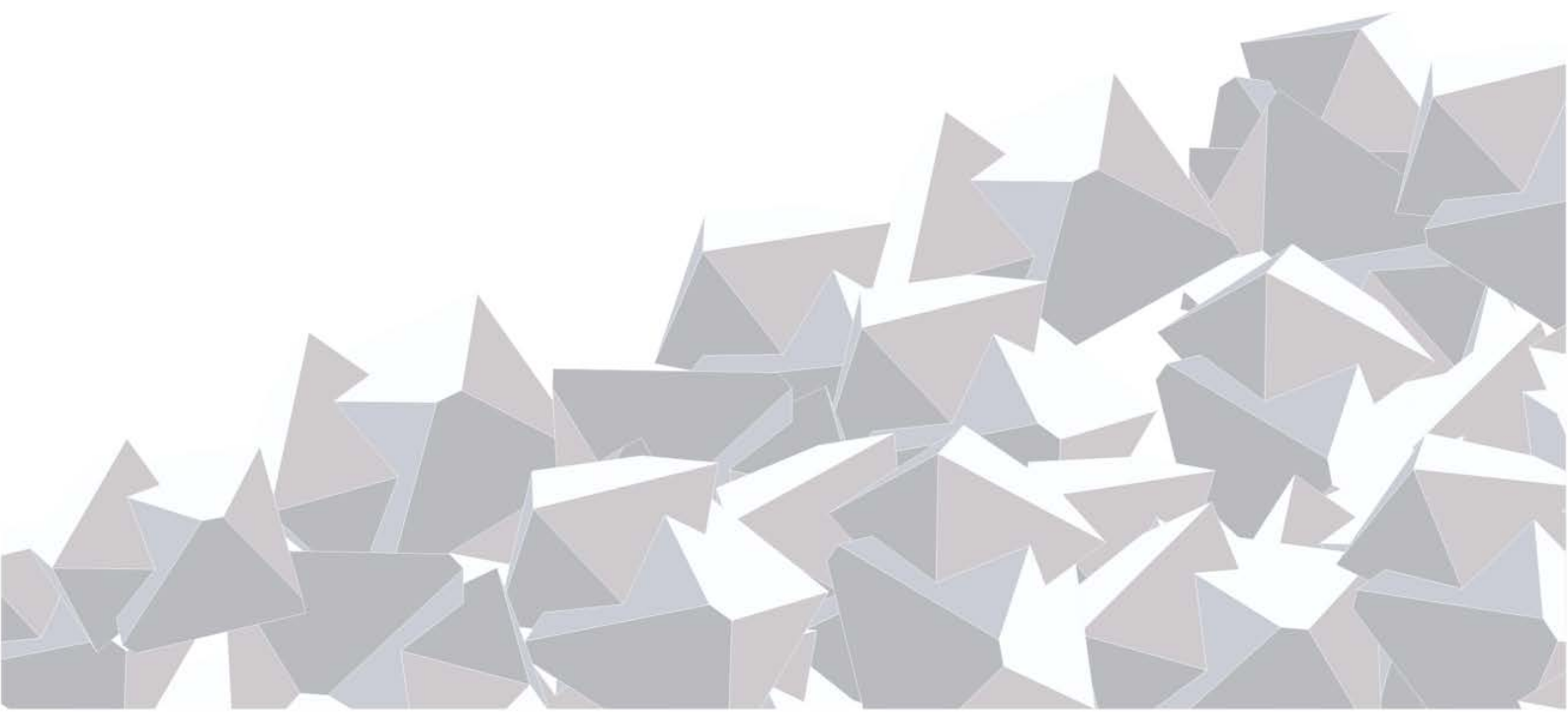




**MAGNETITE MINES LIMITED**  
Making Steel **Stronger**

*Our Project's Primary  
Differentiator  
Q and A*

Version: 2.0





## Introduction

Magnetite Mines Limited (Magnetite Mines) Mawson Iron project located in South Australia's mid north east is quickly gaining traction as a world class magnetite iron ore deposit. The proponents of which, led by chairman Mr. Gordon Toll, are currently involved in conceptual studies<sup>1</sup> to determine the capability of producing large quantities of magnetite from an available JORC 2004 combined Inferred and Indicated Resource of 3.9 Billion Tonnes<sup>2,3</sup>, the product of which - high grade iron ore concentrate - can be transported by slurry pipeline to the coast rather than traditional rail. These studies<sup>4</sup> are a continued optimisation of a PFS base case<sup>5</sup> completed in 2013. Please note that there is low level of geological confidence associated with an inferred mineral resource and there is no certainty that further work will result in the determination of indicated mineral resources or that the production target itself will be realized.

