NORTHERN STAR
RESOURCES LTD

Works Approval Application
Attachment 6A

Emissions and Discharges

Northern Star (Carosue Dam)

Kurnalpi - Northern Operations

May 2025

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1 Rationale

The construction and operation of the Project will result in emissions to air, and discharges to land and groundwater, as a result of the proposed prescribed activities (see Attachment 3B). These emissions and discharges are described in detail in the following sections.

The IR-F09 Application Form: Works Approval and Licence, Part 9, advises the use of the Guidance Statement: Risk Assessment (DWER, 2017) to determine what information is required to be presented to assist the Government of Western Australia's Department of Water and Environmental Regulation (DWER) in assessing the risks associated with the Prescribed Premises, as detailed in Table 1.

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

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 shutdown 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.

The emission and/or discharge sources and potentially impacted receptors are described in the following sections with reference to the pathway.

2 Environmentally Sensitive Receptors

Siting and location of the proposed prescribed activities in relation to sensitive receptors is described in Attached 7 and include:

- Water Bodies - Lake Yindarlgooda, located approximately 8 km south of the Project

There are no Public Drinking Water Source Areas (PWDSAs) near the Prescribed Premise boundary. There are no RAMSAR or wetlands of National Significance within the prescribed premise boundary.

3 Emission and Discharge Sources

The activities associated with the prescribed premise activities are described in Table 2, together with the potential for emissions and/or discharges to the environment. 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	Noise Emissions	Discharge to Land or Surface Water	Discharge to Groundwater
Mobile crushing and screening plant (Category 5 & 12)	Yes	Yes (Risk)	Yes (Risk)	No
Landfill (Category 63 & 64)	Yes	No	Yes (Risk)	Yes (Risk)
Turkeys Nest and mine pits (mine dewater storage) and associated pipelines (Category 6)	No	No	Yes (Risk)	Yes (Risk)

3.1 Emissions to Air

3.1.1 Sources

Processing of ore in arid environments involves a potential for generation of dust emissions. Dust emissions generated during construction and operation of the mobile crushing and screening plant have the potential to impact environmentally sensitive receptors by impacting air quality.

Sources of dust emissions relating to the Prescribed Premises may include:

- Construction and earthwork activities.
- Dust lift off from the ROM Pad and interim ore stockpiles.
- Ore crushing, screening and stockpiling.
- Material handling and transport activities.
- Vehicle movements on unsealed roads.

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

- Engine exhausts from construction equipment and light vehicles.
- Transport of materials and equipment to the Kurnalpi Project.

The production of odours is expected to be minimal for the Project due to the following:

- Putrescible waste will be covered over on a fortnightly basis.

3.1.2 Potential Impacts

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

The potential impacts from diffuse source particulate and gaseous emissions as a result of project implementation are:

- Impact on human and fauna health through inhalation.
- Impact on in vegetation health and condition in adjacent areas due to dust covering vegetation, blocking stomata and reducing the plant's ability to photosynthesise.
- Impact on human health of nearby communities due to reduced air quality from greenhouse gas emissions and dust particulates.
- Reduction in local air quality from mobile equipment emissions from engine exhausts including particulates, carbon monoxide, carbon dioxide, sulfur dioxide and nitrous oxides.
- Poor aesthetics within and outside the project area.

3.1.3 Control Measures

The Project design has considered exposure to dust and other emissions in order to minimise adverse environmental impacts.

Northern Star will implement dust control measures during construction and operational stages of the Project to ensure compliance with occupational health and environmental standards. Implementation of these controls will also assist to maintain plant aesthetics and prevent potential impacts to human health, fauna and adjacent vegetation.

3.1.3.1 Dust Emissions

The control measures from dust particulates to be implemented include:

- Land disturbance will be kept to the minimum necessary for development of the Project.
- Dust suppression (via water cart) on material stockpiles prior to crushing and screening activities.
- Dust suppression (via water cart) on ore and ROM stockpiles.
- Dust suppression (via water cart) on access roads and work areas within the Prescribed Premise to minimise dust from movement of vehicles and equipment (e.g. loaders).
- Planned preventative maintenance to ensure the processing plant is operating as designed.
- Moving vehicles and equipment will keep to defined roads.
- Vehicles will be required to travel at safe operating speeds on unsealed roads and will be restricted from accessing rehabilitated surfaces except for management purposes.

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.
- Energy efficiency and greenhouse gas emissions will be considered as part of equipment selection and purchase.

3.1.4 Predicted Residual Environmental Risk

It is unlikely that atmospheric pollution from the proposed activities will adversely impact the environment as:

- Dust associated with construction will be short term in duration and highly localised.
- The Project is remote, with the nearest environmentally sensitive receptor, Lake Yindarlgooda, is located approximately 8 km from the project

- Scope 1 reportable emissions are unlikely to be triggered.
- Measures will be implemented to minimise combustion emissions as far as is reasonably practicable.
- Dust will be managed to industry standards.

The proposed emissions are typical of many similar open pit mining operations in Western Australia. Emissions produced from the proposal are not considered significant and are unlikely to impact identified environmentally sensitive receptors or the surrounding environment.

