



22 August 2019

ASX ANNOUNCEMENT

**OPTIMISED GOLD PLANT LAYOUT COMPLETED**

Theta Gold Mines Limited ("Theta Gold" or "Company") (ASX: TGM, TGMO) is pleased to advise shareholders that the Company has completed internal engineering studies to maximize use of the existing permitted plant footprint. The new metallurgical plant layout position will create the flexibility to materially increase the Company's gold production profile. This exercise is in terms of the Company's strategy to achieve a production profile of 100,000 ounces per annum.

## Highlights

- **Phase 1: 500,000 tpa Open Cut Oxide CIL Plant (Theta Project FS Design May 2019)**
- **Phase 2: Permitted plant space to expand Open Cut Oxide CIL Plant to 1 Mtpa**
- **Phase 3: Permitted Plant space available for Underground Ore process circuit**

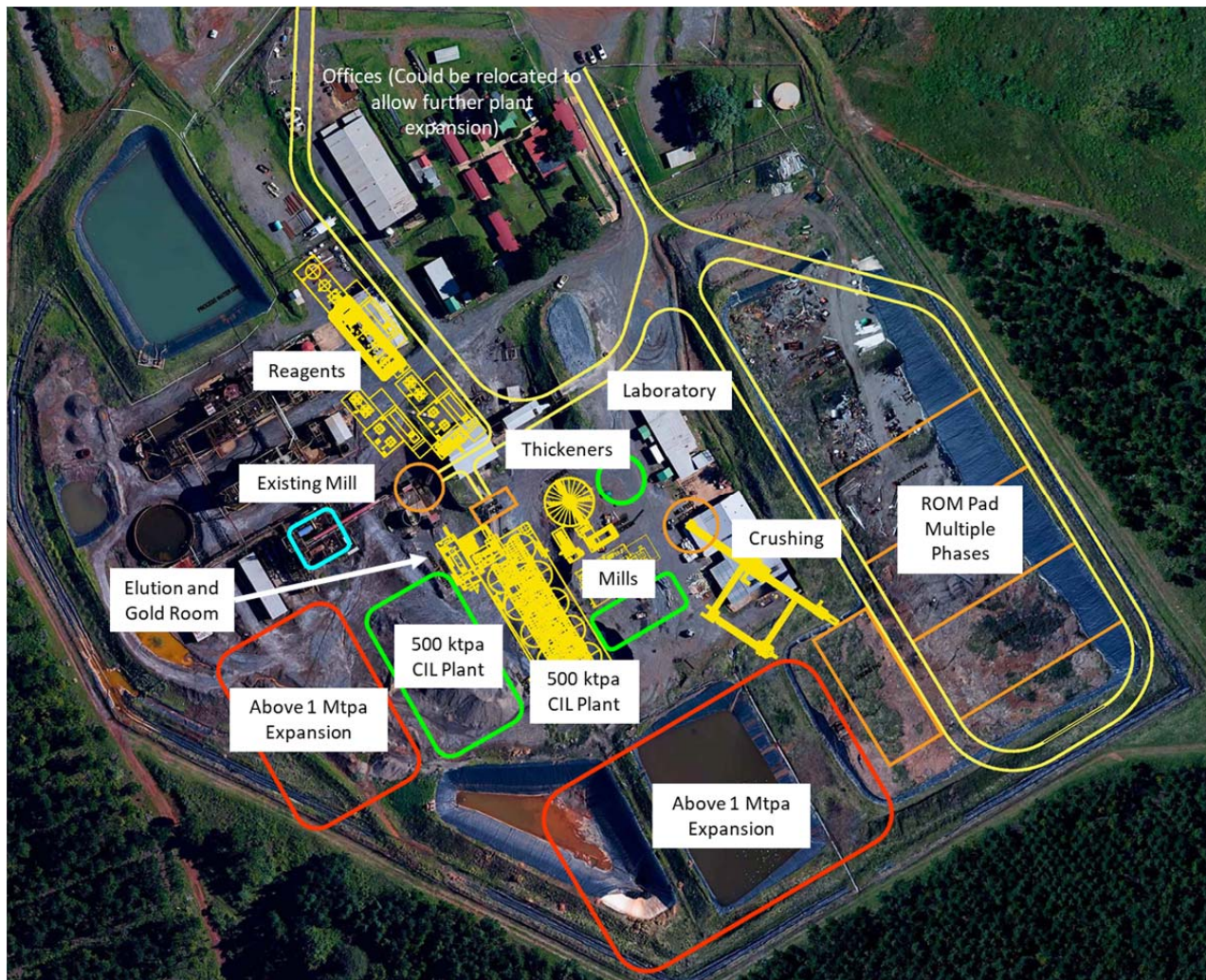
Following the positive results of the Theta Project Feasibility Study ("FS") the Company wanted to ensure that, in the future, it had the flexibility to scale production from the FS envisaged gold plant throughput of 500,000 tpa to 1 Mtpa and further to have the ability to treat potential underground ore resources. The study explored potential future plant expansion possibilities that makes use of TGME's large footprint of permitted plant area that is currently un-utilized in terms of the May 2019 FS.

