



Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number W6315/2019/1

Applicant IB Operations Pty Ltd

ACN 165 513 557

DWER File Number DER2019/000541

Premises Iron Bridge Magnetite Project
Mining Tenements M45/1226, M45/1244, L45/293, L45/294,
L45/359, L45/360, L45/361, L45/364 and L45/367
MARBLE BAR WA 6760

Date of Report 24 March 2020

Status of Report Final

Table of Contents

1. Definitions of terms and acronyms	1
2. Purpose and scope assessment	4
2.1 Application details	4
3. Overview of Premises	7
3.1 Operational aspects	7
3.2 Infrastructure	9
3.3 Commissioning	11
4. Legislative context	11
5. Siting	12
5.1 Residential and sensitive Premises	12
5.2 Specified ecosystems	12
5.3 Groundwater and surface water sources	14
5.4 Soil type	15
5.5 Meteorology	15
6. Risk assessment	16
6.1 Determination of emission, pathway and receptor	16
6.2 Consequence and likelihood of risk events	30
6.3 Acceptability and treatment of Risk Event	31
6.4 Risk Assessment – Discharge of contaminated stormwater to land (commissioning and operation)	31
6.5 Risk Assessment –Discharges, spills and leaks of untreated wastewater, RO reject water and liquid chlorine to land (commissioning and operation)	34
6.6 Risk Assessment – Discharge of treated wastewater and RO reject water via irrigation (commissioning and operation)	36
6.7 Risk Assessment – Discharge of hydrocarbon from the BFSF to land (commissioning and operation)	40
7. Regulatory controls	43
7.1 Works Approval controls	44
7.2 Licence controls	46
8. Determination of Works Approval conditions	47
9. Consultation	48
10. Conclusion	48
Appendix 1: Key documents	49
Appendix 2: Summary of applicant’s comments on risk assessment and draft conditions	51

Tables

Table 1: Definitions	1
Table 2: Classification of premises and assessed design capacity.....	4
Table 3: Infrastructure and equipment.....	9
Table 4: Relevant approvals and tenure.....	11
Table 5: Receptors and distance from activity boundary	12
Table 6: Environmental values	12
Table 7: Groundwater and water sources.....	14
Table 8: Soil and sub-soil characteristics	15
Table 9: Identification of emissions, pathway and receptors during construction	16
Table 10: Identification of emissions, pathway and receptors during commissioning and operation.....	17
Table 11: Risk rating matrix.....	30
Table 12: Risk criteria table.....	30
Table 13: Risk treatment table	31
Table 14: Applicant's proposed controls for discharge of contaminated stormwater to land ...	32
Table 15: Applicant's proposed controls for discharges, spills and leaks of wastewater, RO reject water and liquid chlorine to land	35
Table 16: Expected effluent and influent discharge amounts.....	37
Table 17: Quality of treated effluent prior to blending with RO reject water	37
Table 18: Total Dissolved Solids in RO reject water	37
Table 19: Expected overall blended effluent concentrations.....	38
Table 20: Applicant's proposed controls for irrigation of treated wastewater effluent blended with RO reject water.....	38
Table 21: Applicant's proposed controls for discharge of hydrocarbons to land.....	40
Table 22: Risk assessment summary.....	42
Table 23: Summary of regulatory controls to be applied during construction	43
Table 24: Summary of regulatory controls to be applied during commissioning.....	43
Table 25: Summary of regulatory controls to be applied during time-limited operation	44
Table 26: Summary of conditions to be applied.....	47

Figures

Figure 1: Project location	5
Figure 2: Premises boundary	6

This page has been intentionally left blank.

1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Applicant	IB Operations Pty Ltd
BFSF	Bulk Fuel Storage Facility
BOD	Biochemical Oxygen Demand
°C	Degrees Celsius
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
cfu	Colony forming unit
Decision Report	refers to this document
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act
dS/m	deciSiemens per metre
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the <i>Public Sector Management Act 1994</i> and is responsible for the administration of the <i>Environmental Protection Act 1986</i> along with other legislation
EC	Electrical Conductivity
EP	Equivalent persons
EPA	Environmental Protection Authority

Term	Definition
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
ha	hectares
IBC	intermediate bulk container
kg/day	kilogram per day
kg/year	kilogram per year
kg/hectare/year	application rate
kL	kilolitre
km	kilometre
m	metre
m ³	cubic metres
m ³ /day	cubic metres per day
mbgl	Metres below ground level
mg/L	milligrams per litre
Minister	the Minister responsible for the EP Act and associated regulations
mL	millilitre
ML	megalitre
mm	millimetre
MS	Ministerial Statement
Mtpa	million tonnes per annum
NATA	National Association of Testing Authorities
NEPM	National Environmental Protection Measure
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act
OWS	Oil-water separator

Term	Definition
Prescribed Premises	has the same meaning given to that term under the EP Act
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
PECs	Priority Ecological Communities
Project	Iron Bridge Magnetite Project
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
RO	Reverse Osmosis
SAR	sodium adsorption ratio
TDS	Total Dissolved Solids
TECs	Threatened Ecological Communities
TN	Total Nitrogen
TP	Total Phosphorus
tpa	Tonnes per annum
TSS	Total Suspended Solids
TTC	Thermotolerant coliforms
TWL	Top Water Level
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)</i>
WWTP	Wastewater Treatment Plant
WQPN	Water Quality Protection Note

2. Purpose and scope assessment

On 3 October 2019, IB Operations Pty Ltd (the Applicant) applied for a new works approval under Part V, Division 3 of the *Environmental Protection Act 1986* (EP Act) for the Iron Bridge Magnetite Project (the Project) located in the Shire of East Pilbara.

The scope of this Decision report includes assessment of emissions and discharges associated with construction, commissioning and operation of infrastructure specified in section 2.1 in accordance with DWER's *Guidance Statement: Risk Assessments (February 2017)*.

2.1 Application details

The works approval application is for the following activities:

- Wastewater Treatment Plant (WWTP) and associated irrigation field and pipelines;
- Used tyre storage facility;
- Waste transfer station;
- Bulk Fuel Storage Facility (BFSF); and
- Landfill facility.

This works approval application is required in relation to the prescribed premises categories and design capacities detailed in Table 2.

Table 2: Classification of premises and assessed design capacity

Category	Description	Assessed design capacity
Category 54	Sewage facility: premises: a) on which sewage is treated (excluding septic tanks), or b) from which treated sewage is discharged onto land or into waters.	520 m ³ /day
Category 57	Used tyre storage (general): premises (other than premises within category 56) on which used tyres are stored.	Up to 150 tyres
Category 62	Solid waste depot: premises on which waste is stored, or sorted, pending final disposal or re-use.	4,000 tonnes per year
Category 73	Bulk storage of chemicals etc: premises on which acids, alkalis or chemicals that: c) contain at least one carbon to carbon bond, and d) are liquid at standard temperature and pressure, are stored.	3,600 m ³ in aggregate
Category 89	Putrescible landfill site: premises (other than clean fill premises) on which waste of a type permitted for disposal for this category of prescribed premises, in accordance with the <i>Landfill Waste Classification and Waste Definitions 1996</i> , is accepted for burial.	4,000 tonnes per year

Figure 1 and **Figure 2** illustrate the project location and premises boundary.



