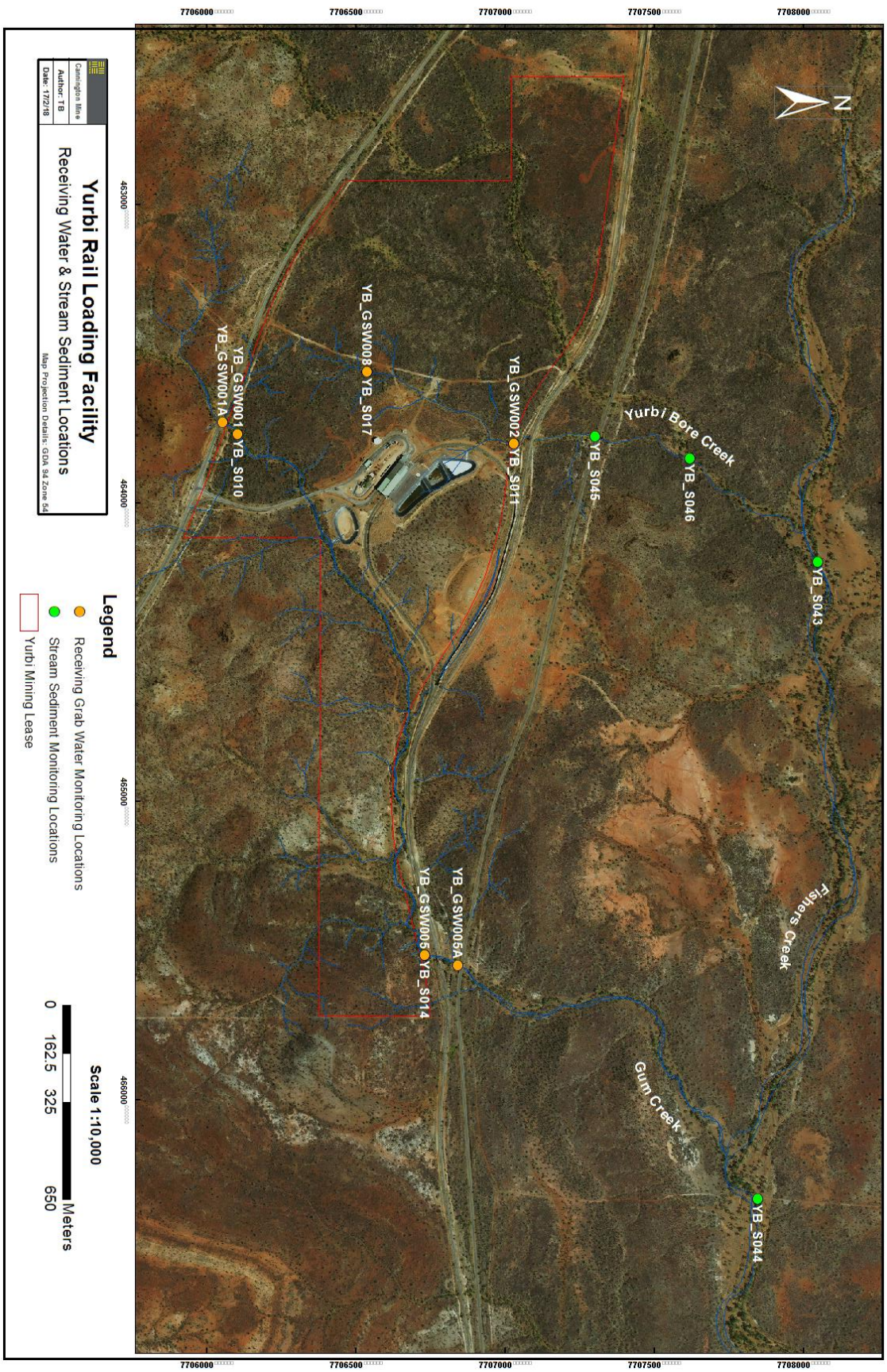


Schedule J – Figure 5 (Yurbi release locations)



