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McPhillamys Gold Project (SSD-9505)

Resource & Economic Assessment

Division of Resources & Geoscience

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More information

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Determination

The Division of Resources and Geoscience (Division) assessed the McPhillamys Gold Project (the Project or Proposal). The Division determined the Project will:

- establish a new mine in the Central West.
- extract up to 1.73 million ounces (Moz) of gold over the project life.
- provide 260 full-time equivalent (FTE) jobs during operation, peaking to 320 FTE jobs.
- provide 710 FTE jobs during peak construction.
- ensure an appropriate return to the NSW Government including;
  - $91 million royalties (current dollars)
  - $3 billion total revenue (current dollars)
- be an efficient use of resources.

The Project

Regis Resources Limited (Regis or the Proponent) through SSD 9505 seek approval to develop a greenfield open cut gold mine in the Central West region that will:

- develop a 90 kilometre water supply pipeline and associated infrastructure, that will transport surplus water from collieries and a power station near Lithgow to the mine.
- extract up to 8.5 Mtpa of ore, to produce approximately 200,000 ounces per annum of product gold.
- have a project life of 15 years, including ten years of mining.
- involve the construction of mine related infrastructure.
- Create 260 FTE jobs during operation, peaking to 320 FTE.

Introduction

State significant development is regulated under the *Environmental Planning and Assessment Act 1979*, which requires a proponent to apply to the Department of Planning, Industry and Environment for development consent, supported by an Environmental Impact Assessment (EIS).

This Resource & Economic Assessment (REA) conducted for the McPhillamys Gold Project by the Division assessed:

- the social and economic benefits to NSW including royalties, capital investment, revenues and jobs.
- the resource/reserve estimates stated in the proponent's EIS.
- if the proposal is an efficient development of the resource, that resource recovery is optimised and waste minimised.
- if the proposal will provide an appropriate return to NSW.

The objects of the *Mining Act 1992* are to encourage and facilitate the discovery and efficient development of mineral resources in NSW.

Of particular relevance to this REA are section 3A Objects:

- to recognise and foster the significant social and economic benefits to NSW that result from the efficient development of mineral resources.
- to ensure an appropriate return to the State from mineral resources.

The relevant section of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 is Part 3, Clause 15: Resource Recovery requires that resource recovery is efficient, optimised and minimises waste.

Project overview

The McPhillamys Gold Project is a proposed open cut gold mine south of Blayney, with an expected operating mine life of ten years. The Project is operated by Regis who in September 2017 announced a maiden Ore Reserve estimate of 60.1 million tonnes (Mt) at 1.05 gram/tonne (g/t) gold for 2.0 Moz of gold.

The Proposal for the major gold mine west of Blayney includes:

- A single open cut will be developed to a final pit depth of 460 metres from surface with a maximum diameter of 1050 metres.
- Construction and use of a conventional carbon-in-leach (CIL) processing plant where ore will be processed by industry standard methods including recovery of gold by gravity separation and fine grinding.
- Site infrastructure consisting of a processing plant, waste rock emplacements, tailings storage facility and other mine amenities.
- The Project proposes to operate on a 24-hour basis with a majority residential workforce.

Geological Background

The Project is located within the metallogenic province of the Eastern Lachlan Orogen. The regional geology consists of Ordovician to Devonian aged sequences including the Molong Volcanic Belt, Mumbil Shelf and the Hill End Trough. To the north and east, these are intruded by Carboniferous aged granites of the Bathurst Batholith.

The mineral resource is situated within the Anson Formation, of the Mumbil Shelf. Volcaniclastic rocks account of the majority of the logged lithologies in the proposed open cut. These range from matrix supported breccias and conglomerate to fine grained tuffs. Minor lithologies include sandstone, intermediate extrusive, siltstone, clay and limestone. Host rocks strike north-south and dip towards the east.

Shearing associated with the Sherlock Fault, part of the regional Godolphin-Copperhania thrust fault zone, is the primary control on gold mineralisation. The shear zone dips steeply towards the east, sub-parallel to stratigraphy and is approximately 200 metres wide.

Conclusion

The Division has no issues with the Proponents understanding of the Project geology.

However, the Division requests that a pit-scale geological plan and section be provided to the Division, which clearly shows the geological units in relation to the mineral resource.

Size and quality of the resource

The mineral resource is defined within a sub-vertical cylindrical shaped body identified by a broad mineralisation grade shell of greater than 0.1 g/t gold. The mineral resource estimate was constrained within this domain and is hosted entirely within the sheared volcanics of the Anson Formation.

The resource occurs within a 200 metre wide shear zone. The modelled ore body extends from surface to the limit of economic extraction at approximately 460 metres below surface. Some additional gold mineralisation has been identified beneath the base of the proposed pit.

Gold is typically associated with strong quartz-carbonate-sericite-pyrite-pyrrhotite alteration localised within the shear zone. Fine-grained free gold is located on mineral grain boundaries and associated with other sulphide minerals, in particular the coarse-grained pyrite.

On the 8 September 2017 Regis announced an updated mineral resource estimate and maiden ore reserve (Maiden Ore Reserve) conducted as part of prefeasibility studies.