Figure 1: Project location

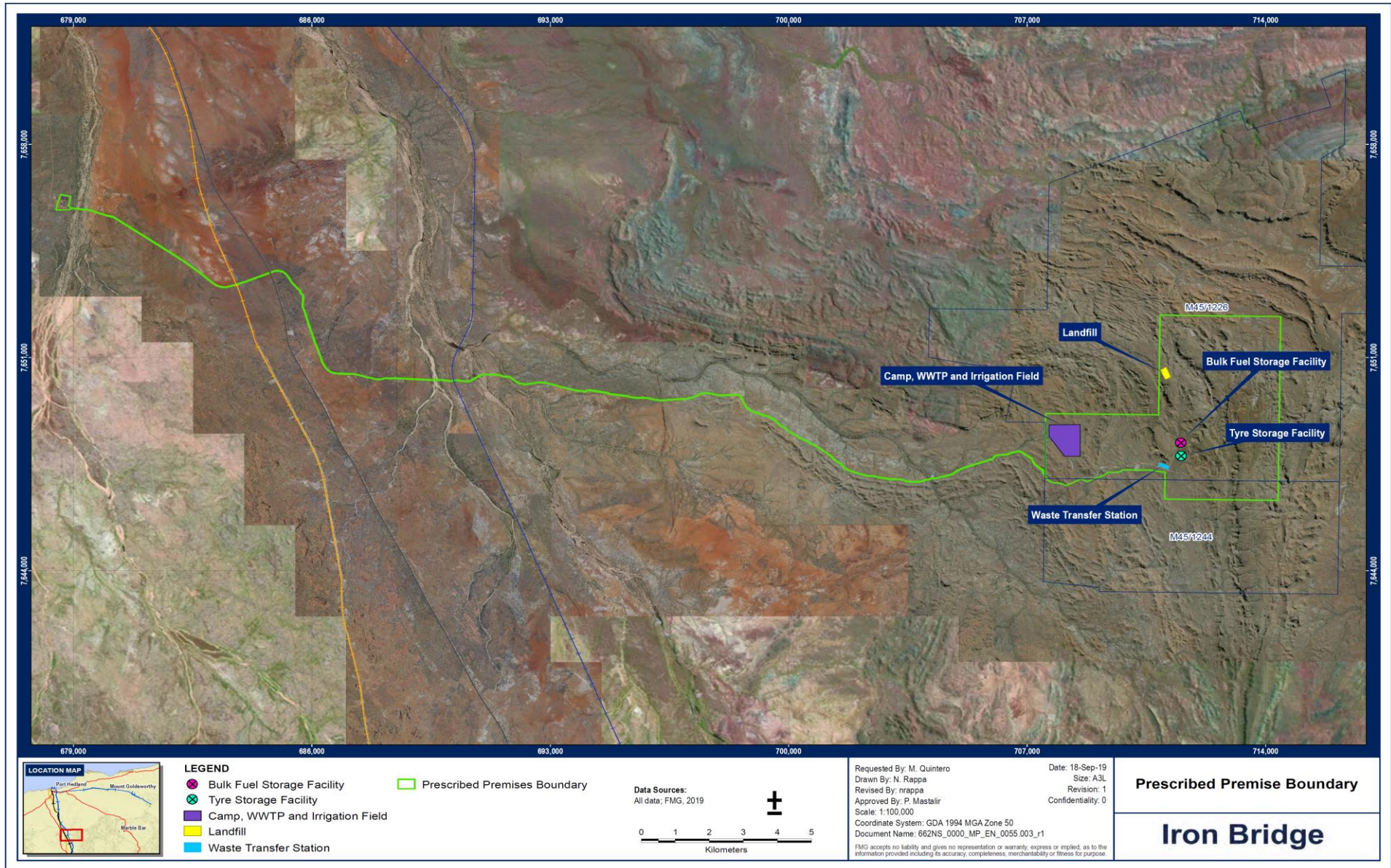


Figure 2: Premises boundary

3. Overview of Premises

3.1 Operational aspects

The Project will ultimately process up to 72 million tonnes per annum (Mtpa) of magnetite ore, producing up to 25 Mtpa of concentrate. Processing of ore and storage of tailings will be undertaken at the site, with product slurry and return pipelines reporting from the Project to a port facility in Port Hedland.

Stage 1 of the Project is constructed and operational, and is licensed under L8845/2014/1. The licence incorporates the following prescribed activities:

- North Star ore processing facility (Category 5);
- Power station (Category 52); and
- WWTP and irrigation field (Category 54).

This works approval – associated infrastructure

This Works Approval assessment, W6315/2019/1, is for part of Stage 2 of the Project. The assessment includes the following proposed prescribed activities:

- WWTP and irrigation field (Category 54 – proposed to replace the WWTP and expand the irrigation field licensed under Licence L8845/2014/1);
- Used tyre storage facility (Category 57);
- Waste transfer station (Category 62);
- BFSF (Category 73); and
- Landfill facility (Category 89).

Construction is planned to take several months and the estimated operating period for the premises is at least 20 years.

Ore processing and Tailings Storage Facility

A separate Works Approval application (W6322/2019/1) is being assessed for the balance of Stage 2 of the Project, due to the timing of activities coming online. That assessment will include the following proposed Prescribed Activities:

- Ore processing facility (Category 5 – proposed to replace the facility licensed under Licence L8845/2014/1); and
- Tailings Storage Facility (TSF) (Category 5).

Power is supplied by reticulated power supply from the Fortescue Solomon operations with battery backup.

3.1.1 WWTP and irrigation field

A WWTP will be constructed and designed to treat 490 m³/day of sewage (from 1400 persons at 350 Litres per person per day) with an additional 30 m³/day from satellite facilities (small ablution facilities located around the site, transported to the WWTP via truck).

The WWTP will be constructed close to the existing Stage 1 WWTP that is to be decommissioned when the WWTP for Stage 2 is commissioned.

The WWTP is intended to treat general domestic sewage from the following typical sources:

- Accommodation rooms;
- Laundries;
- Kitchen and outdoor mess areas (kitchen waste will pass through a grease trap prior to entering the sewer collection network);
- Floor waste drains in the bin wash down and recycling depot areas; and
- Ablutions throughout the Project.

No stormwater, laboratory waste or trade waste will be disposed to the WWTP. A spray irrigation field of approximately 16 ha is proposed for disposal of the treated effluent. Reverse Osmosis (RO) reject water will be blended with the treated effluent from the WWTP within the effluent holding tanks and discharged via the irrigation field.

It is expected that 140 m³/day RO reject water will be blended with treated effluent and discharged via the irrigation spray field, resulting in a total of 660 m³/day of combined wastewater discharged via the irrigation field.

3.1.2 Used tyre storage facility

The used tyre storage facility will be designed to hold a maximum of 150 used tyres approximately for a month (until there is a full load for transport off site) prior to being taken offsite for recycling or disposal at a licensed landfill facility.

Used tyres will be stored on a 0.1 ha earthen pad, with the tyres stacked to a height of 4 m. To reduce risk of fires, used tyre stacks will be stored no less than 6 m from any other tyre stack. Tyres will be stacked on their side walls and/or baled with a securing device made from a non-combustible material.

3.1.3 Waste transfer station

The waste transfer station will be approximately 3 ha in area and will segregate up to 4,000 tpa of waste and recyclable material generated by construction and operation of the Project.

The waste transfer station involves a laydown area constructed from compacted earth for temporary storage for waste collection before transport offsite to licensed facilities for final disposal or recycling. The different areas will be signposted and areas for the temporary storage of hazardous materials will be lined and bunded with a minimum capacity of 110% of the largest container stored within the bund, or 25% of the volume of all the containers within the temporary storage area, whichever is larger.

- A sediment pond sized to cater for a 1:2 year rainfall event will capture surface water run-off from the waste transfer station.
- A stock-proof fence will be installed around the waste transfer station that will also assist with reducing dispersion of wind-blown waste.
- Putrescible wastes will report to the onsite landfill facility and will not be stored at the waste transfer station.

3.1.4 Bulk Fuel Storage Facility

A permanent BFSF will be constructed for Project operations, consisting of approximately 18 individual self-bunded horizontal diesel-only storage tanks with a storage capacity of 200 kL each. The BFSF is designed to store approximately 3.6 ML of diesel, which is the anticipated fortnightly diesel demand for the Project. Fuel will be delivered fortnightly via triple road train. The BFSF will supply the mining fleet, power stations and other infrastructure.

Refuelling and unloading areas will be within concrete aprons that are self-draining to a contained sump sized for a 1:2 year, 1-hour rainfall event. A vac truck will be used to transfer the sump contents to an oil-water separator (OWS).

Coolants, lubrication and hydraulic oils for servicing the mobile fleet will be stored separately within workshop, maintenance and reagent areas.

3.1.5 Landfill facility

The landfill facility will be up to 5 ha with a capacity of approximately 4,000 tpa of putrescible waste, inert waste, hydrocarbon contaminated soils and waste meeting Class II criteria as defined in the Landfill Waste Classification and Waste Definitions 1996 (As amended 2019) (DWER 2019).

The landfill facility will be unlined and open cells will be up to 30 m in length. Each landfill cell will be progressively capped with approximately 1 m of excavated material.

A sediment pond sized to cater for a 1:20 year rainfall event, will capture surface water run-off from the landfill facility.

Three groundwater monitoring bores will be installed around the landfill site to determine if there are any impacts to groundwater quality as a result of waste disposal.

A stock-proof fence will be installed around the landfill facility to assist with reducing dispersion of wind-blown waste and prevent feral animal access.

3.2 Infrastructure

The infrastructure and equipment are outlined in Table 3 and the site layout is shown in **Figure 2**.

