



Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8845/2014/1
Licence Holder	IB Operations Pty Ltd
ACN	165 513 557
File Number	DER2014/002065-1
Premises	Iron Bridge Magnetite Project Mining Tenements M45/1226, M45/1244, L45/292, L45/294, L45/359, L45/360, L45/361, L45/364 and L45/367 MARBLE BAR WA 6760 As defined by the Premises map attached to the Revised Licence
Date of Report	29 August 2023
Decision	Revised licence granted

A/MANAGER, RESOURCE INDUSTRIES

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

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Amendment summary	1
2.2.1 Premises boundary extension	3
2.2.2 Category 52 – Back-up power station	3
2.2.3 Category 64 – Landfill	7
2.2.4 Category 73 – Bulk fuel storage	7
2.2.5 Satellite sewage acceptance volume	7
2.2.6 RO reject water used for dust suppression	8
2.2.7 Additional discharge points	11
2.2.8 Ambient groundwater monitoring bores	11
2.2.9 Other amendments	14
2.3 Part IV of the EP Act	14
2.4 Aboriginal Heritage and Native Title	14
3. Risk assessment	14
3.1 Source-pathways and receptors	15
3.1.1 Emissions and controls	15
3.1.2 Receptors	18
3.2 Risk ratings	20
4. Consultation	25
5. Conclusion	25
5.1 Summary of amendments	25
References	28
Appendix 1: Summary of Licence Holder’s comments on risk assessment and draft conditions	30
Appendix 2: Application validation summary	32
Table 1: Proposed design capacity changes	2
Table 2: Diesel generators summary results table (Ektimos 2023)	5
Table 3: Comparison of RO reject water quality with the ANZG 2018 and mean site groundwater quality	9
Table 4: RWP seepage monitoring bores water quality data	13
Table 5: Licence Holder controls	15
Table 6: Environmental receptors and distance from prescribed activity	19
Table 7: Risk assessment of potential emissions and discharges from the Premises operation	

.....21

Table 8: Consultation25

Table 9: Summary of licence amendments25

1. Decision summary

Licence L8845/2014/1 is held by IB Operations Pty Ltd (Licence Holder) for the Iron Bridge Magnetite Project (the Premises), located approximately 70 km south-west of Marble Bar.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L8845/2014/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Amendment summary

On 17 March 2023, the Licence Holder submitted an application (FMG 2023a) to the department to amend Licence L8845/2014/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Update premises boundary to accommodate infrastructure constructed under W6322/2019/1.
- Increase category 5 capacity from 50,000 tonnes per annum (tpa) to 72,000,000 tpa to align with W6233/2019/1.
- Transfer of constructed and commissioned infrastructure under W6322/2019/1 to the Licence which includes:
 - Ore Processing Facility (OPF) infrastructure;
 - Process water pond;
 - Raw water storage pond;
 - Return Water Pond (RWP); and
 - Tailings Storage Facility (TSF) – Stage 1A
- Remove old power station (emission points to air) and replace with the back-up power station approved under Stage 1 of W6506/2021/1.
- Update Table 2 of L8845/2014/1 to reduce the inspection requirements for Stage 1 TSF delivery pipelines to quarterly as the facility is now decommissioned. Table 2 to include TSF 2 inspections.
- Inclusion of category 73 with a design capacity of 3,600 cubic metres (m³) in aggregate.
- Update ambient groundwater quality bore locations due to operational expansion of the TSF 2.
- Changes to the sewage facility operational processes to allow for reuse of reverse osmosis (RO) reject water for dust suppression where required.
- Increase to the satellite sewage acceptance volume from 30 cubic meters per day

(m³/day) to 80 m³/day with no changes to the category 54 approved design capacity.

- Inclusion of the RWP spillway emergency discharge point (as per W6322/2019/1).
- Existing category 89 to be changed to category 64 and an increase in capacity from 4,000 tpa to 6,800 tpa.

The department sent a request for further information letter on 24 April 2023 as an approval to operate cannot be given for infrastructure not yet constructed under a works approval. This is in accordance with the *Guideline: Industry Regulation Guide to Licensing* (DWER 2019) which states “*Section 57(2) of the EP Act requires works completed under a works approval to be completed to the CEO’s satisfaction in accordance with the relevant conditions of the works approval, before a licence application for the premises may be assessed by the Department.*”

On this basis, the Licence Holder deferred some of the elements of the original amendment application (FMG 2023b and FMG 2023c). The amendment scope has therefore been reduced to the following amendments:

- Premises boundary extension – refer to section 2.2.1.
- Category 52 (power generation) design capacity reduced from 14 MW to 12.8 MW; and old power station (emission points to air) removed and replaced with the back-up power station approved under Stage 1 of W6506/2021/1. Refer to section 2.2.2.
- Existing category 89 (putrescible landfill) to be changed to category 64 and an increase in capacity from 4,000 tpa to 6,800 tpa. Refer to section 2.2.3.
- Inclusion of category 73 (bulk fuel storage) with a design capacity of 2,500 m³ in aggregate. Refer to section 2.2.4.
- Satellite sewage acceptance volume increased from 30 m³/day to 80 m³/day with no changes to the category 54 approved design capacity. Refer to section 2.2.5.
- Sewage facility operational processes changed to allow for reuse of RO reject water for dust suppression where required. Refer to section 2.2.6.
- Inclusion of the RWP spillway and OWS as discharge points (as per W6322/2019/1). Refer to section 2.2.7.
- Ambient groundwater quality bore locations updated. Refer to section 2.2.8.

This amendment is limited only to design capacity changes to category 52, 64, 73 and 89 activities. There are no changes to the design capacity of category 5, 12, 54 and 77 approved under the existing Licence as part of this amendment – Refer to Table 1.

Table 1: Proposed design capacity changes

Category	Current design capacity	Proposed design capacity	Description of proposed amendment
5	50,000 tpa	N/A	N/A
12	5,000,000 tpa	N/A	N/A
52	14 MW	12.8 MW	Removal of the old 14 MW power station which has been replaced with an emergency power station with a capacity of 12.8 MW constructed under W6506/2021/1

Category	Current design capacity	Proposed design capacity	Description of proposed amendment
54	585 m ³ /day	N/A	N/A
64	N/A	6,800 tonnes per annual period	Inclusion of previous category 89 capacity (4,000 tpa) and an expansion to the landfill (additional 2,800 tonnes per annual period)
73	N/A	2,500 m ³ in aggregate	Inclusion of category 73 with a capacity of 2,500 m ³
77	217,000 tpa	N/A	N/A
89	4,000 tpa	0 tpa	Removed and replaced by category 64

2.2.1 Premises boundary extension

The Licence Holder has requested the premises boundary be extended to include the prescribed premises boundary for W6322/2019/1 to ensure consistency across approval instruments and allow for streamlined monitoring and reporting.

Under this amendment, tenements M45/1244 and L45/292 have been included; and L45/293 removed.

2.2.2 Category 52 – Back-up power station

The Licence Holder is part of the Fortescue Metals Group Limited (FMG) group of companies. The FMG group of companies are connected by a 257 km electricity transmission infrastructure corridor (Pilbara Energy Connect (PEC) Project). The PEC Project enables electricity to be distributed between a number of FMG sites including the Solomon Power Station, the Pilbara Energy Generation (PEG) Power Station, a proposed renewable energy solar and wind plant and a proposed large scale battery system.

Works approval W6506/2021/1 authorised the construction and time-limited operation of an electric power plant with a maximum energy generation capacity of 44.8 MW at the Premises.

W6506/2021/1 Report states this power station is to be used as a prime back-up generation plant, rather than for standard or emergency back-up power generation, to supplement energy requirements for the Premises during periods when the sites main source of electricity, the PEG Power Station, is unable to meet energy demands of the site over the short term. The PEC Power Station will not generate enough energy to supply the Premises when it is operating at full capacity. The shortfall in energy requirements will be sourced from a combination of other but linked off-site FMG group owned power plants from the PEC networks of companies.

Iron Bridge 2022d states “Stage 1 of the works is complete for a total generation power of 12.8MW. Stage 2 of the works will no longer be completed.”

