Pilot test work validates modified mineral processing circuit design

Key points

- **Pilot test work program has confirmed new Phase 1 mineral processing circuit design**
- **Program results also support a further refinement of the circuit and improved magnetite recovery now being assessed for further potential capital and operating cost reductions**
- **Comminution energy usage of up to 30 per cent below Stantec's original desktop estimate**
- **Findings support a decision to restart work on a modified Bankable Feasibility Study (BFS) for an 11 million tonne per annum (Mtpa) project when funding has been secured**
- **Preparation of a comprehensive project investor information memorandum is well advanced to support discussions with potential strategic partners to help finance the modified BFS**
- **Modified BFS could be completed within 12 months after securing funding**

Hawsons Iron Ltd (**Hawsons** or the **Company**) is pleased to announce that a pilot test work program emanating from the Strategic Review has validated and de-risked the Phase 1 mineral processing design developed by global engineering firm Stantec.

Executive Chairman Mr Bryan Granzien said the pilot test work program, recently undertaken at the ALS metallurgy laboratory in Perth, had validated the effectiveness of the new design and found comminution energy usage was up to 30 per cent below Stantec's theoretical estimates.

"This pilot test work program has successfully de-risked Stantec's proposed Phase 1 flowsheet design as a viable technical solution which can now be progressed to support a modified BFS for an 11 million tonne per annum project," he said.

"Importantly, this proof-of-concept program has also provided valuable data to enable Stantec to improve their flowsheets to potentially reduce capital and operating costs further and revise the process required to generate potential secondary waste stream ore-sand products," he said.

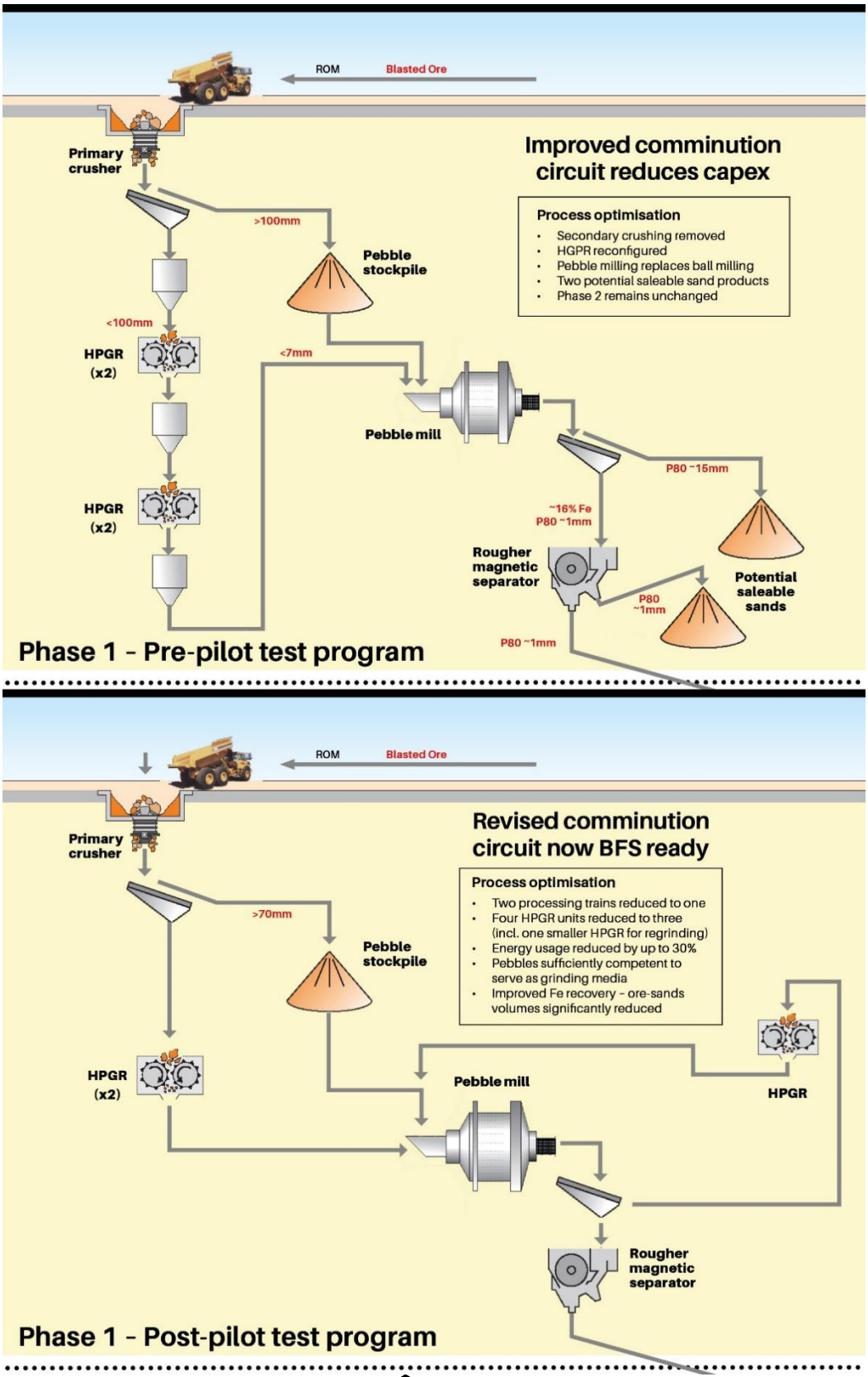
Stantec's design aimed to reduce capital and operating costs by paring the number of processing steps involved; lowering power and water use; eliminating grinding media; trimming downstream equipment sizing; and improving tailings management (*see ASX Announcement dated 13 June 2023: Strategic Review action plan delivers positive outcomes and path forward*).