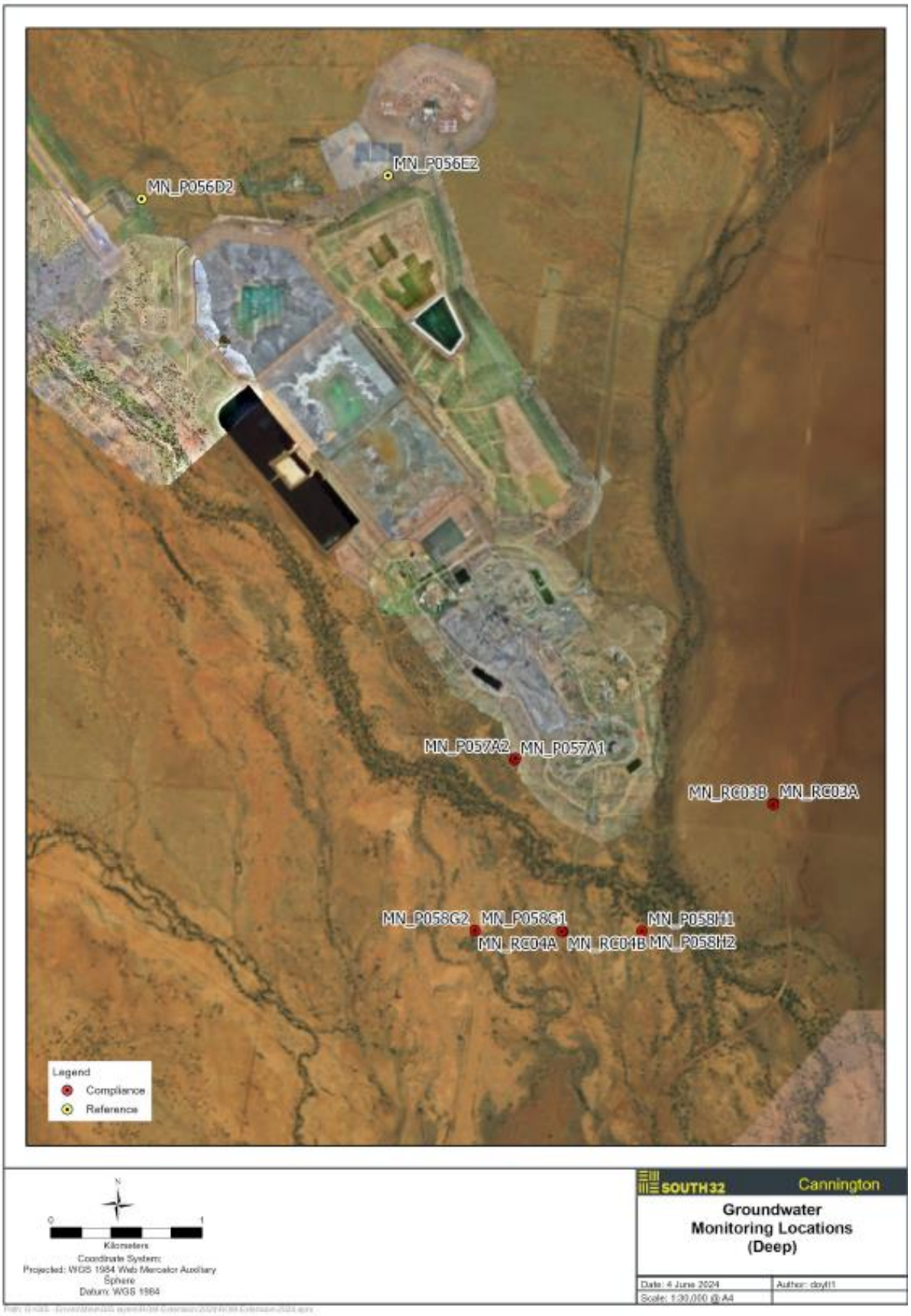
Schedule J – Figure 6 (Cannington Mine Receiving Water & Sediment Monitoring Locations)

Schedule J - Figure 7 (Yurbi Receiving Water & Sediment Monitoring Locations)

