

Statement of Reasons

PNX METALS LIMITED – FOUNTAIN HEAD GOLD PROJECT

PROPOSAL

PNX Metals Limited (the Proponent) submitted a Notice of Intent (NOI) for the Fountain Head Gold Project (the Proposal) to the Northern Territory Environment Protection Authority (NT EPA) on 20 December 2019, for consideration under the *Environmental Assessment Act 1982* (EA Act).

The Proponent proposes to recommence gold mining at Fountain Head (Figure 1) and extract gold from the ore using heap leaching. The life of mine is three years. Mining at Fountain Head was most recently undertaken from 2007 to 2009, however the site has a long history of gold mining and exploration dating back to 1883. Legacy components on site include a water-filled open pit, waste rock stockpile, water storage dams, lakes, run of mine pad, haul roads and access tracks.

The Proposal involves the following:

- expansion and mining of the existing open pit¹ using drilling and basting techniques, to encompass the existing void and deepen the pit by 65 m to a total depth of 140 m
- expansion of the existing waste rock stockpile (to approximately double its current size) to accommodate approximately 23 Mt of waste rock
- construction of processing related heap leach pads, solution ponds, crushing facilities and gold processing plant
- construction of supporting infrastructure including workshops, power station, roads and offices
- progressive rehabilitation of disturbed areas over an unspecified period.

The Proposal is located on Ban Ban Springs Station (NT Portion 695), 170 km south of Darwin and approximately 6 km east of the Stuart Highway. The nearest towns are Adelaide River and Pine Creek, located 50 km to the north and south respectively. The workforce (113 personnel) would be sourced locally and interstate and accommodated at existing mining camps in the area.

Following completion of mining for this Proposal, the site is proposed for use as part of the Hayes Creek Project. This is a separate proposal by the same Proponent to mine polymetallic ore at Mount Bonnie and Iron Blow and haul it to Fountain Head for processing. Tailings generated from that process would be deposited subaqueously in the pit lake at Fountain Head. The NT EPA decided in December 2018 that the Hayes Creek Project requires assessment under the EA Act at the level of an Environment Impact Statement (EIS) and the Proponent is currently preparing that EIS.

¹Dewatering of 1.9 gigalitres from the pit, and temporary storage of the water in an upgraded storage dam, is required to enable mining and will be part of current care and maintenance arrangements for the site under the *Mining Management Act 2001*.