Table 3: Infrastructure and equipment

Ref	Infrastructure or equipment	Site Layout Plan (Figure 2)
Prescribed Activity Category 54: Wastewater Treatment Plant and irrigation area		
1.	Sewer pipeline from the Stage 2 Plant Infrastructure Facility, the site village (Japal Village) and connecting to the WWTP.	
2.	<p>Tanks:</p> <ul style="list-style-type: none"> • Balance Tank • Anoxic Tank • Aeration/Decant Tank. • Effluent Tank. • Sludge Tank: Construction: High-density polyethylene UV/abrasion resistant Enviroliner. <p>Freeboard is to be 400 mm above TWL; Overflows at 300 mm above TWL and plumbed to the (emergency) overflow pond.</p> <p>Process control: analogue level sensors and auxiliary high-high digital level switches.</p>	

Ref	Infrastructure or equipment	Site Layout Plan (Figure 2)
3.	Brine Tank: approx. 50 kL Freeboard is to be 400 mm above TWL; Overflows at 300 mm above TWL and plumbed to the (emergency) overflow pond. Process control: analogue level sensors and auxiliary high-high digital level switches.	
4.	Overflow pond: Working volume: 1000 kL at TWL; Construction: un-lined, constructed from compacted earth.	
5.	An alarm system which will activate in the event of a spillage, including any spills into the (emergency) overflow pond. Flow meters to record influent and effluent volumes.	
6.	Chemicals contained within 1000 L intermediate bulk containers (IBCs). The IBCs are housed inside purpose-built, fully bunded chemical storage containers.	
7.	Treated effluent irrigation area. (approx. 16 hectares in size)	
8.	Effluent rising main pipeline to irrigation field.	
Prescribed Activity Category 57: Used tyre storage		
9.	0.1 ha earthen pad with bunding to prevent stormwater ingress.	
Prescribed Activity Category 62: Waste transfer station		
10.	3 ha laydown area.	
11.	Unlined sediment pond designed to capture a 1 in 2 year event.	
12.	Temporary storage of hazardous materials lined and bunded (minimum capacity of 110% of the largest container stored within it, or 25% of the volume of all containers, whichever is larger). Bunded areas designed to hold any rainfall ingress and allow water to evaporate.	
13.	Stock-proof fence.	
Prescribed Activity Category 73: Bulk Fuel Storage Facility		
14.	18 x 200 kL self-bunded diesel-only storage tanks constructed and managed in accordance with the 'Australian Standard for Storage and Handling of Flammable and Combustible Liquids' (AS 1940-2018).	
15.	Pipework with bollards and/or earthen bunds.	
16.	Self-draining concrete aprons at refuelling and unloading areas draining to a sump.	
17.	Contained sump sized for a 1:2 year, 1-hour rainfall event.	

Ref	Infrastructure or equipment	Site Layout Plan (Figure 2)
18.	Oil-water separator (OWS)	
Prescribed Activity Category 89: Landfill facility		
19.	5 ha landfill area.	
20.	A perimeter drainage channel around the putrescible landfill.	
21.	A stormwater drainage pond designed to store a 1-in-20 year rainfall event.	
22.	Stock-proof fence.	
23.	3 x groundwater monitoring bores.	

3.3 Commissioning

Commissioning of the WWTP will be required and include validation monitoring conducted to ensure the WWTP is capable of treating wastewater to the required standard before operation.

Validation monitoring will be undertaken by obtaining influent and effluent samples over a six week period.

4. Legislative context

Table 4 summarises approvals relevant to the assessment.

Table 4: Relevant approvals and tenure

Legislation	Approval identification Number(s)	
<i>Mining Act 1978</i>	Reg ID 80247	Under assessment
EP Act Part IV	Ministerial Statement 993 (MS 993)	The proposed activities are within the Development Envelope. Conditions predominately relate to surveys and management plans to protect priority fauna within the Mine Development Envelope.
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)	Decision Notice EPBC 2012/6689	The Project was a controlled action for impacts to listed threatened species and communities (sections 18 & 18A of the EPBC Act), approved with conditions on 5 February 2015.
EP Act Part V (Clearing)	CPS 5427/5 CPS 6106/2 CPS 6236/2	In addition, clearing permit exemption applies under MS 993.

Legislation	Approval identification Number(s)	
<i>Rights in Water and Irrigation Act 1914</i>	GWL179289 CAW203155(1)	Applicant is not applying for further licences or permits – a valid licence/permit applies.
Dangerous Goods Licence	N/A	Yet to be acquired

5. Siting

5.1 Residential and sensitive Premises

The distances to residential and other sensitive receptors are detailed in Table 5.

Table 5: Receptors and distance from activity boundary

Sensitive receptors	Distance from Prescribed Activity
Residential Premises	There are no residential receptors within a 30 km radius of the Premises
Other mining areas	Atlas Iron Limited – Abydos Ore Project – 7 km north east BHP Billiton Iron Ore Pty Ltd - Turner Camp – 16 km south west Altura Lithium Operations Pty Ltd - Pilgangoora Lithium Project – 21 km north west Wodgina Lithium Pty Ltd - Wodgina Operations – 32 km west
Chinnamon Creek	Crossing from the north into the proposed TSF area within the premises boundary
Turner River	Approximately 20 km downstream and west of the activity

5.2 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at, or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 6. Table 6 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

The table aligns with the *Guidance Statement: Environmental Siting*. Surveys of flora and fauna have been previously conducted during the Part IV process under the EP Act (refer to Section 4).

Table 6: Environmental values

Specified ecosystems	Distance from the Premises
Ramsar Sites in Western Australia	Eighty Mile Beach approximately 160 km to the north east of the Premises

Specified ecosystems	Distance from the Premises
Important wetlands – Western Australia	De Grey River approximately 95 km north east of the Premises Leslie (Port Hedland) Saltfields System approximately 100 km north of the Premises Fortescue Marshes approximately 110 km south of the Premises
RIWI Act Pilbara Groundwater Area	Premises is within the Area
RIWI Act Pilbara Surface Water Area	Premises is within the Area
Department of Biodiversity, Conservation and Attractions Managed Lands and Waters	Mungaroona Range Nature Reserve approximately 70 km south west of the Premises
Threatened Ecological Communities and Priority Ecological Communities	Survey work did not record any Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the proposal's development envelopes (Source: EPA Report 1514). Nearest PECs are as follows: <ul style="list-style-type: none"> • Priority 1, Four plant assemblages of the Wona Land System approximately 90 km south and 125 km south west of the Premises • Priority 1, Freshwater claypans downstream of the Fortescue Marsh - Goodiadarrie Hills on Mulga Downs Station (Koodjeepindarranna Pool and GnoonaPool – South) approximately 110 km south west of the Premises • Priority 3, Eighty Mile Land System approximately 125 km north of the Premises, And therefore not a sensitive receptor to the proposed activities.
Biological component	Distance from the Premises
Threatened or Priority Flora	No Threatened or Priority Flora has been reported within the premises boundary or within 3 km of the proposed activity (information from DWER mapping database) – not considered sensitive receptors to the proposed activities.
Threatened or Priority Fauna	Pilbara Leaf-nosed Bat, Northern Quoll and Pilbara Olive Python are found in the area (Source: EPA Report 1514). These species are not considered sensitive receptors for the proposed activity due location and scale.

Specified ecosystems	Distance from the Premises
Other relevant ecosystem values	Distance from the Premises
Site 12 Pool	Located outside the eastern boundary of the Prescribed Premises, four individuals of the Pilbara Olive Python recorded which is an unusually high number of individuals for this species and suggests that this pool is particularly important habitat for this species (Source: EPA Report 1514). This site is not considered to be a sensitive receptor for the proposed activity due location and scale.
Cave 13	<p>Located toward the southern boundary of the Prescribed Premises.</p> <p>Cave 13 is a maternal roost cave for a large colony of approximately 200-250 individuals of Pilbara Leaf-nosed Bat and is located within the Mine Development Envelope. All natural known roost caves in the Pilbara region are habitat critical to the viability of the Pilbara Leaf-nosed Bat and a Mine Exclusion Zone of 100 m from the predicted lateral extent of Cave 13 has been imposed (Source: EPA Report 1514). This site is not considered to be a sensitive receptor for the proposed activity due location and scale.</p>

5.3 Groundwater and surface water sources

The distances to groundwater and water sources are shown in Table 7.

Table 7: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Major watercourses/waterbodies	<p>The Turner River is approximately 20 km downstream and west of the proposed activities.</p> <p>Two main ephemeral drainage lines are located within the Prescribed Premises:</p> <ul style="list-style-type: none"> • Chinnamon Creek is located within the area required for the TSF, which ultimately flows into the Turner River. • An unnamed creek which roughly travels parallel to the mine access road and flows into the Turner River. 	The Project lies on the catchment boundary of Turner River and Strelley River.
Unnamed ephemeral Creeks which flow into the Turner River.	Numerous creek lines cross the Project area.	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.

Groundwater and water sources	Distance from Premises	Environmental value
Groundwater	<p>Groundwater levels vary around the site:</p> <ul style="list-style-type: none"> • Depth to groundwater in the vicinity of the WWTP is reported by the applicant to be approximately 5 to 10 metres below ground level (mbgl). • Depth to groundwater at the irrigation area and the waste transfer station is reported by the applicant to be approximately 20 mbgl. The used tyre storage facility and the BFSF is near the waste transfer facility and is expected to have similar groundwater levels. • Depth to groundwater at the landfill is reported by the applicant to be approximately 50 mbgl. 	Groundwater salinity within the exploration and production bores is relatively low (fresh) to moderately brackish ranging between 300 mg/L and 1,750 mg/L.

5.4 Soil type

The Premises is located within the Chichester subregion of the Interim Biogeographic Regionalisation for Australia Pilbara Bioregion. The subregion is characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges.

Table 8 details soil types and characteristics relevant to the assessment.

Table 8: Soil and sub-soil characteristics

Soil characteristics	Distance from Premises	Environmental Value
Soil type classification	Within the premises	<p>The area is characterised by:</p> <ul style="list-style-type: none"> • Shallow stony soils along the ridgeline and mesas • Silt and clay rich soils within broad flat plains • Gravelly soils on the low hills, rises and slopes • Stony soils within dissected valleys and creek lines

5.5 Meteorology

The area experiences a dry desert climate, with hot dry summers and mild winters. The closest Bureau of Meteorology recording station to the Project is Marble Bar (Site No. 004106) located approximately 80 km east of the Premises.

