28 January 2020

ASX ANNOUNCEMENT

RESULTS OF THE INDEPENDENT PLANT DESIGN OPTIMISATION STUDY (20% increase to 600 ktpa)

Highlights

- **Plant Optimisation Study evaluated a throughput increase to 600 ktpa**
- **Incorporates the 2.5 MW ball mill purchased in October 2019 into a revised plant design**
- **Flexible plant design to facilitate expansion should the project grow**
- **Capital costs estimated to be within 1% of Theta Project Feasibility Study (including mill purchase and relocation costs)**
- **Tender documents are ready for plant construction on an Engineering, Procurement, Construction (EPC)/Lump Sum Turnkey (LSTK) basis**
- **Ball Mill and associated infrastructure have been removed and are ready for transport to TGME plant site in February 2020**

Figure 1: 2.5MW Ball Mill being prepared for removal from structure

Theta Gold Mines Limited ("Theta Gold" or "Company") (ASX: TGM, TGMO | OTCQB: TGMGF) is pleased to announce that METS Engineering SA has completed a study into increasing the TGME Gold Plant throughput from the original 500ktpa capacity in the Feasibility Study (ASX release 16 May 2019) to 600ktpa. The 20% increase in the new plant design is expected to be achieved with less than a 1% change to the Feasibility Study Process Plant Capex of 24.85 M USD.

The Increased design parameters incorporate the newly purchased (October 2019) 2.5 MW ball mill and the study was concluded in sufficient detail to allow for the development of a Lump Sum Turnkey (LSTK) tender document.

More importantly the 20% improvement in capacity (primarily as the result of the procurement of a 2.5 MW ball mill) is expected to only result in a 1% capital cost increase when compared to the Theta Project Feasibility Study (See details in Appendix A).

Description	Feasibility Study	Optimisation Study	Variance
Throughput (ktpa)	500	600	+ 20 %
Capital Cost (ZAR M)	353	362	+ 2.5%
Capital Cost (USD M)	24.84	24.98	+ 0.6 %
Exchange Rate (ZAR/USD)	14.2	14.5	- 2.1 %

Recent work has also included ongoing optimization of the Theta project and focused on improving the current throughput constraint of the tailings dam, specifically the annual deposition rate. This annual deposition rate has now been confirmed at 600ktpa which matches the increased plant throughput capacity.

The Company has also completed the removal of the 2.5 MW mill and the original equipment manufacturer has confirmed that it is in good condition with minor repairs expected to be completed on site during the installation of the mill.

Chairman Mr Bill Guy stated, "The optimization plant design study completed for the Theta Project is further demonstration of the robust nature of the project. The inclusion of the 2.5 MW mill and new design work means the plant can be readily expanded in future. The Company has not lost sight of its medium-term production target of 100 kozpa.

The team is updating the mine schedule to accommodate any potential production increases. The mill purchase mitigates potential future capital costs risks, but more importantly it is traditionally one of the longest lead time pieces of equipment."

This announcement was authorised for release by the Board of Directors.

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APPENDIX A

Plant Throughput Optimisation Study

Following the release of the Theta Project Feasibility Study, the company continued to investigate the potential for increased throughput opportunities. The throughput constraint for the project remains the annual deposition rate and total capacity on the existing permitted tailings dam. Further work by the tailings engineers (Tailex) has unlocked an additional 100 kt per annum of deposition rate, now 600 ktpa, however the overall tailings capacity remains unchanged at 2.5 Mt.

The company engaged METS (Part of the UMS Group) who completed the original plant design and costing as part of the Theta Project Feasibility Study, to complete an optimized design at the increased throughput.

The results of this study saw the delivery of updated capital and operating cost that has remained within 1 % of those presented in the Theta Project Feasibility Study. The costs also include the purchase, removal and relocation costs for the large 2.5 MW mill purchased in October 2019.

