MAGNETITE MINES LIMITED
Making Steel Stronger

## ASX Announcement

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# *Questions and Answers on the Mawson Iron Project*

For the benefit of shareholders, investors and media the Company has prepared a frequently asked questions and answers in respect to the Mawson Iron Project.

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# Introduction

The Mawson Iron Project is a large tonnage, high iron, low impurity magnetite project located in the Mawson Iron Province of north east South Australia. This document aims to provide an up to date compilation of commonly asked questions and answers in relation to the project.

The document is divided into generalised topics as frequently requested by prospective investors and media outlets.

- *The Big Picture – Our vision for the Mawson Iron Project*
- *Iron Ore and it's future*
- *Geology, mining and beneficiation*
- *Infrastructure – The innovative utilisation of proven technologies*
- *Social and Environmental Impact*

Should the reader have any further questions or comments regarding the project please feel free to contact us using the details below:

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# The Big Picture Questions for the Mawson Iron Project

## 1. What is the “Big Picture" vision for development of the Mawson Iron Province in South Australia?

The Mawson Iron Province of South Australia contains the Braemar Iron Formation, first discovered by Sir Douglas Mawson while mapping the geology of the Adelaide Geosyncline in the Barrier Ranges. Studies[1] have shown that this region has the capacity to supply over 100 million tonnes per year of high grade, high quality magnetite concentrate to the global steel industry for over 50 years. This is the largest undeveloped region of magnetite in the world, with Magnetite Mines being the dominant player.

We also believe from conceptual studies[1] that production costs are in the lowest quartile of all internationally traded iron ore. Metallurgical studies[2] have proven that a concentrate can be produced with a grade of 67.4 % Fe or above (compared to much of the Pilbara production at circa 58% Fe), which will be desirable feed for sintering or pellet making prior to addition to blast furnaces. It also has the capacity to become desirable feed for direct reduction iron-making plants. We believe that in a world where emission reduction is vital, the simplest way to achieve this in steel making is to use very high grade iron ores and concentrates. Grade, delivered at a competitive cost, will be King.

The potential is huge. If this was all to be achieved, this would place Magnetite Mines the 5th largest producer of iron in the world.

*[1] Conceptual Feasibility Study has been completed by the Lodestone Group for the Braemar Iron Project, which shows that the proposed Infrastructure Solution can achieve a capacity of up to 100 mtpa. The Company advises that this conceptual feasibility study is based on Lodestone's Braemar Iron Project.*
*[2] ASX announcement 27th November 2013*

## 2. Could you briefly describe the basic production facilities required to develop your iron ore deposits?

The approach is a seamless one from mine to ship-loading. Conceptual studies[1] of the planned mine will be an open pit in which we will use high intensity blasting to not only fragment the soft, non-abrasive ore but also achieve a very significant level of comminution to liberation size. Conveyor belts will transport the ore from the mine face to a mill and concentrator. The combined capital and operating cost for conveyors, on a life of mine basis, are suggested by conceptual studies[1] to be a minimum of 5 times cheaper than for trucks. The concentrator will employ well proven magnetic separation and hydro-separation technologies to make a very high grade, low impurity magnetite concentrate. The concentrate will be mixed with water to a desired thickness (slurry density) and pumped immediately as a slurry via a pipeline to a floating port moored about 5 nautical miles off shore from Wallaroo in South Australia's Spencer Gulf. There will be no visible facilities at the shore line.

*[1] Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 3. Aren't you proposing to employ untested, high risk technologies: truckless mining; slurry pipelines; use of seawater in the concentrators; floating production storage; and offloading ports (FPSO's)?

Truckless mining has been used for almost a century in brown coal mines in Germany and more recently in Victoria, Australia. The geological, mineralogical and geometrical characteristics of the Braemar Iron Formation deposits allow for exactly the same approach, with in-pit crushing and conveying (IPCC).

The Savage River slurry pipeline has been operating since 1967 and iron ore pipelines have been operating in Brazil since 1976. There are also several successful iron ore pipelines in India. Other minerals transported by pipeline include coal in the USA and bauxite in Brazil. In Australia, this includes the slurry of zinc concentrate to the coast from the Century Mine in Queensland. Operating costs per unit are an order of magnitude (ten times) lower than railroads. The flow regime is such that pipe wear is almost zero. The Savage River and Brazilian pipelines are still using the original pipes.

FPSO's (Floating Production Storage and Offloading) facilities are being used for complete "floating" gas processing plants in the Oil & Gas industry (*see Woodside Browse Basin offshore gas projects*). There is absolutely nothing new being done here. They are capable of withstanding class 5 storms. Little or no onshore facilities are needed, and hence the footprint at the shoreline is minimal and very environmentally friendly. Capital costs are hugely reduced. Floating ports already exist for both iron ore (Venezuela, India and New Zealand) and coal (Venezuela and Indonesia). Additionally, the use of a FPSO for the port means we will have a sailing draft of 23 metres at any state of tide - i.e. we can handle the largest bulk carriers currently available and achieve per tonne freight costs to China lower than the Pilbara and much lower than Brazilian producers. This is of great interest to the Chinese steel mills able to take delivery by Chinamax or Valemax vessels.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*
[2] *ASX announcement 27th November 2013*

## 4. How can you compete against, and gain market share from, the "Big Four"?

We believe the sector of the global steel industry that is dependent on ocean borne iron ore supply has reached the limits of tolerance for iron ore with declining grades, declining quality, increasing slag rates and hence increasing coke rates and increasing costs (i.e. The Pilbara and Minas Gerais).

