

24 April 2019

## Iron Ore Scoping Study Update

### HIGHLIGHTS

- SIMEC Mining's internal scoping study and due diligence work is nearing completion with positive results reported.
- Exploration drilling has greatly expanded the known area of iron ore mineralisation, justifying infill drilling to define a JORC resource.
- Results from testing of Maldorky samples show that targeted product grade of 65% Fe and 40% product yield for an overall 85% Fe recovery can be achieved with conventional processing methods.
- Potential opportunity to reduce comminution capital costs and process water requirements using alternative grinding technology.

Havilah Resources Limited (Havilah) is pleased to provide an update on the due diligence work program being led by SIMEC Mining ([ASX Announcement 20 June 2018](#)) on Havilah's Maldorky and Grants iron ore projects in northeastern South Australia, near Broken Hill. The scope of work is to assess the resource, project life, production, infrastructure and ultimately commercial viability of the iron ore projects.

This work commenced in June 2018 and SIMEC Mining has an exclusivity period until the end of April 2019 ([ASX Announcement 28 March 2019](#)) in order to complete its work program.

SIMEC Mining has provided Havilah with an update on the status of the internal scoping study work program with encouraging overall outcomes to date as reported below.

### Mineralisation Potential

The recent Grants Basin drilling program has confirmed a greatly expanded area of iron ore mineralisation comprising thick, continuous iron formation over an area of at least 3.5 km<sup>2</sup> ([ASX Announcement 4 December 2018](#)). A new diamond drillhole in Grants Basin ([ASX Announcement 29 January 2019](#)) completed at a final depth of 624.4 m to obtain metallurgical samples returned an exceptional 486 m continuous downhole thickness of iron bearing sequence.

An Exploration Target\* of 3.47 - 3.79 billion tonnes of mineralised iron formation grading 23.9-27.6% Fe ([ASX Announcement 5 April 2019](#)) has been estimated for the Grants Basin discovery (\*The potential quantity and grade of the Exploration Target is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The Company confirms that it is not aware of any new information or data that materially affects the Exploration Target\* and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed).

Results are considered to be sufficiently encouraging to warrant a resource drilling campaign with the objective of defining a JORC resource of sufficient size to support a viable commercial operation in terms of mine life and processing plant throughput.

## Processing

An extensive metallurgical testing program was undertaken on Maldorky iron ore drillcore samples using a conventional processing circuit that included crushing and grinding followed by gravity and magnetic separation. Results to date have demonstrated the targeted product grade of 65% Fe and mass recovery level of 40% can be achieved, as well as a high total iron recovery of 85%. While the initial program was focused on the Maldorky deposit, diamond drillcore from Grants Basin is currently being tested to validate replication for both deposits. More detailed results of the Maldorky ore testing are shown in **Table 1** and accord with the results generated by Havilah's own ore beneficiation test work in 2014 ([ASX Announcement 1 September 2014](#)).

The testing program also identified a potential opportunity to reduce the capital cost of comminution by employing alternative dry grinding technology that simplifies the circuit and eliminates the requirement for water in front end processing.

**Table 1** – Results of Maldorky iron ore metallurgical testing

Gravity-LIMS-WHIMS	Concentrate Grade (%)			Recovery (%)		
	Fe	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	Mass	Fe
Wilfley Table	66.9	2.5	0.5	0.8	19.3	43.2
LIMS	64.7	7.0	0.9	0.1	4.0	8.8
Ereiz WHIMS*	63.0	6.3	1.0	0.8	17.0	35.9
Final Concentrate	65.0	4.5	0.7	0.7	40.3	87.9
Target Concentrate	<b>65.0</b>	<b>4.0</b>	<b>1.0</b>		<b>40.0</b>	<b>85.0</b>

\*Minor elements are calculated. Wilfley Table is a type of gently sloping shaking table that is a very effective gravity concentration method. LIMS refers to low intensity magnetic separation. WHIMS refers to wet high intensity magnetic separation.

## Infrastructure & Services

Initial investigations into both rail and slurry pipelines to transport concentrate from the mine site to Whyalla are being carried out. Findings to date show that the existing east-west Transcontinental rail corridor has capacity to carry an additional 10 Mtpa, with minor modifications only to some of the existing passing lanes. Further work to investigate opportunities to reduce cost associated with concentrate transport continue.

Conceptual power requirements for the project have been estimated and potential supply options have been identified. Initial investigations identify potential savings on power costs through supply optimisation. Future work will explore potential hybrid power options to determine if costs can be further reduced.