Under Stage 1, 8x 1.6 MWe containerised CAT 3516B diesel generating units G1-G8 were installed.

The Licence Holder has requirements under W6506/2021/1 to monitor emissions during time limited operations as shown below:

Condition 9. The works approval holder must monitor emissions during time limited operations in accordance with Table.

Table 3: Emissions and discharge monitoring during time limited operations

Emission point reference	Parameter	Units¹	Averaging period	Frequency²	Method
<i>E1-E56 exhaust stacks from containerised diesel generator sets G1- G28</i>	<i>NO_x</i>	<i>mg/m³ and g/s</i>	<i>30 minute</i>	<i>Once, within 36 weeks of commencing time limited operations</i>	<i>USEPA Method 7E</i>
	<i>CO</i>				<i>USEPA Method 10</i>
	<i>TPM</i>				<i>USEPA Method 17</i>
	<i>SO_x</i>				<i>USEPA Method 6 or 6C</i>
	<i>Total VOCs</i>				<i>USEPA Method 18</i>

Note 1: All units are referenced to STP dry and 15% O₂.

Note 2: Monitoring shall be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production

Ektimo Pty Ltd was engaged to perform the emission testing and monitoring was undertaken from 13 – 15 March 2023. The results for the target parameters are shown in Table 2.

Refer to section 3 for the department’s risk assessment of this activity. During this amendment the power station emission stacks have been included under condition 9 as authorised discharge points.

Greenhouse gas (GHG) emissions

The *Greenhouse Gas Emissions Policy for Major Projects* and the *Environmental Factor Guideline: Greenhouse Gas Emissions* (EPA 2020) guides but does not bind government decision making for proposals with significant potential for GHG emissions.

Instead, they provide a trigger value for proposals with emissions of over 100,000 tonnes (t) of carbon dioxide equivalent (CO₂-e) per annum by which GHG reduction obligations should be considered under Part IV of the EP Act.

An estimate of GHG emissions predicted in tCO₂-e per annum and over the life of the power station operating as a backup power station is 179,750 tCO₂-e (3,595 tCO₂-e per annum over 50 year life-of-power station).

This is on the basis that the maximum annual operating hours at 400 hours, 3,595 tonnes of CO₂-e per annum will be emitted. If generators were operating at 100% loading 24 hours a day, 7 days a week annually: Cumulatively 48,340 tCO₂-e would be generated which is 6,042 tCO₂-e per single generator (FMG 2023d).

Table 2: Diesel generators summary results table (Ektimos 2023)

Location	Process Conditions	Units	Parameter*				
			Nitrogen Oxides (as NO ₂)	Total particulate matter (TPM)	Carbon monoxide (CO)	Sulfur dioxide (SO ₂)	Total VOCS
Diesel Generator 1 East	Engine at 1.7MW	g/s	2.1	0.01	0.37	<0.005	<0.0001
		mg/m ³	1,400	8.4	250	<4	<0.1
Diesel Generator 1 West	Engine at 1.6MW	g/s	3.1	0.019	0.45	<0.006	0.0002
		mg/m ³	1,500	9.1	220	<3	0.094
Diesel Generator 2 East	Engine at 1.7MW	g/s	2.9	0.0049	0.18	<0.006	<0.0002
		mg/m ³	1,600	3.1	99	<3	<0.1
Diesel Generator 2 West	Engine at 1.7MW	g/s	2.7	0.013	0.46	<0.006	0.00021
		mg/m ³	1,400	7.6	240	<3	0.11
Diesel Generator 3 East	Engine at 1.7MW	g/s	2.2	0.0053	0.21	<0.005	<0.0001
		mg/m ³	1,500	4.2	140	<3	<0.08
Diesel Generator 3 West	Engine at 1.7MW	g/s	2.5	0.0086	0.46	<0.005	<0.0001
		mg/m ³	1,400	4.9	260	<3	<0.08
Diesel Generator 4 East	Engine at 1.7MW	g/s	2.3	0.006	0.33	<0.005	<0.0001
		mg/m ³	1,300	4.0	190	<3	<0.07
Diesel Generator 4 West	Engine at 1.7MW	g/s	2.7	0.013	0.57	<0.005	<0.0001
		mg/m ³	1,400	7.9	300	<3	<0.07
Diesel Generator 5 East	Engine at 1.7MW	g/s	3	0.0036	0.32	<0.006	<0.0002
		mg/m ³	1,500	2.2	160	<3	<0.08
Diesel Generator 5 West	Engine at 1.7MW	g/s	2.8	0.0096	0.56	<0.006	<0.0002
		mg/m ³	1,400	5.7	290	<3	<0.08
Diesel Generator 6	Engine at	g/s	2.2	0.0056	0.12	<0.005	<0.0001

Location	Process Conditions	Units	Parameter*				
			Nitrogen Oxides (as NO ₂)	Total particulate matter (TPM)	Carbon monoxide (CO)	Sulfur dioxide (SO ₂)	Total VOCS
East	1.7MW	mg/m ³	1,400	4.3	79	<3	<0.09
Diesel Generator 6 West	Engine at 1.7MW	g/s	2.5	0.0059	0.28	<0.005	<0.0001
		mg/m ³	1,400	3.4	150	<3	<0.08
Diesel Generator 7 East	Engine at 1.7MW	g/s	2.5	0.011	0.48	<0.005	<0.0002
		mg/m ³	1,300	6.8	240	<3	<0.08
Diesel Generator 7 West	Engine at 1.7MW	g/s	2.5	<0.005	0.34	<0.005	<0.0001
		mg/m ³	1,400	<4	200	<3	<0.08
Diesel Generator 8 East	Engine at 1.7MW	g/s	2.2	<0.003	0.31	<0.005	<0.0001
		mg/m ³	1,300	<2	180	<3	<0.07
Diesel Generator 8 West	Engine at 1.7MW	g/s	2.3	0.015	0.19	<0.004	<0.0001
		mg/m ³	1,600	14	130	<3	<0.07

*All values are corrected at 15% oxygen.

2.2.3 Category 64 – Landfill

The existing licence currently approves the disposal of 4,000 tpa of waste (putrescible, inert waste type 1 and inert waste type 2 (not including tyres)) to the landfill facility. The Licence Holder is proposing to incorporate an additional cell into the facility to maximise the available footprint as the current cell is nearing capacity. The additional cell will give the facility a combined total capacity of 6,800 tpa.

Refer to section 3 for the department's risk assessment of this activity.

2.2.4 Category 73 – Bulk fuel storage

The Licence Holder has requested the inclusion of category 73 with a total capacity of 2,500 m³. The following infrastructure has been constructed under works approvals:

- 5x 200 kilolitre (kL) storage tanks constructed under W6315/2019/1. Environmental Compliance Report (ECR) (Iron Bridge 2022a) was submitted to the department on 29 July 2022.
- 2x 110 kL double skinned diesel fuel tanks constructed under W6506/2021/1. ECR (Iron Bridge 2022d) was submitted to the department on 11 November 2022.

The Licence Holder has stated that additional bulk fuel storage at the Premises includes:

- 1 x 200 kL Bulk Fuel storage at Japal Village; and
- 1,080 kL minor storage comprising: short term/day-use tanks, lubricant, coolant acids and ANFO related to the explosives facility.

A permanent bulk fuel storage facility (BFSF) is being built at the Premises. W6315/2019/1 authorised the construction of 18 x 200 kL self-bunded diesel-only storage tanks (only five of the 18 have been constructed).

The BFSF supplies the mining fleet, power stations and other infrastructure.

Refer to section 3 for the department's risk assessment of this activity.

2.2.5 Satellite sewage acceptance volume

The Licence Holder currently operates a wastewater treatment plant (WWTP) and associated irrigation field with a total discharge volume of 725 m³/day (comprising 585 m³/day of treated effluent, inclusive of 30 m³ satellite site waste acceptance volumes and up to 140 m³/day of RO reject).

The Licence Holder originally requested an increase (50 m³/day) in the acceptance volume of effluent trucked from the satellite sites (from the 30 m³/day to 80 m³/day) due to increased operational manning.