A major source of iron units to off-set these negative trends is required. It is going to be high grade, high quality magnetite concentrates. Braemar concentrate has the potential to:

Displace the high cost and/or low quality ores in the ocean borne mix of iron ores; and
Replace depleting orebodies (e.g. Chinese domestically produced concentrates); and
Meet any increased demand for high "value in use" iron ore.

The nature of all Pilbara operations is such that operating costs will escalate at a much greater rate than Braemar operating costs. Ship size in the Pilbara is limited by a sailing draft of just over 18 metres (at high tide). Our planned[1] offshore port development in Spencer Gulf will allow for a sailing draft of 23 metres regardless of tide. This mean the potential to use bigger ships at lower cost.

*[1] Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 5. How is this low cost possible? How can you be competitive with DSO operations?

There are several key competitive advantages the Mawson Iron Province has over other magnetite (and DSO) projects;

*Access to existing infrastructure*

Our operations are within easy driving distance of major urban areas (e.g. 280km by car to Adelaide, the state capital of South Australia). We will not have the expense of either company towns, or fly in - fly out. We should also be able to get materials and supplies delivered at a significantly lower cost than in remote areas. The driving distance from Adelaide to Wallaroo, the base for our off shore floating port, is only 156 km. The driving distance from Perth, the capital of Western Australia, to Port Hedland, the largest iron ore port in the Pilbara is 1,648 km.

Our access to electricity is also a competitor advantage. Electric power on the Yorke Peninsula and Mid North of South Australia costs about one sixth the cost of power in the Pilbara. The Mawson Iron Province is not far (~100Km) from the Eastern Australian power network. Major high voltage supply lines cross the proposed infrastructure corridor near Burra.

***Good Geology***

Studies[1,2] have shown that the geometry and simplicity of our orebodies are such that we can use very low cost bulk mining methods (i.e. Fully Mobile In Pit Crushers and Conveyors), rather than higher polluting and expensive diesel trucks. With or without drivers, trucks are still polluting and expensive.

Metallurgical and geotechnical studies at Razorback Deposit [1,2], have shown the rock is soft and relatively non-abrasive when compared to other magnetite projects, which contributes to very cheap mining and very low comminution (crushing and grinding) costs.

***Transport of Material***

From previous iron ore projects in Australia, Brazil and India, it is known that slurry transportation is an order of magnitude cheaper than railroad transportation. Conceptual studies[1] have determined that the slurry pipeline is lower in capital cost than a railroad even before adding on the cost of the train sets necessary to carry the ore or concentrates.

From the time the ore is excavated at the mine face, the product does not stop moving and is never stockpiled until it reaches the floating port facility, where it can be directly loaded in ships from the filter plant or stored in bunkers in the floating port. Whereas in conventional rail and port, every time an ore or concentrate is put into a storage bin or placed on the ground in a stockpile it costs from 2 to 5 AUD per tonne. Our plan is to eliminate this issue. The fewer handling steps, surge bins and stockpiles in the flow sheet from orebody to ship, the lower the cost - both capital and operating.

Steel makers with whom we are in discussion, have grasped the essential importance of this concept. It is much more cost effective and sustainable, to design-in such low capital cost and low operating cost concepts at the earliest stage of project development, than to attempt half hearted retro-fits later, which has been the issue of many marginal producers.

***Shipping***

We will be able to load the largest bulk carriers afloat and will therefore have the cheapest delivered freight cost per tonne of any operation delivering to China. We will take advantage of Chinamax and Valemax vessels which can carry about 400,000 dry metric tonnes. This is because the planned position of the Filter and Loading Vessel will be in water depths of >23 metres at Mean low, low water. There are no ports able to load such vessels anywhere else in Australia. Additionally, there are no disruptive cyclones in Spencer Gulf. The Gulf constitutes a huge natural harbour ideally suited to an offshore floating iron ore port.

***Superior Product***

Metallurgical studies[2] show our product will potentially be 67 to 69% Fe, versus the 58% Fe of much of the production from the Pilbara. This gives us a natural cost advantage in cost per contained iron unit delivered to the customers' steel mills. It also significantly reduces the cost of steel making, and reduces the pollution liabilities. Although that benefit accrues to the steel maker and not us, it makes our concentrates very attractive.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*
[2] *ASX announcement 27th November 2013*

## 6. If we invest now, how/when can we expect to have the possibility of a profitable exit?

All value add points are potential liquidity events or exit points, e.g. after drilling out significantly more JORC Resource; completing a DFS; or securing significant sales arrangements; reaching agreement with a joint venture partner; arranging finance to proceed with construction etc.