Temperatures are generally high, with mean maximum temperatures at Marble Bar ranging from 27.0°C in July to 41.9°C in December. Average minimum temperatures at Marble Bar range from 12.1°C in July to 26.5°C in January. Mean annual rainfall is 394 mm, with January recording the highest monthly total of 107 mm. Evaporation rates are expected to be high, noting that at Port Hedland (Site No. 004032) located approximately 110 km north of the Premises, the evaporation rate is approximately 9 mm per day.

6. Risk assessment

6.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out. The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 9 and Table 10.

Table 9: Identification of emissions, pathway and receptors during construction

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Construction, mobilisation and positioning of WWTP and irrigation field, used tyre facility, waste transfer station, BFSF and landfill facility	Earthworks, vehicle movements, construction of plant and infrastructure	Noise Dust	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity impact Dust – potential health impacts	No	The Delegated Officer considers there is sufficient separation from sensitive receptors to mitigate the risk of noise and dust impacts.
		Potentially contaminated stormwater runoff - sedimentation	Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land	Increased sedimentation of surface water affecting water quality and surface water dependent organisms	No	The Delegated Officer considers there is sufficient separation from sensitive receptors to mitigate the risk of impacts to surface water receptors.
	Use and storage of hydrocarbons and reagents	Spills and breach of containment causing hydrocarbon or chemical discharge to land.	Soil and vegetation adjacent to areas of spill or breach Groundwater >5 mbgl	Direct discharge to land and infiltration to groundwater	Soil contamination inhibiting vegetation growth/survival, health impacts to fauna Groundwater contamination	No	Applicant to comply also with Australian Standard AS 1940 <i>The Storage and Handling of Flammable and Combustible Liquids</i>

Table 10: Identification of emissions, pathway and receptors during commissioning and operation

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Wastewater Treatment Plant normal operations (category 54)	Storage of raw and treated sewage, sewage sludge and screenings, and liquid chlorine (i.e. sodium hypochlorite).	Odour	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> Daily maintenance schedule to check for odours outside the facility. If odours are being produced, the source of the odours will be identified and any necessary repairs to the facility will be made. Low noise equipment and barriers will be installed where practicable to comply with the Environmental Protection (Noise) Regulations 1997. <p>The Delegated Officer considers there is sufficient separation from sensitive receptors, and that the proposed management measures adequately mitigate the risk of odour and noise impacts, and considers that additional regulatory controls are not required to mitigate this risk.</p>
	Operation of pumps and aeration unit	Noise					
	Stormwater runoff from WWTP spillage/ leak	Contaminated stormwater runoff – sewage and chemicals	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water with sewage affecting soil biota and native vegetation	Yes	See Section 6.4

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Wastewater Treatment Plant upset conditions (Category 54)	Spillage or leak sewage from: pipes, balance tank, screening tank, waste sludge storage tank, anoxic tank, aeration/decant tank and (emergency) overflow containment pond	Rupture/ failure of pipelines, overtopping of tanks and/or emergency overflow containment pond resulting in discharge to land	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water with sewage affecting soil biota and native vegetation	Yes	See Section 6.5
Irrigation/ spray area (Category 54)	Irrigation of treated effluent	Treated effluent blended with reject water from Reverse Osmosis Water Treatment Plant discharged to land	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water with sewage and RO reject water, affecting soil biota and native vegetation	Yes	See Section 6.6
		Contaminated stormwater runoff – sewage RO reject water	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water with sewage affecting soil biota and native vegetation	Yes	See Section 6.4

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Used tyre storage (Category 57)	Vehicle movements/ open areas	Dust	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> Dust suppression activities such as applying water to open areas and using biodegradable stabilising agents. An assessment of visible dust sources to devise appropriate treatment. Monitor and prepare for high risk weather conditions for dust emissions (i.e. windy weather). <p>The Delegated Officer considers there is sufficient separation from sensitive receptors, that operations are occurring within an established mine and that the proposed management measures adequately mitigate the risk of dust impacts.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>
	Fire – upset conditions	Contaminated fire water and burnt materials	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water, and affecting native vegetation	Yes	See Section 6.4
		Smoke	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	The Delegated Officer considers there is sufficient separation from sensitive receptors and considers that additional regulatory controls are not required to mitigate this risk.

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
	Storm water runoff from storage area	Contaminated fire water	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water, and affecting native vegetation	Yes	See Section 6.4
Waste transfer facility (Category 62)	Vehicle movements	Dust	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> • Dust suppression activities such as applying water to open areas and using biodegradable stabilising agents. • An assessment of visible dust sources to devise appropriate treatment. • Monitor and prepare for high risk weather conditions for dust emissions. <p>The Delegated Officer considers there is sufficient separation from sensitive receptors, that operations are occurring within an established mine and that the proposed management measures adequately mitigate the risk of dust impacts.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Storing hazardous/ controlled waste such as lead acid batteries, dry cell batteries, fluorescent light tubes and globes, printer cartridges, oily water, coolant, grease, medical waste and miscellaneous chemical waste.	Odour	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> No putrescible material will be stored in the waste transfer facility. Inspections conducted on a regular basis to ensure storage practices are adequate. Liquid waste is to be contained in sealed containers to minimise odour emissions. An investigation and appropriate remedial actions will be undertaken if odour complaints are received. Hazardous or controlled waste will be removed from site and disposed at an appropriately licensed facility. <p>The Delegated Officer considers there is sufficient separation from sensitive receptors, that operations are occurring within an established mine and that the proposed management measures adequately mitigate the risk of odour impacts.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
		Leachate from waste stored at the facility	Groundwater 20 mbgl	Infiltration to underlying groundwater	Contamination of groundwater	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> No putrescible material will be stored in the waste transfer facility. Areas for the temporary storage of hazardous materials will be lined and bunded, with a minimum capacity of 110% of the largest container stored within it, or 25% of the volume of all containers, whichever is larger. Bunded areas will be designed to hold any rainfall ingress and allow water to evaporate. Any spills will be controlled, contained and cleaned up in accordance with the Chemical and Hydrocarbon Spills Procedure (100-PR-EN-0014). <p>The Delegated Officer considers there is sufficient separation from groundwater, waste and recyclable material will be stored for relatively short periods and the proposed management measures adequately mitigate the risk of odour impacts.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>
	Sediment pond	Contaminated stormwater runoff - chemical and hydrocarbon spill.	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water, and affecting native vegetation	Yes	See Section 6.4

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
	Night time operations	Light	<p>Fauna present within the area</p> <p>Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine</p>	Air dispersion	Amenity	No	<p>The applicant has advised that the night time operations will be undertaken occasionally by portable diesel-powered lighting units.</p> <p>Impacts from light spill were assessed within the Public Environmental Review as part of the approval under Part IV of the EP Act (Assessment 1946).</p> <p>The Delegated Officer considers that there are existing light emissions occurring within an established mine and that, as night time activities will be occasional and the impacts were considered during the assessment under Part IV of the EP Act, there will not be a significant change in risk profile for light emissions.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>
	Fire- upset conditions	Contaminated fire water and burnt materials	<p>Soil, vegetation and groundwater</p> <p>Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises</p>	<p>Direct discharge to land.</p> <p>Infiltration to underlying groundwater</p>	Contamination of soil, groundwater and surface water, affecting native vegetation	Yes	See Section 6.4
		Smoke	<p>Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine</p>	Air / wind dispersion	Amenity	No	The Delegated Officer considers there is sufficient separation from sensitive receptors and considers that additional regulatory controls are not required to mitigate this risk.

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Bulk Fuel Storage Facility (Category 73)	Vehicle movements	Dust	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> Dust suppression activities such as applying water to open areas and using biodegradable stabilising agents. An assessment of visible dust sources to devise appropriate treatment. Monitor and prepare for high risk weather conditions for dust emissions. <p>The Delegated Officer considers there is sufficient separation from sensitive receptors, that operations are occurring within an established mine and that the proposed management measures adequately mitigate the risk of dust impacts.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>
	Bulk fuel storage	Contaminated stormwater runoff containing hydrocarbons	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water, and affecting native vegetation	Yes	See Section 6.4

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Light (night time operations)	<p>Fauna present within the area</p> <p>Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine</p>	Air dispersion	Amenity	No	<p>The applicant has advised that the night time operations will be undertaken occasionally by portable diesel-powered lighting units.</p> <p>Impacts from light spill were assessed within the Public Environmental Review as part of the approval under Part IV of the EP Act (Assessment 1946).</p> <p>The Delegated Officer considers that there are existing light emissions occurring within an established mine and that, as night time activities will be occasional and the impacts were considered during the assessment under Part IV of the EP Act, there will not be a significant change in risk profile for light emissions.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>
	Breach of containment causing hydrocarbon discharge to land	<p>Soil, vegetation and groundwater</p> <p>Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises</p>	<p>Direct discharge to land.</p> <p>Infiltration to underlying groundwater</p>	Contamination of soil, groundwater and surface water, and affecting native vegetation	Yes	See Section 6.7
	Sump / oil-water separator	Spills of hydrocarbons during refuelling	<p>Soil, vegetation and groundwater</p> <p>Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises</p>	<p>Direct discharge to land.</p> <p>Infiltration to underlying groundwater</p>	Contamination of soil, groundwater and surface water, and affecting native vegetation	Yes