FMG 2023a states "*the increased satellite site waste acceptance volume of 50 m³ per day will not change the effluent composition*" and "*currently the WWTP under L8845/2014/1 is receiving approximately 400 m³ of effluent per day from the accommodation village. The requested increase in satellite sewage acceptance volumes will not exceed the current approved sewage volumes of 585 m³ per day*".

On 17 August 2023 (FMG 2023d) the Licence Holder requested the removal of 'trucked from satellite sites within the premises boundary'.

The Licence Holder has stated "*As per DWER advice provided via phone on 20 July 2023, the satellite sewage directly from toilet to holding tank with no treatment or processing in anyway, will not require Part V approval to truck raw sewage from outside of a Premise Boundary and disposed of within a licenced WWTP. The total discharge volume and parameters must not be exceeded with the controlled waste regulations to be adhered to*".

The department notes reference to a phone conversation on 20 July 2023 and provides the Licence: L8845/2014/1

following:

- Under Schedule 1 of the *Environmental Protection Regulations 1987*, Category 61 - liquid waste facility is triggered if the production or design capacity is more than 100 tonnes per year; and where the premises accepts liquid waste **produced on other premises (other than sewerage waste)** is stored, reprocessed, treated or irrigated.

In this instance, as it is sewerage waste it does not trigger category 61. Notwithstanding this, the Licence Holder must ensure they are aware of the following:

- Obligations under the *Environmental Protection (Controlled Waste) Regulations 2004*; including tracking and transport;
- Condition 6 of the existing licence for the processing of sewage waste which excludes septage; and
- That all sewage waste must be treated through the WWTP prior to disposal to the irrigation field.

The department has made changes to the sewage specification wording under condition 5 (refer also to Appendix 1 for Licence condition 5, Table 4 for sewage waste) based on the following:

- Condition 5 limits the quantity of sewage accepted at 585 m³/day;
- Condition 6 outlines the sewage (excluding septage) processing requirements;
- Condition 10 provides limits for water quality discharged to the irrigation field; and
- Condition 15 requires monitoring of the WWTP discharge.

2.2.6 RO reject water used for dust suppression

The RO plant currently contributes reject water from the RO plant to the blended irrigation tank of the WWTP where it is blended with the treated effluent prior to discharge to the approved irrigation field.

Current operational demands require the proposed reuse of RO reject water for dust suppression where possible to stabilise and optimise the WWTP and RO plant.

The Licence Holder is seeking to utilise RO reject water for dust suppression within cleared, maintained and operational areas while maintaining the ability to dispose of blended RO reject with treated effluent to the irrigation field. The RO reject water will not be used on topsoil stockpiles, vegetated areas, during clearing operations or on rehabilitated areas.

The RO reject water will be contained in two separate tanks, one RO reject and effluent for blending prior to discharge to the irrigation field; and the other RO reject storage tank to supply the water cart with dust suppression water.

The RO reject water will be distributed via water cart sprays filled from a standpipe fed from 2x 100 kL skid mounted holding tanks.

The RO reject water produced by the RO plant is anticipated to produce an approximate Total Dissolved Solids (TDS) of 3,490 mg/L. *FMG 2023a* states that “*Monitoring data results (latest as at 6 February 2022), detected the TDS of the RO reject at 2,100 mg/L. Internal field monitoring results for TDS have ranged from 556 mg/L to 1,805 mg/L, averaging 1,000 mg/L.*” “*These TDS water quality results have been below the ANZECC guideline limits for tolerant crops (2,880 to 4,928 mg/L), that is in the range of acceptable groundwater TDS (111 mg/L to 3,170 mg/L).*”

Refer to Table 3 for a comparison of the RO reject water against the *ANZG 2018* and mean site groundwater (analysis completed in *Mining Proposal Registration ID: 93044*).

Refer to section 3 for the department’s risk assessment of this activity.

Table 3: Comparison of RO reject water quality with the ANZG 2018 and mean site groundwater quality

Analyte	Units	ANZG 2018 95% level of species protection	RO Reject Train 1	RO Reject Train 2	Mean Site Groundwater (From MP REG: ID 93044)	Total Samples Analysed
TDS (grav)	mg/L	-	2,100	2,100	858 (Max 3,170)	319
Electrical Conductivity (EC)	µS/cm	-	3,100	3,100	1,348 (Max 5,420)	321
pH	pH units	-	8.1	8.1	7.8	321
Aluminium-Dissolved	mg/L	0.055	<0.01	<0.01	0.013	310
Arsenic-Dissolved	mg/L	0.013	0.004	0.004	0.0097	265
Bicarbonate HCO ₃ as CaCO ₃	mg/L	-	1,600	1,600	403	296
Boron-Dissolved	mg/L	0.94	0.39	0.41	0.721	319
Beryllium-Dissolved	mg/L	-	<0.0005	<0.0005	0.0004	265
Cadmium-Dissolved	mg/L	0.0002	<0.0001	<0.0001	0.0001	265
Calcium-Dissolved	mg/L	-	140	150	40.6	296
Carbonate CO ₃ ²⁻ as CaCO ₃	mg/L	-	<5	<5	2	296
Hydroxide OH- as CaCO ₃	mg/L	-	<5	<5	1	293
Total Alkalinity as CaCO ₃	mg/L	-	1,600	1,600	404	296
Chloride	mg/L	0.003	260	250	202	292
Chromium-Dissolved	mg/L	0.001	0.004	0.003	0.0008	265
Cobalt-Dissolved	mg/L	-	<0.001	<0.001	0.0031	265
Copper-Dissolved	mg/L	0.0014	0.006	0.006	0.0035	265
Fluoride	mg/L	-	0.6	0.6	0.4	148
Iron-Dissolved	mg/L	-	<0.01	<0.01	0.54	311
Lead-Dissolved	mg/L	0.0034	<0.001	<0.001	0.0005	265
Magnesium-Dissolved	mg/L	-	290	310	95.2	296
Manganese-Dissolved	mg/L	1.9	<0.005	<0.005	0.1716	319
Mercury-Dissolved	mg/L	0.0006	<0.00005	<0.00005	0.00013	265
Molybdenum-Dissolved	mg/L	0.034	0.002	0.001	0.0026	188
Total Nitrogen	mg/L	-	2.1	2.1	0.49	278
Nickel-Dissolved	mg/L	0.011	0.002	0.002	0.0169	265
Nitrate as N	mg/L	-	1.9	1.9	0.45	171

Analyte	Units	ANZG 2018 95% level of species protection	RO Reject Train 1	RO Reject Train 2	Mean Site Groundwater (From MP REG: ID 93044)	Total Samples Analysed
Nitrite as N	mg/L	-	<0.005	<0.005	0.49	278
Potassium-Dissolved	mg/L	-	1.7	1.9	4.6	296
Selenium-Dissolved	mg/L	0.011	0.003	0.003	0.0042	265
Silver-Dissolved	mg/L	0.00005	<0.001	<0.001	0.0004	229
Sodium-Dissolved	mg/L	-	190	180	123.2	296
Sulphate	mg/L	-	200	190	106	296
Hardness as CaCO ₃	mg/L	-	1,600	1,700	558	3
Uranium-Dissolved	mg/L	0.0005	0.0011	0.0011	0.00601	185
Vanadium-Dissolved	mg/L	0.006	0.29	0.29	0.0314	265
Zinc-Dissolved	mg/L	0.008	0.016	0.017	0.089	265

*Red highlighted numbers indicate levels above ANZG 2018.

2.2.7 Additional discharge points

The Licence Holder has requested that the return water pond (RWP) contingency discharge spillway and oily water separator (OWS) be included on the licence as authorised emission points to enable emergency stormwater discharge.

RWP

All decant and runoff water collecting on the tailings beach of the TSF 2 is conveyed via gravity decant structures into outfall pipes to the RWP, which is directly downstream of the TSF 2.

Confinement for accumulated water in the RWP is achieved by small embankments approximately 1.5 km downstream of the TSF 2 embankment. All water in the RWP is pumped to process water ponds and re-used within the OPF only.