## 7. How do you propose to finance such a large capex - isn't this the big risk in the whole vision?

We will be evolving multiple funding plans, e.g. build own and transfer (BOT) for mining; build own and transfer (BOT) for floating production storage offloading port or facility (FPSO); possible similar arrangements for concentrators since the pipeline will be interesting to contractors who build linear infrastructure; and to utilities that operate linear infrastructure/ water supply/ desalination. Other possible sources of funding are export credit funding (Ex-Im); off-take pre-pay finance; strategic investor equity finance; etc. We are currently talking with several parties about the provision of funding to complete a comprehensive DFS. Additionally, we are discussing conditional sales contracts with a number of steel mills. Such contracts could be used to back conventional bond financing.

## 8. There have been huge cost blow-outs and schedule delays on some recent iron ore projects. How will you avoid such undesirable events?

To a very large extent the costs, both capital and operating, are cemented in at the earliest conceptual configuration and specification stage of planning, engineering, construction and operation. This has not been done well in several iron ore projects in Australia in the past. No amount of subsequent attention to detail or management attention can make a "high cost" concept or configuration a "low cost" construction job or "low cost" operation. Similarly, the specifications of the materials of construction have to be set at the earliest possible time. This is particularly relevant in our case given the use of sea water in the concentrator.

One of the primary contributors to such recent blow-outs have been the employment of prime contractors totally unfamiliar with Australian laws, labour and conditions. Often such ill-advised decisions are driven by the providers of finance, but these finance people know even less about building projects to the lowest effective cost and on schedule than the inappropriate service provider upon whom they insist. Often there are financial "ties" between the insistent partner or finance provider, and the inappropriate prime contractor insisted upon. Use of an inexperienced and/or inappropriate prime contractor will double the capital cost – guaranteed (personal experience GT).

When building a major project at the peak of the cycle, everything gets more expensive, and the best people are often satisfyingly employed elsewhere, or their services are very expensive to secure.

Often the original cost estimates were simply not realistic because insufficient detail was developed in the configuration stage to produce reliable preliminary estimates.

One critical management factor is that **scope and configuration creep must not be allowed**. i.e. "nice to have" add-ons must not be allowed to creep in as the design engineering progresses. Only cost reducing changes or changes absolutely necessary to the effective and efficient operation of the project should be allowed and then only after the most intense scrutiny.

"Stick by Stick" construction is another major cost increaser. Off-site completion of the largest possible modules reduces both cost and time schedules on-site. The ultimate example of a module in our case is the float port (FPSO) which will be built and commissioned in a Chinese or Korean shipyard, and then delivered to its moorings in Spencer Gulf as a fully operating module.

## 9. How supportive are the South Australian State Government and the Australian Federal Government?

Very. South Australia is the best jurisdiction on earth in which to develop a major resource project. The South Australian Government has conferred "major project" status on the “Braemar Infrastructure” and have appointed a task force of senior department heads to work with us to facilitate and expedite the development. We are similarly seeking “Project of National Significance” status at the Federal level.

## 10. Why invest in a new iron ore project now? The global economy is in a very uncertain state! Isn't iron ore now in a state of structural over- supply?

Iron ore is in oversupply due mainly to the big 3 producers deciding to continue increasing levels of production while prices were collapsing. A cut in the iron ore price hurts the national economy and our own superannuation, as many of us will have iron ore producers in our portfolios. Others seem even more critical, thinking of them as the 3 Stooges:
http://finance.yahoo.com/video/cramer-3-biggest-morons-iron-231500897.html

But this over supply is only temporary. The global steel industry needs a large new source of iron units with the carefully controlled and consistent quality and high iron content that can only be supplied by concentrates, and in particular from Braemar formation magnetite concentrates. Now is the time to be developing the Mawson Iron Province to meet this inevitable requirement for consistent quality and high iron content.

The demand/need is already creeping upon us. Chinese domestic production (circa 300 million tpy) of such concentrates is continually on the wane and underground production has become too expensive. Pilbara Direct Shipping Ore (DSO) quality has in recent years been in decline and this will continue. They are depleting all their better resources and reserves, with no new “World Class” deposits to replace them. Additionally, the Pilbara products cannot replace Chinese magnetite production without considerable disruption to the operation of Chinese blast furnaces, and a subsequent significant increase in hot metal costs. For steel makers, the simplest and cheapest way to reduce emissions from blast furnace steel making is to use the highest grade iron ore possible - **Grade is King.**

The demographics and development of India, SE Asia (other than China) and Africa (with a current combined population that exceeds 3 billion) have the potential to increase global steel demand by an amount at least equivalent to current Chinese steel demand - where is the iron ore supply for this demand?

For additional information see our presentation on “demographics and the steel industry”

Also read - J. Barkes (Metalytics), “Perspective of the long term outlook of Iron Ore”, in **AUSIMM Bulletin**, October, 2015

One must remove the blinkers of what the iron ore price is today and rather look at the future demand on iron ore. One of the inherent problems with raising finance in the resources market is that money is often poured into projects when the commodity price is high. This is when project costs from drilling, to wages, consulting services and construction of mining equipment is high. Also, the lead time of iron ore projects can be 3 to 6 years, and by the time the project is up and running, we are in the low end of the cycle. For the start up of a mine, this is not the best time to commence production.

This is why Magnetite Mines is bucking the trend and continuing to develop the the Mawson Iron Project.

