

POONDANO IRON ORE MINE

ENVIRONMENTAL LICENCE APPLICATION
ATTACHMENT 6A – EMISSIONS AND DISCHARGES

PREPARED FOR:

HEDLAND MINING PTY LTD



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environmental and geoscience consultants

POONDANO IRON ORE PROJECT ATTACHMENT 6A - EMISSIONS AND DISCHARGES

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TABLE OF CONTENTS

1.	CONTEXT AND RATIONALE	1
2.	ENVIRONMENTALLY SENSITIVE RECEPTORS.....	2
3.	EMISSION AND DISCHARGE SOURCES	4
3.1	EMISSIONS TO AIR.....	4
3.1.1	Sources	4
3.1.2	Potential Impacts	5
3.1.3	Control Measures	5
3.1.4	Predicted Residual Environmental Risk.....	6
3.2	NOISE EMISSIONS	6
3.2.1	Sources	6
3.2.2	Potential Impacts.....	6
3.2.3	Control Measures	6
3.2.4	Predicted Residual Environmental Risk.....	7
3.3.1	Sources	7
3.3.2	Potential Impacts	7
3.3.3	Control Measures	7
3.3.4	Predicted Residual Environmental Risk.....	8
3.4	DISCHARGES TO GROUNDWATER.....	8
3.4.1	Sources	8
3.4.2	Potential Impacts	8
3.4.3	Control Measures	8
3.4.4	Predicted Residual Environmental Risk.....	8
4.	MITIGATION MEASURES.....	9
5.	REFERENCES	11

1. CONTEXT AND RATIONALE

Operation of the mobile crushing and screening plant may result in emissions to air and discharges to land, as a result of the Prescribed Premise activity (Category 5) described in this Environmental Licence Application (see Attachment 3B).

The mobile crushing and screening plant operates 24 hours a day to crush, screen and separate ore into lump and fines stockpiles. The emission and/or discharge sources and potentially impacted receptors, as outlined in Table 1, are described in the following sections.

The proposed mitigation measures in Section 4 outline pollution prevention and control measures implemented to prevent adverse environmental impacts or minimise them to levels where appropriate environmental standards can be complied with.

Table 1: DWER Considerations for Emissions and Discharges from Prescribed Premise

Linkage	Information
Source	Identify the type, volume, concentration, and duration of the emissions.
	Identify the foreseeable operations and expected infrastructure, equipment and operational failures at the Prescribed Premises which may, from time to time, cause higher emission levels or different emissions than those of normal operations (e.g. because of plant start-up or shut-down for maintenance).
Pathway	Identify the site location and environmental context such as topography and meteorology.
Receptors	Identify environmentally sensitive receptors.
	Consider separation and environmental siting factors to determine how emissions or discharges may impact on a receptor.
	Receptors exclude employees, visitors or contractors of the licence holder. This is because other state legislation protects them from exposure risks and mandates prevention strategies.

2. ENVIRONMENTALLY SENSITIVE RECEPTORS

Operation of the mobile crushing and screening plant has the potential to impact environmentally sensitive receptors detailed in Section 2 of Attachment 7 and summarised below as:

Ecological communities, flora and vegetation include Priority 3 (P3) Flora species:

- *Gymnanthera cunninghamii*.
- *Euploca mutica*.
- *Triodia chichesterensis*.

Fauna

- Northern quoll (*Dasyurus hallucatus*).
- Western pebble-mound mouse (*Pseudomys chapmani*).
- Ghost bat (*Macroderma gigas*).
- Pilbara leaf-nosed bat (*Rhinionictis aurantia*).
- Greater bilby (*Macrotis lagotis*).

Water Bodies

- De Grey River and the Turner River which are approximately 57 km to the east and to 25 km to the west of the PPB, respectively.
- Petermarer Creek: a locally significant watercourse passing directly through the PPB but not intersecting the proposed activity areas.
- Petermarer Pool: a locally significant soak associated with Petermarer Creek located within the PPB.
- Beebingarra Creek: a locally significant watercourse approximately 3 km to the east of the PPB.