FMG 2023a states the RWP “modelling has shown a 1 in 330 chance of spillway overflow over the 20-year Life of Mine. All simulated spillway overflows result from coupled events comprising both high pond volume (above normal operating levels), and extreme rainfall events. In the event of an extreme rainfall event it is expected that all water storage locations will be at capacity and therefore require a controlled release to drainage lines.”

FMG 2023b advised that the RWP be withdrawn from this application along with TSF 2 (as supporting infrastructure was not yet fully constructed).

Based on this, the department has not added the RWP contingency spillway to the licence under this amendment. The inclusion of the RWP contingency spillway as an authorised discharge point should be included in the amendment associated with the operation of TSF 2.

OWS

An OWS has been constructed at the heavy vehicle wash bay under W6322/2019/1 (Iron Bridge 2022c).

The OWS receives wastewater and contaminated water from the heavy vehicle washdown; fuel farm bund; and other capture points around the Premises.

The OWS discharges to recirculation tanks whereby the water is tested to ensure total recoverable hydrocarbon (TRH) are below 15 mg/L. Upon return of results and if the TRH is less than 15 mg/L, the Licence Holder is proposing to:

- Utilise this treated water resource within the Premises for dust suppression; and
- In the event of major storm event (where dust suppression is not feasible), discharge the treated water into the existing stormwater drainage network on the Premises (FMG 2023d).

Refer to section 3 for the department’s risk assessment of this activity.

2.2.8 Ambient groundwater monitoring bores

The Licence Holder has requested that ambient groundwater monitoring quality bores NS-0624 and NS-0663 be removed as these bores are located within the TSF Stage 2 footprint and will be decommissioned.

The Licence Holder had requirements under W6322/2019/1 to submit a Seepage Monitoring Plan as shown below:

Condition 9: The works approval holder must, within 30 days of the submission of the Critical Infrastructure Containment Report in conditions 6 and 7, submit a Seepage Monitoring Plan. The plan must aim to establish background groundwater data of the local area, and must contain, but not be limited to:

- (a) *Bore locations (lateral and further downstream of the TSF and RWP);*
- (b) *Groundwater quality analysis after initial bore construction;*
- (c) *Identification of groundwater and other sensitive receptors;*
- (d) *Triggers and limits based on the background groundwater data of the local area;*
- (e) *Sampling frequency and parameters;*
- (f) *Reporting of results of monitoring such as standing levels of bores, piezometer readings, quality of groundwater and direction of groundwater flow; and*
- (g) *Review of the plan.*

A Tailings Storage Facility Monitoring Procedure (Iron Bridge 2022e) was received by the department on 04 November 2023.

Condition 3 of W6322/2019/1 also required the construction of groundwater monitoring bores downstream of the RWP. Refer to Table 4 for the water quality data of the RWP seepage monitoring bores.

Table 4: RWP seepage monitoring bores water quality data

Range	IB_RWP_MB1	IB_RWP_MB2	IB_RWP_MB3	IB_RWP_MB4	IB_RWP_MB5	IB_RWP_MB6	ANZECC 95% of Species Limit of Protection
Sample date	18/10/2022	18/10/2022	18/10/2022	18/10/2022	18/10/2022	18/10/2022	
pH	6.8	7.1	7.1	7.2	7.3	7.4	6.0-8.5
EC (µS/cm)	810	1700	1900	1900	2000	2000	-
TDS	560	1200	1400	1400	1400	1300	-
Al	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.055
As (V)	0.012	0.0010	0.0019	0.0017	0.0046	0.0039	0.013
B	0.21	0.36	0.44	0.48	0.56	0.64	0.37
Ba	0.047	0.015	0.013	0.023	0.061	0.051	-
Be	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00013
Cd	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0002
Cl	46	270	300	310	340	330	-
CN (Tot)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.007
Co	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	0.0014
Cr (VI)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001
Cu	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014
F	0.24	0.74	0.72	0.74	0.69	0.73	-
Fe	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.3
Hg	<0.000050	0.00027	0.000059	0.0046	<0.000050	0.000053	0.0006
Mn	0.34	0.017	0.019	0.11	0.31	0.24	1.9
Mo	<0.0010	0.0024	0.0031	0.0030	0.0052	0.0055	0.034
NH3 as N	0.031	<0.0050	<0.0050	0.005	<0.0050	<0.0050	0.9
Ni	0.024	0.0038	0.0081	0.0088	0.014	0.016	0.011
NO3 as N	0.050	2.1	0.99	0.58	0.038	0.70	0.7
NO2 as N	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Nox as N	0.011	0.48	0.23	0.13	0.01	0.16	-
Phosphorus	0.079	<0.05	<0.05	<0.05	0.055	<0.05	-
Phosphate as P	<0.005	0.011	0.011	0.019	0.034	0.029	-
TN as N	<0.10	0.55	0.25	0.14	<0.10	0.16	-
Organic Nitrogen	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-
Pb	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0034
Se (Tot)	<0.0010	0.0032	0.0022	0.0023	<0.0010	<0.0010	0.011
SO4	160	290	330	340	270	250	-
Sr	0.090	0.35	0.41	0.40	0.42	0.40	-
TKN as N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
U	0.0023	0.0054	0.0063	0.0063	0.012	0.014	0.0005
V	<0.0010	0.0019	0.0023	0.0027	0.0010	0.0081	0.006
WAD CN	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	-
Zn	0.0077	0.0018	0.0018	0.0039	0.0031	0.0015	0.008

0.001: value below detection limit

0.008: value exceeding ANZECC 95% of Species Limit of Protection

During this amendment the following changes have been made to Table 11 of Licence L8845/2014/1:

- Removal of bores NS-0624 and NS-0663 and inclusion of IB_RWP_MB1; IB_RWP_MB2; IB_RWP_MB3; IB_RWP_MB4; IB_RWP_MB5; and IB_RWP_MB6.
- Inclusion of Sulfate, Nitrite, Nitrate, Barium, Calcium and Strontium to the list of parameters; and
- Removal of Fluoride.

This is consistent with the ambient monitoring requirements for time limited operations under W6322/2019/1 and section 2.2 of *Iron Bridge 2022e* which requested the removal of Total Kjeldahl Nitrogen, Total Nitrogen, Total Phosphorus, Reactive Phosphorus, Ammonia, Total Cyanide, Weak Acid Dissociable Cyanide and Fluoride.

On 17 August 2023 the Licence Holder provided (FMG 2023d) the Safety Data Sheet for the flocculant (Magnafloc 336) used in the tails thickener process. This product is classified as anionic polyacrylamide which refers to a group of water-soluble molecules which are synthesised from acrylamide.

Based on this, the department has also included acrylamide as a parameter to be measured six-monthly under the ambient groundwater quality monitoring regime for the TSF.

2.2.9 Other amendments

The Licence Holder requested that condition 7, Table 5 of Licence L8845/2014/1 be updated for the Concrete Batch Plant 1; Concrete Batch Plant 2; and Aggregate and sand bins to reflect the Concrete Batching Facility Compliance Report (Iron Bridge 2020) received by the department on 04 September 2020.

The requested change has been made to the licence.

2.3 Part IV of the EP Act

The North Star Magnetite Project was assessed by the Environmental Protection Authority (EPA) and approved under Ministerial Statement (MS) 993.

- Conditions 6 and 7 relate to the Priority 1 *Pityrodia* sp;
- Condition 10 relates to maintaining the viability of the Pilbara Leaf-nosed Bat, through a Mine Exclusion Zone around Cave 13;
- Condition 11 ensures that mine construction and operational activities are carried out in a manner that minimises impacts to the Northern Quoll; and
- Condition 12 ensures that mining activities do not impact the water quality or hydrogeological regime of Site 12 Pool.

2.4 Aboriginal Heritage and Native Title

FMG 2023a states the Licence Holder will work to avoid impacting Aboriginal cultural heritage places wherever possible and will otherwise minimise and mitigate impacts. Where impacts cannot be avoided to Aboriginal cultural heritage places, the Licence Holder will seek the required consent under the *Aboriginal Heritage Act 1972* and *Aboriginal Cultural Heritage Act 2021* to undertake the prescribed activities and prior to doing so will seek to discuss and agree management and impact mitigation measures with the Traditional Owners of the area.