# Burning Questions on Iron Ore

## 1. What are the relative merits of magnetite versus haematite?

The magnetic properties of Magnetite make it easier to concentrate than haematite. Magnetite's exothermic conversion to $Fe_2O_3$ is a significant energy input (saving) in sintering and in pellet making. However, the key thing for both magnetite and haematite concentrates is to have high iron grades and low deleterious impurities in the concentrate - then both have high value in use. We believe that the iron grade of the input to the blast furnace will be King in the future, providing it is cost competitive.

## 2. Isn't magnetite something new? Are there technical risks involved? What are the relative merits of concentrates versus direct shipping ore (DSO)?

Magnetite has been the steel making resource of choice in the USA, Russia and China for many decades and was used before WWII. It has only been from around 2000, where Chinese supplies of domestic magnetite were insufficient to meet total iron units in demand, where imported haematite ores were necessary to meet hugely increased needs. There is, however, still over 300 million tonnes of magnetite used in Chinese blast furnaces every year. There are no significant operational or technical issues with the mining, concentration and use of magnetite.

Social and governmental pressures for a cleaner environment in China are now compelling Chinese steel makers to reassess their sources of iron ore. They are looking for sources of high grade ores and concentrates, to replace the more polluting lower grade haematite and goethite ores which go into sinter. The use of high grade ores and concentrates can significantly reduce all categories of pollution in the steel making process. Use of magnetite concentrates and high grade ores reduces the quantity of high cost coking coal used in the steel-making process. Read this news release in March 2014 by Wood Mackenzie for further details.

## 3. What constitutes lump iron ore? What is sintered iron ore and what are iron ore pellets?

In traditional blast furnace iron making, the iron ore is fed to the blast furnace in one of three common forms: Lump, pellets or sinter. All of which are designed (in conjunction with coke) to maintain a porous feed bed in the blast furnace and thus facilitate rapid and uniform reduction of the iron ore (iron oxide) to iron metal.

Lump is the natural -30mm x +6mm fraction of iron ore that is produced predominantly from Direct Shipping Ore (DSO = ore that is mined and crushed and screened, only, before being sold).

Pellets are made by taking very fine iron ore and/or concentrates (e.g. magnetite) and agglomerating them with moisture and a binder in balling discs or drums to form balls approximately 16mm in diameter. These are then indurated (baked and fused) at temperatures of 1,275 degrees centigrade to form very strong agglomerates for charging to the blast furnace. Pellets are essentially artificial lump.

Sinter is made from the size fraction -6mm produced from DSO and / or beneficiated -6mm fines and concentrates. The fines and concentrates are preconditioned and mixed with fluxes and coke breeze, before charging to a travelling grate (the sinter strand) on which they are ignited. Combustion air is drawn through the sinter bed to fuse the fines into a fused mass that is crushed and screened with the correct sizes going to the blast furnace. Any undersize is returned for more sintering.

## 4. What are the relative merits of concentrates versus direct shipping ore (DSO)?

Firstly, we need to describe what constitutes DSO these days. Originally, DSO described ore that was simply mined, crushed, and then screened into either lump or fines, which was then immediately sold as such. With many of the good ore bodies in the world already exhausted, producers of DSO are mining "fruit-cake like" orebodies, where the sultanas and raisins represent the ore and the predominating, intervening cake-dough is waste rock (gangue). Mining and blending to produce a saleable product from such orebodies requires multiple cycles of expensive loading and truck hauling, and intermediate stockpiling. A large proportion of what is currently called "DSO", is actually beneficiated (beneficiation = to concentrate or make better) because even expensive selective mining cannot deliver the grade required by the steel makers without some beneficiation.

Studies[1] have shown that uniformity and favourable geometries of the Braemar Iron Formation orebodies should allow very simple and cheap mining with the gangue separated in the concentrator, thus yielding a consistent and very high grade, high quality product at a very low cost.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 5. Can you use concentrates in a sinter plant?

Yes, the proportion of ultra fine ores and magnetite concentrates used in conventional iron ore sintering can be over 50% in many steel mills around the world, including those in Brazil, China and Japan. This is achieved by the addition of lime and the relatively inexpensive processes of micro-agglomeration (pre-agglomeration) before the material is added to the sinter plant feed stream. We believe the steel industry has reached a cross over point where the benefits of high grade concentrates, far more than off-sets any perceived benefit of using lower priced but increasingly inferior Pilbara and Minas Gerais (Brazil) ores. Incidentally, these often contain a very significant proportion of ultra fine material. Additionally, many steel mills, particularly in China, will continue to run pellet plants to take advantage of the raised capacity that pellets provide in the the blast furnace, versus other iron unit feeds. Magnetite concentrates are ideal feed to pellet plants. Pellets are also needed to replace dwindling supplies of lump ore.

## 6. In what physical form is concentrate used? Can concentrates be used as conveniently as DSO?

Concentrates can be pelletised (essentially manufactured lump ore) or sintered (usually in a blend with low quality DSO sinter fines where the concentrates enhance the quality of the final sinter product). These are charged into the blast furnace as either pellets or sinter. High grade concentrate can also be used in several "Direct Reduction" iron making processes.

