

Statement of Reasons

PRIMARY GOLD LIMITED – TOMS GULLY MINE PROJECT

PROJECT

Background

The Toms Gully Mine is located within Old Mount Bunday Station, approximately 90 km south-west of Darwin, and 15 km west of Annabaroo, beside the Arnhem Highway.

Toms Gully Gold Project was assessed under the *Environmental Assessment Act* (EA Act) in April 1988, as a Preliminary Environmental Report, submitted by Carpentaria Gold Pty Ltd. The Toms Gully gold (and silver) deposit was open-pit mined from 1988 until May 1991. The mine included evaporation ponds and a tailings dam. Underground mining commenced from the east end of the pit in January 1990, but halted after 465m in December 1990 when the Crabb Fault Zone was encountered. The mine was sold to Esmeralda Exploration Ltd, and the pit allowed to flood. In 1993 ownership was transferred to Kakadu Resources NL (KR), who constructed a Carbon In Leach (CIL) plant in 1995 to re-process sulphide and oxide tailings, and a new Tailings Dam and Wetlands Oxbow. Pit dewatering was commenced through approved waste water discharges during the wet season. Poor recoveries led to ceasing of operations, and the pit being allowed to flood. KR was restructured as Sirocco Resources NL (Sirocco) who began open pit mining activities at the nearby Quest 29 (Q29) in June 1999, after undergoing environmental assessment under the EA Act at the level of a Public Environment Report. As part of the assessed proposal, a crushing circuit was added to the Toms Gully CIL circuit to process sulphide/oxide grade ores from Q29, however the inability to segregate high and low grade ore saw all of the ore treated in the Q29 heap dump leach facility.

By 2001 the Toms Gully open pit was dewatered. In 2004 Sirocco, re-named as Renison Consolidated Mines NL, undertook further drilling and recommenced production in 2006. In 2007 floods damaged underground operations and production stopped, and the mine was sold in July 2007 to Burnside Operations Pty, a subsidiary of GBS Gold Australia. GBS undertook refurbishment until being placed into administration in August 2008, with Toms Gully Mine operating under care and maintenance from October 2008.

Crocodile Gold Australia acquired Toms Gully Mine in November 2009, and continued refurbishment prior to mining from January to September 2010. Crushed and uncrushed stockpiled ore was hauled to Union Reefs Mill for processing until January 2011.

In early 2013, Primary Gold Ltd acquired the Toms Gully Project Area. Primary Gold undertook review of historical data and completed a Feasibility Study for recommencement of gold production at Toms Gully, which supported a low capital and low cost return to gold mining and production. The study indicated a maiden Probable Ore Reserve of 775,000 tonnes at 6.9g/t for 175,000 ounces of gold.

On 28 February 2014 the Department of Mines and Energy (DME) referred the Toms Gully Project Area Mining Management Plan (MMP) 2013-2014 and 18 associated documents to the Northern Territory Environment Protection Authority (NT EPA) for consideration under the *Environmental Assessment Act* (EA Act).

Infrastructure

Infrastructure now includes the open pit (88m deep, flooded), underground decline (200m vertical depth, flooded), waste rock dumps (sulphide and oxide), ROM Pad, crushers, mill circuit, Carbon-In-Leach circuit, two tailings storage facilities, haul and access roads, process water / tailings

network, evaporation ponds, artificial wetlands (oxbow), storm water ponds, passive treatment systems, irrigation pasture, diversion channels, dewatering network, diversion channels, dewatering network and various ancillary infrastructure. The Toms Gully Project Area is currently closed and under 'care and maintenance'.

Legacy Issues

The Toms Gully Mine currently presents a number of legacy environmental issues, including:

- Significant acidic and metalliferous drainage (AMD) from mine infrastructure, including the oxide waste rock dump, sulfide waste rock dump, old tailings dam, evaporation ponds and the open pit. Non-acid forming (NAF) mine waste may also leach elevated Arsenic concentrations (also Pb, Zn, Cd, Sb, Ni and Co);
- Poor water quality (low pH, high metal content) has developed in the pit and evaporation ponds. The pit requires dewatering before mining could recommence.
- Both of the tailings dams leak. Tailings Storage Facility (TSF2) is overflowing under wind and wave action;
- The rehabilitated waste rock dump leaks AMD and is covered in Gamba grass; and
- Development of an AMD seepage plume is apparent to the west of the sulphide waste dump, in close proximity to Mt Bunday Creek.

Mt Bunday Creek lies approximately 180m north of the mine, and holds declared beneficial use of 'aquatic ecosystem protection'. Coulter Creek runs approximately 1km to the south of the mine site. Both Creeks run into the Mary River and the Mary River National Park to the North East.

Current Proposal

The current proposal described in the MMP (Part B) and associated documents is to dewater the flooded mine and resume underground mining, at an increased rate. Details include:

- A new process water dam (2.6 GL). The new TSF would envelop the old TSF (TSF 1) and an area partially disturbed by a network of exploration drilling pads;
- Upgrade of TSF2 with two wall-lifts over two years, using tailings to construct the lifts. The lifts would increase TSF2 height by 7.5m and create over 400,000 m³ extra capacity. The upgrades aim to address both current issues of limited freeboard and immediate storage requirements;
- Dewatering of the Toms Gully open-cut pit, and underground mine, to re-establish underground services in the Toms Gully Decline. Dewatering would initially utilise a combination of treatment and discharge (as per the current water discharge licence), enhanced evaporation, relocation of water to proximal storage facilities. Enhanced evaporation methods may include a combination of water sprays, fan evaporation, multi-spigot trickle lines over black plastic recycled back into the evaporation ponds;
- Ramp-up of operations over 24 months from existing capacity of 250ktpa up to 350ktpa, to be achieved through:
 - Mine, crushing plant and processing circuit refurbishment; and
 - Addition of a second primary mill, modifications to the floatation circuit, increased fine grinding capacity, a new elution circuit and the second lift to TSF2.
- A potential 3m wall-raise to the evaporation ponds.