Investigations are ongoing to source a suitable water supply to sustain the project. Desktop studies are underway to review regional groundwater sources and to develop a scope of work to validate the preferred supply. Sourcing the relatively large volumes of water required for the project remains a key focus of the work program, hence the importance of any dry processing efficiencies that can be confirmed.

## Next Steps

Pending a favourable assessment of the internal scoping study and successful negotiation of the commercial path forward, a follow up prefeasibility study (**PFS**) would include the following key steps:

1. Additional drilling to establish a JORC mineral resource estimate at the Grants Iron Ore Basin to support the required mine life and design production rate.
2. Develop the preferred flowsheet, and define supporting infrastructure requirements.
3. Evaluate downstream concentrate utilisation and market analysis.
4. Finalise strategies to source water and power to support the project.
5. Commence environmental baseline studies and stakeholder engagement to support project permitting process.

It is anticipated that the completion of the scoping study will align closely with the end of the current exclusivity arrangement after which a decision to proceed with the PFS can be made.

### **Commenting on progress of SIMEC Mining’s due diligence, SIMEC Mining’s COO, Mr Matthew Reed said:**

“Outcomes of our work to date on Havilah’s Grants and Maldorky projects are very encouraging.

“The scoping study work program has provided valuable insight into the nature and potential size of the iron ore deposits, results achievable by conventional processing methods, product transport options and possible areas of cost reduction.

“The scoping study provides the platform for productive negotiations with Havilah on a commercial path forward for the Grants and Maldorky projects,” he said.

### **Commenting on progress of the SIMEC Mining due diligence, Havilah’s Technical Director, Dr Chris Giles said:**

“Havilah and SIMEC Mining have been able to identify sufficiently extensive iron ore mineralisation in the Grants Basin to warrant an infill resource drilling campaign.

“Comprehensive metallurgical testing of Maldorky iron ore samples has confirmed that it can be beneficiated to a high quality, 65% Fe product with favourable yields (40%) and high overall Fe recovery (85%).

“These results, along with favourable logistics support progressing to a PFS study in order to determine the prospects of defining a commercially viable mining and processing operation in the region,” he said.

**Table 2** – Details of diamond drillholes from which core samples were taken for metallurgical test work

Hole_ID*	GDA_E	GDA_N	AHD_RL	Az_amg	Dip	EOH_depth
CTDD001	465437.6	6413336.5	218.3	30	-60	141.7
CTDD002	465521.4	6413399.4	217.1	300	-80	150.7
CTDD003	465235.0	6413563.1	220.3	210	-80	120.1
CTDD005	465442.5	6413334.7	218.3	30	-60	140.0
CTDD006	465236.3	6413561.2	220.3	210	-80	140.0
Datum: GDA94 Zone 54						

\*All drill core of HQ size (63.5 mm diameter)

