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## **Nyota Minerals Limited ('Nyota' or 'the Company')**

### **OPTIMISATION OF TULU KAPI GOLD PROJECT**

Nyota Minerals Limited (ASX/AIM: NYO), the gold exploration and development company in East Africa, is pleased to announce an update on the Company's programme to enhance and optimise the economic and operational fundamentals of its most advanced asset, the 100% owned Tulu Kapi Gold Project in Western Ethiopia ('Tulu Kapi' or 'the Project').

#### **Overview of the Optimisation Programme**

Over the last three months the Company has worked on optimising the returns offered by the Project, focussing on three key areas:

1. An independent review of the structural geological model and controls on mineralisation to take into account the large volume of data collected but only partially assimilated and modelled in the Mineral Resource estimation of October 2012;
2. A review of the open pit optimisation, design and mine scheduling used in the Feasibility Study, with the intention of increasing early gold production and increasing the Project's net present value; and
3. Commencing scoping studies for an underground mine to exploit the "Feeder Zone" mineralisation.

#### **Highlights**

- Pit optimisation shows the proposed mine development to be tolerant of a lower gold price.
- Mine design and scheduling will employ a pit shell optimal at US\$1,050/oz as it provides a robust case in a changing gold price environment with negligible loss of financial performance at higher gold prices.
- Re-scheduling and the use of a stockpiling strategy could increase the grade of ore delivered to the plant to between 2.1g/t and 2.4g/t for the first five years.
- Potential to increase average annual gold production by up to 30% in the first five years to 133koz, peaking at 145koz:
  - This compares with 105koz and 111koz in the Feasibility Study; and

- the additional gold represents an increase in annual revenue of approximately US\$30m to US\$50m in each of those initial years (at a gold price of between US\$1,050/oz and US\$1,500/oz).
- The *Inferred* Mineral Resource would contribute an additional 325,000oz of gold to the mine production at the same average grade and at the same gold price (US\$1,050/oz) if it were upgraded to at least the *Indicated* category.
- An underground mine could contribute 42,000oz per annum based on 250,000 tonnes per annum (“tpa”) of ore at an average ore grade of 5.9g/t
  - The capital cost is estimated to be US\$43m and the total operating costs to be US\$162/tonne of ore processed (both costs are considered to be accurate to +/- 50% at this stage of evaluation); and
  - Scenario analysis in conjunction with re-scheduling of the open pit indicates that the underground mine be developed during the first four years of the open pit mine life.

Richard Chase, Nyota's Chief Executive Officer, commented, "Nyota continues to work on the technical aspects of the Tulu Kapi project with a view to improving the benefits for all concerned and delivering an attractive development plan to advance the Project towards production. In line with this, the work conducted over the past three months has enabled us to review various aspects of the Project, and I believe we are now in a stronger position to improve early cash flow, investment returns and the net present value of Tulu Kapi."

### **Open Pit Optimisation**

By optimising the scheduling of the open pit mine development and using sensible but aggressive stockpiling, Redden Mining Consulting ('Redden Mining'), Nyota's appointed mining engineering consultants, and the Nyota Board believe it will be possible to achieve a grade of more than 2g/t delivered to the process plant (the 'process plant head grade') in the first four to five years; improving early cash flow, investment returns and the net present value ('NPV') of the project.

Furthermore, by developing an underground mine during years three and four so that it contributes ore from the fifth year, as the grade of both direct feed and stock-piled ore declines, it is anticipated that gold production can be maintained between 70-80,000 ounces per year for the balance of the 10 year initial mine life.

### **Structural Review**

SRK (UK) Limited ('SRK') has been retained to review and analyse the large amount of structural data collected during the Feasibility Study. This data was incorporated in the resource model (announced October 2011) used for the Feasibility Study but the level of confidence in the predictability of mineralisation at that time was reflected in the absence of any part of the Mineral Resource being classified as "*Measured*" (as opposed to *Inferred* and *Indicated* according to the JORC Code, 2004).