The Licence Holder regularly meets and consults with nominated representatives of the Nyamal traditional owner group to discuss all matters relating to the identification, protection and management of their cultural heritage. FMG and the Kariyarra People are parties to a Land Access Agreement (LAA) dated 10 October 2005. The LAA assists in facilitating FMG's exploration and mining activities within the Kariyarra determination area. FMG regularly meets and consults with nominated representatives of the Kariyarra over all matters relating to the identification, protection and management of their cultural heritage.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 5 below. Table 5 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 5: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction associated with category 64			
Dust	Construction of additional landfill trenches	Air/ windborne pathway	<ul style="list-style-type: none"> Regular inspections to ensure no visible dust. Water carts for dust suppression used as required.
Operation			
Category 52 - Emergency back-up power station (W6506/2021/1 Report and Iron Bridge 2022d)			
NOx SOx PM CO ₂	Combustion emissions from diesel fuel	Air/wind dispersion Additive effects of global cumulative GHG emissions	<ul style="list-style-type: none"> Only operated for back-up purposes. Equipment inspected, maintained and serviced regularly. Each generator unit has two vertical exhaust stacks and a minimum height of 2.5 m above ground level. <p>No further assessment required as there is sufficient separation distance to receptors (Woodstock Aboriginal Community situated 30 km south and Panorama Homestead located 40 km north-east).</p>
Noise	Operation of back up diesel generators	Air/ windborne / vibration pathway	<ul style="list-style-type: none"> All generators, inspected, maintained and serviced regularly. Generation units fitted with exhaust silencers.
Diesel, engine oil, transformer oil, coolant	Accidental release	Direct discharge Overland flow Contaminated stormwater run-off Infiltration to soil	<ul style="list-style-type: none"> Containment and storage infrastructure meet the requirements of: <ul style="list-style-type: none"> AS 1940 The storage and handling of flammable and combustible liquids; AS/NZ 3833 The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers; and Principal Chemical and Hydrocarbon Storage Procedure

Emission	Sources	Potential pathways	Proposed controls
			<p>(100-PR-EN-1064).</p> <ul style="list-style-type: none"> All generator units are containerised self-bunded to contain 110% volume of on-board engine fluids. Generator diesel day tanks are of double-walled design. Site roads designed to divert stormwater away from operational areas. The site has a 2% gradient slope across the operational area leading to a large stormwater drain to the western side of the site.
Category 64 (L8845/2014/1 Amendment Report granted 19 January 2023 and FMG 2023a)			
Dust	Covering of landfill trench Waste disposal Vehicle movements	Air/windborne pathway	<ul style="list-style-type: none"> Regular inspections to ensure no visible dust. Water carts for dust suppression used as required.
Odour	Increase in waste acceptance, handling, storage and burial at the Landfill	Air/windborne pathway	<ul style="list-style-type: none"> Waste covered at least weekly with dense inert and incombustible material. <p>No further assessment required.</p> <p>There is sufficient separation distance to receptors (Woodstock Aboriginal Community situated 30 km south and Panorama Homestead located 40 km north-east) and the proposed controls are adequate to mitigate the risk of odour impacts.</p>
Contaminated stormwater		Overland runoff Rainfall egress	<ul style="list-style-type: none"> Stormwater diverted away from the landfill cells. Drain along the eastern side of the trench, with the trench berm forming the western batter of the drain. The area along the northern side also directed to this drain.
Windblown waste		Air/windborne pathway	<ul style="list-style-type: none"> Waste covered at least weekly with dense inert and incombustible material. Stock-proof fence encloses the putrescible landfill site. Waste contained within facility, with any waste that has been washed or blown away from the tipping area returned at least monthly.

Emission	Sources	Potential pathways	Proposed controls
Leachate		Infiltration	<ul style="list-style-type: none"> Landfill located approximately 570 m from a mapped 250k dataset watercourse. Depth to groundwater at the landfill is approximately 20 m below ground level (mbgl). Not located in the vicinity of production bores used for drinking water supply.
Category 73 (W6315/2019/1 Report, Iron Bridge 2022a, Iron Bridge 2022b and FMG 2023b)			
Contaminated stormwater runoff containing hydrocarbons	Bulk fuel storage	Discharges to land	<ul style="list-style-type: none"> Steel aprons at the refuelling and unloading areas that are self-draining. Integrated sumps. Sumps emptied via a sucker truck and transported to the OWS at the heavy vehicle washdown facility.
Breach of containment		Infiltration to underlying groundwater	
RO reject water disposal (FMG 2023a)			
RO reject water	RO brine tanks	Pipeline ruptures Overflow	<ul style="list-style-type: none"> 2x 100 kL skid mounted holding tanks. Tanks connected to existing RO reject storage tank, utilising a 2 way valve. One line to the blended irrigation tank, the other to a separate tank with standpipe attached. Both lines have backflow valves to prevent any inadvertent mixing of effluent and RO into the discharge tanks. Overflow from storage tanks diverted into the overflow pond. Bunding installed to capture any excess discharge and drain back to the current wastewater overflow pond. Flow meters installed on both the standpipe line as well as the WWTP RO reject line. Visual observations of piping and standpipe undertaken to identify any leaks.
	RO reject water used for dust suppression	Discharges to land via dust suppression	<ul style="list-style-type: none"> Distributed via water carts fitted with trickle and spray bars to ensure water is controlled and directed to required area.

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> Applied to cleared, maintained and operational areas such as roads, active mine areas such as pit voids and waste rock landforms and ore stockpiles. RO reject water will not be used within major creek lines or drainage channels; in the vicinity of Conservation Significant Flora Species or Groundwater Dependent Ecosystem vegetation; on topsoil stockpiles; vegetated areas; during clearing operations; and or on rehabilitated areas. Visual monitoring of native vegetation, if impacts noted the use of RO water will cease in that location until vegetation stabilises. Dust suppression not required during and immediately following rainfall events therefore reducing surface water mobilising potential salts.
OWS treated water disposal			
OWS treated water	Used for dust suppression within Premises	Discharges to land via dust suppression	<ul style="list-style-type: none"> OWS designed to treat water to less than 15 mg/L TRH. OWS discharge to recirculation tanks whereby water is tested to ensure TRH is below 15 mg/L prior to use for dust suppression or discharge. Water used for dust suppression will be via watercart and within cleared operational areas. No discharge to drainage lines. Volume is limited at the capacity of the offshoot of the “clean tank”. Release is controlled and as on needs basis. Water discharge aligns with the <i>Water quality protection note 68: Mechanical equipment washdown</i> (Department of Water 2013).
	Emergency discharge of treated water (where dust suppression is not feasible) due to major storm events	Discharges to land via the stormwater drainage network	

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder’s from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 6 below provides a summary of potential environmental receptors that may be impacted

as a result of activities upon or emission and discharges from the prescribed premises (Guideline: *Environmental siting* (DWER 2020)).

Table 6: Environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Aboriginal and other heritage sites	Archaeological Place KAR057-01 mapped within premises boundary.
<i>Rights in Water and Irrigation Act 1914</i>	Premises is located within the Proclaimed Pilbara Groundwater and Surface Water Areas.
Threatened or Priority Fauna	<p>MS 993 places conditions on the Project in relation to the management of significant fauna species.</p> <p>Pilbara Leaf-nosed Bat caves recorded within the boundary.</p> <p>Cave 13 exclusion boundary is 520 m from the final boundary of the WRD footprint, 1.4 km east of the current used tyre storage, and 2.4 km from the landfill.</p>
Threatened or Priority Flora	<p>Threatened flora species <i>Quoya zonalis</i>.</p> <p>Mapped within the premises boundary.</p>
Groundwater	<p>Groundwater is generally neutral to slightly alkaline in pH and fresh to slightly brackish with recorded total dissolved solids (TDS) in the range of 300 mg/L to 3,500 mg/L.</p> <p>Depth to groundwater at the landfill is approximately 20 meters below ground level (mbgl).</p>
Surface water	<p>Drainage lines in the region are ephemeral in nature and generally only flow for short durations following rainfall events. Intermittent flows normally occur during the wet season with long periods without flows during the dry season.</p> <p>Numerous ephemeral drainage lines are found across the Premises. The main ephemeral drainage lies in the area are:</p> <ul style="list-style-type: none"> • Lost Boys creek to the north of the proposed mine pit, within the area required for the TSF, which ultimately flows into the Turner River (20 km away) via Cinnamon Creek (to the north of the Premises); and • An unnamed creek which roughly parallels the mine access road and flows into the Turner River just south of Pincunah Waterhole. <p>The landfill is located approximately 570 m from a mapped 250k dataset watercourse.</p> <p>There are no permanent watercourses within the premises boundary.</p>

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 7.