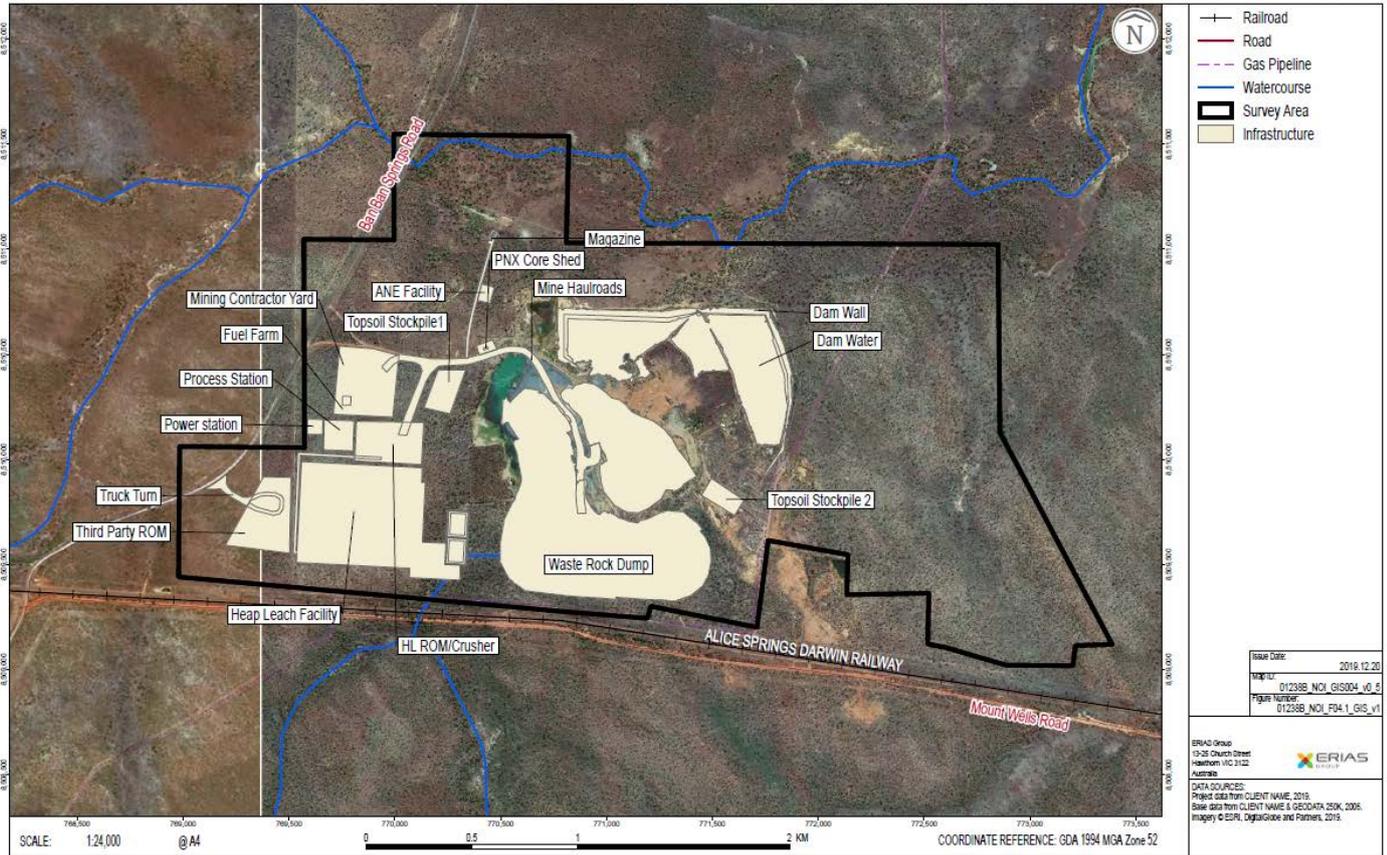


Figure 1: Fountain Head Gold Project Layout

CONSULTATION

The NOI has been reviewed as a notification under the EA Act in consultation with Northern Territory Government advisory bodies (see Attachment 1) and the responsible Minister, in accordance with clause 8(1) of the Environmental Assessment Administrative Procedures 1984.

JUSTIFICATION

The NOI was assessed against the NT EPA’s environmental factors and objectives. The NT EPA identified six environmental factors (Table 1) that could be potentially be significantly impacted by the Proposal. The NT EPA considered the importance of other environmental factors during the course of its assessment, however those factors were not identified as being potentially significantly impacted.

Table 1. Key environmental factors

Theme	Key Environmental Factor	Objective
Land	Terrestrial flora and fauna	Protect the NT’s flora and fauna so that biological diversity and ecological integrity are maintained.
	Terrestrial environmental quality	Maintain the quality of land and soils so that environmental values are protected.
Water	Aquatic ecosystems	Protect aquatic ecosystems to maintain the biological diversity of flora and fauna and the ecological functions they perform.
	Inland water environmental quality	Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

Theme	Key Environmental Factor	Objective
	Hydrological processes	Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.
People and Communities	Social, economic and cultural surroundings	Protect the rich social, economic, cultural and heritage values of the Northern Territory.

1. Terrestrial flora and fauna

Objective: Protect the NT's flora and fauna so that biological diversity and ecological integrity are maintained

The proposed activities occur largely in areas where flora and fauna have been subject to past disturbance. While no threatened flora and fauna species have been recorded on site, the Gouldian finch has been previously recorded within 5 km of the Proposal area. The Gouldian finch (*Erythrura gouldiae*) is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* and vulnerable under the *Territory Parks and Wildlife Conservation Act 1976*. The Proposal site consists predominantly of disturbed Eucalyptus woodland on sandstone plains, which is classed as suitable habitat for the species. Other threatened species including the ghost bat (*Macroderma gigas*), partridge pidgeon (*Geohaps smithii*), yellow-spotted monitor (*Varanus panoptes*), pale field-rat (*Rattus tunneyi*), fawn antechinus (*Antechinus bellus*), *Stylidium ensatum* and *Acacia praetermissa* have been recorded nearby.

The NOI concluded that it is unlikely that the Proposal would have a significant impact on listed threatened species and communities or migratory species that occur or potentially occur in the area. As threatened species are unlikely to occur on site, the NT EPA concurs that it is unlikely that threatened species or communities would be significantly impacted.