Table 1 - Mineral Resources and Ore Reserves

Category	Tonnes (Mt)	Gold Grade (g/t)	Gold (ounces)
Mineral Resource			
Indicated	67.7	1.05	2,282,000
Inferred	1.2	0.64	25,000
Total	68.9	1.04	2,307,000
Ore Reserves			
Probable	60.1	1.05	2,034,000

A large proportion of the mineral resource estimate has been determined to an indicated level of confidence with a high conversion rate of resources to reserves. All Probable Ore Reserves have been derived from Indicated Resources.

The mineral resource and ore reserve estimate have been completed in accordance with the Australasian Joint Ore Reserves Committee (JORC) Code for reporting of Exploration Results, Mineral Resources and Ore Reserves. The JORC Code is an industry standard, best practice professional code that sets minimum standards for public reporting. This ensures the work has been conducted to a high level of quality and confidence.

Conclusion

The Division has no issues with the Proponents understanding of the size and quality of the mineral resource.

Resource recovery

The mine will operate by conventional open cut methods including drill, blast, load and haul with extraction capacity of up to 8.5 Mtpa of ore. Operations will occur in two stages, including one pit cut-back.

A recovery factor based on comprehensive metallurgical test work has been incorporated into the Ore Reserve optimisation. A process of carbon-in-leach (CIL) processing combined with gravity separation and fine grinding is expected to recover 85% of the contained gold. Over the life of the Project approximately 1.73 Moz of gold will be produced.

The proposed mine design and site layout have evolved during the study stages of the Project but should achieve satisfactory resource extraction. The proposed mine site infrastructure is not expected to significantly sterilise any resources.

Due to the sub-vertical nature of the mineral resource, approximately 12% of ore reserves will remain in the ground at the completion of mining. Project economics do not favour its extraction and resource recovery is maximised with the proposed design.

Conclusion

The Division finds that there will be no significant sterilisation of resource and has no objections to the Proposal.

Economic benefits of the resource

Over the life of the Project, the Division has estimated that the value of the gold produced would be around A$3 billion in current dollars, with the net present value of this revenue stream around A$2 billion at a real discount rate of 7%.

All gold produced from the Project would be exported. Export income is vital for the health of both the NSW and Australian economies. Export income also contributes to the Nation's balance of trade, which provides benefits to both the state and Australian credit ratings, plus it generally has a positive impact on the Australian dollar exchange rate.

The Project, if approved, would provide an average of 260 full time operational jobs over the Project life, peaking at 320 jobs in the middle years of the Project. The Division estimates that these direct mine jobs would result in around an additional 1000 indirect jobs in both mine and non-mine related services. Ongoing and initial capital expenditure for the Project would be of the order of A$500 million.

A cost benefit analysis conducted by the Proponent's economics consultant (Gillespie Economics) has indicated that the Project would have net production benefits to NSW of A$143 million, present value at 7% discount rate.

The Division notes from the Proponent's supplementary local effects analysis, that the total annual impact of the peak year of construction on the regional economy is estimated at up to:

- A$531 million in annual direct and indirect regional output.
- A$218 million in annual direct and indirect regional value added.
- A$114 million in annual direct and indirect household income.

From this same local effects analysis, the Division notes that the Project operation is estimated to make the following contribution to the regional economy:

- A$492 million in annual direct and indirect regional output.
- A$272 million direct and indirect regional value added.
- A$67 million in annual direct and indirect household income.

Royalty calculation

The Project is a proposed gold mine; therefore, a royalty rate of 4% applies to all gold (refined metal) produced. For gold operations deductions are allowable on the price received and include: onsite treatment expenses, realisation expenses, onsite administration and depreciation. The net value after these deductions is called the ex-mine value. The 4% royalty rate is applied to the ex-mine value amount.

One of the most important assumptions in the calculation of future royalty is the estimate of a future gold price over the life of a project. The Proponent has used a real gold price of US$1320 per ounce over the life of the Project and an exchange rate of US$0.75 to A$1.00 resulting in a price of A$1760 per ounce. The Division is of the opinion that these assumptions are reasonable.

Another important aspect of future royalty calculation for a proposed gold project is estimation of future annual production. The Proponent has estimated that around 1.73 Moz of gold would be able to be economically mined from the Project. The Division is of the opinion that this is a reasonable total based on a rigorous analysis of the geological information available.

Using the above parameters, the Division has calculated that the State will receive around A$91 million in current dollars, and around A$65 million in NPV terms (real discount rate of 7%) in royalty from the Project over its lifetime. At full production scale, the NSW Government would receive around A$11 million per year in royalties from the Project.

Departmental Assessment

Assessed by	Unit	Branch
Assessing Officer: Dr David Forster Senior Geologist	Mineral Resource Assessment – Strategic Resource Assessment & Advice	Geological Survey of NSW
Assessing Officer: Karen Montgomery Senior Geologist	Mineral Resource Assessment – Strategic Resource Assessment & Advice	Geological Survey of NSW
Assessing Officer: Bryan Whitlock Senior Resources Analyst	Resource Economics	Resources Policy, Planning & Programs
Assessing Officer: Adam W. Banister Senior Advisor	Assessment Coordination Unit – Resource Assessments	Resource Operations

Approvals

Approved by	Signature	Date
Approving Officer: John Davidson A/Director Strategic Resource Assessment & Advice	Approved in CM9	4 October 2019
Approving Officer: Tamsin Martin Director Resources Planning & Programs	Approved in CM9	8 October 2019
Endorsing Officer: Dr David Blackmore Director Resource Assessments		11 October 2019