But the use of alternative technologies does not stop there, in fact the project prides itself on the use of many innovative solutions to achieve its goals even in a depressed iron ore market. Included in their repertoire of solutions is the use of IPCC, infrastructure corridor for slurry and water and a floating iron ore port. Most importantly, this is just the beginning, with an Exploration Target<sup>6</sup> suggesting the area has substantially more mineralization which could significantly increase the scale of the Project and become a major iron ore competitor on the world market.

Presented below is a Q and A with Magnetite Mines on how they believe they differentiate themselves from their competitors and what they believe to be the critical factors in developing a magnetite iron ore mine in the short to long term commodities cycle.

<sup>1</sup> Conceptual Feasibility Study has been completed by the Lodestone Group for the Mawson Iron Project, which shows that the proposed Infrastructure Solution can achieve a capacity of 25 Mtpa or more. The Company advises that this conceptual feasibility study is based on Lodestone's Braemar Iron Project and is ongoing.

<sup>2</sup> ASX Release 21<sup>st</sup> November 2012

<sup>3</sup> ASX Release 11<sup>th</sup> June 2013. The details contained in this report that pertains to ore and mineralisation and the resource is based upon information compiled by Gavin England BSc (Hons), PhD, a full-time employee of the Royal Resources Limited and Mr Lynn Widenbar BSc(Hons), MSc, DIC, Principal Consultant - Widenbar and Associates Pty Ltd. Dr England and Mr Widenbar is a member of Australian Institute of Geosciences (AIG) and Australian Institute of Mining and Metallurgy. These two people have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as a Competent Persons as defined in the December 2004 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (JORC 2004 Code). Dr England, and Mr Widenbar consent to the inclusion in this report of the matters based upon their information in the form and context in which it appears. The information for the Razorback Project was prepared and first disclosed under the JORC Code 2004. The information has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.

<sup>4</sup> ASX Releases on 27<sup>th</sup> November 2013

<sup>5</sup> ASX Releases on 30<sup>th</sup> January 2013

<sup>6</sup> ASX Release on 29<sup>th</sup> October 2015



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- 1. Your Chairman is on record stating that the development of a very large magnetite concentrate production operation in the Mawson Iron Province of South Australia by the South Australian Magnetite Consortium has a number of critical factors that very positively differentiate the proposed development from other magnetite projects - both operating projects and proposed projects - and indeed from many haematite projects too. Could you outline the more important of these factors?**

Firstly, the Mawson Iron Province is probably the largest accumulation of magnetite in the world and it is in reasonable proximity to a convenient port location with 25 metres water depth in Spencer Gulf. It is close to the State capital of Adelaide and there are existing towns dotted throughout the province with excellent road and power infrastructure.

Secondly, the size, geometry and favorable rock characteristics of the potential resource provides the possibilities for a very large scale and long life operation.

Thirdly, the end product has a very high iron grade and low impurities. Additionally, the product can be delivered to global steel makers at costs that competes with the lowest cost DSO projects.

And finally, our disciplined application of Configuration Engineering has achieved what we believe to be the most effective, low cost, sustainable project "Configuration". A configuration that can survive the worst of any business cycle.

- 2. Which of these factors do you consider the most important?**

Accepting that the first three listed factors are geographical, geological and metallurgical reality, then CONFIGURATION is the primary differentiator of the South Australian Magnetite Consortium project. It is the factor that ensures sustainably low delivered costs that rival many DSO haematite operations.

- 3. Why do some recently completed projects appear to have gotten everything so completely wrong?**

Yes, a casual observer would be forgiven for concluding that some recent iron ore projects and many proposed projects have not been intelligently put together. Certainly, there are some that will never be able to achieve sustainable low delivered costs.