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Putrescible Landfill (Category 89)	Stockpiled cover material, trench excavation, vehicle movement and covering activities	Dust	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> • Dust suppression activities such as applying water to open areas and using biodegradable stabilising agents. • An assessment of visible dust sources to devise appropriate treatment. • Monitor and prepare for high risk weather conditions for dust emissions (i.e. windy weather). <p>The Delegated Officer considers that there is sufficient separation from sensitive receptors, that operations are occurring within an established mine and that the proposed management measures adequately mitigate the risk of dust impacts.</p> <p>The Delegated Officer considers that additional regulatory controls are not required to mitigate this risk.</p>

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Waste acceptance, handling, storage and burial	Odour	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	<p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> Waste is to be covered on a regular basis. Regular inspection schedule to ensure adequate waste storage practises. An investigation and appropriate remedial actions will be undertaken if odour complaints are received. Internal management measures. <p>The Delegated Officer considers there is sufficient separation from sensitive receptors and the proposed management measures adequately mitigate the risk of odour and noise impacts, and considers that additional regulatory controls are not required to mitigate this risk.</p>
	Windblown waste	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity Nuisance	No	<p>The applicant has committed to covering waste on a regular basis. The Delegated Officer considers there is sufficient separation from sensitive receptors and the proposed management measures adequately mitigate the risk of windblown waste impacts, and considers that additional regulatory controls are not required to mitigate this risk.</p>
	Contaminated stormwater runoff	Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge (stormwater contaminated with leachate and/or sediment)	Contamination of stormwater potentially impacting on surface water systems	Yes	See Section 6.4

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
		Seepage of leachate	Soils Groundwater 50 mbgl	Infiltration to underlying groundwater	Contamination of soil and impacts to groundwater or surface water quality	No	<p>The landfill will be developed using four cells, each with a depth of approximately 2 m. Open cells will be no more than 30 m in length at any time.</p> <p>The applicant has committed to the following management measures:</p> <ul style="list-style-type: none"> Landfill will operated in accordance with the <i>Environmental Protection (Rural Landfill) Regulations 2002 (WA)</i>. The landfill is located 570 m from a watercourse. The depth to groundwater at the landfill is approximately 50 mbgl. Clinical waste and asbestos will not be disposed at the landfill. <p>The Delegated Officer considers there is sufficient separation from sensitive receptors and the proposed management measures adequately mitigate the risk of seepage, and considers that additional regulatory controls are not required to mitigate this risk.</p>
	Stormwater drainage pond	Contaminated stormwater runoff	Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge (stormwater contaminated with leachate and/or sediment)	Contamination of stormwater potentially impacting on surface water systems	Yes	See Section 6.4
	Burning green waste	Fire (contaminated fire water and burnt materials)	Soil, vegetation and groundwater Surface water receptors; ephemeral creeks which feed into the Turner River 20 km west of the Premises	Direct discharge to land. Infiltration to underlying groundwater	Contamination of soil, groundwater and surface water	Yes	See Section 6.4

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Fire (smoke)	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air / wind dispersion	Amenity	No	The Delegated Officer considers there is sufficient separation from sensitive receptors and considers that additional regulatory controls are not required to mitigate this risk.
	Attraction of pests and vermin	Closest receptor is the Atlas Iron Limited Abydos Ore Project accommodation camp located 7 km north east of the mine	Air and land via insects, birds and rodents	Amenity Pest-associated diseases	No	The applicant has committed to covering waste on a regular basis. The Delegated Officer considers that there is sufficient separation from sensitive receptors and that the proposed management measures adequately mitigate the risk of pest impacts, and considers that additional regulatory controls are not required to mitigate this risk.

6.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 11.

Table 11: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 12.

Table 12: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
		Environment	Public health* and amenity (such as air and water quality, noise, and odour)	
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

[^] Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

"onsite" means within the Prescribed Premises boundary.

6.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment Table 13.

Table 13: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

6.4 Risk Assessment – Discharge of contaminated stormwater to land (commissioning and operation)

6.4.1 Description of discharge of contaminated stormwater to land impacting groundwater and surface water (operation)

During operation of the WWTP, contaminated or potentially contaminated stormwater may result from leaks or spills of wastewater and/or liquid chlorine (i.e. sodium hypochlorite) and/or sludge/biosolids from tanks or pipelines at the WWTP. Section 6.5 details the assessment for discharges or leaks of untreated wastewater and liquid chlorine which could report to the stormwater system.

Waste and recyclable material temporarily stored at the Waste Transfer Station may result in contaminated or potentially contaminated stormwater from a chemical or hydrocarbon spill.

During operation of the BFSF, contaminated or potentially contaminated stormwater may result from leaks or spills of hydrocarbons tanks or dispensing pipelines.

Putrescible wastes disposed of within the landfill may interact with stormwater and become contaminated or potentially contaminated.

Used tyre storage may result in contaminated or potentially contaminated stormwater if a fire and fire suppressants are uncontrolled, and flow into surrounding surface water systems.

6.4.2 Identification and general characterisation of emission

For the WWTP, the breakdown of pumps, rupture or failure of pipes and tank failure may result in the unintentional release to land of treated wastewater or sludge/biosolids. Operation of the waste transfer station and the BFSF may result in spills of chemicals or hydrocarbons. The used tyre storage is unlikely to result in potentially contaminated stormwater, however, it may generate fire water containing fire suppressants.

6.4.3 Description of potential adverse impact from the emission

Discharges may result in surface water contamination and to a lesser extent, groundwater contamination (via infiltration), localised soil contamination, vegetation degradation.

6.4.4 Applicant controls

This assessment has reviewed the controls set out for discharge of contaminated stormwater to land in Table 14.

Table 14: Applicant’s proposed controls for discharge of contaminated stormwater to land

General – WWTP	
The WWTP has been located outside the 1-in-100 year average flood extent.	
All wastewater storage components of the WWTP will be impermeable (i.e. fiberglass, concrete or lined with HDPE).	
WWTP tanks will be installed on an impermeable concrete pad.	
The WWTP will be installed as per manufacturer specifications.	
For commissioning, the applicant has indicated that the following management measures will be implemented: <ul style="list-style-type: none"> • The WWTP will be inspected prior to filling with water to ensure it has been constructed according to manufacturer specifications. • Fresh water will be used to test the WWTP for leaks prior to filling with wastewater. • Verification and validation monitoring will be undertaken in accordance with Department of Health <i>Guidelines for the Non-potable Uses of Recycled Water in Western Australia</i>. 	
Potentially contaminated soil will be removed and taken to a licensed facility.	
An alarm system will be used which will activate in the event of a spill, including any spills into the emergency overflow pond.	
All pipelines will be inspected on a regular basis for leaks or damage.	
Provide hydrocarbons and chemical spill control training and equipment to staff and contractors.	
Keep clean and potentially contaminated stormwater separate.	
Site infrastructure	Description – WWTP
Sludge storage tanks	Sludge generated from the treatment process will be stored in separate sludge storage tanks and pumped directly from the tanks during sludge removal to avoid spills.
	Freeboard of 400 mm will be maintained within the tank to ensure overspill does not occur, with overflows set at 300 mm above the TWL and plumbed to the overflow pond. The tank will have both analogue level sensors and auxiliary high-high digital level switches.
Sludge disposal	Sludge will be dewatered within the WWTP and disposed of periodically at the onsite landfill or in an approved landfill facility.

General – used tyre storage facility	
Stormwater will drain into the broader (already existing) workshop drainage system, which diverts stormwater to settlement basins prior to discharge into the environment.	
Any fire suppressants captured within the settlement basins will be taken to a licenced facility after a fire event.	
Low toxicity fire suppressants will be used, where available.	
General – waste transfer facility	
Spill response equipment including absorbent socks, pillows or mats will be available.	
Site infrastructure	Description – waste transfer facility
Waste transfer facility	Temporary storage areas for hazardous materials will be lined and bunded.
	Bunded areas will have a minimum capacity of 110% of the largest container stored within it, or 25% of the volume of all containers, whichever is larger.
Sediment pond	Sediment pond designed to capture a 1 in 2 year event.
	Periodically remove built-up sediment in the sediment pond.
	Regularly inspect for the presence of a hydrocarbon sheen, and after any significant rainfall.
General – BFSF	
The BFSF will be located outside the 1-in-100 year flood zone.	
Fuel storage and dispensing facilities constructed and managed in accordance with the 'Australian Standard for Storage and Handling of Flammable and Combustible Liquids' (AS 1940-2018).	
Spill response equipment including absorbent socks, pillows or mats will be available.	
Site infrastructure	Description – BFSF
Pipework	Bollards and/or earthen bunds will be installed to protect pipework at risk of vehicle strike.
Diesel storage tanks	Diesel storage tanks will be self-bunded.
	All storage tanks will be inspected for leaks on a regular basis and any leaks found will be repaired.
Sump	Self-draining concrete aprons at refuelling and unloading areas draining to a sump sized for a 1:2 year, 1-hour rainfall event. Contents transferred to an OWS.
Oil-water separator	Spills and contaminated runoff will be directed towards an OWS designed to discharge water that does not contain greater than 15 mg/L Total Recoverable Hydrocarbons (TRH).