SRK undertook a site visit in April 2013 and have since completed its initial data analysis. Its findings broadly support the interpretation used in the Feasibility Study for the bulk of the open pit mineralisation but also confirm that, although dominant, these grade trends are

more complicated and are also not the sole style of mineralisation; with the additional data now available, a more sophisticated model to differentiate a number of domains is expected to be possible. This may assist in the determination of improved grade continuity

### Pit Optimisation

The key steps in the open pit optimisation studies carried out by Redden Mining have been:

- i. Determine the most appropriate final pit “shell” to balance maximum ore extraction with the highest NPV at a given gold price and provide a robust design even at reduced gold prices;
- ii. Pushback selection to group the intermediate shells together to give the maximum net present value achievable using practical mining parameters; and
- iii. Scheduling of the ore mined based on low, medium and run of mine (‘ROM’) ore grades to develop a stockpiling strategy to enhance the ore grade available for processing in the early years of the Project.

The Diluted Mineral Resource model and the optimisation parameters used by Wardell Armstrong International for the Feasibility Study form the basis of this new optimisation which has been completed using Whittle 4X.

A series of nested pit shells based on revenue factors from 0.3 to 2.0 in increments of 0.02 (that is, from 30% to 200% of the base selling price of gold of US\$1,500/oz) were created using the Indicated Mineral Resources only. A single pit shell is the theoretical 3-D outline of a pit applied to the deposit at a particular revenue factor. For each shell results include both financial and mining statistics as well as the undiscounted and discounted net cash flow.

The results of the optimisation clearly show that the mining inventory is relatively insensitive to the gold price down to a level of approximately US\$1,000/oz and that for pit shells above US\$1,290/oz the NPV plateaus as the optimisation reaches the *Indicated - Inferred* Resource boundary and begins to “mine” small amounts of ore for ever increasing amounts of waste (high strip ratios).

Marking a significant deviation from the Feasibility Study, for which the US\$1,500 pit shell was used to maximise the net present value, mine life and ore extraction at the study’s gold price assumption, the decision was taken to use a smaller shell for the new design and re-scheduling, equal to the shell at a gold price of US\$1,050/oz. This shell results in a reduction of 38,000 ounces (4%) of the gold produced, compared with a gold price of US\$1,500/oz, but requires significantly less waste rock mining (a reduction of 10%) and no material change in the average grade of the ore (Table 1). The net effect at a constant gold price is therefore a negligible change in the Whittle best case undiscounted cash flow from the mine (US\$691m versus US\$701m at US\$1,500/oz), which becomes even smaller when discounted back.

Table 1: Comparison of pit shells at US\$1,050/oz and US\$1,500/oz

Shell Gold Price	Waste	Ore	Au Output	Grade	Strip Ratio (Note *)	Incremental Strip ratio	Undiscounted Cash flow (at \$1,500/oz)
US\$/oz	Mt	Mt	koz	g/t	Waste:Ore	Waste:Ore	\$m
1,050	105.9	16.4	889.5	1.8	6.44	11.84	691
1,500	117.4	17.2	927.8	1.8	6.83	17.92	701

Note \*: The engineered mine strip ratio will increase when haul road and other required access is added.

Selecting this shell to proceed with pit design work not only provides added robustness in an uncertain gold price environment but also de-risks the financials associated with larger more marginal shells that require greater waste stripping and for which any unfavourable change in gold price, processing recovery, grade, mining recovery, dilution or operating costs would potentially make these shells uneconomic.

However, the larger shells will be used for trade-off studies with underground mining scenarios and for demarking an area of “zero infrastructure development” to prevent the need for future forced relocation if the decision to mine them is subsequently reviewed.

A “what if” scenario was subsequently run using the *Indicated* and *Inferred* Mineral Resources. At a revenue factor of 0.70 (i.e. US\$1,050/oz) and compared with the base case (*Indicated* Resources only) this scenario results in 22.0Mt of ore at a grade of 1.8g/t (versus 16.4Mt at 1.8g/t) for an increase in gold of approximately 325,000 ounces (from 890koz to 1.2Moz) and no change in the strip ratio. The undiscounted pre-tax operating cash flow therefore rises from US\$691m to US\$945m.