In terms of the studies undertaken, the process and engineering teams reviewed the ability to expand the plant to 1 Mtpa of open cut oxide ore (see Figure 1 below) and also to further ensure that the plant's design and spatial layout for Phase 1 is flexible enough to allow for the installation of additional process circuits to expand the plant to Phase 2 and Phase 3. The proposed new plant will be built with minor design alterations that allow for scaling up to these potential production profiles. This approach will allow the Company to more than double the production profile in future with minimal disturbance to gold production at the Theta Project.

**Chairman Mr Bill Guy stated,** "The immediate-term focus for the Company remains the delivery of the FS production profile with a strategic approach to ensure plant layout allows for future expansion. The company has 6 Moz gold resource under management and the production profile will be key to unlocking full value for shareholders. The engineering team's optimisation work has demonstrated that the permitted plant area can accommodate multiple plant expansions to increase overall throughput.

The new plant modifications and layout for the current Phase 1 are not expected to impact on the Theta Project FS Capex."

**Figure 1: Plant Layout Showing Expansion Opportunities**



**YELLOW/ORANGE: FS Phase 1 – 500 ktpa, GREEN: Phase 2 Expansion to 1 Mtpa+,**

**RED: Phase 3 Expansion to ~1.5 Mtpa or more**

## Background

### Plant Optimisation Expansion Strategy

The Company's current resource of over 6 Moz is split between open cut (1.3 Moz) and underground (4.5 Moz)<sup>(1)</sup> (Appendix A). Given the large resource base size, management decided to investigate the potential to expand the FS to ensure flexibility for future plant expansion. The ability to readily increase the plant production profile is a key part of the medium-long term strategy.

To take full advantage of the existing permitted plant site space, minor modifications have been made to the initial plant layout to facilitate three potential phases of plant expansion (Figure 1) into the future.

- Phase 1 : 500 ktpa Open Cut Oxide CIL Plant (Theta Project FS Design)
- Phase 2 : Expand Open Cut Oxide CIL Plant to 1 Mtpa+
- Phase 3 : More permitted plant space available for an additional 500 ktpa expansion (considered to treat Underground Ores)

Phase 1 relates to the Feasibility Study which was completed on 16 May 2019 and is detailed in the ASX release on that date.

### **Plant engineering modifications to transition from Phase 1 to Phase 2 (1 Mtpa)**

The initial Feasibility Study “Theta Project” has a capacity of 500 ktpa. The new modified Phase 1 plant will be built with sufficient flexibility to allow for a potential Phase 2 plant expansion. The layout changes can be incorporated in the existing plant permitted footprint and also allows for the Phase 3 underground ore process plant to be integrated into the Phase 2 plant. Initial design work completed to date will provide sufficient flexibility to allow for all three phases of expansion. Below is a list of the modifications that will be made to Phase 1 to provide flexibility to expand into Phases 2 and 3.

**ROM Pad:** Existing ROM is already sized correctly for Phase 1 and Phase 2.

**Crushing section:** All conveyors and feeders will be designed to handle 1 Mtpa in order to allow for a potential increased throughput should the plant be expanded to Phase 2. The design of the crusher plinths and steelwork will cater for a potential later change-out to larger crushers.

**Mill feed stockpile:** New mill feeders and new mill feed belt under mill feed stockpile will be designed to have a capacity of 1 Mtpa to accommodate a potential future expansion into Phase 2.

