Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6214/2019/1
Works approval holder	Australian Garnet Pty Ltd
ACN	646 741 157
Registered business address	Level 1, 46 Edward St OSBORNE PARK WA 6017
DWER file number	DER2018/001613
Duration	30/04/2019 to 29/04/2022
Date of issue	29/04/2019
Date of amendment	29 April 2021
Premises details	Balline Garnet Mine George Grey Drive YALLABATHARRA WA 6535 Legal description - Tenements M70/1280, G70/253 & L70/134 within Lot 1 on Diagram 91564, Lot 300 on Plan 60565 & Lot 1431 on Plan 251608

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed production capacity**
Category 8: Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed.	8,400,000 tonnes per annual period

This transfer is granted to the works approval holder, subject to the attached conditions, on 29 April 2021, by:

Melanie Bruckberger Date: 2021.04.29 08:18:58 +08'00'

Melanie Bruckberger

A/SENIOR ENVIRONMENTAL OFFICER – RESOURCE INDUSTRIES REGULATORY SERVICES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
26/08/2010	W4709/2010/1	Original works approval granted to Altura Mining.
23/08/2013	W4709/2010/1	Amendment to extend duration by 3 years.
29/04/2019	W6214/2019/1	Replacement works approval granted to Australian Garnet, to replace expired approval.
14/07/2020	W6214/2019/1	Amendment to relocate infrastructure.
29/04/2021	W6214/2019/1	Transfer of ACN from 121 051 965 to 646 741 157 and update of registered business address. No name change to the occupier required.

Interpretation

In this works approval:

(a) the words 'including', 'includes' and 'include' in conditions mean 'including but not limited to', and similar, as appropriate;
(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
(c) where tables are used in a condition, each row in a table constitutes a separate condition;
(d) any reference to an Australian or other standard, guideline or code of practice in this works approval means the version of the standard, guideline or code of practice in force at the time of granting of this works approval and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the works approval;
(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

Construction phase

Infrastructure

1. The works approval holder must construct and undertake the works for the infrastructure specified in Table 1, and to the requirements listed in that table.

2. Subject to condition 1, within 28 days of the completion of the works specified in Table 1, the works approval holder must submit to the CEO an environmental compliance report prepared by a licensed professional engineer that:
(a) lists and describes the completed works and any associated items of infrastructure listed in Table 1;
(b) certifies whether or not each item of infrastructure or component of infrastructure specified in Table 1 has been constructed, complies with the corresponding requirements in that table and contains any material defects;
(c) contains as constructed' plans for each item of infrastructure or component of infrastructure specified in Table 1; and

(d) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person within the company.

3. Subject to condition 2(b), where an item of infrastructure or component of infrastructure has been certified as not being constructed, or does not comply with the corresponding requirements, or contains material defects, the works approval holder must:

(a) correct the non-compliant or defective works, prior to recertifying in accordance with condition 2(b); or
(b) provide the CEO with a description of, and explanation for, any departures from the requirements listed in Table 1 that do not require rectification and do not constitute a material defect, along with the report required by condition 2.

Table 1: Infrastructure requirements table

	Infrastructure/ Equipment	**Requirements (design and construction)**
1	Process water pond	• Must be lined with HDPE of at least 1.0 mm thickness;
2	HMC stockpile area	• Pad must be sloped to allow the collection of water runoff;
3	Wet Concentrator Plant (WCP)	• Design capacity: 511 tph;
4	Dry Separation Plant (DSP)	• Design capacity: 47 tph; • Must be constructed with a “Lisbon Engineering 2000 MC” or equivalent diesel or gas-fired rotary dryer with a Pulse jet fabric filter (baghouse) and minimum 15 m high stack.
5	Sand tailings storage area	• Must be constructed with overburden material or similar and track rolled with a dozer; • Dimensions: 350 m x 400 m x 10 m; • Pad must be sloped to allow the collection of supernatant water and surface water runoff.
6	Solar drying ponds	• Must be constructed with overburden material or similar and track rolled with a dozer, with angle of repose for the outer pond wall being at least 1:2 (V:H); • Cell wall height must not exceed 2.5 m above natural ground level; • Pond floors must be sloped to allow the collection of supernatant water.
7	Pipelines carrying ore, clay slimes, sand tailings and wash water	Must be constructed with: • Automatic cut-outs in the event of a pipe failure; OR • Secondary containment sufficient to contain any spill for a period equal to the time between routine inspections; OR • Telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures.
8	Groundwater monitoring bores	Must construct at least 1 bore immediately downgradient of the sand tailings storage area, prior to stockpiling tailings in that area. Bore(s) must be: • sited in accordance with WQPN #30 (“Siting of monitoring bores” section); • installed to meet the requirements of Minimum Construction Requirements for Water Bores in Australia; • surveyed to allow the ground level (to AHD) at each location to be accurately determined;

	Infrastructure/ Equipment	Requirements (design and construction)
		• screened to permit effective monitoring of the shallow groundwater levels and quality; and • have the ability to recover groundwater.

Hours of operation

4. The works approval holder must only carry out civil and earthmoving activities as part of works authorised under this works approval between 07:00 AM and 07:00 PM, Monday to Saturday (excluding public holidays).