The principle takeaway from this scenario is the significant value in the *Inferred* Resource; and if the *Inferred* Resource is converted the pit expansion which would eat into a portion of the underground resource. There is clearly justification for further work to increase the confidence level of these resources.

### Scheduling

Three ore grade ranges were selected (low, medium and ROM) and used to analyse the ore extracted in each of the four intermediate mining steps, or pushbacks that were selected on the basis of practical mining parameters.

Initial analysis indicates that although the ore is treated at a rate of 2 million tonnes per annum over a period of nine years, in order to maximise the process plant head grade mining should be compressed in to six or seven years. This will require a more rapid build-up in the mining fleet to a steady state of 25 million tonnes per annum in year three; as opposed to year six in the Feasibility Study.

The benefit is expected to be that the process plant head grade can theoretically be maintained at between 2.1g/t and 2.4g/t for a period of five years; as opposed to one year followed by four years at between 1.6g/t and 1.8g/t in the Feasibility Study. On this basis average annual gold production in those years would be 133koz, peaking at 145koz; compared with 105koz and 111koz in the Feasibility Study (see attached graphs). This additional gold represents an increase in annual revenue of approximately US\$30m to US\$50m in each of those initial years (at a gold price of between US\$1,050 and US\$1,500). Offsetting the revenue gain will be some increased mining costs through the extra volume.

Clearly the quid-quo-pro is that in the last four years the ore available from the open pit stockpiles would be significantly lower grade, and in the last three would be less than 1 g/t. This is where the imperative of the underground mine comes in (with a potential head grade of 6 g/t), as does the potential for feed from new deposits yet to be delineated in the Proximal Exploration licences surrounding Tulu Kapi.

In addition, the Feasibility Study capital costs assume that Nyota owns and operates the mining equipment at a total purchase cost of approximately US\$57m with US\$29m initially. This more rapid build-up and concise initial mining period lends itself to contract mining, whereby Nyota's initial capital cost and personnel training would be greatly reduced but the operating costs would be increased.

### **Underground Scoping Studies**

Following the announcement of an initial, in-house resource for the "Feeder Zone" (1.1 million tonnes at an average grade of 5.4g/t containing 188,000 ounces of gold), in January 2013, exploration focused on the potential up-dip extension and scoping-level studies for the potential to develop an underground mine. Redden Mining has been engaged to oversee these studies.

### Geological Review

The Feeder Zone was not included in the Feasibility Study and specifically the targeted drill programme undertaken in Q4 2012 post-dates the mineral resource used in it.

SRK's review and interpretation concurs with Nyota's thesis that the Feeder Zone is localised at the intersection of two geological features: the eastern contact of the syenite intrusion (the host for gold mineralisation) with diorite country rock; and the Bedele Shear that bounds the deposit on the eastern side.

This zone of intersection creates linear features that give rise to the north-northeast plunge of the Feeder Zone. With this interpretation consolidated, confidence in the deep drilling programme that will be designed to target the Feeder Zone down-plunge is increased.

Up-plunge, the projection of the Feeder Zone to surface is intercepted by 29 diamond drill holes and six reverse circulation drill holes. Of these, eight holes contain significant gold intercepts including four that have peak grades in excess of 10g/t over 1m or more. (All of these are included in the Feasibility Study resource estimation.)

Re-analysis of these drill holes shows that although there is Feeder Zone style alteration and sulphide mineralisation, including elevated base metal sulphides, the deformation tends to be more ductile and although there are occasional highly anomalous gold grades, there is insufficient evidence to confirm a continuous extension of the Feeder Zone.

The initial review of the drill hole database and resource model by Redden Mining confirmed the absence of obvious continuity in gold mineralisation in the current resource model, and rather outlined six "pods" of higher grade mineralisation of mineable widths located at the same depth or shallower than the Feeder Zone and broadly along the same orientation.