Good quality lump ore is in very short supply and the quality of DSO sinter fines from all sources is steadily decreasing. Levels of Phosphorous (P), Alumina ($Al_2O_3$), Silica ($SiO_2$), and Sulphur (S) are all getting higher. The results are increasing undesirable emissions, increasing slag rates and increasing costs in the blast furnace, as well as the consumption of more expensive metallurgical coal.

High levels of phosphorous affects costs in the basic oxygen furnaces down stream of the blast furnaces. High grade, high quality concentrates can not only obviate these problems completely, but also significantly lower emissions. In addition, the overall costs of producing hot metal in the blast furnace and steel in the basic oxygen furnace can be reduced.

The Middle East has the potential to emerge as a significant steel making and steel consuming region. The industry there will be based on direct reduction (DR) of iron ore using the abundant natural gas available in the region. Efficient DR steel making requires high grade, high quality iron ore concentrates. Magnetite, with its inbuilt energy bonus, is the ideal feed. The Braemar Iron Formation can be “tailored” to be the feed for direct reduction steel making.

## 7. Why are the impurities - Silica, Alumina, Phosphorous and Sulphur, so important and so undesirable in steel making?

Silica and Alumina are slag forming minerals. The blast furnace operators do not wish to make any more slag than is necessary to “slag-off” impurities from the hot metal in the furnace. Excess slag forming mineral content in the iron ore necessitates the use of excessive energy to melt and form the slag, and hence more emissions as well. Additionally, a balance has to be maintained between the silica and the alumina in the slag - too much alumina and the slag becomes very viscous and will not run out of the furnace when the time comes to remove it; too much silica and slag becomes too “runny” and cannot be controlled as it flows from the furnace.

Sulphur and phosphorous are difficult to remove (slag-off) in the blast furnace and all are dissolved into the hot metal in the furnace. If not subsequently removed the steel made from the high sulphur and phosphorous hot metal will be very poor quality, with serious strength defects and imperfections. This means no application for high end uses, if at all. To remove these impurities from hot metal requires a double slagging step in the basic oxygen steel plant (BOF). This is very expensive as attested by the fact that no steel maker in the world is doing it. Hence the iron ore input to the blast furnace must be such that the hot metal going to the BOF is low in phosphorous and sulphur. Our ore contains virtually no sulphur and is also very low in phosphorous.

## 8. How can you sell so much concentrate?

All Chinese domestic iron ore is produced as concentrate and grade is KING. The supply is volume and cost constrained, and there is no significant replacement for domestic orebodies.

Virtually all the iron ore from Minas Gerais in Brazil is haematite concentrate and quality is declining. Vale is chronically short of product in the region, which is not helped by the urban sprawl that has permanently sterilised many of the remaining orebodies in the area.

Africa will not live up to any reasonable expectations as a source of quality iron ore - the direct shipping ore (DSO) from most new and proposed operations is poor quality and concentrates will be very high cost. The Simandou Project, Guinea, which is the only possible new source of significant quantities of DSO high grade ore in Africa, is associated with a capex estimate of 25 Billion USD. This high capex project is put at risk by an unstable political system and disease, such as Ebola.

We are talking of producing and selling an initial 50 million tpy in a current seaborne market already approaching 1,200 million tpy. As mentioned earlier, expansion of current cities, development of new cities and all the associated infrastructure and demand from a growing middle class in rapidly developing countries in Asia and Africa, will increase tonnage demand at a time when very few new mines are coming on stream or being planned. In current discussions with steel mills, all say they would have interest in buying significant amounts if a high grade magnetite concentrate was available in quantity right now.

# Questions on Project Geology, Mining and Beneficiation

## 1. How big is the ground holding of Magnetite Mines in the Mawson Iron Province?

The Mawson Iron Province, which extends over both sides of the Barrier Highway from the towns of Yunta to Broken Hill (~200km distance), covers approximately 12,000 square km, about the equivalent size of Sydney. The combined exploration tenement area of Magnetite Mines (Royal Resources and Lodestone Equities), the largest holder in the area, is 4,370 km square (3/4 size of Shanghai).

## 2. This is a very early stage exploration project. Do you have any JORC resources - why should I invest in an exploration phase project?

This is not grass roots exploration. Magnetite Mines has JORC 2004 Resources approaching 4 billion tonnes[1], and with modest additional drilling these resources could be significantly increased. A large proportion of any new funding will be used to drill resources and begin a comprehensive DFS - this can be done sequentially or in parallel. The Braemar Iron Formation is well known and understood. Our geological knowledge and certainties are quite advanced. Where we have no or only limited drilling, we apply field mapping and observations, as well as high resolution air and ground geophysics to get a good understanding of the exploration potential in regards to the potential deposit size. We have pioneered ground magnetometer surveying in the Braemar. Recently, Magnetite Mines announced a conservative Exploration Potential of 16 to 34 Billion Tonnes[2].