Commissioning phase

5. The works approval holder must notify the CEO, at least 7 days prior to, the commencement date of commissioning.

6. The works approval holder must conduct commissioning of the WCP, DSP and associated infrastructure for a period not exceeding 3 months.

7. The works approval holder must conduct commissioning of the WCP, DSP and associated infrastructure with not more than 400,000 tonnes of ore.

8. The works approval holder must notify the CEO, within 7 days after, the completion date of commissioning.

9. The works approval holder must provide to the CEO an environmental commissioning report within 3 months of the completion date of commissioning.

10. The works approval holder must ensure the report required by Condition 9 of this works approval includes:

(a) a summary of the commissioning activities undertaken, including timeframes and amount of ore processed;
(b) a summary of groundwater triggers established in accordance with Condition 13;
(c) a summary of groundwater monitoring results obtained under Condition 22;
(d) a summary of the environmental performance of all plant and equipment as installed, including but not limited to:
    (i) hydro-testing of pipelines and pump system functions testing;
    (ii) commissioning of the raw water system;
    (iii) dry commissioning of the WCP circuit and thickener;
    (iv) wet commissioning of the WCP circuit and thickener;
    (v) commissioning of the DSP, dryer and baghouse system;
    (vi) testing the clay and sand tailings systems; and
    (vii) commissioning of the process control system;
(e) a review of performance against the manufacturers design specification; and
(f) where they have not been met, measures proposed to meet the manufacturer's design specification and conditions of this works approval, together with timescales for implementing the proposed measures.

Time limited operational phase

11. The works approval holder may conduct full mining and processing operations for a period not exceeding 90 days from the completion date of commissioning, or until such time as a licence for the same is granted.

Disposal of mine tailings

12. Following construction of the 'sand tailings storage area' and the initial 'solar drying pond', the works approval holder must ensure that tailings produced during commissioning and the time limited operational phase are deposited in accordance with the requirements specified in Table 2.

Table 2: Tailings disposal requirements table

Emission	Requirements	Site plan reference
Sand tailings from the WCP & DSP	Must be: • temporarily stockpiled at the sand tailings storage area; OR • deposited directly into mined voids using cyclone stackers	'Sand tailings storage area' and 'mined voids', as shown in Schedule 1
Clay slimes from the thickener	Must be pumped as a thickened slurry to: • solar drying ponds; OR • used as dust suppressant on exposed areas within the Premises	'Solar drying ponds', as shown in Schedule 1

13. The works approval holder must set groundwater triggers for all bores specified in Table 7, to mitigate the potential for mounding effects caused by seepage of water from the storage and disposal of sand tailings on the Premises.

14. Upon exceeding the bore groundwater triggers set in accordance with condition 13, the works approval holder must commence groundwater recovery to limit any potential mounding effects to within 1 m of the natural ground level.

Emissions to air

15. The works approval holder must ensure that waste emitted to air from the DSP during commissioning and the time limited operational phase is emitted in accordance with the requirements specified in Table 3.

Table 3: Emissions to air requirements table

Emission point reference	Emission point and source	Emission point height (m)	Pollution control equipment
A1	DSP – rotary dryer stack	15 (minimum)	Pulse jet fabric filter (baghouse) or equivalent

Dust controls

16. During the time limited operational phase, the works approval holder must implement the actions/requirements listed in Table 4 for each control specified in that table.

Table 4: Dust controls table

Control	Actions/Requirements
Topsoil stripping	• Must be scheduled to avoid periods of high winds from unfavourable directions relative to off-site receptors (including George Grey Drive); • Where there is a risk of dust affecting off-site receptors, must conduct when soil conditions are moist; • Must cease/suspend topsoil stripping operations during high wind conditions where there is a risk of dust impacting on off-site receptors;
Water carts/sprays	• Must operate when discernible levels of dust are generated from ground surfaces on the Premises and there is a risk of dust affecting off-site receptors;

Control	Actions/Requirements
	• Must apply proactively subject to weather forecasting over a 24-hour period; • Must ensure that any water used on the Premises for dust suppression does not impact on the health of native vegetation;
Dust suppressant (other than water)	• Must apply proactively to overburden/topsoil stockpiles; • Must apply proactively subject to visual inspection and weather forecasting over a 24-hour period;
Cessation of activities	• Must cease an activity causing discernible levels of dust where dust management measures have not prevented dust lift-off and there is a risk of dust affecting off-site receptors

Noise controls

17. During the time limited operational phase, the works approval holder must implement the actions/requirements listed Table 5 for each control specified in that table.

Table 5: Noise controls table

Control	Actions/Requirements
Heavy earthmoving equipment	• Must use the quietest equipment reasonably available; • Must use broadband reversing alarms (e.g. squawkers/quackers) on all earthmoving equipment instead of standard single frequency 'beepers'; • Must not operate haul trucks on the Premises on Sundays and public holidays during calm or light westerly wind conditions;
Mining unit	• Must be located in the mining pit below the natural ground level at all times whilst operating

Monitoring general

18. The works approval holder must ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
(b) all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and
(c) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured, unless indicated otherwise in the relevant table.