In some of these cases the appearance is that there has been an absence of "Configuration Engineering" analysis in the early stages of these developments and/or a belief that unsustainably high prices would continue forever.

- 4. So "What is Configuration Engineering?"**

The discipline of configuration engineering in the mining world quite simply entails a highly disciplined and ruthless analysis of the production chain from orebody to customer to ensure all steps or unit processes in that chain are:

1. necessary and



2. employ the most cost effective, sustainable equipment and technology solutions available.

The term "Configuration Engineering" was coined in the US aero-space industry but as applied to the mining world it is more common sense than rocket science.

Considering an open pit mine the steps in the process are simple. Usually the ore and any waste rock has to be drilled and blasted. It then has to be loaded onto a mine transportation system and taken to a processing plant or to the waste dumps in the case of overburden or waste rock. The ore has to be processed to a saleable product and that product has to be sold to and transported to customers.

#### **5. Yes - no rocket science - so why do some project developers get it all so wrong?**

To highlight the elegance of Configuration Engineering it is best to look at possible comparative outcomes.

Let's do this by taking a look at all the production steps in the development proposal of the South Australian Magnetite Consortium and consider some of the less effective solutions that are often adopted.

The following describes in brief the essentials of the productions steps involved in the SA MAGNETITE CONSORTIUM development.

Everything starts with the development of a thorough understanding of rock properties, mineralogy and geo-metallurgy. Failure to develop such understanding early in the evolution of a mining project is a very old recipe for failure or at very least poor performance until the understanding is developed.

Ore and waste will be drilled with a proprietary blast hole layout and blasted with an ultra high powder factor to achieve the optimum effective degree of fragmentation and comminution attainable with cheap explosive energy. Effective optimisation across the combined mining and processing operations begins with drilling and blasting - the entire system must be effectively optimised - not each individual, isolated unit operation. For Example - Minimising drilling and blasting costs almost invariably significantly increases down stream costs.

The blasted material will be loaded into fully mobile sizers to "knock down" any oversize. Then it will be transported to the process plant or waste dumps by conveyor belts. Diesel trucks are expensive to operate and maintain regardless of whether they are driverless or not. Similarly, they are a very significant source of particulate and gas pollution.

#### **6. Do you intend to reduce the total financing requirements by having the mining done by a contractor?**

No, contractors are expensive and have the main objective of mining our bank account so we will mine the orebody ourselves.



This is an important point - there are other ways to sensibly finance the mining equipment and mine development.

Now continuing, ore from the mine conveyors is fed directly to the process plant where the ore will be reduced to liberation size (with gangue rejected at the earliest opportunity) in the largest proven Semi-Autogenous (SAG) mills and ball mills. There will be no huge stockpiles ahead of the process plant - the blasted ore in the mine is the only stockpile. The liberated product magnetite will be separated from gangue minerals by simple low intensity magnetic separators and hydro separators.

The concentrate will then (with no stockpile being required) immediately enter a slurry transportation system to be transported directly to a floating filter plant, storage and ship loading facility in Spencer Gulf (A Floating Iron Ore Port (FIOP))<sup>1</sup>. Filtered concentrate at <8.5% moisture will be immediately loaded onto waiting ships or stored in the holds of the FIOP. The FIOP will be able to load the largest VLOC's available (Valemax) - with water depth of 25 metres at MLLW, this will be the only port in Australia with this capability.

Bins and stockpiles add significant costs to bulk materials handling. Their absence in the above described flow sheet is a significant result of the application of configuration engineering to the Mawson Iron Project. Such a flow sheet is only possible with slurry pipeline transportation. A railroad requires train loading stockpiles at the mine end and port stockpiles at the other end.

<sup>1</sup> Based on Lodestone Equity Group Conceptual Feasibility Studies.

**7. So from blast to ocean going VLOC the material will be in constant motion - it will not stop until it gets to the customer's port of delivery?**

That is the essence of it all - that is why we can project costs that compete with DSO operations.

