ntepa Northern Territory Environment Protection Authority

Statement of Reasons

MCARTHUR RIVER MINING – OVERBURDEN MANAGEMENT PROJECT

PROJECT

The McArthur River Mine (MRM) is located approximately 45 km south-west of the township of Borroloola and 470 km south-east of Darwin, in the Gulf Region of the Northern Territory. MRM is the world's largest producer of zinc in bulk concentrate form and zinc concentrate. The concentrate is transported from the mine to the Bing Bong loading facility 100 km north-east of the mine.

Following the preparation of an Environmental Impact Statement (EIS) in 1992, development of MRM's underground operation commenced in 1994, with the first shipment of concentrate commencing in mid-1995. Phase 2 of the mining operations involved converting MRM to an open pit. The Phase 2 environmental impact assessment (EIA) process was completed in 2006.

An EAI for the MRM Phase 3 Development Project was complete in 2012. The project was approved by the Northern Territory Government in 2013. This project involved the expansion of the operation including increasing the size of the open pit, overburden emplacement facilities and tailing storage facility.

The Proponent submitted the Notice of Intent (NOI) for the Overburden Management Project to the NT EPA on 27 June 2014 for consideration under the EA Act. The proposed project is considered an alteration to the Phase 3 Development Project under clause 14A of the Environmental Assessment Administrative Procedures.

CONSULTATION

NT EPA staff have reviewed the NOI in consultation with Northern Territory Government (NTG) advisory bodies, as required by clause 8(1) of the Environmental Assessment Administrative Procedures.

JUSTIFICATION

Waste Rock Geochemistry

The Proponent has modified the classification system used for the waste rock. The latest classification divides the non-acid forming (NAF) and potentially acid forming (PAF) material into:

- Benign overburden
  - Low salinity non-acid forming rock (high capacity) [LS-NAF(HC)]
- Non-benign overburden
  - Metalliferous saline non-acid forming rock (high capacity) [MS-NAF(HC)]
  - Metalliferous saline non-acid forming rock (low capacity) [MS-NAF(LC)]
  - Potentially acid forming rock (high capacity) [PAF(HC)]
  - Potentially acid forming rock (reactive) [PAF(RE)]

The NOI indicates that a 'large proportion' of the originally classified NAF material is in fact non-benign and may have environmental implications if not appropriately managed, including the potential to generate acid mine drainage, metalliferous mine drainage or saline drainage. The

Proponent does not provide detail on the extent of non-benign material, however information from DME suggests it could be as high as 89% of the total overburden material. This is a significant change from the Phase 3 Development Project estimation of less than 25% of the overburden being non-benign material.

PAF waste rock is typically encapsulated in benign NAF material to prevent the possibility of acid, metalliferous or saline drainage.

Waste Rock Storage

The substantial change to the quantity of non-benign waste rock has major implications for the design, construction methodology and water management of the waste rock dump, referred to by the Proponent as the northern overburden emplacement facility (NOEF). Design of the NOEF is not presented in the NOI, however, the Proponent states that the design of the NOEF is required to be significantly altered from that presented in the Phase 3 Development Project.

The Proponent also states that:

"*The NOEF will be developed in accordance with the previous flood mitigation design (constructing below the 100 year flood level utilising benign NAF only) throughout 2014 and 2015, however beyond that time, a revised design will be implemented (the proposed project subject of this NOI)*".

Information from DME suggests that the Proponent has already placed 10.2 million m^3 of non-benign material in the base layer of the NOEF, i.e. below the 100 year flood level.

Previously approved encapsulation of the PAF material was to be undertaken using benign NAF. The Proponent acknowledged there are constraints on the availability of benign NAF and that following investigation of the clay performance and geochemistry, revised capping and encapsulation strategies will be developed. No detail has been provided as to the likely design of the NOEF except that the footprint, shape and water management infrastructure will change.

Clay Capping

The NOI does not identify the availability of suitable clay for PAF encapsulation. Compacted clay layers were part of the original encapsulation strategy as they form a low permeability layer to limit the ingress of water into the PAF cells. Compacted clay layers are also planned to be used as the temporary cap on active PAF cells during wet seasons. No detail has been provided in this NOI apart from the comment that the clay layer thickness, specifications and position will be revised.

Previous test results on the locally available clay suggest that they are susceptible to shrinking and swelling due to wetting and drying through the year. This may lead to the desiccation of clay liners and cracking, allowing water ingress into the PAF cells and resultant formation of acid leachate. The large particle size and high metal content also increase the unsuitability of these clays as effective capping material. The sourcing of alternate low permeability layers has not been investigated to date.

Water Management

Significant changes to the quantities of non-benign waste indicate there will be a need for significant changes to the water management at the site. Water management will be of particular importance if non-benign material is to be used as base and encapsulating material on the NOEF. Non-benign material may already have been placed below the 100 year ARI flood level.

The initial management of acid, metalliferous and/or saline mine drainage (AMD) at MRM involved ensuring PAF (non-benign waste rock) is encapsulated in clay and (benign) NAF material. Additionally, runoff from the NOEF was to be diverted into sediment ponds prior to discharge. The

use of non-benign material as a capping material increases the potential for the generation of AMD in the runoff from the NOEF. Any increase in the potential generation of AMD will increase the risk of AMD entering the surrounding waterways and impacting associated aquatic ecosystems.

There is also the risk of AMD seepage from runoff ponds, and percolation through the base of the NOEF, impacting groundwater in the area. This risk will be increased by ineffective encapsulation of non-benign material and by increases to the AMD entering the runoff ponds.

Tailing Storage Facility and other Infrastructure

The adequacy and availability of appropriate construction materials (e.g. clay and benign NAF) for the construction of the tailing storage facility (TSF), dams and other infrastructure has not been addressed in the NOI. Any changes to infrastructure required by change to the classification of NAF and PAF, including drains and dams for storage of leachates from PAF and other wastes is also absent in the NOI. The potential impacts of these on downstream aquatic ecosystems have not been considered.

DECISION

Pursuant to clause 14A(1) of the EAAP the NT EPA has determined that the proposed action has been altered in such a manner that its environmental significance is changed.

Under clause 14A(3) of the EAAP, the NT EPA has decided that an EIS is necessary with respect to the proposed action.

DR BILL FREELAND

CHAIR

NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY

10 JULY 2014