**Mill feed surge bin:** A new small surge bin with double feeder capacity will be designed for future expansion into Phase 2. (This addition is dependent on final mill size selection. The team is presently considering installing a larger mill for Phase 1 and in this case the larger feed bin will not be required).

**Milling:** Should a larger capacity mill be selected for Phase 1, then a second milling circuit will not be required for the ramp up into Phase 2.

**Gravity circuit:** Phase 1 has been designed with a gravity circuit to cater for 500 ktpa, design modifications will allow for a duplicate gravity circuit for Phase 2 expansion.

**Cyclone and gravity tower:** Phase 1 has been designed to cater for 500 ktpa, design modifications will incorporate flexibility for additional equipment to be installed.

**Thickening:** A new thickener before CIL circuit is likely an upsize thickener to allow for 1 Mtpa capacity – the size of the thickener will be evaluated during the value engineering that will be undertaken during Phase 1. (Should a smaller thickener be selected during Phase 1, the expansion will be accommodated through the addition of a second thickener in Phase 2).

**pH Conditioning tank:** Extra tank capacity has been designed that will allow for 2 hours of surge capacity at 1 Mtpa.

**Carbon In leach (CIL):** - Phase 1 envisages 8 CIL tanks allowing for 24 hours retention time. Phase 2 will require a second train of 8 CIL tanks. Plant layout and design will allow for installation of this extra CIL train of tanks.

**Cyanide Destruction:** Subject to final value engineering during Phase 1, the expansion might be accommodated through the upsizing of the Cyanide Destruction tanks in preparation for expansion to 1 Mtpa. Alternatively, the cyanide destruction section for the 1 Mtpa option will form part of the Phase 2 construction.

**Tailings Filtration:** A new 230 ktpa tailings filtration circuit has been engineered that will allow 46% of Phase 1's total tailings to be filtered for tailings dam buttressing thus allowing for the deposition of 500 ktpa. At this rate, 2.5 Mt of tailings capacity is achieved on the existing tailings dam. For Phase 2, expansion of tailings storage facility will be required.

**Elution:** *No change* - the new 2.5 tpd elution circuit installed for Phase 1 should sufficiently cater for expansion to 1 Mtpa.

**Gold Room:** The Phase 1 gold room will be sized to accommodate a 1 Mtpa production profile.

**Reagents Section:** To accommodate an expansion to 1 Mtpa small modifications were made to the reagent section design and revolve around pump positioning to cater for a second set of pumps in the Phase 2 expansion with tank sizes not expected to change.

**Notes:**

1. ASX Release 16 May 2019 – Theta Gold Mine Increases Mineral Resource to Over 6 Moz, 30% Increase in Open Cut Resources
2. ASX Release 16 May 2019 – Positive Feasibility Study for Theta Project
3. ASX Release 16 May 2017 – Beta Scoping Study Reveals Potential Second Low Cost Gold Mine

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## ABOUT THETA GOLD MINES LIMITED

Theta Gold Mines Limited (ASX: TGM, TGMO) is a gold development company that holds a range of prospective gold assets in a historic 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 Mines core project (the Theta 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 planned refurbishment of the existing CIL plant and nearby mines/prospects with the intention of resuming gold production and is considering open pit mining on certain identified mineral resources amenable to open pit production. The Company has completed a detailed feasibility study and is in the process of seeking approvals for open pit mining on the existing mining licences held.

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 Mines has access to over 43 historical mines and prospect areas that can be accessed and explored, with over 6.7Moz of historical production recorded.



### Competent Persons Statement

#### Mineral Resources and Ore Reserves

The information in this report relating to Mineral Resources is based on, and fairly reflects, the information and supporting documentation compiled by Mr Uwe Engelmann (BSc (Zoo. & Bot.), BSc Hons (Geol.), Pr.Sci.Nat. No. 400058/08, MGSSA), a director of Minxcon (Pty) Ltd and a member of the South African Council for Natural Scientific Professions.

The information in this report relating to Ore Reserves is based on, and fairly reflects, the information and supporting documentation compiled by Mr Daniel van Heerden (B Eng (Min.), MCom (Bus. Admin.), MMC, Pr.Eng. No. 20050318, FSAIMM, AMMSA), a director of Minxcon (Pty) Ltd and a member of the Engineering Council of South Africa.