The Department of Environment and Natural Resources (DENR) Flora and Fauna Division advised that while suitable foraging habitat for the Gouldian finch may occur on site, it is degraded by prior disturbance and has a small extent compared to surrounding areas of potentially suitable foraging habitat for the species. The Flora and Fauna Division advised that the Proposal presents a low risk of impacts to the Gouldian finch and other threatened species listed above.

The NOI identified the potential for indirect impacts to flora and fauna due to altered conditions for plant growth due to dust deposition, the spread of weed or feral animal species, and exposure to process ponds containing Cyanide from the heap leach facility. The NT EPA also notes that there is potential for impacts on flora and fauna species or reduction in habitat quality, including threatened species, through erosion and sedimentation (discussed in section 2 of the NOI), exposure to contaminated water (discussed in section 4) and altered hydrological conditions (discussed in section 5).

To protect flora and fauna from indirect impacts identified above, it will be important for the Proposal to meet the environmental objectives for other relevant factors, particularly terrestrial environmental quality (section 2) and inland water environmental quality (section 4).

In conclusion, the NT EPA considers that there is a low risk of significant impacts on terrestrial flora and fauna, and that the NT EPA's objective for this factor can be met.

2. Terrestrial environmental quality

Objective: Maintain the quality of land and soils so that environmental values are protected.

The Proposal requires clearing of native vegetation and stockpiling of topsoil and sub-soils for rehabilitation, expansion of the existing waste rock stockpile, construction and operation of the heap leach facility and the management of fuels, lubricants, explosives and other reagents. These activities have the potential to contribute to the erosion and generation of dust or contamination of land and soils.

There is uncertainty regarding the potential for waste rock and ore to produce acid and/or metalliferous drainage (AMD), as geochemical investigations are currently underway and results were not reported in the NOI. Without a good understanding of waste rock and ore characteristics, it is uncertain whether the proposed management and storage methods are suitable. The storage of mining waste materials at surface could present a long term contamination risk to downstream environmental values.

During operations there is potential for contamination of land and soil to occur from spills or from leaching from mined materials and through the operation of the heap leach facility. There is also potential for erosion due to vegetation clearing, altered surface water hydrology, and the placement of mined materials on the soil surface. The NT EPA is supportive of the proposed standard mitigation measures outlined in the NOI, including liners, bunds, sumps, drains, diversion channels, sediment traps, oil traps, soakage pits and chemical storages. However the NT EPA considers that the information provided in the NOI is not sufficient to assess the effectiveness of proposed management measures, particularly in relation to waste classification and potential legacy conditions in the Proposal area.

The NT EPA considers that comprehensive and effective mine closure planning and implementation will be essential for the prevention of future legacy impacts. A Mine Closure Plan has not been developed by the Proponent. The intended land use post closure is continued mining as part of the Hayes Creek Project, and this is subject to a separate assessment, at the level of an Environmental Impact Statement, and environmental approval processes. A Mine Closure Plan would clearly outline a contingency in the case that the Hayes Creek Project does not proceed. The Mine Closure Plan would need to demonstrate how successful rehabilitation would be achieved post closure. The NT EPA considers that leading-practice mitigation, monitoring and mine closure strategies must be implemented to avoid impacts to water quality and downstream aquatic ecosystems.

The NT EPA considers that the NOI has not provided sufficient information to enable an assessment of the proposed avoidance, mitigation and management measures including closure.

In conclusion, the NT EPA considers that there is potential for significant impact on terrestrial environmental quality and that the information provided in the NOI is not sufficient to assess the likelihood and extent of the potential impacts. Uncertainty remains about whether the NT EPA's environmental objective for terrestrial environmental quality can be met.

3. Aquatic ecosystems

Objective: Protect aquatic ecosystems to maintain the biological diversity of flora and fauna and they ecological functions they perform.

The downstream surface water environment sustains important aquatic ecosystem values that depend on the existing quality and quantity of water in the system. In the vicinity of the Proposal these occur in the Margaret River and its ephemeral tributaries, including ephemeral creeks. Further downstream is the Adelaide River coastal floodplain Site of Conservation

Significance² and conservation reserves including Djukbinj National Park³. The beneficial uses are environment, riparian, agriculture and cultural⁴.