Description	Feasibility Study	Optimisation Study	Variance
Throughput (ktpa)	500	600	+ 20 %
Capital Cost (ZAR M)	353	362	+ 2.5%
Capital Cost (USD M)	24.84	24.98	+ 0.6 %
Exchange Rate (ZAR/USD)	14.2	14.5	- 2.1 %

Table 1: Comparison table of Feasibility Study 500 ktpa to Optimisation Study 600 ktpa

The brief was to provide an updated detailed capital schedule and plant operating costs as well as a detailed tender document that the company could use into the market for the delivery of a Lump Sum Turnkey (LSTK) Price for the construction of the plant.

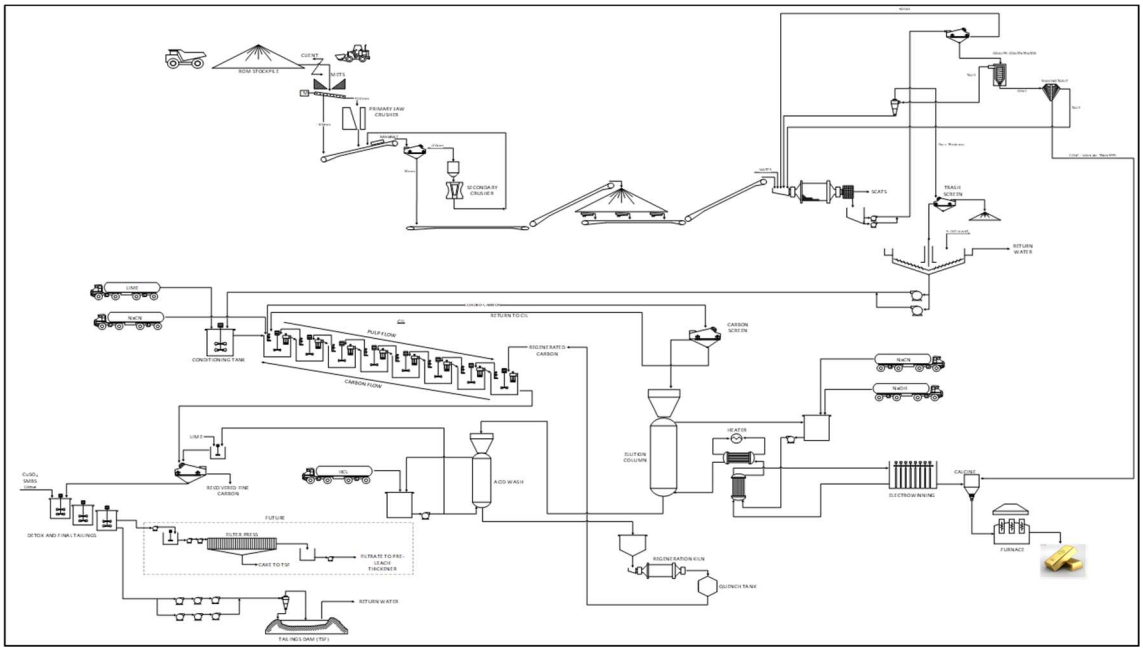

Figure 21: Theta Project Plant Process Flow Diagram

The design caters for potential future expansions up to 1.2 Mtpa throughput of oxide material. Expansion of the plant would require further studies to confirm project economics at different production rates. The crushing section allows for simple expansion to 1.2 Mtpa through the inclusion of a tertiary crusher which can be installed while the plant continues to run and will then only require a short 48 hours shutdown to tie in. This additional crusher will allow for a reduction in feed size to the mill which will then allow for the 2.5 MW mill to increase throughput to 1.2 Mtpa. The design allows for future increases required for pumping, cycloning and gravity gold recovery. The CIL and cyanide destruction sections will simply be duplicated to allow for the increased throughput however the elution section, gold room and reagents section are designed to cater for any future increases in throughput.

Brief Process Design Overview

Run of Mine (ROM) ore will be stockpiled from the mining operation and introduced into the plant by means of a Front-end Loader (FEL) into a feed bin, which will be used to feed a two stage, crushing plant, in closed circuit. The crushing section of the plant is designed to treat 201 tph for 18 hours. a day, 7 days per week.