The original reports titled "Theta Gold increases Mineral Resource to over 6Moz" and "Positive Feasibility Study for Theta Project" were dated 16 May 2019 and were released to the Australian Securities Exchange (ASX) on that date. The Company confirms that –

- it is not aware of any new information or data that materially affects the information included in the ASX announcements; and
- all material assumptions and technical parameters underpinning the estimates in the ASX announcements continue to apply and have not materially changed.

## **DISCLAIMER**

This announcement has been prepared by and issued by Theta Gold Mines Limited (ASX: TGM, TGMO) to assist in informing interested parties about the Company and should not be considered as an offer or invitation to subscribe for or purchase any securities in the Company or as an inducement to make an offer or invitation with respect to those securities. No agreement to subscribe for securities in the Company will be entered into on the basis of this announcement.

This announcement may contain forward looking statements. Whilst Theta Gold Mines has no reason to believe that any such statements and projections are either false, misleading or incorrect, it does not warrant or guarantee such statements. Nothing contained in this announcement constitutes investment, legal, tax or other advice. This overview of Theta Gold Mines does not purport to be all inclusive or to contain all information which its recipients may require in order to make an informed assessment of the Company's prospects. Before making an investment decision, you should consult your professional adviser, and perform your own analysis prior to making any investment decision. To the maximum extent permitted by law, the Company makes no representation and gives no assurance, guarantee or warranty, express or implied, as to, and take no responsibility and assume no liability for, the authenticity, validity, accuracy, suitability or completeness of, or any errors in or omissions, from any information, statement or opinion contained in this announcement. This announcement contains information, ideas and analysis which are proprietary to Theta Gold.

## **FORWARD LOOKING AND CAUTIONARY STATEMENTS**

This announcement may refer to the intention of Theta Gold Mines regarding estimates or future events which could be considered forward looking statements. Forward looking statements are typically preceded by words such as "Forecast", "Planned", "Expected", "Intends", "Potential", "Conceptual", "Believes", "Anticipates", "Predicted", "Estimated" or similar expressions. Forward looking statements, opinions and estimates included in this announcement are based on assumptions and contingencies which are subject to change without notice, and may be influenced by such factors as funding availability, market-related forces (commodity prices, exchange rates, stock market indices and the like) and political or economic events (including government or community issues, global or systemic events). Forward looking statements are provided as a general reflection of the intention of the Company as at the date of release of the document, however are subject to change without notice, and at any time. Future events are subject to risks and uncertainties, and as such results, performance and achievements may in fact differ from those referred to in this announcement. Mining, by its nature, and related activities including mineral exploration, are subject to a large number of variables and risks, many of which cannot be adequately addressed, or be expected to be assessed, in this document. Work contained within or referenced in this report may contain incorrect statements, errors, miscalculations, omissions and other mistakes. For this reason, any conclusions, inferences, judgments, opinions, recommendations or other interpretations either contained in this announcement, or referencing this announcement, cannot be relied upon. There can be no assurance that future results or events will be consistent with any such opinions, forecasts or estimates. The Company believes it has a reasonable basis for making the forward looking statements contained in this document, with respect to any production targets, resource statements or financial estimates, however further work to define Mineral Resources or Reserves, technical studies including feasibilities, and related investigations are required prior to commencement of mining. No liability is accepted for any loss, cost or damage suffered or incurred by the reliance on the sufficiency or completeness of the information, opinions or beliefs contained in this announcement.

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 Mines 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.

Theta Gold Mines 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.

## APPENDIX A

**Table 1: Combined Mineral Resources as at 1 May 2019**

Mineral Resource Classification	Type of Operation	Tonnage	Gold Grade	Gold Content	
		Mt	g/t	Kg	koz
Measured	Underground	0.091	5.37	489	15.7
<b>Total Measured</b>		<b>0.091</b>	<b>5.37</b>	<b>489</b>	<b>15.7</b>
Indicated	Underground	4.774	6.21	29,661	953.7
	Open Pit	7.161	2.11	15,091	485.2
	Tailings	5.244	0.83	4,373	140.6
<b>Total Indicated</b>		<b>17.179</b>	<b>2.86</b>	<b>49,126</b>	<b>1,579.4</b>
Inferred	Underground	21.452	5.22	111,880	3,597.0
	Open pit	5.922	4.35	25,730	827.3
	Tailings	0.023	0.57	13	0.40
	Rock Dump	0.121	1.64	199	6.40
<b>Total Inferred</b>		<b>27.518</b>	<b>5.01</b>	<b>137,823</b>	<b>4,431.0</b>
<b>Grand Total</b>		<b>44.788</b>	<b>4.18</b>	<b>187,438</b>	<b>6,026.2</b>