General – landfill	
The landfill will be located outside the 1-in-100 year flood zone.	
The facility will be operated in accordance with the <i>Environmental Protection (Rural Landfill) Regulations 2002 (WA)</i> .	
No hazardous or liquid wastes will be disposed of in the landfill facility.	
Waste will be covered on a regular basis.	
A drainage sump will be constructed within the landfill site to capture any potentially contaminated stormwater within the operational areas.	
Site infrastructure	Description – landfill
Landfill stormwater diversion channel	Stormwater will be diverted around the operational areas using a perimeter drainage channel constructed around the upslope side of the landfill site.
Stormwater drainage pond	A stormwater drainage pond designed to store a 1-in-20 year rainfall event to capture potentially contaminated stormwater.
	Stormwater captured within the stormwater pond will be disposed of via evaporation within the stormwater pond or placed in the landfill.

6.4.5 Consequence

If discharge of contaminated stormwater to land occurs, the Delegated Officer has determined that the impact of unplanned release to land of treated wastewater, sludge/biosolids, chemicals, hydrocarbons or fire water containing fire suppressant will have minimal impact. Therefore, the Delegated Officer considers the consequence of discharge of contaminated stormwater to land to be **Slight**.

6.4.6 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of discharge of contaminated stormwater to land could occur at some time. Therefore, the Delegated Officer considers the likelihood to be **Possible**.

6.4.7 Overall rating of discharge of contaminated stormwater to land impacting groundwater and surface water

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of discharge of contaminated stormwater impacting groundwater and surface water is **Low**.

6.5 Risk Assessment –Discharges, spills and leaks of untreated wastewater, RO reject water and liquid chlorine to land (commissioning and operation)

6.5.1 Description of discharges, spills and leaks of untreated wastewater, RO water and chlorine to land impacting surface water

Unplanned release of nutrient rich untreated wastewater, RO reject water and liquid chlorine (i.e. sodium hypochlorite) to land due to containment failure or overtopping.

6.5.2 Identification and general characterisation of emission

The breakdown of pumps, rupture or failure of pipes, tank failure and/or overtopping of emergency overflow containment pond may result in the unintentional release to land of nutrient rich wastewater. A worst-case scenario would be a complete rupture of the balance tank (containing wastewater prior to treatment). Unblended RO reject water may introduce salt in higher concentrations (Total Dissolved Solids [TDS] of approximately 3500 mg/L) than reports to the irrigation area (refer to Section 6.6 for the risk assessment of discharging treated effluent to the irrigation area) and sodium hypochlorite used for disinfection in the WWTP could be spilled into the environment.

6.5.3 Description of potential adverse impact from the emission

Discharges may result in surface water contamination and to a lesser extent, groundwater contamination (via infiltration), localised soil contamination, vegetation degradation.

6.5.4 Applicant controls

This assessment has reviewed the Applicant controls for discharges, spills and leaks of wastewater, RO reject water and liquid chlorine to land as set out in Table 15.

Table 15: Applicant’s proposed controls for discharges, spills and leaks of wastewater, RO reject water and liquid chlorine to land

General
The WWTP will be installed as per manufacturer specifications.
<p>For commissioning, the applicant has indicated that the following management measures will be implemented:</p> <ul style="list-style-type: none"> • The WWTP will be inspected prior to filling with water to ensure it has been constructed according to manufacturer specifications. • Fresh water will be used to test the WWTP for leaks prior to filling with wastewater. <p>Any incident involving a spills will be responded to immediately with any contaminated soil removed and taken to a licensed facility.</p>
The WWTP will use an alarm system which will activate in the event of a spillage, including any spills into the emergency overflow pond.
Contaminated soil from a spill of untreated sewage will be removed and taken to a licensed facility. Remediation actions will be taken to minimise the risk of reoccurrence.
All pipelines will be inspected on a regular basis.
Sodium hypochlorite will be contained within a designated storage area at the WWTP.
<p>Training to staff assigned with the WWTPs operation will consist of:</p> <ul style="list-style-type: none"> • The normal operation of the WWTP and resolving unusual operating conditions. • How to perform regular maintenance on the WWTP.

Site infrastructure	Description
WWTP tanks	Installed on an impermeable concrete pad.
	Sufficient freeboard maintained to ensure overspill does not occur.
	Wastewater storage components will be impermeable. The construction of the balance, anoxic, aeration/decant, effluent and sludge tanks utilises a bolted Galvabond steel panel shell and High-density polyethylene UV/abrasion resistant Enviroliner. The RO reject water (brine) tank will be constructed from rotational moulded low-density polyethylene.
Emergency overflow pond	Will capture any potential overflow due to process upset, spills and leaks from any part of the WWTP.
	The pond will be constructed compacted clay earth to minimise seepage.

6.5.5 Consequence

If discharge or spillage of untreated, or partially untreated sewage, RO reject water and/or liquid chlorine from Premises storage, treatment or transfer infrastructure occurs, then the Delegated Officer has determined that soil or groundwater contamination and native vegetation degradation will have minimal impact. Therefore, the Delegated Officer considers the consequence of the Risk Event to be **Slight**.

6.5.6 Likelihood of Risk Event

Based upon the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of discharges, spills and leaks of untreated wastewater, RO reject water and liquid chlorine to land causing soil or groundwater contamination and native vegetation degradation could occur at some time. Therefore, the Delegated Officer considers the likelihood of the Risk Event to be **Possible**.

6.5.7 Overall rating of discharges, spills and leaks of untreated wastewater, RO water and liquid chlorine to land impacting surface water

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk posed by nutrient rich wastewater or brine discharge to land impacting surface water is **Low**.

6.6 Risk Assessment – Discharge of treated wastewater and RO reject water via irrigation (commissioning and operation)

6.6.1 Description of discharge of treated wastewater and RO reject water to land impacting surface water

Irrigation of sprayfield with treated wastewater effluent from the WWTP blended with RO reject water containing high levels of nutrients and salts, respectively.

6.6.2 Identification and general characterisation of emission

Up to 520 m³/day of treated effluent from the WWTP will be blended with 140 m³/day of RO reject water before being irrigated to the irrigation field (660m³/day total). The expected influent and effluent discharge amounts is outlined in Table 16.

Table 16: Expected effluent and influent discharge amounts

Parameter	Description
Equivalent persons (EP); usage	1400; 350 Litres per EP per day
Raw influent to the WWTP	490 m ³ /day
Influent from satellite facilities	30 m ³ /day
Treated effluent from the WWTP	520 m ³ /day
RO reject water	140 m ³ /day
Total blended effluent volume (at full capacity)	660 m ³ /day

The WWTP will be designed to treat effluent as outlined in Table 17.

Table 17: Quality of treated effluent prior to blending with RO reject water

Parameter	Concentration
Biochemical Oxygen Demand (BOD)	<20 mg/L
Total Suspended Solids (TSS)	<30 mg/L
Total Nitrogen (TN)	<30 mg/L
Total Phosphorus (TP)	<8 mg/L
Thermotolerant coliforms (TTC)	<1000 CFU/100 mL
Residual Free Chlorine	0.5-2.0 mg/L
pH	6.5-8.5

The expected dilution of the RO reject water TDS to be disposed of via the irrigation field after blending with the WWTP treated effluent is shown in Table 18.

Table 18: Total Dissolved Solids in RO reject water

Parameter	Description
TDS in RO reject water (Applicant 2019b; Attachment 2)	3492.3 mg/L
Dilution	4.7
TDS	743 mg/L

The concentrations presented in Table 17 will be further reduced with the blending of the RO reject water as that stream is not anticipated to contain significant amounts of the parameters in Table 17. Overall effluent concentrations of blended effluent to be discharged to the irrigation field are shown in Table 19.

Table 19: Expected overall blended effluent concentrations

Effluent Parameter	Concentration
Biochemical Oxygen Demand (BOD)	<20 mg/L
Total Suspended Solids (TSS)	<23.6 mg/L
Total Nitrogen (TN)	<23.6 mg/L
Total Phosphorus (TP)	<6.23 mg/L
Thermotolerant coliforms (TTC)	<1000 CFU/100 mL
Residual Free Chlorine	0.5-2.0 mg/L
pH	6.5-8.5
TDS	743 mg/L

6.6.3 Description of potential adverse impact from the emission

If the final blended effluent does not meet the criteria as detailed in Section 6.6.2, there could be a potential for soil and groundwater contamination, impacts on soil structure (from salts), native vegetation degradation and surface water receptors (i.e. via ephemeral creeks which feed into the Turner River 20 km west of the Premises).