JUSTIFICATION

Review of the MMP by DME, NT EPA and advisory agencies identified a number of risks associated with the proposal. These included:

- The Project site presents legacy AMD issues from historical mining from various mine components. Risk exists that these will be exacerbated by further loading of existing infrastructure;
- Water quality in the pit and evaporation dams is poor (low pH, high metal content), and the pit requires dewatering. The pit currently serves as a depository to contain AMD seepage and runoff onsite. Without the pit to receive water, the Mine would have a positive water balance of over 800ML/yr., requiring treatment, enhanced evaporation and/or waste discharge into Mt Bunday Creek. The proposal has not yet demonstrated how this excess water will be managed and discharged during operations. Proposed contingency using evaporation fans presents risks of wider dispersal of the contained metals and salts to surrounding soils and vegetation.
The documentation has not adequately demonstrated that waterways (including groundwater) surrounding the mine will not be impacted by the proposed development. Due to concerns around contamination of surface water and groundwater the proposed development will require consideration for licensing under the *Water Act*.
- Use of existing tailings to construct lifts in TSF2 presents risk of Acidic and/or Metalliferous Drainage (AMD) runoff from created outer dam walls, depending on the AMD potential of the tailings;
- The current water balance model assumes seepage rates to groundwater of 10% per year from each storage, based on discussions with Primary Gold. Contaminated seepage and runoff presents risks to local groundwater quality, soils, groundwater dependent ecosystems, and aquatic ecosystems in Mt Bunday Creek;

Mary River National Park is a downstream sensitive receptor of water quality impacts if poor quality water extends off site into Mt Bunday Creek, a tributary of the Mary River. Mt Bunday Creek itself has also a declared Beneficial Use of aquatic ecosystem protection;

The Mary River National Park contains national and international Sites of Conservation Significance for biodiversity values based on the parks freshwater wetlands, saline and tidal areas. The park has twelve threatened species and the floodplain is the most significant and reliable breeding site for magpie geese in the NT. The Mary River wetlands are also listed as an internationally Important Bird Area for the abundance and significance of its waterbird and shorebird populations. The floodplain environments also provide a major breeding area for many fish species, including barramundi. The Mary River is an extremely significant recreational fishing site with iconic locations such as Shady Camp, Wildman Rockhole and Hardies;

- The underground mine is in zone of high groundwater transmissivity, making mining conditions potentially very wet and potentially hazardous to workers. Risks are apparent to underground mine worker safety from operating in a continually flooding space. The proposed extension of the underground decline underlies the site of the proposed new process water dam, in a field disturbed by a network of exploratory drilling core holes, and between two fault zones (Crabb Fault and Williams Fault). The local Wildman aquifer reports high yields of up to 20 L/s at the surface, and higher input rates inside the mine decline, particularly in close proximity to the faults;
- Information gaps were identified around a number of potential environmental risks for the Project. Targeted studies would be appropriate to better define and address risks. Identified information gaps include:
 - Characterisation of tailings projected for the construction of TSF2, and engineering feasibility studies to demonstrate that the proposed lifts will not elevate AMD discharge rates, and that the facility will be stable;
 - Hydrogeological assessment of the Project area, including new infrastructure, to ascertain likely flow paths and seepage rates;

- Site-wide groundwater and contaminant transport modelling of the proposed upgrades / mine recommissioning, to predict changes in contaminant loads to local sensitive receptors;
- Demonstration of whether or not the Crabb's and/or Williams Fault Zones are hydraulically connected to any current or future water storage facilities;
- A site-wide AMD management strategy and environmental management plan addressing existing legacy AMD issues and expected changes with the proposed mine recommissioning;
- Risk analysis and contaminant transport modelling of options to reduce excess annual water budget, such as use of banks of evaporative fans; and
- Demonstration is required of:
 - how the proponent intends to manage increasing concentration of contaminants in the evaporation ponds; and
 - Use of water quality trigger values. The derivation of water quality trigger values, and the subsequent corrective actions outlined in the NOI are considered inadequate to protect the declared beneficial uses in area. It is also apparent that the summaries of monitoring data in the NOI are based on a limited data set.

CONSULTATION

On 14 March 2014, in accordance with the Environmental Assessment Administrative Procedures (clause 8(1)), the MMP was circulated to Northern Territory Government advisory agencies that have administrative responsibilities relating to this action.

Submissions were received from:

- Department of Land Resource Management;
- Department of Mines and Energy;
- NT Tourism
- Medical Entomology - Department of Health - Centre for Disease Control;
- The Parks and Wildlife Commission of the Northern Territory
- Department of Health - Environmental Health Branch;
- Environment Protection Authority – Pollution
- Department of Lands, Planning and the Environment - Heritage Branch; and
- Department of Business

DECISION

The Northern Territory Environment Protection Authority (NT EPA) considers that there is a risk of significant impacts to the environment from this proposal. A number of the risks have not been adequately characterised and require further studies and a more comprehensive assessment. Pursuant to clause 8(2) of the Environmental Assessment Administrative Procedures (EAAP) the NT EPA therefore has determined that an Environmental Impact Statement (EIS) is required for the proposal.



DR BILL FREELAND

CHAIR

NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY

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