Alteration to water quality or hydrology (as discussed in sections 4 and 5) may affect the health and survival of aquatic species, which may in turn affect ecosystem function. Any release of contaminants including Cyanide from the heap leach facility, has potential to have catastrophic impacts on downstream aquatic ecosystems. The NOI discussed a number of measures to avoid, mitigate and manage the potential impacts.

However, without a better understanding of the current level of impact; the potential for future impacts to inland water environmental quality and an assessment of proposed management measures, the NT EPA cannot assess the likelihood and severity of potential impacts on aquatic ecosystems.

Depending on the likelihood of impacts to surface water quality, work may be required to characterise the current condition of downstream aquatic ecosystems, and to design monitoring programs to detect, assess and remedy any impacts attributable to the Proposal.

The NT EPA considers that there is potential for significant impact on aquatic ecosystems and that the information provided in the NOI is not sufficient to assess the likelihood and extent of the potential impacts. Uncertainty remains about whether the NT EPA's environmental objective for this factor can be met.

4. Inland water environmental quality

Objective: Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

The Proposal area is located within the head waters of the Adelaide River Catchment. This river system supports aquatic ecosystems and significant riparian vegetation. Downstream land uses include conservation, tourism, aquaculture, horticulture, and pastoralism. The catchment has been identified as a potential component of Darwin's future water supply⁵.

There are limited groundwater users in the vicinity of the Proposal area although the Grove Hill Hotel is located approximately 6 km east of the site. There are potentially other values dependent on the current groundwater quantity and quality, including environmental and/or cultural.

The Proposal will require the handling of hazardous chemicals and waste rock that has the potential to contain or generate contaminants that, if released, could lower the quality of groundwater or surface water. The proposed activities also require the removal of groundwater to enable mining.

The NOI acknowledges that mined materials have the potential to produce AMD that require appropriate management for preventing the release of contaminants to the surrounding environment and impacting water quality. It also outlines proposed measures to prevent the generation and release of resulting contaminants to the environment. However, the NT EPA considers that an assessment of the acceptability of these proposed measures is not possible using the information given in the NOI as there are uncertainties regarding the following:

² https://www.territorystories.nt.gov.au/bitstream/handle/10070/254075/12_adelaide.pdf

³ https://dta.nt.gov.au/_data/assets/pdf_file/0006/249036/Adelaide-River-Conservation-Reserves-JM-Plan-August-2014_final.pdf

⁴ https://territorystories.nt.gov.au/jspui/bitstream/10070/225332/1/EJ_NTGG_2002_G06.pdf

⁵ Advised by Power and Water Corporation. See Darwin Region Water Supply Strategy https://www.powerwater.com.au/_data/assets/pdf_file/0019/8443/2013-Power-and-Water-Corporation-Darwin-Region-Water-Supply-Strategy.pdf

- the quantity and quality of ore and waste rock and its capacity to generate acid, neutral, saline, metalliferous and/or other non-benign drainage and the potential impacts of any such drainage on the quality of surface water and groundwater
- the quality of groundwater due to legacy impacts and predicted impacts caused by new mining activities
- potential receptors of poor quality water due to a lack of information on the quantity, quality, sources and management of water required during construction and operation
- potential impacts to people and fauna post-closure due to potential overflow of water of unknown quality from the final pit lake, heap leach process ponds and water storage dams
- flood risk, particularly containment of runoff or leachate from the heap leach facility during high rainfall events.

In conclusion, the NT EPA considers there is potential for significant impacts to inland water environmental quality resulting from proposed pit dewatering, AMD from waste rock and ore, operation of the heap leach facility and hazardous chemical spills. The information provided in the NOI is not sufficient to enable an assessment of the potential impacts and the suitability of the proposed mitigation and management measures. There remains uncertainty about whether the NT EPA's environmental objective for this factor can be met.

5. Hydrological processes

Objective: Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.

Surface water flows at the Proposal site drain into ephemeral creeks that join the Margaret River which passes approximately 4 km north-west of the site. Groundwater in the vicinity of the Proposal occurs within local aquifers in fractured and weathered basement rocks. There are few other groundwater users in the area, the closest being Grove Hill Hotel, approximately 6 km east of the Proposal.

The NOI identified that the Proposal is likely to reduce the quantity of water in local creeks due to the diversion, retention and management of water that comes into contact with disturbed areas. This could impact riparian vegetation and aquatic ecosystems in local creeks. The changes to surface water flows and resulting potential impacts are uncertain at this stage until a water balance is developed for the Proposal.