**8. There has been mention that the port will have a water depth at low tide of 25 metres. How does this compare with other iron ore ports and what are the implications?**

This water depth gives us the ability to load and dispatch the largest bulk carriers afloat at any tidal state. By comparison in the Pilbara the maximum sailing draft at most of the ports is 18.5 metres and that is only at high tide. Additionally, there is a very large dredged channel into Port Hedland Harbor. The net effect is that the Mawson Iron Project will be able to load 400,000 dwt ore carriers at any state of tide while in the Pilbara the best they can hope for is to load 260,000 dwt carriers and have them sail on the high tide. Despite a couple of days extra sailing time this will allow the South Australian Magnetite Consortium to achieve lower freight rates than the Pilbara in any given market.



**9. What about water supply? South Australia is the driest state in the Commonwealth? Most of the water used in the State comes from the Murray River and the Murray-Darling river system is under significant stress. Where will the project water be sourced?**

Sea water from Spencer Gulf will supply all water needs of the project via a water pipeline installed in the same trench as the concentrate slurry pipeline. A multi-billion project cannot be prefaced on assumptions that water will be available - water absolutely has to be available. Although requests to the JORC committee have been ignored, Magnetite Mines believes there should be an equivalent of a JORC code for ground water resources particularly when the success of an entire enterprise is dependent on achieving a 100% reliable water supply.

**10. What about the water for the slurry to transport the concentrates to the port?**

Our plan is to desalinate sea water at the mine to constitute the concentrate slurry for pipeline transportation. For every two tonnes of concentrate, one tone of high quality desalinated water will be required. Studies<sup>1</sup> have shown that for every 25 million of concentrate that can be produced, 12.5 GL of high quality water could be available for municipal, agricultural and industrial uses at the coast after the slurry concentrate is filtered to a residual water content of <8.5% moisture<sup>1</sup>. An expansion of the project will see the availability of water increase.

<sup>1</sup> Based on Lodestone Equity Group Conceptual Feasibility Studies.

**11. Would you like to comment on other utilities essential to the Project?**

Electricity will come from the South Australian grid at low cost. The grid is interlinked to the East Australia grid. Workforce and support will come from existing towns. Should self generation of electric power be necessary a very efficient and cost effective combined cycle gas turbine plant could be built close to where the Cooper Basin pipeline will be crossed by the slurry pipeline. Additionally, there will be the opportunity at the mine site to develop possibly the largest solar power installation in the world either using molten salt solar-thermal or PV plus valence change battery storage. The projects robust power connection would be available for export of power as well as import. Eventually another inter-connector could result through the Mawson Iron Province into NSW significantly strengthening the entire network.

**12. What makes you so supremely confident of the future of iron ore production from the Mawson Iron Province?**

Chinese domestic annual magnetite concentrate production has dropped substantially in the last several years. The message we get from steel mills, large and small, is that they want a replacement source of high grade, low impurity magnetite. Additionally, one of the easy ways to reduce emissions in steel making is to start with very high iron content ores or concentrates. So think about it – studies<sup>1,2</sup> show the Mawson Iron Province as potentially one of the largest unexploited high grade magnetite regions in the world, and could be the answer to this coming shortfall. The carefully designed configuration<sup>1</sup> will ensure that production will be delivered to the global steel industry at highly attractive costs. To me, a bright future for the project is inevitable.



<sup>1</sup> Based on Lodestone Equity Group Conceptual Feasibility Studies.

<sup>2</sup> ASX Release 29<sup>th</sup> October 2016

### **13. Closing Comments from the Chairman?**

Yes! I would like to underline my belief in this project by stating my conviction that the Mawson Iron Province is far more worthy of development and represents a more attractive development for investors than the Simandou DSO deposit in Guinea, West Africa. For what has been spent on that project so far for no tangible development, our studies<sup>1</sup> have shown that the “The Mawson Iron Project” phase one (at the Razorback Deposit) could have been up and running. Then a significantly expanded project could be built-out in stages rather than needing 20 to 25 billion USD up front. Political stability and attendant sovereign risk cannot be dismissed either. Neither presents an issue in South Australia.

In any case, for any project, a configuration that leads to an affordable, sustainable, low cost operation for life of mine is essential. The configuration must result in a project that can survive all the ups and particularly the downs of the business cycle. If such a configuration cannot be designed or envisaged, then the project should not proceed.

<sup>1</sup> Based on Lodestone Equity Group Conceptual Feasibility Studies.