The crushing circuit consists of a primary jaw crusher including a vibrating grizzly feeder (VGF) and crushing feed bin including a static grizzly on top. The undersize from the VGF will bypass the crusher, discharging onto a conveyor reporting to a single deck screen. The primary crusher discharge product, combined with the VGF undersize, reports to the single deck screen. The screen undersize (-20 mm) proceeds to the mill feed stockpile, with the screen oversize being sent to the secondary cone crusher with the product recycled back onto the screen feed (in closed circuit).

The mill feed stockpile has been designed for a 60 hours live capacity providing sufficient buffer capacity to maintain the required overall utilisation of the process plant. A precast concrete tunnel beneath the stockpile will house vibrating pan feeders. The stockpile extraction feeders will control feed onto the mill feed conveyor (via weightometer) and will feed the milling circuit.

The milling circuit will consist of a ball mill, classification cyclone and gravity concentration circuit. The throughput to the process plant is 85 tph (0.6 MTPA), with the plant designed to operate 24 hours a day at 90% utilisation. The mill discharge will be pumped o the gravity concentration circuit.

Feed to the gravity circuit will report to a 2 mm guard screen, and the oversized material will be fed back to the mill feed. The undersized material will then be fed to the Gravity concentrator. Concentrate from the gravity concentrator proceeds to a shaking table located in the wet section of the gold room for further gold upgrading.

The shaking table will have a dedicated feed tank with pump and is designed as a batch operation. The tailings from the shaking table will be pumped back to the mill discharge sump. Gold accounting of the gravity gold will be separate from the CIL section of the plant.
The tails from the gravity concentrator will report to a sump and then be pumped to the mill classification cyclone.

The mill cyclone overflow will pass over a trash screen to prevent any organic material entering the CIL circuit. The underflow of the screen reports to the pre-leach thickener (24 m diameter) and underflow at 50% solids will be pumped to the CIL conditioning tank. The thickener overflow will return to the adjacent process water tank to be re-used in the plant.

The CIL circuit will have 8 agitated CIL tanks. Lime will be added at the pre-leach thickener and conditioning tank to control the pH of the slurry at ±10.5.

Between the conditioning tank and the CIL circuit a MACH reactor has been added which recirculates the plant feed at a ratio of 6 times through a needle tank. The MACH reactor ensures high attritioning of feed material and improves on leach kinetics and efficiency. Overflow from the needle tank will flow to CIL tank 1 or 2.

Reagent for gold dissolution is added in tanks 1 and 2 and topped-up, if required, in tank 5 and 6. A residual cyanide concentration of >100ppm in the leach tailings is desired to ensure excess cyanide in the CIL to ensure a suitable environment for gold leaching to take place..

Regenerated carbon will be added in either tank 7 or 8 and pumped upstream to tank 1. Dissolved gold is loaded onto the carbon as the carbon moves upstream. A total leach residence time of 24 hours has been allowed for.

Loaded carbon is then pumped from either CIL tank 1 or 2 to the elution circuit where it will be stripped, and the carbon regenerated for re-use in the CIL circuit. Slurry moves downstream from tanks 1 to 8 and is pumped by interstage up-pumper screens from one tank to the next.

CIL tailings pass over a carbon catchment screen to recover any gold bearing fine carbon before the tailings is disposed of. The tailings then undergoes a cyanide detoxification process by chemical means (INCO Process) before being split 50/50 with 50% of the tailings reporting to a dewatering plant and the remaining 50% pumped as a slurry to the tailings dam. The dewatering plant may be deferred for a period of up to 12 months however thereafter 100% of the tailings will need to be filtered in order to cater for the requirements of the tailings dam construction.

The dewatering plant will treat 50% of the mass flow and this will be pumped into a filter press system for dewatering in order to produce a filter cake. This filter cake will be used to construct the outer walls of the TSF.

The elution process will be the ZADRA design, which is a continuous circulation of eluate through the elution column and electrowinning cells via the heat exchangers and eluate tank. The gold bearing cathodes will proceed to the calcine and smelting furnace to produce gold doré bars.