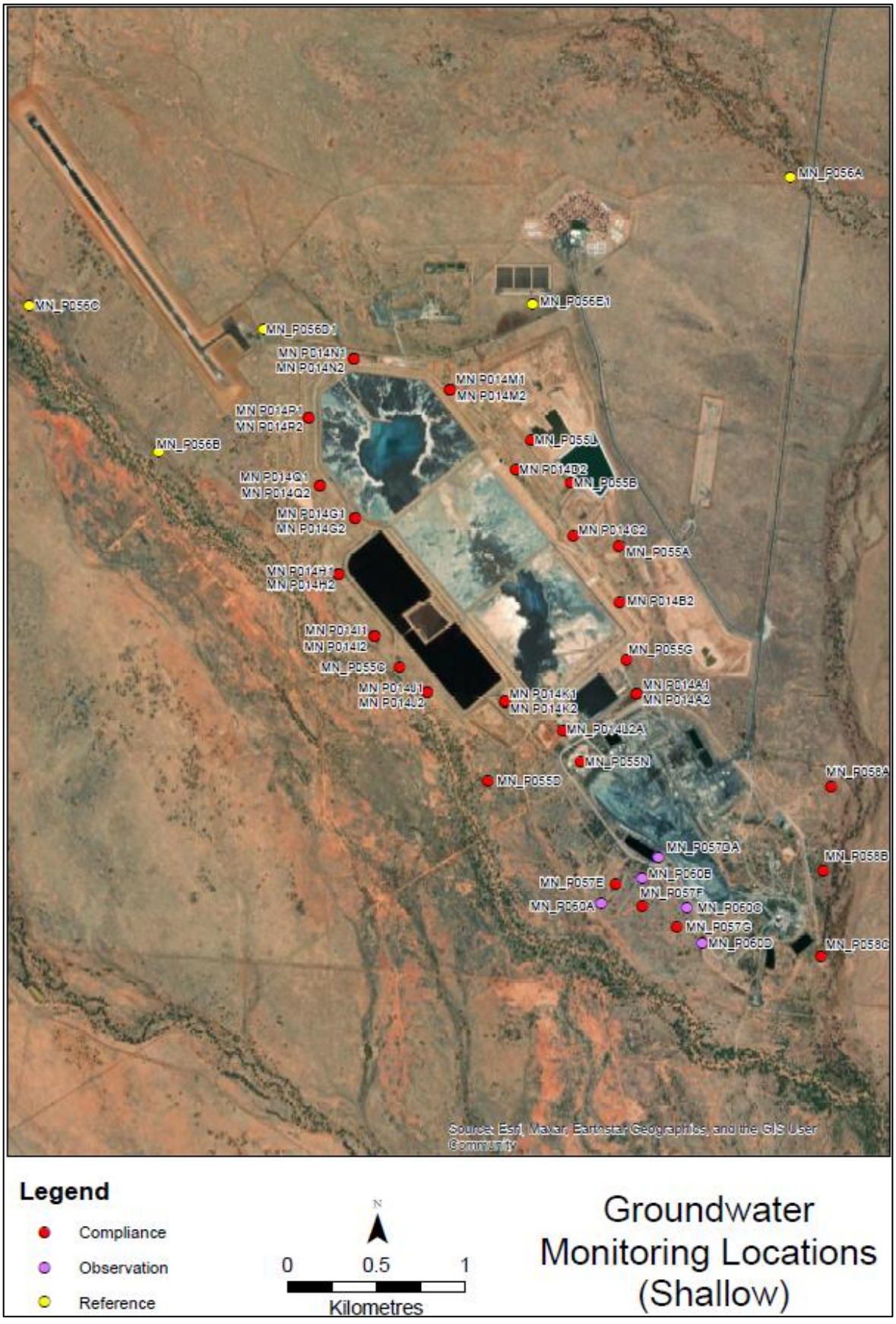


Schedule J - Figure 8 (Cannington Onsite Water Storage Locations)

