Selective Mining

Studies identify high insitu grade potential

Magnetite Mines Limited (**MGT**) is pleased to announce the completion of initial selective mining assessments of the Razorback Iron Project (**Project**) by McElroy Bryan Geological Services Pty Ltd (**MBGS**). MBGS' initial appraisal of mineralisation at Razorback confirms the lateral continuity of high grade iron ore horizons within the existing JORC 2012 resource potentially amenable to a selective mining scenario.[1] Together with complementary ore sorting[3,4], selective mining these higher grade horizons has the potential to result in higher grade material being presented to the ore processing plant. Higher plant head grades would result in higher tonnages of ore produced compared to an equivalent conventional bulk mining and processing scenario with potential advantages in operating and capital cost efficiency.

Selective mining as opposed to bulk mining was identified as a potential optimisation during the 2019 Scoping Study[2] and aims to recover discrete horizons of high grade mineralisation for the purpose of mining and subsequent processing. A historical examination of the deposit mineralogy had indicated the mineralisation is distributed as stratiform, with magnetite and hematite-enriched zones following individual layers within the sediments. Selective mining seeks to improve project economics by taking advantage of stratified and outcropping mineralisation as commonly found at the Razorback Iron deposit. As with comparable iron ore projects such as FMG's initial operations the innovative use of selective mining is being used to help realise the Project's resource potential.[5,6]
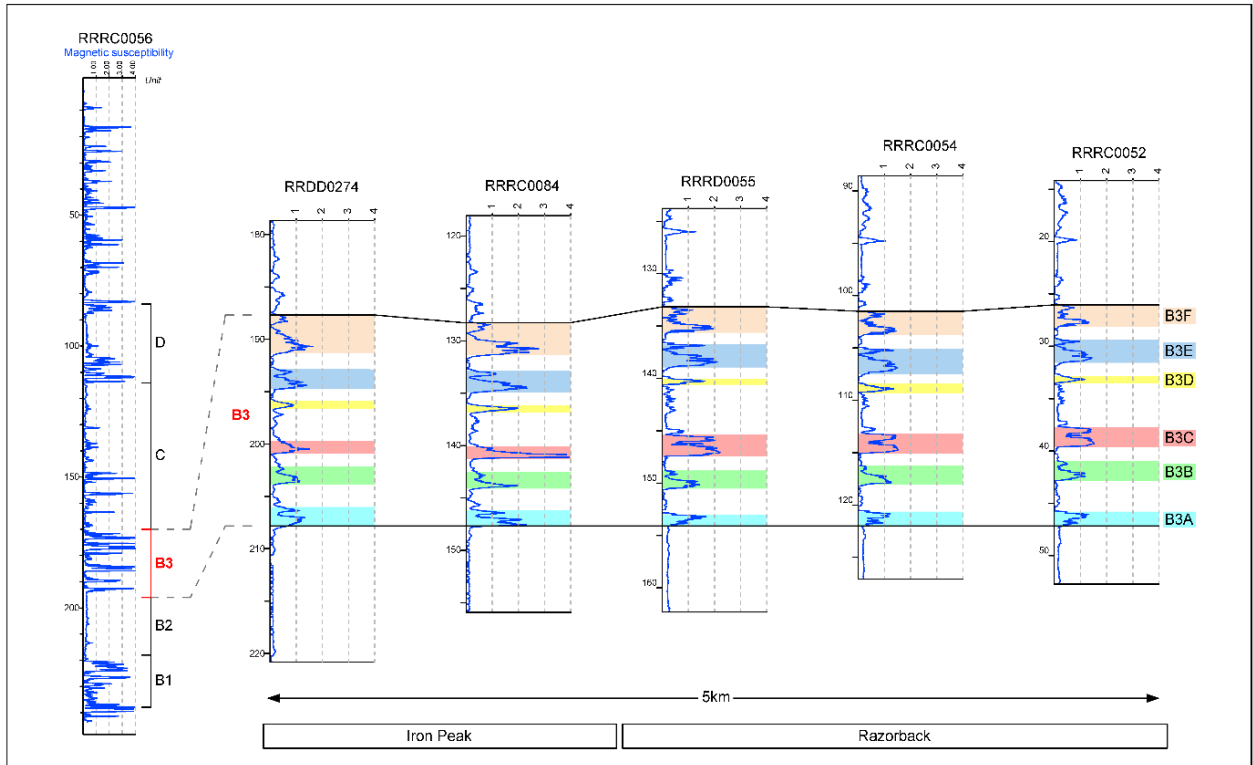
Figure 1. Lateral continuity of mineralisation is traceable across large sections of the deposit as in Unit B3, an interbedded ironstone horizon. Note in the figure above, magnetic susceptibility units are SI, where 100% magnetite is >4.0 SI