The knowledge we have of Magnetite Mines' 3.9 billion tonne of JORC 2004 Resources at the Razorback Deposit and Ironbark Hill Prospect[1], translates directly across to other areas in our Braemar land package. This includes the 100% Lodestone owned Olary Magnetite Exploration Licences, (containing the Devonborough and Red Dam Prospects) that have had significant drilling and have an Exploration Potential of 5 to 8 billion tonne[3]. The further drill-out of Magnetite Mines and Lodestone's Resources should ensure a significant increase in perceived valuation of a merged entity. A further increase will come from completion of the DFS and the engineering of the infrastructure solution. The combined potential could exceed 50 Billion tonne[2,3]. This is definitely the right time to fast track the development of the Mawson Iron Province.

(JORC = Joint Ore Resource Committee of the Australasian Institute of Mining and Metallurgy - a code of the reporting of exploration potential, ore resources and ore reserves)

(DFS = Definitive Feasibility Study - which is at a level of detail to secure funding for the project and to allow "bid-ready" construction packages to be prepared)

*[1] Reported to ASX 11/6/2013. The Mineral Resource information for the project was prepared and first disclosed under the JORC Code 2004 and 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.*
*[2] ASX Announcement 29/10/2015. Note that there has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource. The estimate of an exploration target tonnage should not be construed as an estimate of Mineral Resource.*

*[3] Based on Braemar Iron Pty Ltd and Braemar Infrastructure Pty Ltd Conceptual Feasibility Studies*

## 3. The iron grade of the orebodies in the Mawson Iron Province seems very low?

The in-situ grades do seem low, but the measure that really matters is the cost per tonne of high grade, high quality concentrate loaded onto ships and delivered to the customers' steel mills. From Lodestone's conceptual studies[1], we are projecting a cost in the lowest quartile of the industry cost curve. That is highly competitive with even the largest DSO producers.

*[1] Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 4. How much water will the project need?

Studies[1] show that at the initial designed production rate of 25 million tpy of magnetite concentrate planned, we will have the installed capacity to pump 70 Giga Litres (GL) - (one GL equals 1 million tonnes of water) per year of sea water from Spencer Gulf to the mine site. At the mine site, there will be a desalination plant to produce 12.5 GL of desalinated, high quality water that will be returned to the coast as part of the slurry of water and high grade magnetite concentrate. After filtering of the slurry on the floating port, this water will be available for industrial, municipal and horticultural use; or can be returned to the mine for reuse.

The slurry is a mixture of (approximately) two parts magnetite concentrate to one-part water, by weight. The desalination plant at the mine site will also produce all other fresh water requirements for the mining and concentrator operations. All the tail brine from the desalination plant will be added to the concentrator process water supply.

*[1] Based on Lodestone Equity Group Conceptual Feasibility Studies. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realized.*

## 5. There does not appear to be significant quantities of water available in the Braemar - at least, not in the quantities needed for large iron ore concentrators. Is the same true throughout South Australia?

Studies[1,2] indicate that sea water is the only risk free source of water for the project. South Australia is the driest state in Australia and hence a risk free water supply is critical. Reliance on alternative sources such as underground aquifers all impose significant continuing risks on the project. Even though using sea water we will be continually working to minimising quantities. For example, we plan to add the brine tails from desalination to the process water (the water used in the concentrator). Free water will be returned from the tailings repository to the process plant etc.

We are proposing to use desalinated water in the slurry pipeline to avoid corrosion issues. This means that after filtering of the slurry on the FPSO we will have significant quantities of high quality desalinated water available for possible industrial, municipal and horticultural use - 12.5 GL for every 25 million tonne of concentrate shipped.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*
[2] *ASX announcement 27th November 2013*

## 6. Where else is salt water used for processing?

Many minerals processing operations in Australia already use ground water that is far more saline than sea water. Several magnetite operations globally use sea water in concentrator operations.

Seawater has been employed globally in gold, nickel, copper, iron ore and diamond concentrators. In the Eastern Goldfields of Western Australia almost every concentrator uses hyper saline water, up to seven times the salinity of sea water. These include many nickel concentrators and dozens of gold concentrators. In Indonesia, Newmount's Batu Hijau has used seawater since operations commenced in 2000. In Chile every new copper concentrator being built uses sea water for water supply as fresh water is no longer available. For example, Las Lucas copper moly concentrator has employed sea water since 1995. In South Africa, almost all of its western diamond recovery plants employs sea water in processing. Iron ore plants such as those at Kirkenes, Norway have used sea water for the best part of forty years. The technology for the use of seawater is not new or novel.

# Questions Addressing the Infrastructure Solution

## 1. You say the iron ore will be transported through a pipeline as a slurry. What exactly is a slurry?

A slurry is a mixture of fine particles of a solid material and liquid which behaves like a relatively uniform liquid when pumped through a pipeline. In our case[1], our planned slurry is finely ground magnetite concentrate mixed with water comprising 2 parts magnetite and 1 part water. This mixture (slurry) can be very cost effectively pumped through a long distance pipeline and the concentrate and water can be simply separated at the terminus of the pipeline by filtering. There are thousands of kilometres of slurry pipelines operating successfully and essentially trouble free world-wide.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 2. Can you filter a slurry on a floating port?