**Notes:**

1. Columns may not add up due to rounding.
2. Gold price used for the cut-off calculations is USD1,500/oz.
3. UG Mineral Resources are reported at a cut-off of 160 cm.g/t, open pit at 0.5 g/t and 0.35 g/t, tailings and rock dumps at 0.35 g/t.
4. Fault losses of 5% for Measured and Indicated, 10% for Inferred Mineral Resources.
5. Mineral Resources are stated as inclusive of Ore Reserves.
6. Mineral Resources are reported as total Mineral Resources and are not attributed.

**Table 2: Theta Project Ore Reserves for MR83 only, 1 May 2019**

Mineral Resource Category in LoM Plan	Pit	Grade	Reef Tonnes	Au Content	
		g/t	kt	kg	oz
Probable	Browns Hill	3.24	564	1,826	58,699
Probable	Iota	2.54	1,253	3,189	102,513
Probable	Theta Hill	2.76	493	1,362	43,798
<b>Total</b>		<b>2.76</b>	<b>2,310</b>	<b>6,377</b>	<b>205,010</b>

**Notes:**

1. Totals in the Ore Reserve may not add-up due to rounding.
2. Mineral Resources are for MR83 only and excludes MR341 (refer Figure 2 below).
3. No Inferred Mineral Resources are included in the Ore Reserve.



**Table 3: Total Theta Project - Mineral Resources, 1 May 2019**

Mineral Resource Classification	Open Pit Mine	Reef	Reef Grade	Reef Width	Content	Reef Tonnes	Au Content	
			g/t	cm	cmgt	Mt	Kg	koz
Indicated	Theta & Browns Hill	Shale	1.02	200	204	0.439	402	12.9
	Theta & Browns Hill	Bevetts	1.10	221	244	0.891	886	28.5
	Theta & Browns Hill	Upper Theta	2.41	100	241	0.724	1,568	50.4
	Theta & Browns Hill	Lower Theta	3.70	100	370	0.888	2,956	95.0
	Theta & Browns Hill	Beta	2.49	100	249	0.383	859	27.6
	Columbia Hill	Bevetts	2.89	114	330	0.105	303	9.7
	Columbia Hill	Upper Rho	2.43	393	956	0.808	1,965	63.2
	Columbia Hill	Lower Rho	2.51	550	1381	0.815	2,047	65.8
	Columbia Hill	Upper Theta	1.08	114	123	0.158	171	5.5
<b>Total Indicated</b>			<b>2.14</b>	<b>246</b>	<b>526</b>	<b>5.211</b>	<b>11,157</b>	<b>358.7</b>