The NT EPA considers that there is potential for changes to the groundwater hydrological regime due to dewatering requirements for mining and the presence of a permanent pit lake and dams following closure. This could affect the quantity and quality of water available to other users in the area, including any groundwater dependent ecosystems. Without a characterisation of local hydrology there is insufficient information to assess this potential impact.

In conclusion, the NT EPA considers that there is potential for significant impact on hydrological processes and there is uncertainty about whether the NT EPA's objective for this factor can be met.

6. Social, economic and cultural surroundings

Objective: Protect the rich social, economic, cultural and heritage values of the Northern Territory.

Little information was provided in the NOI on the range of stakeholders that may be affected by the Proposal. Land use in the region includes pastoralism and mining. There are also a number of tourism values in the region including the Tjuwalyin (Douglas) Hot Springs Park and Butterfly Gorge Nature Park. The North Australian Railway easement on which the Ghan Railway operates runs along the southern boundary of the mining lease. The Stuart Highway runs

approximately 16 km south-west of the Proposal (by road). The nearby small towns of Adelaide River and Pine Creek (populations ~353 and ~328 respectively) have high levels of unemployment.

The Proposal will require the use of public and private roads, including the Stuart Highway which includes a section of the Northern Goldfields Loop tourist drive. No traffic and transport study has been undertaken to determine the impact of increased traffic in the region. The NT EPA considers that trucks entering, leaving and using the Stuart Highway has potential to significantly impact other road users including tourists and tour operators.

The potential socio-economic impacts of the Proposal were not comprehensively addressed in the NOI. The NT EPA acknowledges that there are potential economic benefits to businesses in Adelaide River and Pine Creek through service provision to the mine workforce. There are also potential benefits associated with training and employment for the local population.

The NT EPA considers that engagement with the community and relevant agencies is necessary to understand the full range of potential social and economic impacts (positive and negative) associated with the Proposal and to develop appropriate mitigation and management measures.

Field surveys identified a number of archaeological sites as defined under the *Heritage Act 2011* in close proximity to the Proposal. Four archaeological sites are within the proposed disturbance area east of the pit. The archaeological significance of these sites has not been assessed. The Aboriginal Areas Protection Authority advised that one sacred site has previously been recorded within the Proposal area. This site was not recognised in the NOI. Broader cultural considerations were not comprehensively addressed in the NOI.

The NT EPA considers there is potential for significant impacts to social, economic and cultural surroundings as a result of the Proposal. The information provided in the NOI is not sufficient to enable an assessment of the potential impacts and any mitigation and management measures. There remains uncertainty about whether the NT EPA's environmental objective for this factor can be met.

CONCLUSION

The NT EPA considers that the Proposal has the potential to significantly impact the environment and some of those impacts cannot be adequately characterised without further studies and a more comprehensive assessment.

Detailed matters for assessment will be set out by the NT EPA in Terms of Reference for the Proposal.

DECISION

The Fountain Head Gold Project is capable of having a significant effect on the environment and its environmental significance is such that the preparation of an Environmental Impact Statement under the EA Act is necessary with respect to the proposed action.



DR PAUL VOGEL AM MAICD

CHAIRPERSON

NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY

16 MARCH 2020

Attachment 1: Northern Territory Government Agencies consulted on the Notice of Intent

Department	Division
Department of Environment and Natural Resources	Flora and Fauna Water Resources Weeds Environment Bushfires NT Rangelands
Department of Infrastructure, Planning and Logistics	Planning Transport and Civil Services Infrastructure
Department of Primary Industry and Resources	Mining Compliance Petroleum Primary Industry Fisheries
Department of Tourism, Sport and Culture	Parks and Wildlife Heritage Tourism NT Arts and Museums
NT Police, Fire and Emergency Services	Business Improvement and Planning
Department of Health	Environmental Health Medical Entomology
Department of Trade, Business and Innovation	Economics and Policy Strategic Policy and Research
Department of Local Government, Housing and Community Development	Maintenance Planning Housing supply
Power and Water Corporation	
Aboriginal Areas Protection Authority	Technical
Department of the Attorney-General and Justice	Commercial Division NT Worksafe
Land Development Corporation	
Department of the Chief Minister	Economic and Environmental Policy Social Policy