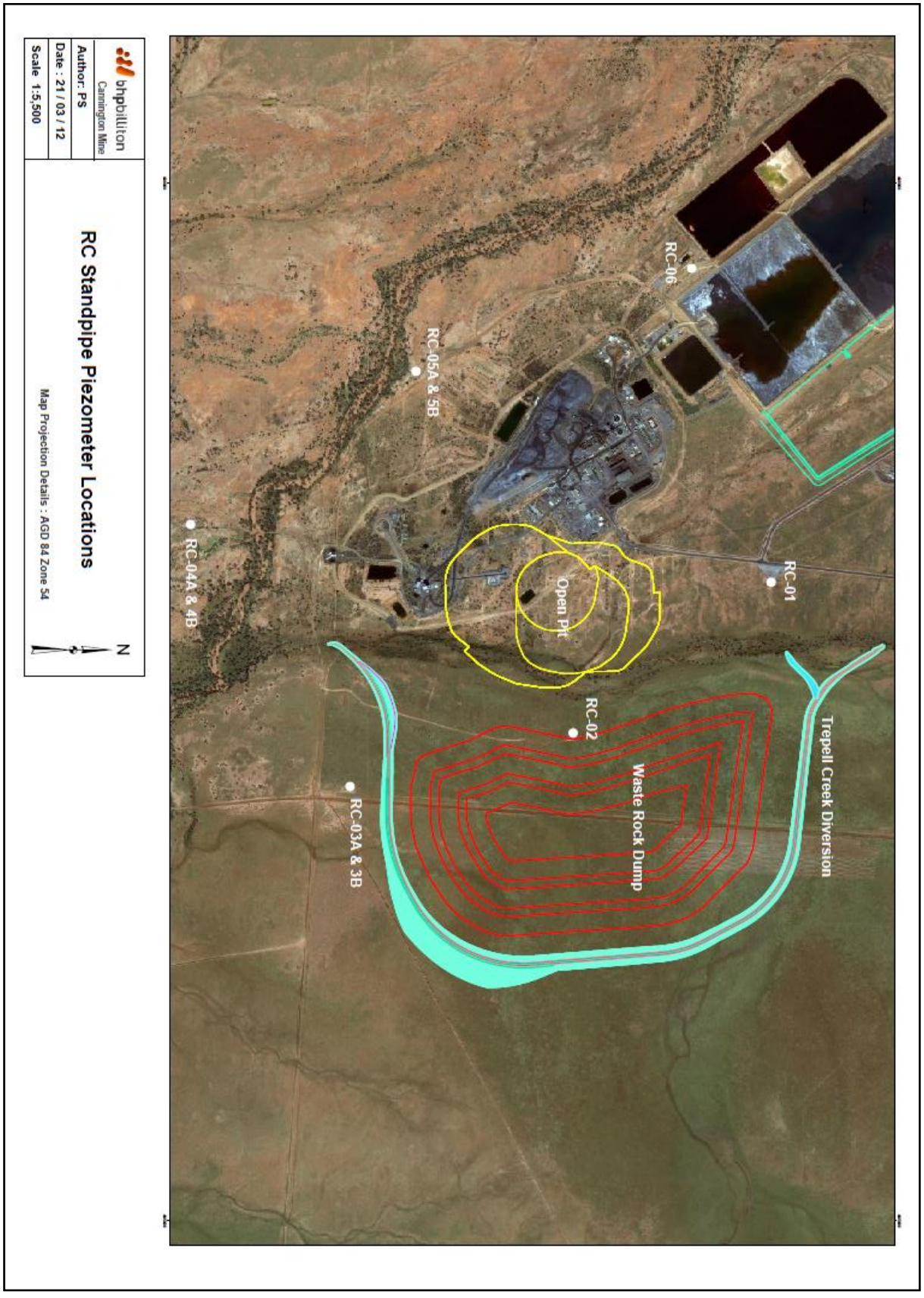
Schedule J – Figure 9a (Cannington Groundwater Monitoring Locations A – Deep)



Schedule J – Figure 9b (Cannington Groundwater Monitoring Locations A – Shallow)



Schedule J – Figure 10 (Cannington Groundwater Monitoring Locations B)



Schedule J – Figure 11 (Cannington Groundwater Monitoring Locations C)