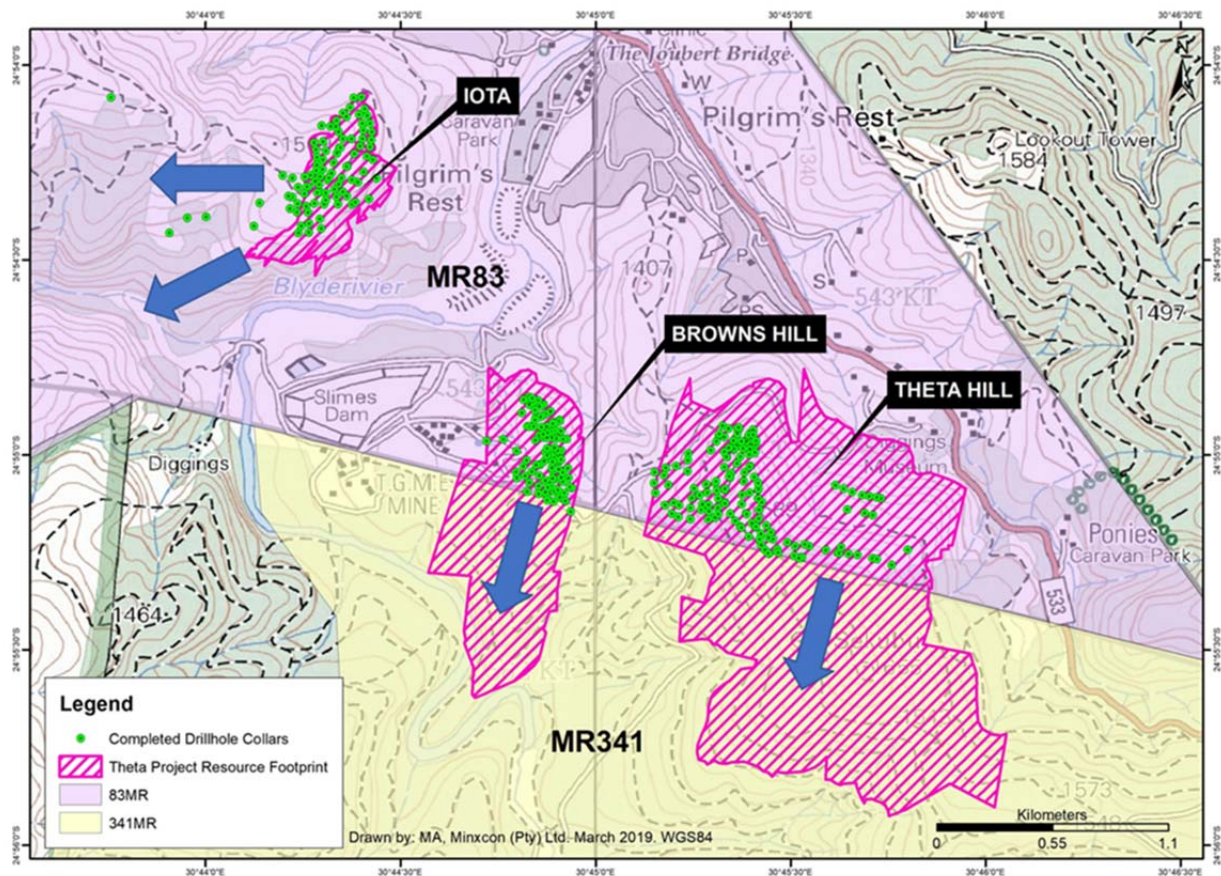
Mineral Resource Classification	Open Pit Mine	Reef	Reef Grade	Reef Width	Content	Reef Tonnes	Au Content	
			g/t	cm	cmgt	Mt	Kg	koz
Inferred	Theta & Browns Hill	Shale	1.11	216	240	0.703	666	21.4
	Theta & Browns Hill	Bevetts	1.07	213	227	0.648	589	19.0
	Theta & Browns Hill	Upper Theta	1.86	100	186	1.071	1,692	54.4
	Theta & Browns Hill	Lower Theta	8.11	100	811	1.643	11,329	364.3
	Theta & Browns Hill	Beta	2.23	100	223	0.748	1,417	45.6
	Columbia Hill	Upper Rho	5.13	106	544	0.099	507	16.3
<b>Total Inferred</b>			<b>3.30</b>	<b>132</b>	<b>434</b>	<b>4.912</b>	<b>16,202</b>	<b>520.9</b>

Mineral Resource Classification	Open Pit Mine	Reef	Reef Grade	Reef Width	Content	Reef Tonnes	Au Content	
			g/t	cm	cmgt	Mt	Kg	koz
Indicated	Total Theta Project	All	2.14	246	526	5.2	11,157	358.7
Inferred	Total Theta Project	All	3.30	132	435	4.9	16,202	520.9
<b>Total Indicated and Inferred</b>			<b>2.70</b>	<b>190</b>	<b>514</b>	<b>10.1</b>	<b>27,359</b>	<b>879.6</b>

Notes:

1. Theta Project (Theta Hill, Browns Hill and Iota) cut-off is 0.35 g/t;
2. The gold price used for the cut-off calculations is USD 1,500 / oz;
3. Geological losses applied are 10% for inferred and 5% for Indicated and Measured;
4. Theta Hill and Browns Hill - Upper Theta Reef, Lower Theta Reef and Beta Reef are diluted grades over 100cm;
5. Historical mine voids have been depleted from the Mineral Resource;

6. The inferred Mineral Resources have a high degree of uncertainty and it should not be assumed that all or a portion thereof will be converted to Ore Reserves;
7. Mineral Resources fall within the mining right MR83 and MR341 (refer Figure 2 below).



**Figure 2: Theta Project Resource Footprint over MR83 and MR341**