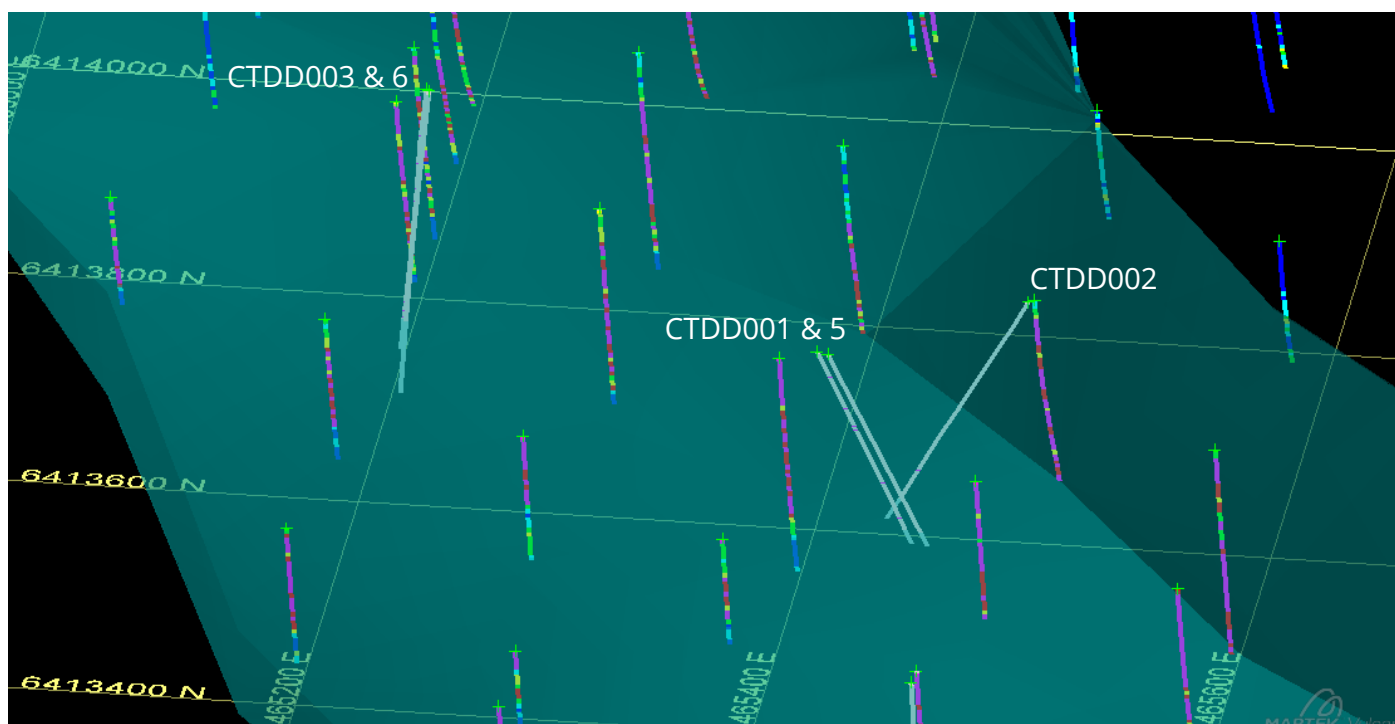


Figure 1 Oblique 3D view of a portion of the Maldorky resource envelope (blue colour) showing the location of diamond drillholes which provided core samples for the metallurgical test work. Core samples from earlier Havilah diamond drillholes CTDD001-003 were used predominantly for the beneficiation test work. Recent SIMEC Mining diamond drillholes CTDD005 & 006 provided core mostly for the comminution test work (refer to JORC Table 1).

#### **Cautionary Statement**

This announcement contains certain statements which may constitute “forward-looking statements”. Such statements are only predictions and are subject to inherent risks and uncertainties which could cause actual values, performance or achievements to differ materially from those expressed, implied or projected in any forward looking statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and investors are cautioned not to put undue reliance on forward-looking statements due to the inherent uncertainty therein.

#### **Competent Persons Statement**

The information in this announcement that relates to Exploration Targets, Exploration Results and Mineral Resources is based on data and information compiled by geologist, Dr Chris Giles, a Competent Person who is a member of The Australian Institute of Geoscientists. Dr. Giles is Technical Director of the Company and is employed by the Company on a consulting contract. Dr. Giles has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activities being undertaken to qualify as a Competent Person as defined in the 2012 Edition of ‘Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves’. Dr. Giles consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears. This information has been prepared to comply with the JORC Code 2012.

For further information visit [www.havilah-resources.com.au](http://www.havilah-resources.com.au)

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## APPENDIX 1: TABLE 1 OF THE 2012 EDITION OF THE JORC CODE

The table below is a description of the assessment and reporting criteria for the Maldorky metallurgical test work in accordance with Table 1 of The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves.