19. The works approval holder must ensure that monthly monitoring is undertaken at least 15 days apart.

20. The works approval holder must ensure that all monitoring equipment used on the Premises to comply with the conditions of this works approval is calibrated in accordance with the manufacturer's specifications.

Process monitoring

21. During the time limited operational phase, the works approval holder must undertake monitoring of the processes listed in Table 6, for the corresponding parameter and in the units specified in that table.

Table 6: Process monitoring requirements table

Process description	Parameter	Units
Overburden removal	Amount of overburden removed	Wet tonnes
Processing of ore	Amount of ore processed through the WCP	
	Amount of HMC produced	

Process description	Parameter	Units
Disposal of tailings	Amount and location of sand tailings and clay slimes disposed on the Premises	

Ambient environmental monitoring

22. The works approval holder must undertake monitoring of ambient groundwater quality at the locations and for the parameters listed in Table 7, in the corresponding units, over the averaging period and at the frequency specified in that table.

Table 7: Groundwater monitoring table

Monitoring point reference	Parameter	Units	Limit	Averaging Period	Frequency
PB1, PB2 PB4, PB5	Standing water level (SWL)[1,2]	m AHD	1 mbgl	Spot sample	Monthly
MB2, MB3, MB4, MB5, MB8, MB9, MB10; MB12; MB13	pH[1]	-	-		
	Electrical conductivity @ 25°C[1]	µS/cm			
	Redox potential[1]	mV			
	Major ions: bicarbonate, calcium, chloride, magnesium, potassium, sodium, sulfate, total dissolved solids	mg/L			At least once throughout the duration of this works approval
	Metals and metalloids: aluminum, arsenic, chromium (as CrVI and total Cr), cobalt, copper, iron, mercury, nickel, selenium, thallium, uranium, zinc				

Note 1: In-field non-NATA accredited analysis permitted.
Note 2: SWL to be determined prior to the collection of other samples.

Record-keeping

23. The works approval holder must maintain accurate books including information, reports and data in relation to the works and the books must:

(a) be legible;
(b) if amended, be amended in such a ways that the original and subsequent amendments remain legible or are capable of retrieval;
(c) be retained for at least 3 years from the date the books were made;
(d) be available to be produced to an Inspector or the CEO.

Definitions

In this works approval, the terms in Table 8 have the meanings defined.

Table 8: Definitions

Term	Definition
ACN	Australian Company Number
AHD	Australian Height Datum
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*
averaging period	means the time over which a limit is measured or a monitoring result is obtained
books	has the same meaning given to that term under the EP Act
CEO	means Chief Executive Officer of the Department CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 10 JOONDALUP DC WA 6919 info@dwer.wa.gov.au
commissioning	means a period of time to allow for stabilisation and optimisation of the process following input of raw materials under operation conditions (including emissions) on the Works Approval for the limited period of operations required
condition	means a condition to which this works approval is subject under s.62 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act
discharge	has the same meaning given to that term under the EP Act
DSP	Dry Separation Plant
emission	has the same meaning given to that term under the EP Act
environmental compliance report	means a report to satisfy the CEO that works have been constructed in accordance with the works approval
environmental commissioning report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment and other environmental factors
EP Act	means the *Environmental Protection Act 1986* (WA)
EP Regulations	means the *Environmental Protection Regulations 1987* (WA)
HDPE	High Density Polyethylene
high wind	means wind conditions rating 7 or greater on the Beaufort Windforce Scale (i.e. wind speeds 50 km/h or greater)
HMC	Heavy mineral concentrate
licence	has the same meaning given to that term under the EP Act
Minimum Construction Requirements for Water Bores in	means the document *Minimum Construction Requirements for Water Bores in Australia*, National Uniform Drillers Licensing Committee (3rd Edition, 2012)

Australia	
mbgl	Meters below ground level
NATA	National Association of Testing Authorities, Australia
NATA accredited	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis
Premises	the premises to which this works approval applies, as specified at the front of this works approval and as shown on the map in Schedule 1 to this works approval
prescribed premises	has the same meaning given to that term under the EP Act
professional engineer	means a person who holds a Bachelor of Engineering and has demonstrated experience working in the relevant discipline
spot sample	means a discrete sample representative of the time and place at which the sample is taken
time limited operational phase	means full mining and processing operations permitted under this works approval, subject to the conditions, whilst an application for licence is being assessed
tph	tonnes per hour
WCP	Wet Concentrator Plant
works approval	refers to this document, which evidences the grant of the works approval by the CEO under s.54 of the EP Act, subject to the conditions
works approval holder	refers to the occupier of the Premises being the person to whom this works approval has been granted, as specified at the front of this works approval
WQPN #30	means the document *Water Quality Protection Note #30: Groundwater monitoring bores*, Department of Water (February 2006). Available at: www.water.wa.gov.au/_data/assets/pdf_file/0010/4033/59685.pdf

END OF CONDITIONS

Schedule 1: Maps

Premises map and map of monitoring locations

The Premises is shown in the map below. The red line depicts the Premises boundary.