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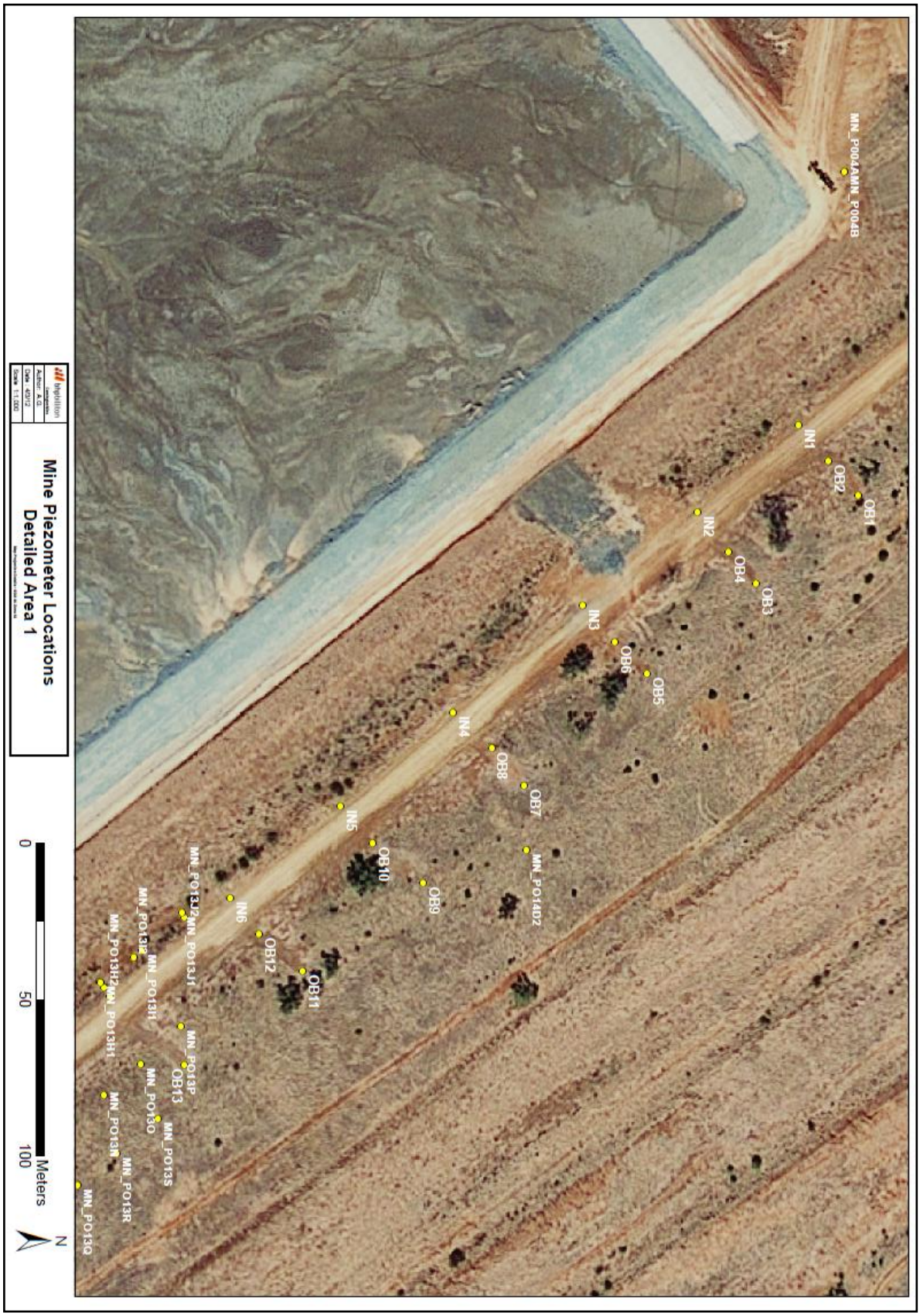
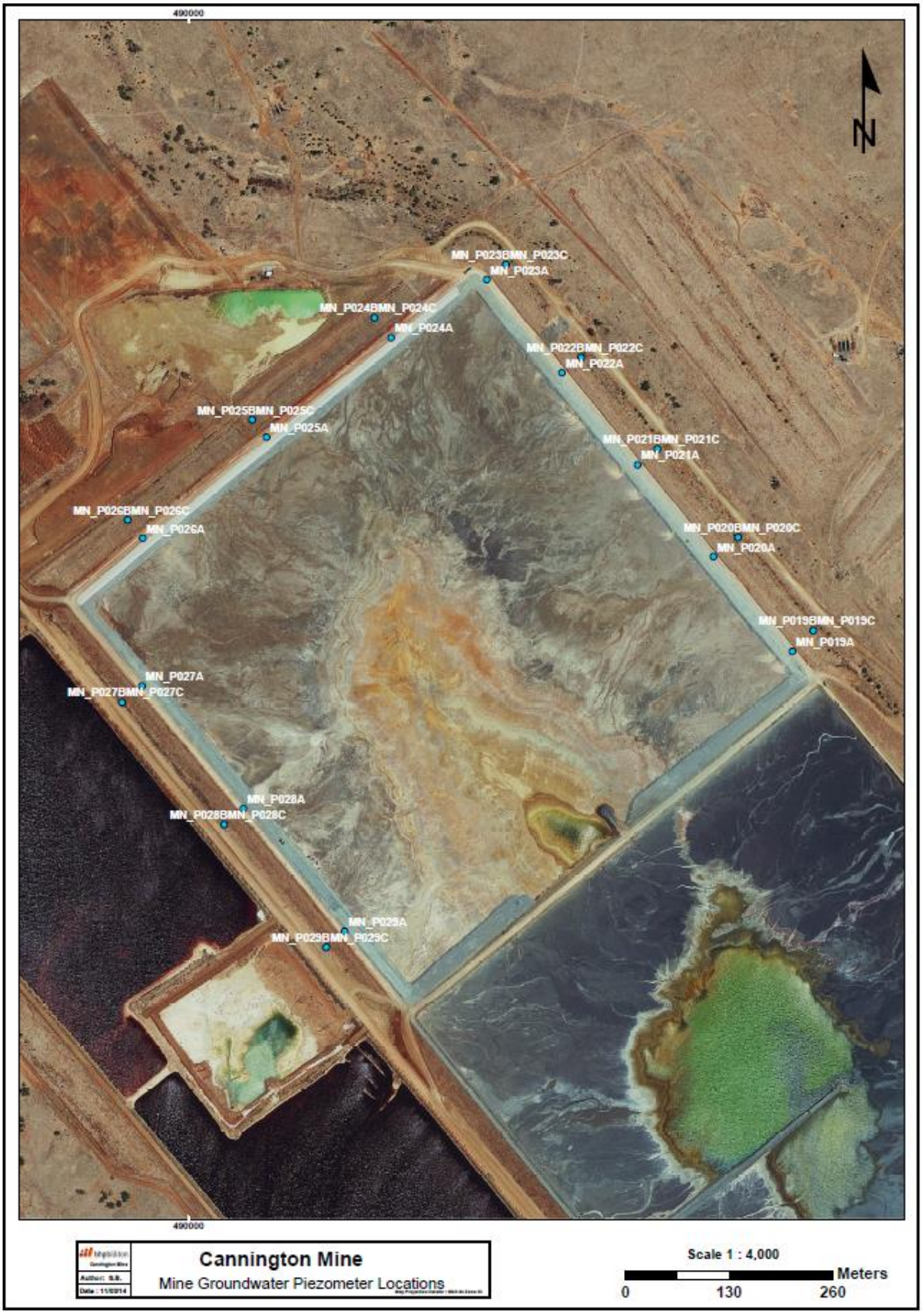
To be provided to the administering authority no later than six (6) months prior to commencement of open pit mining activities (refer EA condition C34 and Schedule C – Table 11, sub-table notation 2).