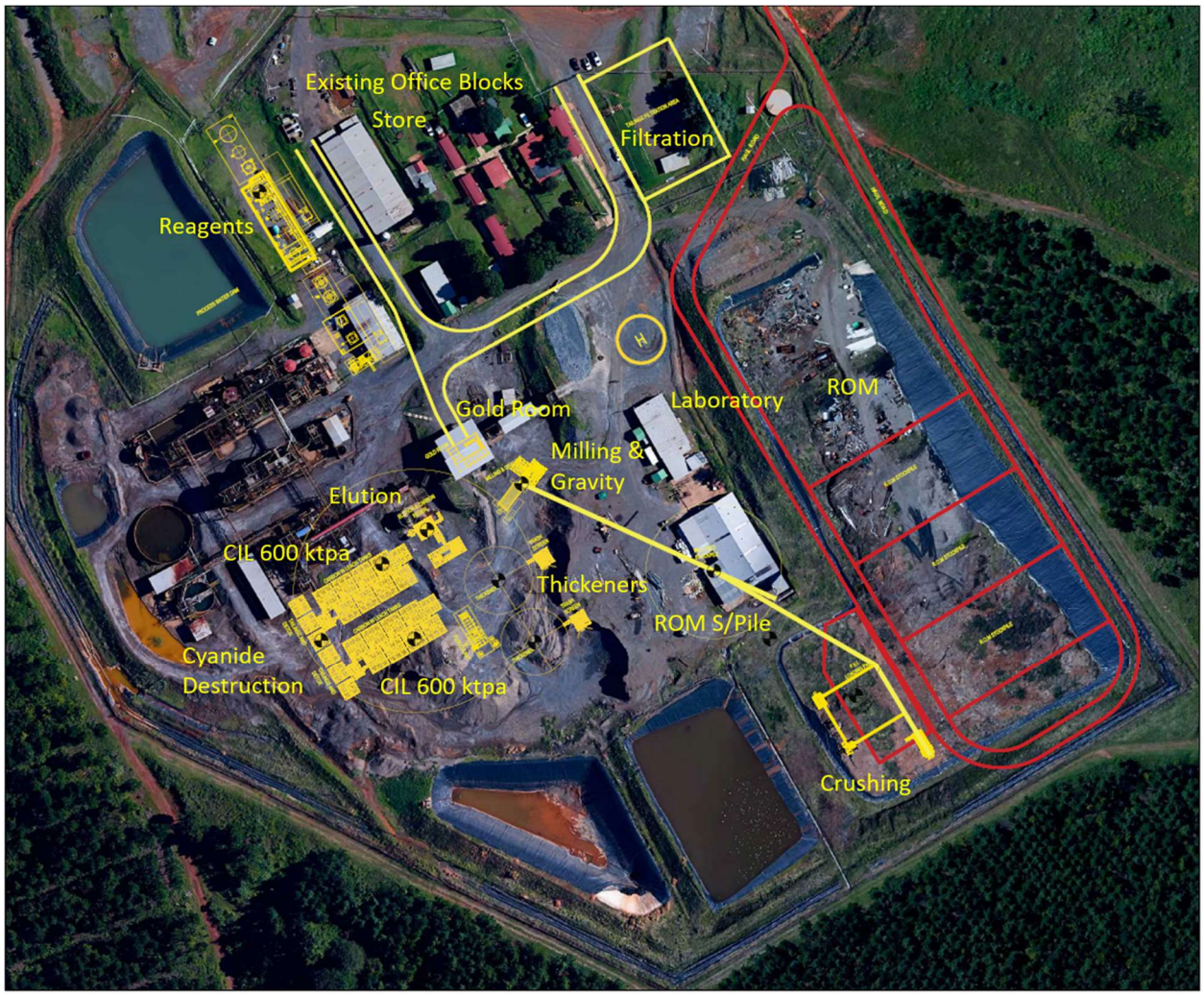

Figure 3: Optimised Plant Layout Showing CIL Duplication for Possible Expansion

Detailed tender documents for the construction of the mine and plant have also been delivered that are of sufficient detail to allow for an Engineering, Procurement, Construction (EPC)/Lump Sum Turnkey (LSTK) basis tender.