Magnetic susceptibility and density geophysical logs indicate that distinctive or signature horizons are traceable across large sections of the Razorback iron deposit, which together with the outcropping nature of the deposit may be mined selectively, effectively increasing the grade of the ore presented to the ore processing plant (Figure 1).

Resource estimation in studies to date, including the 2013 PFS and the 2019 scoping study, has been compiled based on the bulk extraction of the iron ore contained at Razorback. As a result, based on drill hole spacing and proposed mining methods the current resource model comprises large (12x10x8m) resource blocks which tend to smooth the data from which they are calculated.[1] Bulk mining is well suited to deposits with consistent grade, but when applied to layered deposits such as Razorback, the result of a conventional bulk mining approach is that finer geological and assay detail within the blocks is lost and high grade horizons are diluted by low grade interstitial horizons, essentially averaging the values of multiple samples into one value.

The qualitative study by MBGS has confirmed the capability of the technique to identify and trace near-surface high grade zones of mineralisation within discrete lithological horizons at Razorback. (see Figure 2). The next stage of the study will aim to determine the quantitative aspects of resolving higher grade mineralisation without dilution by waste layers, allowing potential Fe grades from selective mining to be assessed.
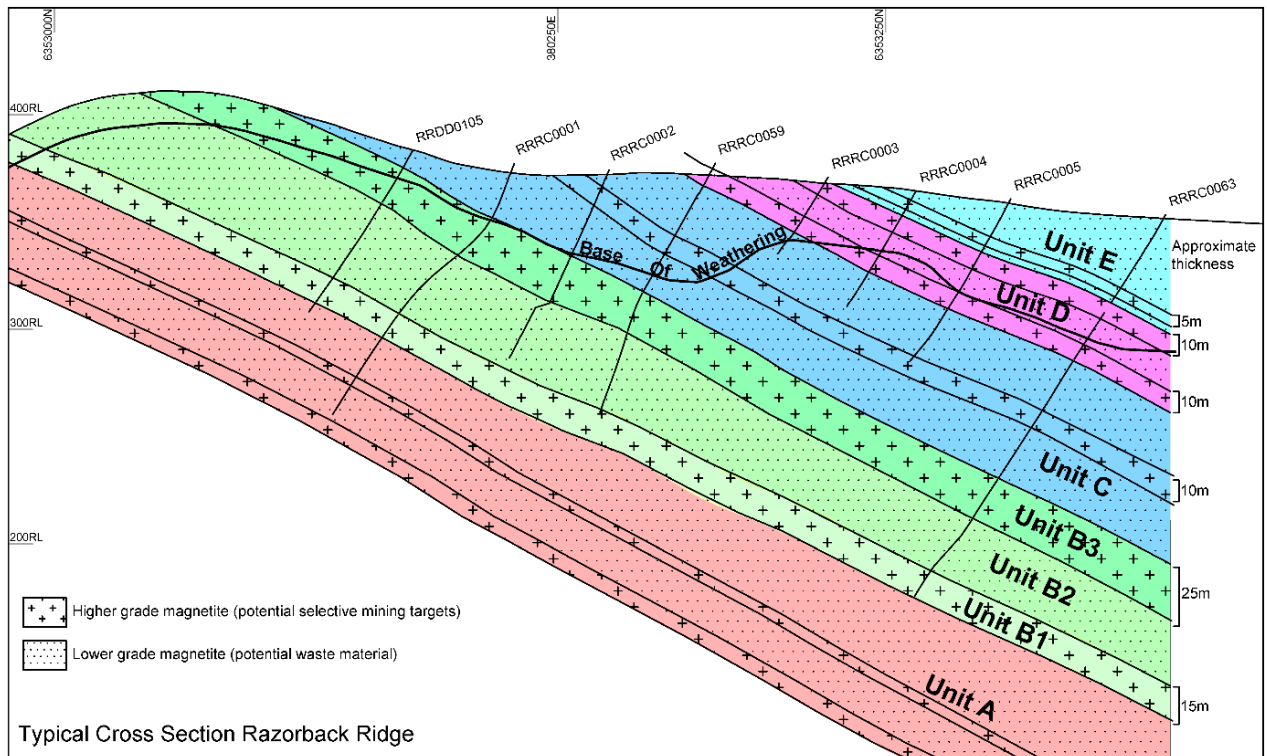
Figure 2. Typical cross section at Razorback Ridge prospect highlighting potential selective mining targets.