The Revised Licence L8845/2014/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 7: Risk assessment of potential emissions and discharges from the Premises operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
Construction								
Construction of additional landfill trenches	Dust	Air/windborne causing impact to amenity	Aboriginal Heritage Sites Vegetation	Refer to Section 3.1	C = Slight L = Possible Low Risk	Y	No additional conditions imposed. Existing conditions on licence relating to: <ul style="list-style-type: none"> • Condition 2 – Containment infrastructure for the Landfill Cell; and • Condition 6 - Waste processing. 	N/A.
Operation								
Category 52								
Operation of back up diesel generators	Noise	Air/windborne/vibration causing impact to health and amenity	Significant Fauna species	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Other regulatory controls apply including: <ul style="list-style-type: none"> • MS 933 (refer to section 2.3); and • <i>Environmental Protection (Noise) Regulations 1997.</i> 	N/A.
Storage and use of diesel; fuel, coolant and transformer oils for operation of back up diesel generators	Accidental release	Direct discharge to land and overland flow. Resulting in contamination in pathway of spill from inundation and infiltration	Surface water Significant Fauna species Vegetation	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	Y	Other regulatory controls apply including: <ul style="list-style-type: none"> • <i>Dangerous Goods Safety Act 2004;</i> • <i>Dangerous Goods Safety (Storage and Handling of Non-Explosives)</i> 	N/A.

Licence: L8845/2014/1

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
							<i>Regulations 2007;</i> <ul style="list-style-type: none"> • General provision of the EP Act; and • <i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i> 	
Category 64								
Covering of landfill trenches Disposal of waste Vehicle movements	Dust	Air/windborne pathway causing impacts to amenity	Aboriginal Heritage Sites Vegetation	Refer to Section 3.1	C = Slight L = Possible Low Risk	Y	No additional conditions imposed.	N/A.
Increase in waste acceptance, handling, storage and burial at the Landfill	Contaminated stormwater	Overland runoff and rainfall egress resulting in possible contamination of surface water	Surface water	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Existing conditions on licence relating to: <ul style="list-style-type: none"> • Condition 2 – Containment infrastructure for the Landfill Cell; 	N/A.
	Windblown waste	Air/windborne pathway causing impacts to amenity	Vegetation	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	<ul style="list-style-type: none"> • Condition 5 – Waste acceptance; • Condition 6 – Waste processing; and 	N/A.
	Leachate	Infiltration to soil and groundwater resulting in impacts to water quality	Soils Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	<ul style="list-style-type: none"> • Condition 7 – Operational requirements for the putrescible landfill. MS 933 also applies (refer to section 2.3).	N/A.

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
Category 73								
Bulk fuel storage	Contaminated stormwater runoff containing hydrocarbons	Discharges to land and infiltration to underlying groundwater resulting in contamination of soil; impacts to vegetation, groundwater and surface water and altered water quality	Soil Vegetation Groundwater Surface water	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Other regulatory controls apply including: <ul style="list-style-type: none"> • <i>Dangerous Goods Safety Act 2004;</i> • <i>Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007;</i> • General provision of the EP Act; and • <i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i> 	N/A.
	Breach of containment			Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y		N/A.
RO reject water								
RO reject water used for dust suppression onsite within cleared, maintained and operational areas such as roads, active mine areas such as pit voids and WRL and ore stockpiles	Over irrigation Discharge of brine with high concentrations of TDS Heavy metals	Discharges to land via dust suppression /spray drift producing surface salt formation Runoff affecting vegetation, soils, surface water Cumulative heavy metals impacting on plant growth if discharged outside of	Vegetation Soils Surface water	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	During this amendment the following conditions have been updated: <ul style="list-style-type: none"> • Condition 7 – requires a flow meter to be maintained on the standpipe line to monitor volume of RO reject water used for dust suppression; • Condition 9 – RO reject water used for dust suppression added as an authorised discharge point and specifies 	N/A.

Licence: L8845/2014/1

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
		cleared areas					<p>the areas that this can be applied; and</p> <ul style="list-style-type: none"> Condition 15 – Monitoring of the volume of RO reject water discharged for dust suppression. 	
OWS treated water disposal								
<p>Water treated through the OWS used for dust suppression onsite</p> <p>Emergency discharge of water treated through the OWS</p>	<p>Treated wastewater</p> <p>Potentially untreated wastewater</p>	<p>Discharges to land via dust suppression</p> <p>Untreated hydrocarbon wastewater and runoff impacting vegetation, soils and surface water</p> <p>Uncontrolled discharge</p>	<p>Vegetation</p> <p>Soils</p> <p>Surface water</p>	Refer to Section 3.1	<p>C = Minor</p> <p>L = Possible</p> <p>Medium Risk</p>	Y	<p>During this amendment the following changes have been made to the licence:</p> <ul style="list-style-type: none"> Condition 9 to include OWS treated water used for dust suppression and the emergency discharge of OWS treated water (L2) as authorised discharge points; Condition 10 with a TRH limit of 15 mg/L for the L2 discharge point and for dust suppression water; and Condition 15 for the monthly monitoring of TRH from the tanks holding the OWS treated water. 	N/A.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 8 provides a summary of the consultation undertaken by the department.

Table 8: Consultation

Consultation method	Comments received	Department response
Kariyarra Aboriginal Corporation RNTBC advised of proposal on 06/06/2023	No comments received	N/A
Nyamal Aboriginal Corporation RNTBC advised of proposal on 06/06/2023	No comments received	N/A
Licence Holder was provided with draft amendment on 07/08/2023	The Licence Holder responded on 17/08/2023 (FMG 2023d) Refer to Appendix 1	Refer to Appendix 1
Licence Holder was provided with a 2 nd draft amendment on 28/08/2023	The Licence Holder responded on 29/08/2023 stating they had no additional comments and requesting to waive the remaining consultation period.	N/A

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 9 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 9: Summary of licence amendments

Condition no.	Proposed amendments
Cover page Premises details	Removal of tenements L45/293 and L45/361; and inclusion of tenements M45/1244 and L45/292.
Cover page Prescribed premises category description	Category 52 capacity changed from 14 MW to 12.8 MW. Inclusion of category 64 with a design capacity of 6,800 tpa. Inclusion of category 73 with a design capacity of 2,500 m ³ . Removal of category 89.
Licence history	Table updated to remove reference to the works approvals and focus on L8845/2014/1 only.
Condition 1	Administrative changes only.