Groundwater

- Groundwater levels and quality of local aquifers.

Native title, Aboriginal and Other heritage sites:

- Ngarla and Ngarla Native Title Determination Area (WCD 2007/003) and the Kariyarra Native Title Determination Area (WC1999/003).
- Registered Heritage Site ID 9099: an artefact/scatter, quarry located 10.6 km from the PPB.
- Other Heritage Place (ID: 27412): a ceremonial site with skeletal/burial material, located 2.3 km from the PPB.
- Petermarer Pool: a locally significant soak associated with Petermarer Creek located within the PPB.

Nearby Communities and other landholders:

- Ngarla 2 and Kariyarra People.
- Pippingarra Station Homestead: located 4 km northwest of the PPB.
- Users of Great Northern Highway: 10 km north of the PPB.
- Main Roads WA Gravel Reserve 29266: located within the PPB (Figure 2, Attachment 2). Access agreements exist for mining operations within the gravel reserve.

There are no Public Drinking Water Source Areas (PWDSAs) near the PPB. The closest PDWSA are the De Grey and Yule PDWSAs located 44 km east and 36 km west of the PPB, respectively.

Employees, visitors and contractors are not recognised as sensitive receptors associated within the Project as other State legislation mandates protects them from exposure risk and mandates prevention strategies.

3. EMISSION AND DISCHARGE SOURCES

The potential for emissions and discharges associated with Category 5 activities undertaken within the Prescribed Premise have been described in Table 2. These have been categorised as following:

- Yes: Where a specific emission or discharge is expected during normal operation.
- Yes (Risk): Where a specific emission or discharge is not expected during normal operations but may occur in emergency or abnormal events (e.g. equipment failure, in response to a weather event etc.).
- No: No potential for emission or discharge exists under credible scenarios.

Table 2: Activity Emissions and/or Discharge Snapshot

Infrastructure	Emissions to Air	Discharge to Land or Surface Water	Discharge to Groundwater
Mobile crushing and screening plant (Category 5)	Yes	Yes (Risk)	No

3.1 EMISSIONS TO AIR

3.1.1 Sources

As outlined in Attachment 3B, ore feeds into a 3-stage mobile crushing and screening plant comprising a jaw crusher (primary), cone crusher (secondary crusher) and horizontal screening plant, before being delivered to the fines and lump stockpiles. All stages are physical in nature and do not include chemical beneficiation methods.

The mobile crushing and screening plant has the potential to generate emissions to air from use of a combustion engine, and through dust generated during crushing and screening operations.

3.1.1.1 Dust Emissions

Processing of ore in arid environments involves a significant potential for generation of dust emissions. Dust emissions generated during operation of the mobile crushing and screening plant have the potential to impact environmentally sensitive receptors by degrading air quality. Sources of dust emissions relating to the Prescribed Premises include:

- Wind erosion from the Run-of-Mine (ROM) pad and ore stockpiles.
- Ore crushing, screening and stockpiling.
- Material handling activities.

ROM ore is stockpiled and subsequently crushed prior to transport offsite, potentially generating fugitive dust emissions. Crushing and screening activities may also produce fugitive dust. The mobile crushing and screening plant does not have any point source emission from equipment such as stacks or baghouses.

3.1.1.2 Combustion Emissions

Operations have the potential to impact on air quality through generation of greenhouse gas emissions (including carbon monoxide, carbon dioxide, sulfur dioxide and nitrous oxides) via:

- Engine exhausts from operational equipment and vehicles.
- Transport of materials and equipment to the Poondano Project.

3.1.2 Potential Impacts

Potential impacts from dust particulates and gaseous emissions as a result of the Prescribed Premises activity include:

- Decrease in vegetation health and condition in adjacent areas due to dust covering vegetation, blocking stomata and reducing the plant's ability to photosynthesise.
- Decrease in fauna health and condition in adjacent areas due to dust covering habitat and potential food sources.
- Decrease in human health of nearby communities due to reduced air quality from dust particulates.
- Poor aesthetics within and outside the project area.
- Reduction in local air quality from mobile equipment emissions including particulates, carbon monoxide, carbon dioxide, sulfur dioxide and nitrous oxides (greenhouse gas emissions).
- Decrease in human health of nearby communities due to reduced air quality from gaseous emissions.

