

# ELECTRANET PTY LTD CURNAMONA PROVINCE ANALYSIS





26 November 2018

Mr. Bradley Harrison ElectraNet Pty Ltd 52-55 East Terrace Adelaide, SA 5000 AUSTRALIA

Dear Mr. Harrison,

### **RE: Curnamona Province Analysis**

AME Consulting Pty Ltd ("AME") has been engaged by ElectraNet Pty Ltd ("ElectraNet", or the "Client") to assess the mining projects in the Curnamona Minerals Province in northeast South Australia and discuss the likelihood of the projects commencing over the next 20 years (the "Report"). We understand and acknowledge that ElectraNet Pty Ltd ("ElectraNet", or the "Client") will use this report, in whole or part, for the purposes of planning for a network interconnector between South Australia and NSW.

### Production and Cost Analysis

Available data varies greatly between operations and projects. Much information is not reliable due to language difficulties, the confidential nature of the information, the inability to estimate the reliability of AME's sources and general lack of data. Consequently, much information has to be estimated and the quality, accuracy and completeness of the resulting cost comparisons will reflect this and cannot be guaranteed. Furthermore, forecast costs embody a number of significant assumptions with respect to exchange rates and other technical variables. Because of these factors, direct comparability between individual projects may be limited and, as such, our supply and cost estimates must be treated with caution and cannot be relied upon.

### Supply/Demand Analysis

In addition, AME has supplied tables of historical data and estimated future supply, demand and market trends by compiling, interpreting and analysing engineering, supply, economic, statistical and technical information from many third-party sources. Such company and country statistics usually contain inconsistencies and utilise sampling data techniques and, thus, should not be relied upon.

### Data Accuracy

AME has prepared this Report using information from its in-house database as well as a wide range of public domain and industry data sources for which assessment cannot be made in regard to accuracy. This is because AME does not have access to confidential company information to verify our data quality. Therefore, reliance can only be provided where we have data of sufficient quality that is acceptable to an international commercial court.

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### Forward-Looking Statements

Statements in this document may contain forward-looking information identified by words such as 'estimates', 'intends', 'expects', 'believes', 'may' and 'will' and include, without limitation, statements regarding companies' plans of business operations, supply levels and costs, potential contractual arrangements and the delivery of equipment, receipt of working capital, anticipated revenues, mineral reserve and mineral resource estimates, and projected expenditures. There can be no assurance that such statements will prove to be accurate—actual results and future events could differ materially from such statements. Factors that could cause actual results to differ materially include, among others, changes to metal prices, risks inherent in the mining industry, changes in the economic environment, financing risks, labour risks, uncertainty of mineral reserves and resource estimates, equipment and supply risks, regulatory risks and environmental concerns. Caution is needed and no reliance on forward-looking information can be made. Except as otherwise required by applicable securities statutes or regulation, AME expressly disclaims any intent or obligation to update publicly forward-looking information, whether as a result of new information, future events or otherwise.

### **Third-Party Sources**

AME's research is undertaken through both primary and secondary research from various sources. Primary sources include contact with market participants and industry experts, such as producers, industry consultants and associations. Secondary research involves desktop research of government departments and statistics, trade data, industry journals, company reports, public domain information, and data from the AME proprietary research database. AME makes attempts to obtain information from multiple sources to cross-reference and ensure consistency. Information and data collected has been analysed, assessed and reasonably validated using the in-house techniques of AME.

Best wishes,

AME Consulting Pty Ltd

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## **1.0 Curnamona Province Mining Projects**

The Curnamona Province is a geological region that straddles the border of New South Wales and South Australia, which hosts the Broken Hill Domain, and the corresponding Olary Domain in South Australia. These areas are host to a number of projects targeting base and precious metals including, copper, cobalt, gold, lead and zinc. There are currently two small operating gold mines, Round Oak's White Dam and CMC's Portia, in the area. Advanced projects in the area includes Havilah Resources' Kalkaroo and Mutooroo projects. There are also numerous small scale historical workings in the area.

On the southern edge of the Curnamona Province is the Braemar Formation, a magnetite bearing region running from near Broken Hill to the southern Flinders Ranges. Although there have been no current or historic operations mining this magnetite, there are a number of current proposed projects in both New South Wales and South Australia. These projects propose to produce a magnetite concentrate from low grade ores to be exported to steel producers globally. The key projects in the South Australian part of the Braemar Formation are Havilah Resources' Maldorky and Grants projects, Magnetite Mines' Razorback projects and Minotaurs' Mutooroo project.