Condition no.	Proposed amendments
Condition 2	<p>Inclusion of reference to Figure/s, which depicts the location of each of the containment infrastructure.</p> <p>Reference to the process water dam and TSF updated to specify the containment infrastructure that has been previously assessed by the department. This being the process water dam at the old OPF location and TSF 1.</p> <p>The new infrastructure constructed under W6322/2019/1 (return water pond, process water pond, raw water pond and TSF 2) have not been assessed for inclusion in this licence.</p> <p>Requirement for TSF 1 updated to specify that this TSF has been decommissioned and capped.</p> <p>Removal of the return water holding tank located at the old OPF location.</p>
Condition 3	Reference to tailings storage facility updated to specify TSF 1 only.
Previous condition 4	Removed in accordance with the new licence format.
Condition 4	<p>Inclusion of new condition 4 which outlines the production or design capacity limits for category 5, 12, 52, 73 and 77 activities.</p> <p>To note: Design capacity limits for category 54 and 64 are within Table 4 (condition 5).</p>
Condition 5	<p>Removal of amount accepted from satellite sites within the premises boundary – refer to section 2.2.5.</p> <p>Inclusion of acceptance of raw untreated sewage from within the premises boundary and other locations as required – refer to section 2.2.5.</p> <p>Updated to specify that RO reject water is stored within the blended irrigation tank and RO reject storage tank.</p> <p>Landfill acceptance limit changed from 4,000 tpa to 6,800 tpa.</p>
Condition 6	<p>Landfill acceptance limit changed from 4,000 tpa to 6,800 tpa.</p> <p>Location of the Landfill Facility updated to depict the correct Figure.</p>
Condition 7	<p>Reference to Figure/s included.</p> <p>Requirement for a flow meter to be maintained on the standpipe line and WWTP RO reject line for dust suppression.</p> <p>Infrastructure associated with the concrete batch plant 1 and 2; and aggregate and sand bins updated.</p>
Condition 8	Administrative changes only.
Condition 9	Inclusion of new condition 9 to stipulate the authorised discharge points including emissions stacks of the back-up power station; RO reject water for dust suppression; and OWS treated water used for dust suppression and in the event of a major storm event (when dust suppression is not feasible).
Previous condition 9	Removed as these points were for the old power station. New back-up power station covered under new condition 9.
Previous condition 10	Removed, and now covered under new condition 9.
Previous condition 11	<p>Now condition 10.</p> <p>Emission limit for TRH included for the OWS treated water used for dust suppression and discharged to land at L2.</p>
Previous condition 12	Removed, all authorised discharge points now covered by new condition 9.

Condition no.	Proposed amendments
Previous condition 13	Now condition 11. Updated in line with new licence format with methods stipulated within monitoring tables.
Previous condition 14	Now condition 12. Updated to include quarterly monitoring and timeframe between samples.
Previous conditions 15 and 16	Now conditions 13 and 14. Administrative changes only.
Previous condition 17	Now condition 15. Inclusion of requirement to monitor and report volume, TDS and EC for RO reject water used for dust suppression. Inclusion to record the monthly volume of wastewater to irrigation. Inclusion of the OWS treated water holding tanks and monthly sampling of TRH.
Previous condition 18	Now condition 16. Table 10 – Administrative changes only. Table 11 – Removal of bores NS_0624 and NS_0663 and inclusion of bores IB_RWP_MB1; IB_RWP_MB2; IB_RWP_MB3; IB_RWP_MB4; IB_RWP_MB5; and IB_RWP_MB6. Inclusion of Sulfate, Nitrite, Nitrate, Barium, Calcium and Strontium. Removal of Fluoride. Inclusion of acrylamide. Refer also to section 2.2.8.
Previous condition 19	Removed in line with new licence format.
Previous condition 20	Now condition 18. Updated in line with new licence format.
Previous condition 21	Now condition 17 - No changes.
Previous condition 22	Now condition 19. Updated in line with condition requirements.
Previous conditions 23, 24 and 25	Now conditions 20, 21 and 22. Administrative changes only.
Definitions	Updated as required.
Figures	Previous Figure 1 removed and updated with new premises boundary Updated as required to align with licence conditions.

References

1. *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG) 2018 available at <http://www.waterquality.gov.au>.
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water 2013, *Water quality protection note 68: Mechanical equipment wash down*, September 2013, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2019, *Guideline: Industry Regulation Guide to Licensing*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. Ektimo 2023, *Fortescue Metals Group, EPS Diesel Generator Emission Testing 2023* (Report Number R013268), dated 17 April 2023 (DWERDT767620).
8. Environmental Protection Authority (EPA) 2023, *Environmental Factor Guideline: Greenhouse Gas Emissions*, Perth, Western Australia.
9. Fortescue Metals Group Ltd (FMG) 2023a, *FMG Submission of the Iron Bridge Licence Amendment for L8845/2014/1*, 17 March 2023 (DWERDT752141).
10. FMG 2023b, *RE: NOTIFICATION : AMENDMENT TO LICENCE (L8845/2014/1) – REQUEST FOR FURTHER INFORMATION – Attn: Leon Sheridan*, received 16 May 2023 (DWERDT779796 and DWERDT779797).
11. FMG 2023c, *RE: NOTIFICATION : AMENDMENT TO LICENCE (L8845/2014/1) – REQUEST FOR FURTHER INFORMATION – Attn: Leon Sheridan*, received 19 May 2023 (A2177031).
12. FMG 2023d, *Notice under section 59(B) of the Environmental Protection Act 1986 – Proposed Amendment to Iron Bridge Magnetite Project Licence L8845/2014/1*, received 17 August 2023 (DWERDT822641).
13. *Greenhouse Gas Emissions Policy for Major Projects* 2019, Western Australian Government, available at [Greenhouse Emissions Gas Policy-Major Projects.pdf \(dmp.wa.gov.au\)](https://www.dmp.wa.gov.au/Greenhouse-Emissions-Gas-Policy-Major-Projects.pdf).
14. Iron Bridge 2020, *Iron Bridge Concrete Batching Facility Licence – L8845/2014/1 Environmental Compliance Report* (IB-RP-EN-0001), dated 03 September 2020 (A1930632).
15. Iron Bridge 2022a, *W6315/2019/1 – Iron Bridge Bulk Fuel Storage Facility & Oil Water Separator Environmental Compliance Report* (662NS-0000-RP-EN-0058), dated 29 July 2022 (DWERDT638378).
16. Iron Bridge 2022b, *Re: Notification :Works Approval Compliance Report – Partial Compliance Demonstrated W6315/2019/1*, received 15 September 2022 (DWERDT660142).
17. Iron Bridge 2022c, *W6322/2019/1 – Iron Bridge Heavy Vehicle Workshop and Wash Bay Environmental Compliance Report* (662NS-0000-RP-EN-0060, Rev 0), dated 22 September 2022 (DWERDT664602).
18. Iron Bridge 2022d, *W6506/2021/1 Environmental Compliance Report, North Star (Iron Bridge) 44.8 MW Emergency Power Station* (662NS-0000-RP-EN-0064; Rev 0), dated 09 November 2022 (DWERDT685836).

19. Iron Bridge 2022e, *Tailings Storage Facility Monitoring Procedure* (Doc 662NS-0000-PR-EN-0020, Rev 0), dated 03 November 2022 (DWERDT682781).
20. *L8845/2014/1 Amendment Report* granted 19 January 2023 available at [Search - Department of Water and Environmental Regulation \(der.wa.gov.au\)](#).
21. Mining Proposal: North Star Stage 2 (Amendment 2) Version 3, Iron Bridge Project, 17 August 2022 (*Mining Proposal Registration ID: 93044*) available at <https://minedex.dmirs.wa.gov.au>.
22. *W6315/2019/1 Report* available at [Search - Department of Water and Environmental Regulation \(der.wa.gov.au\)](#).
23. *W6322/2019/1* available at [Search - Department of Water and Environmental Regulation \(der.wa.gov.au\)](#).
24. *W6506/2021/1 Report* available at [Search - Department of Water and Environmental Regulation \(der.wa.gov.au\)](#).