The potential emissions are typical of many similar mine operations in Western Australia (WA) and are not considered significant and are unlikely to impact the surrounding environment or other sensitive receptors.

Potential adverse impacts on air quality are limited by the reasonably remote location of the Project. As such, potential air quality issues are limited to employees and contractors working at the Project, which, for the purpose of the EL application, are not recognised as environmentally sensitive receptors (Section 2).

3.1.3 Control Measures

Dust is controlled at the source through the implementation of mitigation measures, including water sprays and minimising the area of disturbance. The mobile crushing and screening plant has also been fitted with a hydraulically driven water pump system and is equipped with spray bars for dust suppression.

3.1.3.1 Dust Emissions

The following management measures will be implemented during the project.

- Dust minimisation measures implemented for loading, material movements, crushing, screening include using water carts and watering of stockpiled materials.
- Dust minimisation measures implemented for the ROM pad using water carts.
- Occupational hygiene requirements for dust will be complied with in operational areas.

Emissions from the combustion of diesel in the crushing and screening operations is not likely to impact air quality outside of the immediate area of activity.

3.1.3.2 Combustion Emissions

The control measures from combustion emission to be implemented include:

- Power generator sets will be maintained and serviced to manufacturer's specifications to ensure efficient running and optimum fuel consumption, thereby minimising exhaust emissions.
- Diesel engines will be serviced to maintain efficiency and minimise harmful combustion products.

3.1.4 Predicted Residual Environmental Risk

It is unlikely that atmospheric pollution from the Prescribed Premise activity will adversely impact the environment as:

- Dust associated with operations is highly localised.
- The Project area is remote, with the nearest ESR, approximately 4 km from the Project.
- Greenhouse gas emissions (Scope 1) will be based on diesel usage.
- Measures have been and will be implemented to minimise combustion emissions as far as is reasonably practicable.
- Dust is managed to industry standards.

The potential emissions are typical of many similar operations in WA. Emissions produced from crushing and screening infrastructure are not considered significant and are unlikely to impact the surrounding environment or other sensitive receptors.

3.2 NOISE EMISSIONS

3.2.1 Sources

Noise emissions are generated from the operation of the mobile crushing and screening plant and sorting of ore. The mobile crushing and screening plant has two main point-source noise emissions being the primary crusher and secondary crusher (Figure 3, Attachment 2). Sources of noise emission associated with the Prescribed Premise activity include:

- Transport of ore to the ROM Pad and feed into the crushing unit using mobile earthwork equipment.
- Crushing of ore using a mobile jaw and cone crusher.
- Operational activities including pumps, diesel generators, conveyors and ore processing equipment.
- Warning alarms on the processing plant and reversing sirens on mobile machinery and equipment.
- Transport of equipment and supplies to and from the Project.

3.2.2 Potential Impacts

Potential environmental impacts from noise emissions as a result of the Prescribed Premise activity include:

- A decrease in fauna health and well-being due to increased nuisance from localised noise volumes.
- Displacement of fauna from their natural habitats and/or changes in behaviour.
- A decrease in human health and well-being of nearby communities due to increased nuisance from localised noise volumes.
- Reduced amenity within and outside of the Project area.

The potential emissions are typical of many similar mine operations in WA. Noise emissions produced from the Prescribed Premises are not considered significant and are unlikely to impact the surrounding environment or other sensitive receptors.

3.2.3 Control Measures

Project design has considered exposure to noise in order to minimise adverse impacts. In addition, the following management measures will be implemented during the Project.

- All vehicles and plant equipment will be regularly maintained to ensure they are operating efficiently and are not unduly noisy.
- Engines and generators will incorporate sound attenuating measures where applicable and will be operated and serviced in accordance with the manufacturer's specifications.
- The site induction will provide information on the requirements for and appropriate use of Personal Protective Equipment (PPE) in addition to delineated noise protection areas.