### Section 1 Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	<ul style="list-style-type: none"> <li>A bulk sample of 1772 kg from half cores from 3 Havilah diamond drillholes (CTDD001, 002 &amp; 003) were taken by SIMEC Mining for the beneficiation test work reported here.</li> <li>In addition 900 kg of half core from two new diamond drill holes drilled in 2018 (CTDD005 &amp; 006) was sampled mainly for the comminution test work.</li> </ul>
Drilling techniques	<ul style="list-style-type: none"> <li>The samples were taken from diamond core holes that had been drilled under Havilah supervision within the Maldorky deposit, namely CTDD001, 002, 003, 005, 006.</li> </ul>
Drill sample recovery	<ul style="list-style-type: none"> <li>Havilah Resources drill logs show drillcore recovery was near 100%.</li> <li>As a result there is no sample bias due to recovery issues.</li> </ul>
Logging	<ul style="list-style-type: none"> <li>Drill core were logged in detail by an experienced geologist directly into a tablet with logging software. Data was then uploaded into an Excel spreadsheet database.</li> <li>Logging is semi-quantitative and 100% of reported intersections have been logged.</li> <li>Logging is of a sufficiently high standard to support any subsequent interpretations, resource estimations and mining and metallurgical studies.</li> </ul>
Sub-sampling techniques and sample preparation	<ul style="list-style-type: none"> <li>The 1772 kg bulk sample was homogenized by using a rotary splitter and crushed to 1.7 mm using a jaw and rolls crusher at BV Perth.</li> <li>100 kg of sample was ground using rod mills to p80 75 microns and used for Wilfley tabling at BV Perth. The rejects streams were combined for low intensity magnetic separation (LIMS) processing.</li> <li>The hematite LIMS tail was treated by wet high intensity magnetic separators (WHIMS) at UniSA.</li> <li>Approximately 900 kg of drill core was used for the comminution (HPGR) testing.</li> </ul>
Quality of assay data and laboratory tests	<ul style="list-style-type: none"> <li>Chemical analyses of the metallurgical test work products as presented in Table 1 in the report were carried out at Bureau Veritas (BV) laboratory in Perth and UniSA in Adelaide.</li> <li>Samples were analysed using BV method XRF4_WH01 and AAS in UniSA.</li> </ul>
Verification of sampling and assaying	<ul style="list-style-type: none"> <li>The diamond dill core bulk sample was collected under the supervision of a Havilah Resources geologist who was involved in the original drilling program and approved by a senior SIMEC Mining metallurgist.</li> <li>Rigorous internal QC procedures were followed to check all assay results against expected QC/QA samples.</li> <li>All data entry is under control of an experienced metallurgists and laboratory operators, who were responsible for data management, storage and security.</li> </ul>
Location of drillholes	<p><b>Diamond Holes</b></p> <ul style="list-style-type: none"> <li>Locations of the diamond drillholes sampled are shown in Figure 1 and drillhole data is summarized in Table 2.</li> <li>The drillhole collars were located using a DGPS (Omnistar HP signal with <math>\pm 0.1</math> m accuracy x:y:z) and are quoted in GDA94 datum coordinates.</li> </ul>
Data spacing and distribution	<ul style="list-style-type: none"> <li>The drillholes are strategically located throughout the deposit and therefore samples derived from them are considered to be representative of the iron ore mineralization.</li> </ul>
Orientation of data in relation to geological structure	<ul style="list-style-type: none"> <li>The drillhole azimuth and dip was chosen to intersect the interpreted shallow dipping iron formation as close as possible to right angles to maximize the value of the drilling data.</li> <li>At this stage, no material sampling bias is known to have been introduced by the drilling direction.</li> </ul>

Criteria	Commentary
Sample security	<ul style="list-style-type: none"> <li>The bulk samples were transported to SIMEC Mining's facility in Whyalla under the surveillance of SIMEC Mining personnel. There was no opportunity for systematic tampering with the samples as they were not out of the control of SIMEC Mining until they were delivered to SIMEC Mining's secure facilities in Whyalla.</li> </ul>
Audits, reviews	<ul style="list-style-type: none"> <li>Ongoing internal auditing of sampling techniques and assay data has not revealed any material issues by Havilah Resources.</li> <li>Review and audit of the laboratory procedures and assay methods by SIMEC's supervising metallurgist revealed no cause for concern as to reliability of assays.</li> </ul>

## Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	Commentary
Mineral tenement and land tenure status	<ul style="list-style-type: none"> <li>All drilling was undertaken on Havilah Resources 100% owned Exploration Licence EL 6041, "Cutana".</li> </ul>
Exploration done by other parties	<ul style="list-style-type: none"> <li>There was no drilling carried out on the Maldorky deposit prior to Havilah Resources and no metallurgical work on the iron ore samples.</li> </ul>
Geology	<ul style="list-style-type: none"> <li>Stratiform iron formation belonging to the Braemar Iron Formation of Adelaidean (Neoproterozoic) age. The sequence has been tightly folded into its present shape during post-depositional deformation.</li> </ul>
Drill hole Information	<ul style="list-style-type: none"> <li>See Table 2 in this report.</li> </ul>
Data aggregation methods	<ul style="list-style-type: none"> <li>Not applicable as a bulk sample taken from long intervals of homogeneous drillcore. Assays of the bulk sample were taken and compared with the original drilling results with no major discrepancies reported.</li> </ul>
Relationship between mineralisation widths and intercept lengths	<ul style="list-style-type: none"> <li>Drillholes are generally oriented with the objective of intersecting mineralisation as close as possible to right angles, and therefore most down-hole intersections are in general, close to true width.</li> </ul>
Diagrams	<ul style="list-style-type: none"> <li>Included Figure 1 shows the drillholes locations. Table 2 summarises relevant drillhole information.</li> </ul>
Balanced reporting	<ul style="list-style-type: none"> <li>Metallurgical assay results are reported here as received with no bias.</li> </ul>
Other substantive exploration data	<ul style="list-style-type: none"> <li>Relevant exploration data has previously been reported by Havilah Resources at the time of drilling in 2010 – 2012.</li> </ul>
Further work	<ul style="list-style-type: none"> <li>Advancement of the Maldorky iron ore project is dependent on the outcomes of the present scoping level mining studies, including the metallurgical test work reported here.</li> </ul>