For the Mawson Iron Project, the slurry is a mixture (approximately) of two parts magnetite concentrate to one-part water, by weight. Studies[1] currently have the slurry discharging into agitated surge tanks as it arrives at the floating port. This slurry is then distributed to individual banks of filters to remove the bulk of the water. The filtered concentrate will contain approximately 8.5% moisture. There is nothing novel about the filter plant. Filter plants function perfectly well anywhere, onshore or offshore, as long as they are set up correctly.

The oil & gas industry have the equivalent of entire refineries on floating platforms (Floating Production Storage and Offloading facilities - FPSO's) now, and as planned for the offshore Browse FLNG Development Woodside off Western Australia. Other examples of complex processes being applied at sea, include many of the world's navies using nuclear reactors as a means of power, and garbage processing plants. By comparison, a fixed slurry receiving and filtering plant is a very unsophisticated, low-tech installation and low risk. The high quality desalinated water removed from the slurry by the filter plant will be returned to shore for use in industrial, municipal or agricultural applications or returned to the mine for reuse.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 3. Can you be sure you have a secure water supply for the life of your mines?

This is a good question. South Australia is the driest state in Australia. We believe that it is virtually impossible to quantify, beyond doubt, the water resources in an underground reservoir or the aquifer behaviour over time. Having said that, we know the ground water resources in the Mawson Iron Province (Braemar) are quite limited in area and volume. We would not even ask to use valuable Murray River water unless it came from the pump-back bore fields developed to combat soil salting problems. The decision as per Lodestone's existing studies[1,2] to use sea water from the Spencer Gulf has totally de-risked our water supply versus other projects proposing to live with the risk of extracting a very large amount of water every year via a bore field, from an aquifer, for 25 years or more.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*
[2] *ASX announcement 27th November 2013*

## 4. How could other concentrate producers use the pipeline and other infrastructure?

Third party concentrate producers who wish to use the pipeline and associated infrastructure would firstly have to meet the specification of our concentrate. The third party concentrate could then be co-mingled with Magnetite Mines concentrate and a single uniform product sold and payments made pro-rata. Commercial arrangements for use of the infrastructure would be negotiated on arms length terms. There are many possible commercial structures for the terms of such infrastructure sharing. The port can serve all potential production from the Mawson Iron Province both South and North of the trans-continental railroad. This is a huge plus for South Australian resource development.

# Questions on Social and Environmental Impact

## 1. How many people will be employed after construction?

The conceptual studies[1] show total employees for the first phase that will produce 25 Million tpy of concentrate is estimated to be 459. It is estimated that there will be 229 at the mine and 151 at the Burra control and maintenance centre, while Wallaroo port operations will require 55 and the Adelaide office will have 24 employees. We have to look beyond these numbers to what is called the multiplier effect. With a project like this, every direct job in the project can be expected to support circa an additional 3.5 indirect jobs in the wider economy.

[1] Conceptual Feasibility Study has been completed by the Lodestone Group for the Braemar Iron Project, which shows the the proposed Infrastructure Solution achieve a capacity of up to 100 mtpa. The Company advises that this conceptual feasibility study is not based on any assumptions of actual use of the infrastructure Solution by the Company or any other users in the Braemar region with the exception of the Braemar Iron Project.

## 2. What is the situation in the Braemar for social infrastructure and workforce support?

There will be no "Company Towns" and no Fly In - Fly Out (FIFO) in our proposed mining and infrastructure project. The floating port can be well served from Wallaroo and surrounding towns, while the mine workforce will be able to choose from amongst Burra, Clare, Peterborough and surrounding small towns. As the project expands to the east, Broken Hill will also be a choice of residence. In other words, the projects will contribute to the positive development and growth of existing socially stable communities. Mine employees will be transported to and from work in large personnel helicopters operating from a centralised base or bases.

## 3. What will be the most significant impacts on this project for the global push to reduce emissions and in particular carbon dioxide?

We believe that grade will become King in the push to reduce emissions from steel making. Technically, there is no easier way to quickly reduce emissions from steel making than to use the highest grade iron ore available. Making steel from a feed of 100% magnetite has the potential to reduce carbon dioxide emissions by over 100 kg per tonne of steel (see Crucible Report for Details). Magnetite concentrates present the industry with one of the few sure, high grade iron ore feeds available.

## 4. There has been vocal resistance to other projects from farmers on the Eyre Peninsula. Do you have any issues regarding land access for your mining operations?

Our mining lease will be on pastoral leases covering rather poor quality grazing land. Mining rights rank equally with pastoral lease rights. We do not anticipate any problems in this respect and expect to maintain amicable relations with pastoralists in the area. Neither do we anticipate any insuperable native title issues. This is in contrast to other parts of the state, where there are issues of mining on freehold, high quality, wheat/crop growing country.

## 5. There are rumours that a 100 to 150 metre wide strip of farmland will be permanently taken out of productive use by the pipeline corridor. What are the facts?

Although there will be disturbance while the pipelines are laid, the pipes will be buried 1.5m deep, and after a construction period of a few months in any given area, most of the land can then be returned to its former productive use - crop growing; grazing etc. The best and safest working width for the corridor during pipe laying is 100m. The hole to bury the pipe is more likely to have a width of less than 10 metres. As much as possible we will use pre-existing roads for pipeline access after construction. Between Burra and the mining sites we will be building a high quality, all weather, sealed road in the corridor and installing a high capacity power line to supply electric power to the project. This power line will also be used to return power to the grid when the renewables potential of the mining areas is developed. We see the solar potential in the Mawson Iron Province as enormous.