3.2.4 Predicted Residual Environmental Risk

It is unlikely that noise is a significant impact due to the following:

- The Project is remote and located a significant distance from sensitive receptors.
- Noise associated with operations is highly localised.
- Adequate control measures have been implemented to minimise localised impacts.

3.3 DISCHARGE TO LAND AND SURFACE WATER

3.3.1 Sources

Discharges to land and water are unlikely to result from operation of the mobile crushing and screening plant under 'normal' operating conditions but may present a risk in emergency or abnormal events such as equipment failure and extreme weather events.

The sources of discharges to land and surface water associated with the mobile crushing and screening plant may potentially originate from:

- Stockpile erosion and deposition of windblown ore to land or surface water.
- Hydrocarbon spills or leaks from diesel generators, machinery or vehicles.
- Spillage, leakage or seepage of hydrocarbons used and stored on site.
- Spillage of sewage.

3.3.2 Potential Impacts

Project development has and will result in modification of existing hydrological regimes. Potential impacts include:

- Deposition of sediment from stockpiles in the surrounding environment (local drainage channels and vegetated areas) from uncontrolled runoff.
- Poor establishment of vegetation and inadequate rehabilitation of constructed surfaces due to water management issues.
- Contaminate surface water and land due to spillages or leaks of contaminants.

3.3.3 Control Measures

Surface water management is based around the separation of overland flows that have interacted with disturbed areas (such as the immediate vicinity of the crushing and screening activity) and those that have not. As such, management measures for potential discharges to land and surface water include:

- Construction of storm water diversion drains to direct runoff from stockpiles and ROM Pad within the crushing and screening and screening area to sumps, during extreme weather events.
- Stockpiles located away from stormwater flows to minimise the potential losses through sedimentation runoff.

- Drainage structures will be monitored regularly and after heavy rainfall.
- Hazardous materials will be stored and handled in accordance with AS 1940, AS 3833 or AS 3780 and the *Dangerous Goods Safety Act, 2004* (WA).
- Stormwater infrastructure (as shown in Figure 3 of Attachment 2) has been constructed in accordance with Works Approval (W853/2023/1) and has been demonstrated by the Environmental Compliance Report submitted to DWER on 05 August 2024.

3.3.4 Predicted Residual Environmental Risk

Runoff from rainfall events is predicted to be highly localised given the size of rainfall events required to create surface water flows. Contamination of land and surface waters from spillages and leakages considered unlikely to occur due to the infrequently nature of rainfall in the project location, Given the reasonably remote location of the PPB and the separation from the nearest sensitive receptor (Figure 8, Attachment 2), the proposed mitigation and management measures are sufficient to achieve a low risk of significant impact to local land and surface water quality.

3.4 DISCHARGES TO GROUNDWATER

3.4.1 Sources

The sources of impacts to groundwater may potentially originate from:

- Spillage and leaks of hydrocarbons.

3.4.2 Potential Impacts

The Prescribed Premise activity has the potential to:

- Contaminate groundwater in areas adjacent to the crushing and screening plant and hydrocarbon storage facilities. Ore processing does not use any reagents. Hydrocarbon storage for the Project will be of moderate volumes in purpose-built storage facilities.

3.4.3 Control Measures

The following management measures have been implemented for the Prescribed Premise activity:

- Hydrocarbons for the Project are of moderate volumes and are stored in accordance with AS 1940, AS 3833 or AS 3780 and the *Dangerous Goods Safety Act, 2004* (WA).
- Monitoring of ablutions and maintenance of septic system.

3.4.4 Predicted Residual Environmental Risk

Impact to groundwater associated with the construction and operation of the Prescribed Premise Categories is not expected to be significant after implementing the control measures described above. Groundwater in the Poondano Southwest Mining Area, in which the processing plant will be located, has an average vertical depth between 11–13 m below surface.