3.2 Noise Emissions

The proposed prescribed activities will include physical crushing, screening and ore sorting processes to produce product and has multiple point source noise emissions these being the crusher, multiple screens, ore sorters and their associated diesel-powered generators. All other noise sources are considered to be diffuse.

3.2.1 Sources

Potential sources of noise associated with the Project include:

- Construction and earthwork activities.
- Transport of ore from the open pit to the ROM Pad and feed into the crushing unit using mobile earthwork equipment.
- Crushing and sorting of ore
- Use of pumps, diesel generators, conveyors and ore processing equipment.
- Warning alarms on the mobile plant and reversing sirens on mobile machinery and equipment.
- Transport of equipment and supplies to and from the Project during construction and operations

3.2.2 Potential Impacts

Potential environmental impacts from noise emissions as a result of the project include:

- Disturbance to fauna movements and/or behaviours.
- Displacement of fauna from their natural habitats.
- Reduced amenity within and outside of the Project area.

3.2.3 Control Measures

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, 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 i.e. adjacent noise compressors.

3.2.4 Predicted Residual Environmental Risk

It is unlikely that noise will be a significant impact as:

- The Project is remote and located a significant distance from sensitive receptors.
- Noise associated with construction will be very short term and highly localised.

- Noise emissions have been considered in design of the process flow sheet and during equipment selection.
- Adequate control measures will be implemented to minimise localised impacts.
- Road users of Kurnalpi-Pinjin Road may have very short-term, if any, registered exposure to noise generated by the Project.

3.3 Discharges to Land or Surface Water

3.3.1 Sources

The sources of discharges to land and surface water may potentially originate from:

- Deposition of windblown ore (fines) to land.
- Hydrocarbon spills or leaks from vehicles, equipment use or maintenance activities.
- Spillage, leakage or seepage of hydrocarbons used and stored onsite.
- Leachate from Landfill.
- Spillage of Sewage.

3.3.2 Potential Impacts

Proposed activities have the potential to:

- Cause deposition of sediment in the surrounding environment from uncontrolled runoff.
- Reduce the surface water catchment size and alter drainage patterns.
- Cause localised erosion channels, sedimentation of watercourses and alteration of drainage lines through inappropriately engineered surface water management structures.
- Cause ponding of water in infrastructure areas.
- Contaminate surface water and land due to spillages, leaks or seepage of contaminants.

3.3.3 Control Measures

Project design has considered local topography, drainage lines and flood levels to minimised disturbance of these. It should be noted that the Project does not utilise any chemicals in the mobile processing and screening process, and it is expected that hydrocarbons in the form of diesel, oils and greases constitute the majority of the chemicals onsite.

The following control measures for discharges to land and water will be implemented during the Project:

- Stormwater drains/bunds will be constructed to direct stormwater around processing infrastructure.
- Drainage structures will be monitored regularly and after heavy rainfall.
- All hydrocarbon storages will be designed and constructed in accordance with Australian Standards *AS1940* and *AS1692*.
- Minor hydrocarbon spillage occurring as a result of construction equipment breakdowns will be addressed and reported through the incident report procedure.
- Spill kits will be located at strategic locations throughout the project area and employees trained in their use.
- Equipment and vehicles including surface mobile equipment shall be subject to a regular maintenance program to reduce the likelihood of spills and leakages occurring.
- Static diesel fuel tanks associated with equipment will be self-bunded where available or otherwise located in bunding.

- Hydrocarbon wastes will be segregated from other wastes and disposed of by a licenced third party.
- Safety Data Sheets will be available and accessible at all workplaces where hazardous materials are stored and used.
- A register of all hazardous materials imported to the site or generated as a result of site activities will be maintained. This will document the hazardous material name, location, approximate volume, storage method and where applicable, disposal method for the substance and containers.

3.3.4 Predicted Environmental Risk

Measures as specified above will ensure that the mobile crushing and screening plant is protected from flooding impacts. Given the reasonably remote location of the Prescribed Premise boundary and the separation from the nearest sensitive receptor (Attachment 2, Attachment 7), 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 Discharge to Groundwater

3.4.1 Sources

The sources of impacts to groundwater may potentially originate from:

- Spillages of hydrocarbons.
- Leachate from Landfill.

3.4.2 Potential Impacts

Project activities have the potential to:

- Cause contamination (from hydrocarbons, leachate from Landfill) of groundwater in areas adjacent to the proposed activities (ore processing does not use any reagent).

3.4.3 Control Measures

The following control measures for discharges to groundwater will be implemented during the Project:

- Hydrocarbons will be stored in impermeable bunds in accordance with Australian Standards (AS1940 and AS1692).
- Regular inspection of landfill facility.

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 Kurnalpi Project , has an average vertical depth between 36 and 38 m below surface.

4 References

Australian Standard, AS1940: 2017 *The storage and handling of flammable and combustible liquids* (AS1940).

Australian Standard, AS1692: 2006. *Steel tanks for flammable and combustible liquids* (AS 1692).

Department of Water and Environmental Regulation (DWER). 2022. *IR-F09 Application Form: Works Approval and Licence Version 16*. Government of Western Australia. August 2022.

DWER Guideline, Risk assessments Part V, Division 3, *Environmental Protection Act 1986* (February 2017)