Pipelines in the Mid North region of South Australia are not uncommon. This includes a buried north-south pipeline that carries natural gas from the Cooper Basin to Adelaide (Moomba Gas pipeline). Farming has been able to continue successfully where these pipes are laid beneath the earth.

## 6. Are there significant environmental impacts of running an iron ore slurry pipeline on the sea bed?

There are thousands of kilometres of pipelines carrying all kinds of commodities under oceans, seas and waterways around the world. The risks of a slurry pipe failure are extremely low - probably much lower than that of many other types of pipelines. A valve station at the shore line would immediately shut in the event there was a loss of pipeline pressure in the subsea portion. By comparison, there are thousands of kilometres of oil & gas pipelines on the ocean floor that operate without problems 24/7, year in year out. Magnetite is completely inert and harmless. It will not react with sea water and is not at all toxic to marine life - unlike oil & gas. Leaks in slurry pipelines are extremely rare. The first iron ore slurry pipeline system built is at Savage River in Tasmania. Apart from a very small leak early in the operation of the pipe which did no environmental damage, it has operated for 49 years without leakage. Since this pipeline was built, controls and procedures have been fine-tuned to a virtually "fool-proof" protocol.

**7. Will there be a big environmental footprint and/or continuing impact where the pipeline crosses the shore line?**

After initial installation of the pipelines, the impact of the project at the shore line will be close to zero. After very contained disturbance during construction (pipe laying), the small area where the laying of the pipe has disturbed the natural shore line will be immediately restored to its prior condition or better. Thereafter it will be difficult to even determine the location at which the pipeline enters the sea. The alternative of a conventional iron ore port such as other iron ore developers are proposing, results in large tracts of land being withdrawn from alternative productive uses. A highly visible and large train marshalling yard, as well as a stockpiling area is there to be seen by everyone for the duration of the operation, and hence there are significant continuing environmental disturbance and emissions issues. In the Point Riley area, there has been significant prior shoreline degradation by recreational activities such as motor biking. This can be easily remediated in and around the pipelines, with the area restored to natural contours and planted with native vegetation.

**8. Because you are using sea water for processing the iron ore, will there be issues because of the salinity of the tailings repositories? Is it expensive to desalinate?**

Spencer Gulf water is only 2/3 as saline as the ground water in a large part of South Australia, including the Murray Basin to the south of the Mawson Iron Province, and great parts of the Eyre Peninsular. In any case, our tailings repositories will be designed[1,2] to contain all the residual moisture and salt entrapped in the pores spaces of the fine tailings material by capillary action. Additionally, the ground water (of which there is very little) below the repositories is hyper-saline. We also have a back up plan to intercept, collect and recycle any seepage from the repositories, in the unlikely event that this may occur.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*
[2] *ASX announcement 27th November 2013*

**9. What will be the continuing social and environmental impact of the pipeline versus a railroad over the life of the project?**

Railroads play a vitally important role in the overland transportation of bulk commodities but there are drawbacks in certain situations. Railroads and trains unavoidably involve permanent alteration of the landscape and permanent withdrawal of land from other productive uses. A fenced railway right of way can split paddocks and make them difficult to access as an entirety, thus reducing their value to the farmer. This is accompanied by a permanently visible alteration to the social and natural environment. To move 25 Million tpy of concentrates by railroad would involve multiple trains. If we assume each train carried 15,000 tonnes, then it would require 1667 trains each year, or an average of 4.5 trains every 24 hours. Unavoidably, trains make quite a lot of noise and can cause disruption to traffic when crossing roads and other thoroughfares.

Pipelines are virtually silent and virtually invisible once installed. The minor exceptions are the pump and valve stations. The study[1] of the proposed pipeline shows a pump station at the mine and one approximately half way to the shore of Spencer Gulf only. Other than that, there will be some relatively small valve stations at strategic points such as the Burunga Gap, and just inland from the shore line. As well as these social and environmental advantages, pipelines cost far less than railroads. Our studies early on, showed that pipelines have lower capital costs than the rail line, even before considering the cost of the train sets. Breamar Infrastructure studies[1] showed operating costs are multiples lower per tonne than a Railroad.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*

## 10. Iron ore can be very dusty. Can you give assurances that the area surrounding the port will not become dust blighted like Port Hedland in WA?

With a slurry pipeline, from the moment the ore enters the concentrator at the mine, it essentially becomes a "closed" system, so dust cannot escape the system. The conceptual studies[1] of this project show that even after filtering at the floating port, the concentrate will either be loaded into ships immediately or stored in covered bunkers in the floating port. Even during ship loading, the targeted 8.5% moisture in the concentrate and the equipment used will ensure there is no fugitive dust.

As there are no open stockpiles or open materials handling on shore, there will be no dust in the shoreline area or anywhere in the vicinity of the pipeline or in the town that the pipeline passes nearby.

[1] *Based on Lodestone Equity Group Conceptual Feasibility Studies*