### Mine Scoping Studies

The total of the six pods including likely mining dilution and ore loss is 570,000 tonnes at an average grade of 5.9g/t, containing 107,000 ounces of gold. All of the pods are located beneath the Feasibility Study designed open pit and therefore are not included in the mine plan. They are, however, included in the Feasibility Study Mineral Resource estimate and are

predominantly classified only as *Inferred*; they cannot therefore be considered to be “ore” in the context of economic viability. In addition, the Feasibility Study resource model and the in-house Feeder Zone model “mingle” at the base of one and the top of the other and therefore there is the potential that the two different modelling approaches are giving double-representation to the same metal.

Redden Mining believe that once dilution and ore-losses are applied to the Feeder Zone the combination of both resources may deliver a mineable package of 1-1.2Mt at around 6g/t delivered to the process plant.

Several options for access to an underground mine have been considered, with the most compelling being to develop a simple decline from the floor of the proposed open pit mine in the Southwest Extension area. Such a plan would allow underground mining to commence in year two or three of the open pit and to rapidly access the high grade pods, on the way to the Feeder Zone.

A preliminary review of rock mechanics from Nyota’s drill core photo-logs and structural and engineering logs for three drill holes concludes that for a 5m by 5m access drive, systematic support is unlikely to be required although spot bolting of individual structures will still be needed and for the mining methods being considered by the scoping study for the dimensions of the Feeder Zone and pods as currently modelled, the rock is stable and should not require support. This has obvious implications for keeping the cost of mining down and the rate of mining up.

Based on the size of the resource, a suitable mine life, use of equipment, a period of stable production and the need to cover the time based operating costs, initial plans envisage production of 250,000 tonnes per annum of ore.

At this scale, the capital cost is estimated to be US\$43m and the operating costs to be US\$162/tonne of ore processed (including general and administration and processing) equivalent to a cut-off grade of 3.7g/t (for a US\$1,500/oz gold price); both costs are considered to be accurate to +/- 50% at this stage of evaluation.

At an average ore grade of 5.9g/t and a gold price of US\$1,500/oz, the above parameters suggest an annual operating profit of approximately US\$22.5m. There is therefore clear rationale for further evaluation.

Detailed mine design and planning for the Feeder Zone is not cost-effective at this time. In particular, the deficiencies in the Feasibility Study resource model with respect to the steeply dipping quartz veins need to be rectified and the Feeder Zone drilling must be integrated into a unified model.

### **Next Steps**

The next phase of open pit optimisation will include detailed pit re-design and scheduling and a review of the operating and capital costs for inclusion in the feasibility study cash flow model.

In addition, an update of the resource model would facilitate the next steps for the underground scoping study, mine design and integration with the open pit mine.

At this time Nyota has insufficient funds available to be able to commit to the entirety of this work.

For further information please visit [www.nyotaminerals.com](http://www.nyotaminerals.com) or contact:

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### **Competent Person's Statement**

The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Richard Chase, who is a Member of the Institute of Materials, Minerals and Mining and a Fellow of the Geological Society of London. Mr Chase is a full time employee of the company and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person. Mr Chase consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears.

Redden Mining and SRK (UK) Ltd have reviewed this announcement and consent to the inclusion in the report of the matters based on their information in the form and context in which it appears.

### **Information on Redden Mining**

Redden Mining is a hard rock mining engineering focussed consultancy. Using only seasoned associates with decades of mining experience to offer an alternative to the larger consultancy options and to ensure clients are getting options that have been thought through like an owner. Redden Mining and its associates have been involved in project studies, start-ups and operations in a variety of locations worldwide. Director and Principal Rod Redden has authored a number of reports for the TSX, ASX and AIM and before

establishing Redden Mining in 2011 was General Manager of Technical Services for Oceana Gold. More information can be found at [reddenmining.com](http://reddenmining.com)

**Information on SRK (UK) Ltd**

SRK (UK) Ltd is an associate company of the international group holding company SRK Consulting (Global) Limited. The SRK Group comprises 45 offices in 21 countries, on 6 continents, employing approximately 1,600 staff. The SRK Group's independence is ensured by the fact that it holds no equity in any project. This permits the SRK Group to provide its clients with conflict-free and objective recommendations on crucial judgement issues.

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