As part of the optimization process, the Company and consultants carefully considered the battery limits for the delivery of the study to ensure that the designs captured any downstream elements that could affect the design e.g. Plant design battery limit included the use of cyclones on the dam and design catered for the required operating conditions of the cyclones. In addition, any area where synergies or skills could be shared were also catered for e.g. the transport of filtered tailings from the plant to the tailings dam which has been included into the mining tender.

Ball Mill

Following the completion of a purchase agreement to purchase a 2.5 MW mill (ASX release 2 October 2019: Theta Agrees to Purchase Ball Mill Operated by Glencore), the Company commenced the process of dismantling and removing the mill from its current location at the Glencore Smelter site in Rustenburg.

The purchase of this mill is considered by management to be one of the critical pieces of plant equipment for the proposed new gold processing plant. The purchase mitigates potential future

capital costs risks, but more importantly it mitigates construction time risks as this is traditionally a long lead time piece of equipment.

In October 2019, the Company returned to the site with various engineers to commence with the planning and detailed costing for the removal of the mill and relocation to TGME and in November the Original Equipment Manufacturer (OEM), Thyssen Krupps, was engaged to complete the dismantling and removal of the mill and associated equipment.

On 15 December 2019 the mill was finally removed from the structure and placed in a storage area on site with the rest of the associated equipment for the mill and in preparation for road transport in early 2020.

Figure 4: Mill Removal From Structure

Figure 5: Mill and Containers of Associated Equipment Ready for Transport

The transport of the mill and associated equipment from Rustenburg to the TGME Plant in Pilgrims Rest is expected to occur in February 2020.

ABOUT THETA GOLD MINES LIMITED

Theta Gold Mines Limited (ASX: TGM, TGMO | OTCQB: TGMGF) is a gold development company that holds a range of prospective gold assets in a world-renowned South African gold mining region. These assets include several surface and near-surface high-grade gold projects which provide cost advantages relative to other gold producers in the region.

Theta Gold's core project is located next to the historical gold mining town of Pilgrim's Rest, in Mpumalanga Province, some 370km northeast of Johannesburg by road or 95km north of Nelspruit (Capital City of Mpumalanga Province). Following small scale production from 2011 – 2015, the Company is currently focussing on the construction of a new gold processing plant within its approved footprint at the TGME plant, and for the processing of the Theta Open Pit oxide gold ore. Nearby surface and underground mines and prospects are expected to be further evaluated in the future.

The Company aims to build a solid production platform to over 100kozpa based primarily around shallow, open-cut or adit-entry hard rock mining sources. Theta Gold has access to over 43 historical mines and prospect areas that can be accessed and explored, with over 6.7Moz of historical production recorded.

Theta Gold holds 100% issued capital of its South African subsidiary, Stonewall Mining (Pty) Ltd ("Stonewall"). Stonewall holds a 74% shareholding in both Transvaal Gold Mining Estates Limited ("TGME") and Sabie Mines (Pty) Ltd ("Sabie Mines"). The balance of shareholding is held by Black Economic Empowerment ("BEE") entities. The South African Mining Charter requires a minimum of 26% meaningful economic participation by the historically disadvantaged South Africans ("HDSAs"). The BEE shareholding in TGME and Sabie Mines is comprised of a combination of local community trusts, an employee trust and a strategic entrepreneurial partner.

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The Feasibility Study referred to in this announcement is based on technical and economic assessments to support the estimation of Ore Reserves. There is no assurance that the intended development referred to will proceed as described, and will rely on access to future funding to implement. Theta Gold believes it has reasonable grounds the results of the Feasibility Study. At this stage there is no guarantee that funding will be available, and investors are to be aware of any potential dilution of existing issued capital. The production targets and forward looking statements referred to are based on information available to the Company at the time of release, and should not be solely relied upon by investors when making investment decisions. Theta Gold cautions that mining and exploration are high risk, and subject to change based on new information or interpretation, commodity prices or foreign exchange rates. Actual results may differ materially from the results or production targets contained in this release. Further evaluation is required prior to a decision to conduct mining being made. The estimated Mineral Resources quoted in this release have been prepared by Competent Persons as required under the JORC Code (2012). Material assumptions and other important information are contained in this release.