4. MITIGATION MEASURES

The environmental impact assessment (EIA) framework is designed to ensure that decisions on projects are made in full knowledge of potential impacts on the environment and society. A vital step within the EIA framework is identification of measures that can be taken to ensure the risk of adverse impacts is as low as reasonably practicable (ALARP), that Environmental Protection Authority's (EPA) Environmental Objectives are complied with and that positive impacts are realised wherever possible.

When developing avoidance and mitigation measures for the Project, the following hierarchy of controls, as detailed in the WA Environmental Offset Guidelines (EPA 2014), was considered:

- **Avoid:** Adjust a project layout/development envelope or eliminate the effect of the project on the receptor by design. Significant avoidance and minimisation measures have been incorporated into decision making and project design.
- **Minimise:** Measures that minimise or reduce an impact (examples include storing hydrocarbons in impermeable storage areas or reducing speed limits to reduce dust emissions from vehicle travel on unsealed roads).
- **Rehabilitate:** Measures that rectify, repair, rehabilitate or restore an impact.
- **Offset:** Required if significant residual environmental impacts remain following the application of the above measures.

Additionally, many of the project activities, including crushing and screening relating to the prescribed premise activity, will be subject to conditions associated with other regulatory approvals (e.g. the approved Mining Proposal and Mine Closure Plan under the *Mining Act 1978*). These conditions form a component of the obligations for the Project and are additional to the mitigation measures described herein. Committed avoidance and mitigation measures relevant to the Prescribed Premise activity are detailed in Table 3.

Table 3: Avoidance and Minimisation Measures by Potential Impact Pathway

Potential Impact Pathway	Mitigation Measures
Air	Dust is managed and minimised by watering exposed areas with a water cart and with fixed sprays on the mobile crushing and screening plant as required.
	During high winds, crushing and screening activities are restricted when risk-based assessment measures determine that dust cannot be adequately controlled.
Noise	The crushing circuit is maintained in accordance with original equipment manufacturers (OEMs) requirements to minimise nuisance noise and be compliant with relevant Australian Standard noise criteria.
Surface Water	Storm water diversions constructed to ensure natural flow paths are maintained where possible.
	Crushing and screening operation stockpiles are located away or protected from stormwater flows, minimising potential losses via erosion and sedimentation.
	Appropriate consideration of rainfall and runoff through the project design process to mitigate potential effects of flow concentration and point discharge and include appropriate erosion protection measures as appropriate.
Groundwater	Hazardous materials are stored and handled in accordance with AS 1940, AS 3833 or AS 3780, the <i>Dangerous Goods Safety Act, 2004</i> (WA), any conditions identified as part of EP Act Part V licensing or associated regulations.
	Fuel will be delivered to site in fuel tankers and stored in a 100-kL, double-skinned, self-bunded storage tank. The facility layout will include bowser/s and fuel delivery inlets

Potential Impact Pathway	Mitigation Measures
	equipped with drip trays to contain any drips and spills and will have a sump to collect rainwater and any fuel spillage.
	Spill kits are located at strategic locations throughout the project.
	Hazardous spills will be cleaned up and contaminated soils would be removed from site by a licensed third party. Incident investigation would be undertaken as required to determine the cause of environmentally harmful spills/leaks and control measures identified to prevent future incidents. As required, spills will be reported to the relevant authorities
	Decommissioning and removal of all hazardous storages at closure.

The linkage from the source of emissions, via pathways towards receptors to determine whether a residual environmental impact will occur. Residual risk has been determined in accordance with the risk criteria and risk matrix outlined in the Risk Assessment Guideline (DWER 2020).

5. REFERENCES

Australian Standard 3780-2008 (AS 3780). *The storage and handling of corrosive substances*

Australian Standard 3833-2007 (AS 3833) *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*

Australian Standard 1940-2004 (AS1940). *The storage and handling of flammable and combustible liquids*

Department of Water and Environmental Regulation (DWER), 2020. *Guideline: Risk Assessments*. Government of Western Australia. Joondalup, Perth. December 2020.

Environmental Protection Authority (EPA). 2014. *WA Environmental Offsets Guidelines*. Government of Western Australia Environmental Protection Authority. Perth, Western Australia. August 2014.