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Licence condition 2, Table 1 for the 'Landfill Cell'	The Licence Holder has requested the removal of 'Landfill cells not to exceed 78m x 30m x 3m' for flexibility and practical on-site management of multiple smaller trenches.	The department has made the requested change. Noting that the disposal of waste at the Premises is restricted by the category 64 capacity limit (condition 5); waste type and location (condition 6).
	The Licence Holder has requested an additional disposal area for the disposal of up to 40,000 tonnes of inert waste (concrete) within the Eastern Limb Sterilisation Dump Landform.	The department does not authorise this change at this time. This request was not part of the scope of amendments applied for under this licence amendment application and has therefore not been risk assessed. The Licence Holder will need to request this under another licence amendment.
Licence condition 3, Table 2, Row 3 for Frequency of inspection	The Licence Holder has requested that the inspection frequency be reduced within the amendment. On the basis of the following: <ul style="list-style-type: none"> • TSF 1 has been deemed decommissioned. • Mining activities taking place in the vicinity, safety issues have arisen due to restricted access to working areas. 	The department has updated the inspection frequency for the TSF 1 embankment freeboard to quarterly. The department has updated Table 2 to refer to TSF 1 only, noting that the active TSF 2 is being operated under W6322/2019/1 time-limited operations phase. The Licence Holder should ensure that outstanding compliance documentation for TSF 2 and its associated infrastructure is submitted to the department as soon as possible, followed by a licence amendment application for the inclusion of this infrastructure onto the licence.
Licence condition 5, Table 4 for sewage waste	The Licence Holder requests reference to the transfer of satellite sewage wastes with its removal and disposal. However the 585m ³ /day discharge limit is to remain as is. The Licence Holder proposed the following wording: Accepted from sewer inflow(s),	The department notes the existing specification under Table 4 of the licence is " <i>Accepted from sewer inflow(s), including up to 30 m³/day trucked from satellite sites within the premises boundary</i> ". The department has updated this to read <i>Accepted from sewer inflow(s)</i>

Licence: L8845/2014/1

Condition	Summary of Licence Holder's comment	Department's response
	<p>additional raw untreated sewage from other locations as required when all the below conditions are met:</p> <ul style="list-style-type: none"> - Sewage is raw and untreated, ie. No RO reject is permitted as part of this process. - Controlled waste tracking is undertaken. - Receiving WWTP is licenced and can accept the volume without exceeding the approved discharge quantity and discharge quality parameters. 	<p><i>Acceptance of raw untreated sewage from within the premises boundary and other locations as required.</i></p> <p>Refer also to section 2.2.5.</p>
<p>Licence condition 5, Table 4 for putrescible, inert waste type 1, inert waste type 2 (not including tyres)</p>	<p>The Licence Holder has stated that generated waste is inclusive from within the entire premise boundary for disposal to the landfill. It is not restricted to wastes from only Mine Site, Construction site and Village.</p> <p>It has been requested that this be changed to read "Accepted from within the Prescribed Premise Boundary including from the Iron Bridge Mine Site, site construction and village waste."</p>	<p>The department has updated this to "Accepted from within the premises boundary including from the Iron Bridge Mine Site, site construction and village waste".</p>
<p>Licence condition 16, Table 10 and Figure 13</p>	<p>The Licence Holder requests the removal of Table 10; Figure 13; and reference to both throughout the licence.</p> <p>The Licence Holder has stated that this surface water monitoring is related to the old OPF which no longer exists and sample points have been removed due to mine progression.</p>	<p>The department does not authorise this change at this time.</p> <p>This request was not part of the scope of amendments applied for under this licence amendment application and has therefore not been risk assessed. The Licence Holder will need to request this under another licence amendment.</p>
<p>Licence condition 19, Table 12 for condition 16 (surface water monitoring)</p>	<p>The Licence Holder requests the removal of this from Table 12.</p> <p>The Licence Holder has stated that these monitoring points have been removed as per comment above.</p>	
<p>Licence condition 19, Table 12 for condition 16 (groundwater monitoring)</p>	<p>The Licence Holder has requested that reference to the document 'North Star Groundwater Operating Strategy' (FMG, 20 February 2015, 661MI-0000-PL-HY-0001) be updated to 'Tailings Storage Facility Monitoring Procedure' (662NS-0000-PR-EN-020).</p> <p>The Licence Holder has stated that this document now operates under the Tailings Storage Facility Monitoring Procedure as provided to the department 04 November 2022.</p>	<p>The department has updated the reference to Tailings Storage Facility Monitoring Procedure" (662NS-0000-PR-EN-020).</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L8845/2014/1		
		Relevant works approval number:	<ul style="list-style-type: none"> • W6506/2021/1 - DER2021/000048 • W6322/2019/1 – DER2019/000575 • W6315/2019/1 - DER2019/000541 	N/A	<input type="checkbox"/>
Date application received		17/03/2023			
Applicant and Premises details					
Applicant name/s (full legal name/s)		IB Operations Pty Ltd (ACN 165 513 557)			
Premises name		Iron Bridge Magnetite Project			
Premises location		Mining Tenements M45/1226, L45/293, L45/294, L45/359, L45/360, L45/361, L45/361, L45/364 and L45/367 MARBLE BAR WA 6760			
Local Government Authority		Shire of East Pilbara			
Application documents					
HPCM file reference number:		DER2014/002065-1			
Key application documents (additional to application form):		Attachment 1A – Tenements Attachment 1B – ASIC Company Extract Attachment 1C – EP Act 1986 Legal Authority Attachment 2 – Prescribed Premises Boundary Prescribed Premises Boundary_GDA2020 Attachment 2B – Emission points Attachment 3B – IB-0000-AE-EN-0004 L8845 Amendment Response to Request for Further Information (DWERDT779796) IB Operations confirming amendment requests (A2177031)			
Scope of application/assessment					
Summary of proposed activities or changes to existing operations.		<p>An Under Validation - Request for Further Information was sent by DWER on 24/04/2023. The Licence Holder responded on 16/05/2023 and 19/05/2023 significantly reducing the number of amendment requests. The strikethrough are those that have now been requested to be removed from the Licence amendment application:</p> <ul style="list-style-type: none"> • Update premises boundary to accommodate infrastructure constructed under W6322/2019/1. • Increase category 5 capacity from 50,000 tonnes per annum (tpa) to 72,000,000 tpa to align with W6233/2019/1. • Transfer of constructed and commissioned infrastructure under W6322/2019/1 to the Licence which includes: <ul style="list-style-type: none"> ○ Process water pond ○ Raw water storage pond ○ Return Water Pond 			

	<p style="text-align: center;">TSF Stage 1A</p> <ul style="list-style-type: none"> Remove old power station (emission points to air) and replace with the emergency power station approved under Stage 1 of W6506/2021/1. Category 52 design capacity reduced from 14 MWe to 12.8 MWe. Update Table 2 of L8845/2014/1 to reduce the inspection requirements for Stage 1 TSF delivery pipelines to quarterly as the facility is now decommissioned. Table 2 to include TSF 2 inspections. Inclusion of category 73 with a design capacity of 3,600 2,500 m³ in aggregate. Update ambient groundwater quality bore locations due to operational expansion of the TSF2. Changes to the sewage facility operational processes to allow for reuse of reverse osmosis reject water for dust suppression where required. Increase to the satellite sewage acceptance volume from 30 m³/day to 80 m³/day with no changes to the category 54 approved design capacity. Inclusion of the return water pond spillway emergency discharge point (as per W6322/2019/1). Existing category 89 to be changed to category 64 and an increase in capacity from 4,000 tpa to 6,800 tpa.
--	--

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes per annual period	No change
Category 12: Screening, etc. of material	5,000,000 tonnes per annual period	No change
Category 52: Electric power generation	14 MWe per annual period	Stage 1 of W6506/2021/1 has been constructed with a total generation power of (8 x 1.6 MWe) = 12.8 MW. Licence will be amended to change the category 52 capacity from 14 MW to 12.8 MW.
Category 54: Sewage facility	585 m ³ /day	No change
Category 64:	N/A (4,000 tpa approved under Existing Licence for category 89)	6,800 tonnes per annual period
Category 73	N/A	It was requested to be 3,600 cubic metres in aggregate. Only partially constructed. Category 73 will be added to the

		licence under this amendment with a capacity of 2,500 m ³ in aggregate.
Category 77: Concrete batching or cement product manufacturing	217,000 tonnes per annual period	No change
Category 89: Putrescible landfill site	4,000 tonnes per annual period	To be removed and replaced by category 64
Legislative context and other approvals		
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Ministerial statement No: 993 EPA Report No: 1514
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Reference No: 2012/6689
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input checked="" type="checkbox"/> Expiry: Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Approval: Expiry date: If N/A explain why? Mining tenure
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Licence/permit No: GWL179289
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: Pilbara Type: Proclaimed Groundwater Area and Surface Water Area Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Regional office: North West

<p>Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>
<p>Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx</i>)</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p><i>Mining Act 1978</i> <i>Environmental (Unauthorised Discharges) Regulations 2004</i></p>
<p>Is the Premises within an Environmental Protection Policy (EPP) Area?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>N/A</p>
<p>Is the Premises subject to any EPP requirements?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>N/A</p>
<p>Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i>?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>Classification: N/A Date of classification: N/A</p>