6.6.4 Criteria for assessment

Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality (ANZECC 2000).

6.6.5 Applicant controls

This assessment has reviewed the Applicant controls for irrigation of treated wastewater effluent blended with RO reject water as set out in Table 20.

Table 20: Applicant's proposed controls for irrigation of treated wastewater effluent blended with RO reject water

General
Hydraulic application rate greater than 4 mm to prevent pooling.
Irrigation will not occur during significant rainfall events.
During commissioning, validation monitoring will be conducted over a six week period. The parameters E. Coli, BOD, SS will be monitored weekly, and pH will be monitored at least daily.
During operations, TN, TP, BOD TSS, TDS, E. coli and pH in the treated effluent will be monitored.
All wastewater samples will be collected in accordance with AS/NZS 5667.10. Samples will be submitted to a laboratory with a current NATA accreditation.
Volumes of treated effluent disposed of within the spray irrigation field will be recorded and reported.
Appropriate fencing and signage will be installed.

Site infrastructure	Description
Location of irrigation field	Irrigation spray field sized at 16 ha.
	The perimeter of the spray irrigation field will be located a minimum of 5 m from the sprinkler spray pattern to allow for spray drift.
	The irrigation sprinklers and layout will be designed such that run-off and spray drift will be minimised beyond the boundary of the spray irrigation area

6.6.6 Key findings

The Delegated Officer has reviewed the information regarding discharge of treated wastewater and RO reject water via irrigation and has found:

1. That the proposed area for spray irrigation (16 ha) is sufficient for the disposal of up to 660 m³/day of the treated wastewater blended with RO reject water, without causing waterlogging.
2. The expected concentration levels for Nitrogen and Phosphorus are within ANZECC (2000) guidelines for native vegetation nutrient loading.
3. The TDS in the blended effluent is not expected to affect vegetation health, considering the high dilution of the RO reject water when blended with treated wastewater. The level expected is below ANZECC guidelines for TDS for tolerant crops (2880mg/L to 4928 mg/L). There are no priority vegetation in the vicinity, however the sensitivity of the vegetation in the irrigation area is unknown.
4. The expected dilution from blending the treated effluent from the WWTP and the RO reject water to be disposed of via the irrigation field is such that the blended effluent quality meets the ANZECC livestock drinking water tolerance values (ANZECC 2000).

6.6.7 Consequence

The Delegated Officer has determined that the impact of contamination of soil, groundwater or native vegetation from the irrigation of nutrient rich treated wastewater effluent blended with RO reject water to the sprayfield will have minimal impact. Therefore, the Delegated Officer considers the consequence of the Risk Event to be **Minor**.

6.6.8 Likelihood of Risk Event

Based upon the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of the irrigation of nutrient rich treated wastewater effluent blended with RO reject water to the sprayfield causing soil or groundwater contamination and native vegetation degradation could occur at some time. Therefore the Delegated Officer therefore considers the likelihood of the Risk Event to be **Unlikely**.

6.6.9 Overall rating of discharge of treated wastewater and RO reject water via irrigation to land impacting surface water

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk posed by the irrigation of nutrient rich treated wastewater effluent blended with RO reject water to the sprayfield impacting surface water is **Medium**.

6.7 Risk Assessment – Discharge of hydrocarbon from the BFSF to land (commissioning and operation)

6.7.1 Description of discharge of hydrocarbon from the BFSF to land impacting surface water and groundwater

Spill of diesel from one or more diesel tanks at the BFSF, discharging hydrocarbons to land causing adverse impacts to the surrounding environment, such as to soil, vegetation, and surface and groundwater receptors.

6.7.2 Identification and general characterisation of emission

The storage of hydrocarbons at the BFSF is restricted to diesel. The applicant has stated that coolants, lubrication and hydraulic oils for servicing the mobile fleet will be stored separately within already existing workshop, maintenance and reagent areas, and are not considered further in this assessment.

The BFSF will incorporate 18 individual horizontal diesel storage tanks, re-fuelling stations and containment and stormwater treatment facilities. The tanks are 200 kL self-bunded diesel-only storage tanks.

6.7.3 Description of potential adverse impact from the emission

The release of hydrocarbons from the facility may contaminate soils, impact adjacent vegetation and fauna, and discharge to surface water receptors (i.e. via ephemeral creeks which feed into the Turner River 20 km west of the Premises).

Groundwater contamination could also result from breach of containment or leaks as the depth to groundwater is approximately 20 mbgl.

6.7.4 Applicant controls

This assessment has reviewed the controls set out in Table 21.

Table 21: Applicant's proposed controls for discharge of hydrocarbons to land

General
The facility is located outside the 1-in-100 year flood zone.
Dangerous Goods Licence (yet to be applied for) under the <i>Dangerous Goods Safety Act 2004 (WA)</i> .
Fuel storage and dispensing will be constructed and managed in accordance with the Australian Standard for Storage and Handling of Flammable and Combustible Liquids (AS1940-2018).
The facility will drain to a collection point for treatment at an OWS.
Spill response equipment including absorbent socks, pillows or mats will be available in close proximity to the fuel storage facility.
Provide hydrocarbon and chemical spill control training and equipment to staff and contractors.

Site infrastructure	Description
Tanks	Tanks are self-bunded, compliant with Australian Standard 1940 – 2017, and constructed using steel compliant with AS 1692-2006.
	Regular inspections for leaks will be undertaken, and any leaks repaired.
	Pipework at risk of vehicle strikes to be protected by bollards and/or earthen bunds.
Tank refuelling	Tank refuelling points will be located over an apron to provide containment of any spilled fuel. Collection points will be evacuated as necessary, with fuel and water transferred to an OWS.
Oil-water separator	Spills and contaminated runoff will be directed towards an OWS.
	Treated water from the OWS will be allowed to enter the surrounding stormwater system.

6.7.5 Consequence

If discharge of hydrocarbons to land occurs, then the Delegated Officer has determined that the impact of spills or leaks on adjacent vegetation/fauna or soils and groundwater will be considered mid-level impact to an onsite receptor. Therefore, the Delegated Officer considers the consequence of discharge of hydrocarbon to land to be **moderate**.

6.7.6 Likelihood of Risk Event

Based upon the infrastructure and management proposed by the Applicant, and the depth to groundwater in the vicinity of the facility, the Delegated Officer has determined that the consequence will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **unlikely**.

6.7.7 Overall rating of discharge of hydrocarbon from the BFSF to land impacting surface water and groundwater

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of discharge of hydrocarbon from the BFSF to land impacting surface water and groundwater is **Medium**.

6.8 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 22. Controls are described further in section 7.

Table 22: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	Source	Pathway/ Receptor (Impact)			
1.	Discharge of contaminated stormwater to land	Contaminated stormwater	Adverse impacts to the surrounding environment, such as to soil, vegetation, and surface water and groundwater receptors.	Infrastructure and management controls.	Slight consequence Possible likelihood Low Risk	Acceptable, no further regulatory controls
2.	Discharges, spills and leaks of untreated wastewater, RO water and liquid chlorine to land	Waste-water, RO reject water and sodium hypochlorite storage	Adverse impacts to the surrounding environment, such as to soil, vegetation, and surface water and groundwater receptors.	Infrastructure and management controls.	Slight consequence Possible likelihood Low Risk	Acceptable, no further regulatory controls
3.	Discharge of treated wastewater and RO reject water via irrigation	Irrigation of sprayfield with treated wastewater effluent blended with RO reject water containing high levels of nutrients and salts	Adverse impacts to the surrounding environment, such as to soil, vegetation, and surface water and groundwater receptors.	Infrastructure and management controls.	Minor consequence Possible likelihood Medium Risk	Acceptable subject to proponent controls conditioned / outcomes based controls
4.	Discharge of hydrocarbon to land	Spill of diesel from one or more diesel tanks at the BFSF	Adverse impacts to the surrounding environment, such as to soil, vegetation, and surface water and groundwater receptors.	Infrastructure and management controls.	Moderate consequence Unlikely likelihood Medium Risk	Acceptable subject to proponent controls conditioned / outcomes based controls

7. Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Table 23, Table 24 and Table 25. The risks are set out in the assessment in section 6 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the Works Approval will be set to give effect to the determined regulatory controls.

Table 23: Summary of regulatory controls to be applied during construction

		Controls (references are to sections below, setting out details of controls)		
		Infrastructure and equipment	Monitoring	Reports
Risk Items (see risk analysis in section 6)	Noise			
	Dust			
	Potentially contaminated stormwater runoff	•		•
	Spills/breach of containment			

Table 24: Summary of regulatory controls to be applied during commissioning

		Controls (references are to sections below, setting out details of controls)		
		Infrastructure and equipment	Monitoring	Reports
Risk Items (see risk analysis in section 6)	Discharge of contaminated stormwater to land	•		
	Discharges, spills and leaks of untreated wastewater, RO reject water and liquid chlorine to land	•		
	Discharge of treated wastewater and RO reject water via irrigation	•	•	•
	Discharge of hydrocarbon to land	•		

Table 25: Summary of regulatory controls to be applied during time-limited operation

		Controls (references are to sections below, setting out details of controls)		
		Infrastructure and equipment	Monitoring	Reports
Risk Items (see risk analysis in section 6)	Discharge of contaminated stormwater to land	•		
	Discharges, spills and leaks of untreated wastewater, RO reject water and liquid chlorine to land	•		
	Discharge of treated wastewater and RO reject water via irrigation	•	•	•
	Discharge of hydrocarbon to land	•	•	•

7.1 Works Approval controls

7.1.1 WWTP

The WWTP is required to be constructed in accordance with the application documents, particularly in regard to:

- Siting;
- Stormwater management;
- Emergency Overflow Pond;
- Irrigation spray area; and
- Chemical containment.