Schedule J – Figure 12 (TSF Seepage Monitoring Locations A)

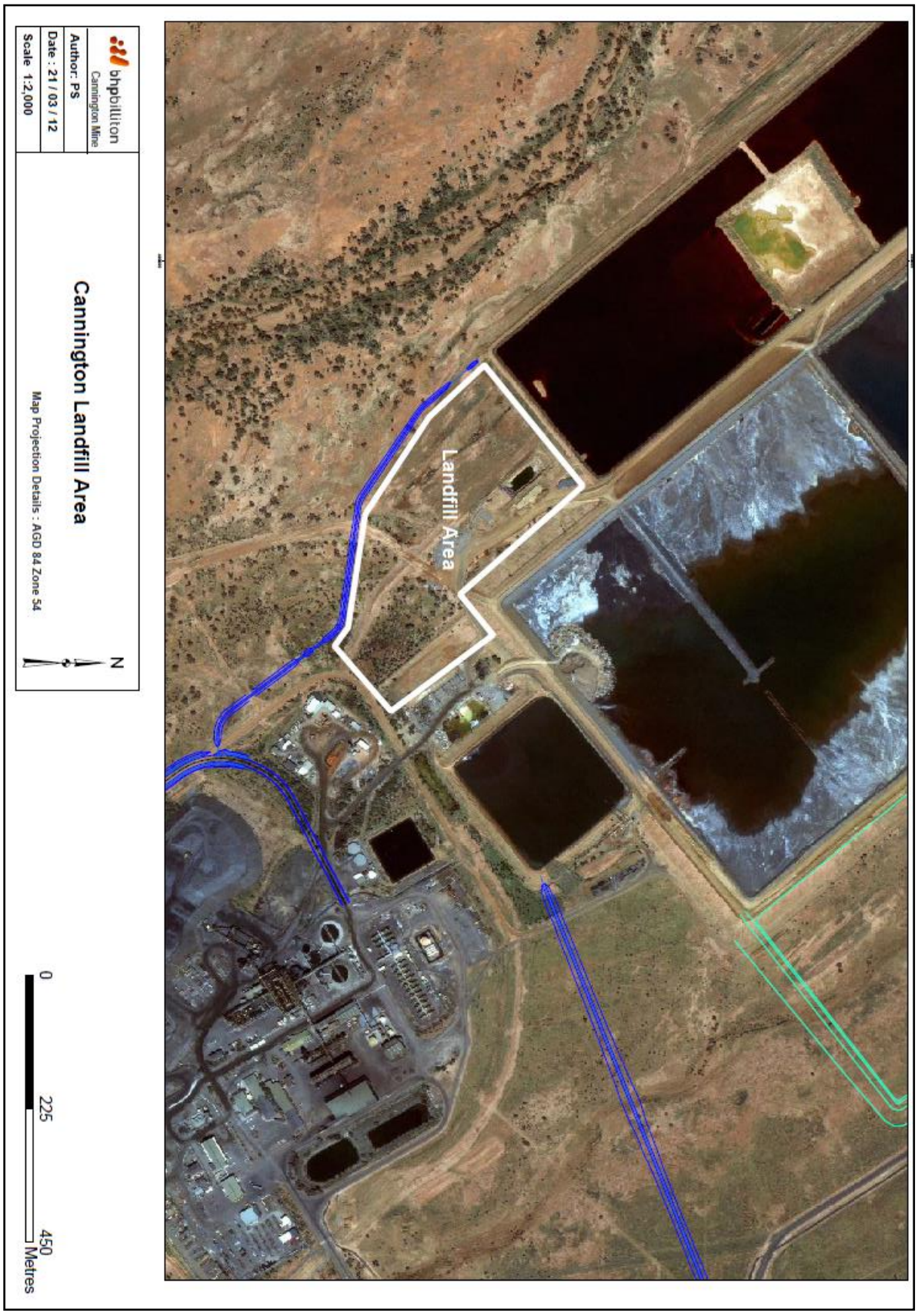
Schedule J – Figure 13 (TSF Seepage Monitoring Locations B)