Figure 1: Mining Projects in the Curnamona Minerals Province and Adjoining Areas

Source: AME

## 2.0 Base Metals Projects

The existing mines in the area are small scale gold operations, with short remaining lives.

Round Oak's White Dam is approaching the end of its extended life, and no further extensions have been identified, and it is expected that the mine will finish in the next 12 months

CMC's Portia has identified copper-gold mineralisation at North Portia, however, despite this being on the same lease, will be a more complex operation than the existing gold operation. This project is currently in the pre-feasibility stage. The operators are looking for other nearby gold mineralisations to extend the current gold only operations.

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Havilah's Mutooroo project is a copper, cobalt and gold project, with a number of targets in the region. There is a resource for this project, however, there is more work required to complete pre-feasibility and to define a reserve for this project.

The most advanced project in the region is Havilah Resources' Kalkaroo project, targeting a resource containing copper, gold and cobalt. This is the only project that has a JORC reserve, which means that sufficient work has been done to establish that part of the resource that is technically and economically viable for mining. Havilah is currently updating the prefeasibility study funded by Wenbao Mining, to further refine the project. The current reserve could support average annual production rate of 34,000 tonnes of copper, 100,000 ounces of gold and 1,000 tonnes of cobalt over a period of at least 14 years from an open cut operation.

The oxide zone of the deposit is rich in native gold and native copper, which can be recovered using low cost gravity concentration, and CIL follow for fine gold. The sulphide zone can be processed using convention flotation concentration. As a producer of base metals concentrates and gold Dore, AME expects this project to have a relatively lower capital intensity compared to large scale copper mines. AME has assessed the project to have a high potential to be a low cost producer and return a positive NPV.



### **Figure 2: Summary Production and Financial Data**

Source: AME

## 3.0 Iron Ore Projects

Iron ore projects in the region are focussed on the magnetite rich Braemar formation. There are three main projects in the area targeting large scale deposits, Havilah Resources' Grants and Maldorky projects, Magnetite Mines' Razorback projects and Minotaur Resources' Mutooroo projects. Each of these target multiple deposits in the exploration leases allocated to each of the projects. All magnetite projects targeting the Braemar formation have the advantage over other magnetite projects in Australia, in that the resource is hosted in softer material, mainly siltstones, that would allow for lower cost processing than that seen in other projects in Australia commissioned to date. Grinding is a significant cost in the production of concentrate products from magnetite deposits, and as such, softer host rocks a considered a material advantage.

None of these projects currently have a reserve, and the resources are only classified as indicated and inferred. This is due to the early stage of the projects and the work required to upgrade the resources into reserves. This will require additional exploration, modelling and completion of feasibility studies in order to identify the portion of the deposit that can be economically mined, and converted into a mineral reserve. AME considers the Maldorky deposit to be the most advanced of the projects in the South Australian part of the Braemar formation, as it has mining lease applications underway, and an experienced partner in SIMEC Mining to assist in progressing the assessment of the resource. As a result, AME considers that these projects are not currently sufficiently advanced to be able to assess the economic viability of these projects at this stage, and would estimate that they would be 3-5 years away from being in a position to be sufficiently advanced to economically assess.



The most advanced project in the broader Braemar Formation, is the Hawsons project in NSW. This project has completed a pre-feasibility study, and is now completing bankability feasibility studies and has submitted a mining lease application. AME considers this to be a viable project that would return a positive NPV, with an initial capital cost of approximately US\$700m. AME estimates that the project would be approximately 5 years from production. This project would be a representative case for those projects currently being assessed in South Australia, demonstrating the possibility for these projects to be commercialised, but also show the potential high capital cost of these projects. Based on the timeline seen in the assessment of the Hawsons project, it would be estimated that the projects in South Australia would be 8-10 years from first production at the earliest.

# 4.0 Historical Project Conversion Rates

AME has reviewed the rate of conversion of copper projects in Australia that reach the feasibility stage progressing to the production phase over the past 13 years. It has been assessed hat the average project conversion rate over this period was approximately 6.0% pa.

AME has reviewed the rate of conversion of iron ore projects in Australia that reach feasibility stage progressing to the production phase over the past 13 years. Over this period, it has been assessed that the average project conversion rate was approximately 6.2% pa. When projects proposed by Rio Tinto, BHP and FMG are excluded, the conversion rate for projects proposed by junior mining companies falls to 5.8% pa.

However, when magnetite projects are separated out as a separate group, over this period only 3 out of 13 proposed projects have entered production during this time, all of which have experienced cost overruns and operational issues. Despite these operations producing a significantly higher value product than that typically produced by Pilbara producers, the complex nature of these projects have made it difficult to attract funding to progress through to the construction phase.