7.1.2 Used tyre storage facility

The used tyre storage facility is required to be constructed in accordance with the application documents, particularly in regard to:

- Siting; and
- Stormwater management.

7.1.3 Waste transfer station

The waste transfer facility is required to be constructed in accordance with the application documents, particularly in regard to:

- Siting;
- Stormwater management (sediment pond); and
- Construction of a stock-proof fence.

7.1.4 Bulk Fuel Storage Facility

The BFSF is required to be constructed in accordance with the application documents, particularly in regard to:

- Siting;
- Spill prevention and containment measures; and
- Oil-water separator.

7.1.5 Landfill facility

The landfill facility is required to be constructed in accordance with the application documents, particularly in regard to:

- Siting;
- Stormwater management (sediment pond);
- Construction of three groundwater bores for monitoring; and
- Construction of a stock-proof fence.

7.1.6 Stormwater infrastructure and equipment

The following environmental controls, infrastructure and equipment should be maintained and operated onsite for stormwater management:

- Sediment pond at the waste transfer facility;
- Oil-water separator at the BFSF; and
- Sediment pond at the landfill facility.

7.1.7 Environmental Compliance Report

Following completion of works authorised under the Works Approval, the Works Approval Holder is required to submit an Environmental Compliance Report to DWER. The Environmental Compliance Report is required for DWER to verify all infrastructure has been constructed in accordance with the Works Approval conditions.

7.1.8 Commissioning and time limited operations

Commissioning of the WWTP is permitted under the Works Approval for a period of 180 days, subject to conditions.

Time limited operation is permitted under the Works Approval after the Environmental Commissioning Report (as outlined in Section 7.1.10) has been submitted to DWER.

7.1.9 Monitoring requirements

Monitoring of the treated effluent during commissioning and time-limited operations is required.

7.1.10 Monitoring reports

Following completion of commissioning authorised under the Works Approval, the Works Approval Holder is required to submit an Environmental Commissioning Report to DWER. The Environmental Commissioning Report is to contain the results of any monitoring undertaken during commissioning and required for DWER to verify that the emissions are as specified.

7.2 Licence controls

The following controls will be imposed as conditions on the future Licence to manage the risk of emissions during operation of the Premises. The below mentioned Licence controls are not final. Finalisation of Licence controls/conditions is subject to the Applicant's compliance with the conditions of the Works Approval; assessment of the Licence application; and, any additional information that becomes available to further inform the risk assessment.

7.2.1 Prescribed premises details

The Licence will detail the approved prescribed premises boundary and the prescribed premises categories, including approved production/design capacities.

7.2.2 WWTP (Category 54)

The Licence will detail the operation of the WWTP. The Licence will require monitoring of water discharged to the irrigation area, coupled with management responses (e.g. ensure irrigation does not occur during periods of heavy rainfall) and other requirements such as chemicals to be stored in accordance with Australian Standard AS3780.

7.2.3 Used tyre storage (Category 57)

The Licence will detail the management of tyres stored at the site, including the following likely controls:

- Tyre stacks must be less than 4 m high and greater than 6 m from any other tyre stacks.
- Store up to 150 tyres.
- Tyres must be disposed offsite at an authorised facility.

7.2.4 Waste transfer facility (Category 62)

The Licence will detail the management of waste via the waste transfer facility, including the following likely controls:

- Segregate and temporarily store waste and recyclable material generated by the Project for collection and transport offsite to licensed facilities.
- No storage of putrescible wastes.
- Temporary storage of hazardous materials lined and bunded (minimum capacity of 110 per cent of the largest container stored within it, or 25 per cent of the volume of all containers, whichever is larger).

7.2.5 Bulk Fuel Storage Facility (Category 73)

The Licence will detail the management of fuel at the BFSF, including the following likely controls:

- Monitoring for the OWS.

7.2.6 Landfill (Category 89)

The Licence will detail the management of waste reporting to the landfill, including the following likely controls, such as:

- Open tipping area less than 30 m in length and less than 2 m high.
- Capped weekly with greater than 1 m of excavated material.
- Wind-blown waste to be recovered.

- Burning of greenwaste.
- Dust suppression.

7.2.7 Reporting

The Licence will require the submission of an Annual Audit Compliance Report (AACR) and Annual Environmental Report (AER).

8. Determination of Works Approval conditions

The conditions in the issued Works Approval in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

The *Guidance Statement: Licence Duration* has been applied and the issued licence expires in three years from date of issue.

Table 26 provides a summary of the conditions to be applied to this works approval.

Table 26: Summary of conditions to be applied

Condition Ref	Grounds
Infrastructure and Equipment 1	These conditions are valid, risk-based and contain appropriate controls.
Environmental Compliance Reporting 2 and 3	Environmental compliance comprises valid, risk-based conditions to ensure appropriate linkage between the licence and the EP Act.
Environmental commissioning requirements 4, 5 and 6	These conditions are valid, risk-based and consistent with the EP Act.
Monitoring during environmental commissioning 7 and 8	These conditions are valid, risk-based and consistent with the EP Act.
Environmental commissioning reporting 9 and 10	Environmental compliance comprises valid, risk-based conditions to ensure appropriate linkage between the licence and the EP Act.
Commencement and duration of time limited operations 11 and 12	These conditions are valid, risk-based and consistent with the EP Act.
Time limited operations requirements and emission limits 13, 14 and 15	These conditions are valid, risk-based and consistent with the EP Act.
Monitoring during time limited operations 16 and 17	These conditions are valid, risk-based and consistent with the EP Act.
Compliance reporting during time limited operations 18 and 29	Environmental compliance comprises valid, risk-based conditions to ensure appropriate linkage between the licence and the EP Act.
Records and reporting 20, 21 and 22	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the works approval under the EP Act.

9. Consultation

The application was advertised in the West Australian and on DWER's website on 25 November 2019 for a period of 23 days. No submissions were received.

The application was referred to DMIRS and the Shire of East Pilbara on 21 November 2019, with no objections to the application.

The Applicant was provided with the draft Decision Report and draft issued Works Approval on 19 March 2020. The Applicant provided minor or administrative comments in addition to comments which are summarised, along with DWER's response, in Appendix 2.

10. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the issued Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Alana Kidd

Manager, Resource Industries

Delegated Officer

under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Application - Works Approval - FMG Ltd - IB Operations Pty Ltd - Iron Bridge Magnetite Project - Supporting Documents - Shire of East Pilbara	Application 2019a	DWER Trim reference: DWERDT208796
2.	Application - Works Approval - FMG Ltd - IB Operations Pty Ltd - Iron Bridge Magnetite Project - Applicant response to Request For Information	Application 2019b	DWER Trim reference: A1855069
3.	<i>Guidance Statement: Regulatory principles.</i> Department of Environment Regulation, Perth. July 2015	DER 2015a	Accessed at www.dwer.wa.gov.au
4.	<i>Guidance Statement: Setting conditions.</i> Department of Environment Regulation, Perth. October 2015	DER 2015b	
5.	<i>Guidance Statement: Licence duration.</i> Department of Environment Regulation, Perth. August 2016	DER 2016a	
6.	<i>Guidance Statement: Risk Assessments.</i> Department of Environment Regulation, Perth. November 2016	DER 2016b	
7.	<i>Guidance Statement: Decision Making.</i> Department of Environment Regulation, Perth. November 2016.	DER 2016c	
8.	Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)	DWER 2019	
9.	Environmental guidelines; Use of effluent by irrigation. Department of Environment and Conservation (NSW), October 2004'.	DEC NSW 2004	Accessed at https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/epa/effguide.pdf

	Document title	In text ref	Availability
10.	Australian and New Zealand Guidelines for Fresh and Marine Water Quality; Volume 1, October 2000	ANZECC 2000	Accessed at https://www.waterquality.gov.au/sites/default/files/documents/anzecc-armcanz-2000-guidelines-vol1.pdf

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition/section	Summary of applicant's comments	DWER response
Section 3.1.3	Applicant advised that the sediment pond will be adequately sized to maximise the retention time and drop-out of suspended particles.	To understand the risk of discharging stormwater, monitoring of TSS from the pond at discharge during time-limited operations has been added to the condition set to allow data to be collected and reviewed
Section 3.1.5	Applicant advised that the sediment pond will be adequately sized to maximise the retention time and drop-out of suspended particles.	To understand the risk of discharging stormwater, monitoring of TSS from the pond at discharge during time-limited operations has been added to the condition set to allow data to be collected and reviewed.