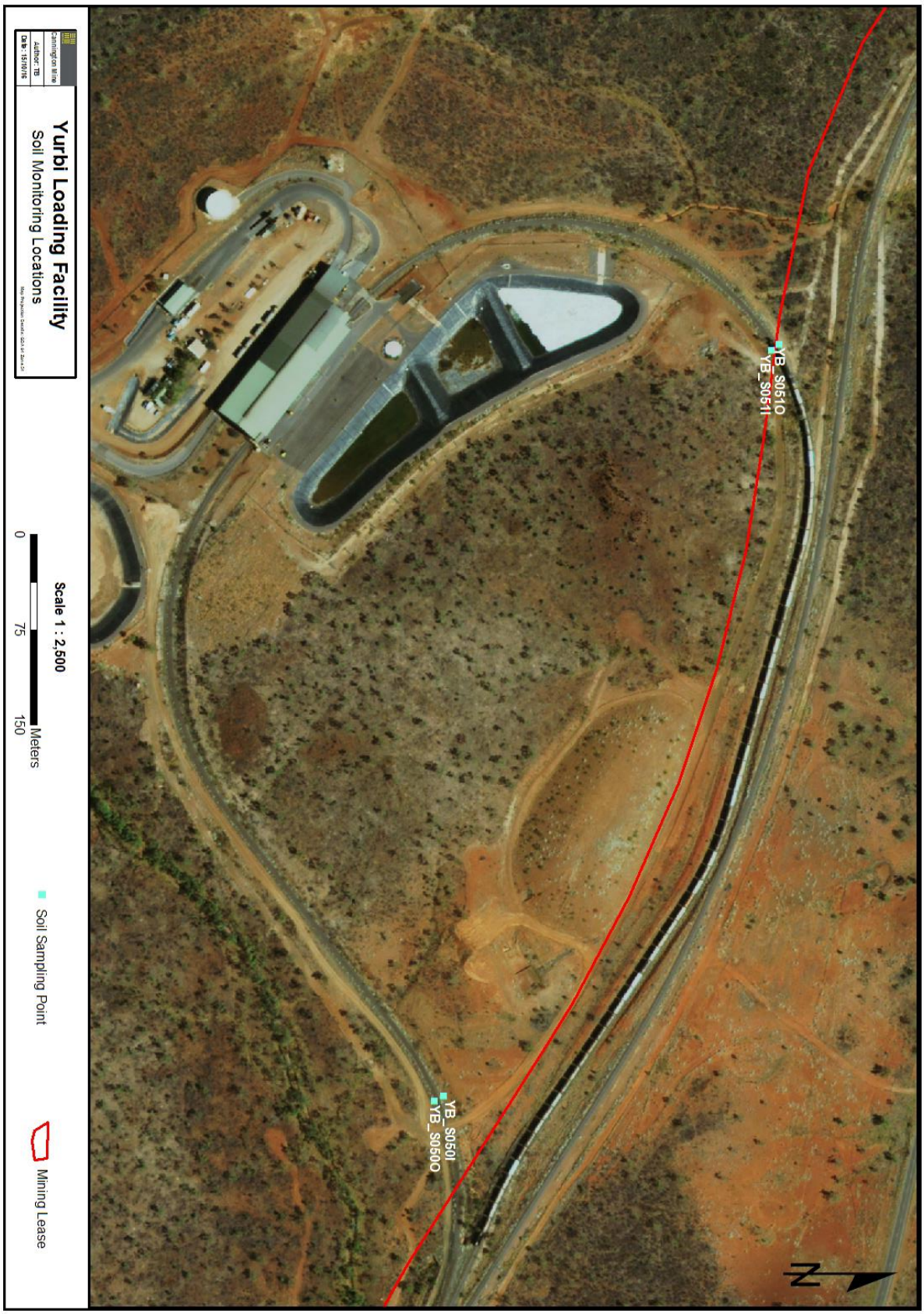
Schedule J – Figure 14 (TSF Seepage Compliance Bores)



Schedule J – Figure 15 (Cannington Landfill Area)



Schedule J – Figure 16 (Yurbi Rail Loop Soil Monitoring Locations)



Schedule J – Figure 17 (Yurbi Groundwater Monitoring Locations)

END OF SCHEDULE J – FIGURES/PLANS

END OF ENVIRONMENTAL AUTHORITY