An initial pilot scale test work program was recommended to confirm the performance and economic benefits of the redesigned processing circuit, which involves a unique configuration of mature and proven technology.

Mr Granzien said the positive results had enabled Stantec to further amend the Phase 1 flowsheet, as shown in **Figure 1**, subject to undertaking recommended follow-up pilot test work programs which would also support refinement of the more traditional Phase 2 magnetite recovery circuit.

"These additional pilot test work programs to support further refinement of the final flowsheet designs can be undertaken as part of an ongoing scope of work once activity on a modified BFS gets underway," he said.

Figure 1 Updated Phase 1 Concept Flowsheet – Comminution Circuit



Stantec's design concept was originally based on two 5.5 Mtpa processing trains, each using two high-pressure grinding rolls (HPGR) fed by primary crushers, with a +100mm sizing screen prior to the HPGRs.

This oversized screened material would be stockpiled and fed into a pebble mill as a grinding medium downstream of the HPGRs, set up in series and choke-fed by surge bins.

As summarised in **Table 1** below, the test work found that the coarse rock (pebbles) ground away in the primary pebble mill at a faster rate than anticipated and that a higher pebble feed-rate than the theoretical estimate would be required to maintain the pebble mill load.

Due to the faster-than-anticipated grinding performance, Stantec now considers only two front end HPGR units to be necessary, in conjunction with a reduction in oversized screened material to +70mm to maintain the pebble mill load.

The revised flowsheet also includes a smaller third HPGR unit operating in a re-crush application with a circulating load reporting to either the primary pebble or secondary milling circuit.

Table 1 Pilot Program Summary

No	Hypothesis – Original Assumption	Yes/No	Hypothesis – Test Work Outcome
1	Prove viability of proposed flowsheet in current configuration i.e., two HPGRs in series required	Yes	Pilot test work concluded that a single HPGR will suffice - two HPGRs in series are not required
2	Verify pebble competency	Yes	Pebbles are sufficiently competent to serve as grinding media. Circuit pebble cut size to be reduced from 100mm to 70 mm to accommodate higher than predicted pebble wear rate and sustain mill load
3	Verify amenability to pebble (autogenous) milling	Yes	Ore is amenable to pebble milling with primary mill requiring no steel media addition to achieve desired throughput
4	Quantify theoretical vs actual power demand	Yes	Theoretical power demand for the pilot pebble mill was 8 kWh/t. Actual power demand was determined to be 5.6 kWh/t
5	Verify ability to discard ~15mm barren pebble stream	No	Reduced volumes of 15mm barren pebbles remained; rather a -8mm+1mm product was produced which contains an 11% Fe grade, the recovery of which may add further value.
6	Generate understanding of mass split for pre-concentrate product and sand by-product streams	Yes	Rougher low intensity magnetic separation (LIMS) yielded a 51% mass rejection to non-magnetic tails. When the +1mm material is returned to the circuit, this rejection is expected to be 71%.
7	Ore variability	Yes	Pilot test work and mine planning has indicated that the anticipated variability on ore feed grade (Fe content) will be managed through blending without impacting in the downstream Phase 2 flowsheet

Within the original proof-of-concept flowsheet -15mm to +1 material was expected to be rejected as barren waste. The test work indicated that this potential waste stream of predominantly -8mm to +1 material was magnetic and still graded 11 per cent Fe.

Consequently, this stream will require additional processing to liberate and recover the contained magnetite, subject to determination of the final process design.

The final flowsheet will therefore require flexibility to be operated in either a closed-circuit mode, where this material returns to the pebble mill, or in open circuit, where it reports to the Phase 2 downstream magnetite recovery circuit.

Overall, the pilot test work program found the ore was amenable to fully autogenous grinding and that the pilot pebble mill comminution energy required was substantially lower than the theoretically calculated estimate of ~8kWh/t. The comminution energy required was as much as 60 per cent less in open circuit mode at 2.8-3.5 kWh/t and 30 per cent less at 4.9-5.6 kWh/t in closed circuit mode.

Next steps

Mr Granzien said Hawsons had essentially implemented the three-pronged Strategic Review action plan adopted in February 2023 to strengthen the business case for developing the project (s*ee ASX Announcement dated 1 February 2023: Hawsons endorses modified 11 Mtpa BFS and Strategic Review action plan*).

"We will now finalise a comprehensive project investor information memorandum in October 2023 to support imminent discussions with potential strategic partners prepared to help fund the modified BFS," he said.

Mr Granzien said a modified BFS could be completed within 12 months after securing the required funding.

Released by authority of the Board
Hawsons Iron Limited
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About Hawsons Iron Ltd
Hawsons Iron Ltd (ASX: HIO) is an iron ore developer and producer listed on the Australian Securities Exchange. The company is focused on developing its flagship Hawsons Iron Project near Broken Hill into a premium provider of high-quality iron ore products for the global steel industry.

The Hawsons Iron Project is situated 60km southwest of Broken Hill, New South Wales, Australia in the emerging Braemar Iron Province. It is potentially capable of producing the world's highest-grade iron product (70% Fe), making it among the world's leading undeveloped high-quality iron ore concentrate and pellet feed projects.

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