MBGS has successfully undertaken preliminary geological modelling of the Razorback Iron Project resource based on the current drill and assay database using 3D grid modelling software (Minex) as commonly utilised for layered, stratiform coal deposits. The next step will be the production of a detailed resource model for use in mining and pit optimisation studies, which is intended to incorporate the new information about higher grade zones. It should be noted that additional resource assessment and testwork may be required to inform metallurgical recovery determination from the higher grade zones. The outputs of this modelling, together with any additional testwork that may be required, will contribute to financial modelling and inform the metallurgy and design of key mining and processing assumptions towards the recently announced prefeasibility study.

Kerry Whitby said:

"Our team has been impressed with the results of the initial selective mining study to date. Although the study is yet to be completed, the lateral continuity of mineralised horizons we have traced throughout the deposit is substantial. The vision of Magnetite Mines to approve downhole geophysical logging of all their exploration holes has led to a consistent and valuable data set that not only identifies the discrete magnetite-rich bands within the sequence but also makes possible the potential to selectively mine those layers. The unusual combination of relatively soft outcropping ore and continuous bands of magnetite mineralisation may be unique to Razorback and the Braemar Iron Formation and as a result, MBGS is now progressing with 3D grid geological modelling of the Razorback deposit with a view to supporting the assessment of a selective approach to mining."

Chairman Peter Schubert said:

"Today's announcement of the potential continuity of high grade zones in the extensive Razorback resource is an important technical opportunity for Magnetite Mines. We are encouraged with the results so far of the selective mining PFS work that our expert advisors are undertaking. These indications have parallels with the 'lateral macroband continuity' presented by Fortescue Metals Group in 2008[5,6]. These findings may result in a pathway to materially shift the key development parameters of the Razorback project. We look forward to keeping shareholders informed as we progress this exciting technical work that is advancing our fundamental understanding of our orebody."

References:

1. *ASX:MGT Announcement 12/11/18 – Razorback Iron Project - JORC 2012 Update*
2. *ASX:MGT Announcement 07/11/19 – Positive Razorback Scoping Study Results*
3. *ASX:MGT Announcement 11/12/19 – Ore Sorting Update Technical Release*
4. *ASX:MGT Announcement 25/10/19 – Ore Sorting Technology Exclusivity Secured*
5. *CARTER, R.A., 2012. Surface Excavators at Fortescue: Production with Precision: Engineering, Geology, Mineralogy, Metallurgy, Chemistry, etc. Engineering and Mining Journal, 213(7), pp. 28-30,32.*
6. *ASX:FMG Announcement 25/11/08 - Presentation to Metal Bulletin Australian Iron Ore Conference*

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