

# Initial NORNICO Scoping Study Indicates Robust At Metallica Minerals Limited North Qld Ni-Co & Scandium Project

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Brisbane, Australia (ABN Newswire) - Metallica Minerals Limited (ASX: MLM) is pleased to announce positive results from its initial scoping study on the proposed Stage 1 mining and processing of the Company's wholly-owned NORNICO nickel-cobalt & scandium project northwest of Townsville in North Queensland.

As a result of potential improvements identified by the initial scoping study in the proposed processing flow sheet, Metallica has moved immediately to generate an enhanced version of the study by year's end to take into account the additional potential now to process high grade (>200g/t Sc) scandium ores discovered by Metallica earlier this year at the Lucknow deposit at the southern end of NORNICO. Scandium is a valuable rare earth element used in aluminium alloys, fuel cells and lighting.

The two scoping studies will position Metallica towards a decision to commence a full feasibility study early next year with a view to achieving first Ni-Co-Sc production from the Greenvale and nearby Lucknow deposits, starting 2013.

## HIGHLIGHTS:

- Positive results on the technical and economic viability of the NORNICO Stage 1 Base Case Scoping Study which incorporated a modest size (180,000 tpa) heated agitated Atmospheric Acid Leaching (AAL) plant to be located on the Greenvale Nickel Mine Site for processing high grade Ni-Co ores. Mining will be a simple free dig shallow open pit to a maximum depth of 50m at Greenvale, supplemented with Ni-Co-Sc ores from nearby Lucknow. In later years, NORNICO's Kokomo deposit is only 55km to the north and will provide more options.
- Suitable for simultaneous tri-metal mining and processing of Ni, Co and Sc bearing laterite ores.
- Delivers significant revenue and margin performance.
- The current combined high grade resource at Greenvale, Kokomo (Mona deposit) and Lucknow is approximately 2.28Mt @ 1.22% Ni, & 0.18% Co (1.58% NiEq\*) and 53g/t Sc. This excludes the Lucknow high grade Sc resource of 4.1 Mt at 205 g/t Sc. (\*1 NiEq calculated using 1 Ni+2Co based on metal prices of US\$9/lb for Ni and US\$18/lb for Co, does not include Scandium credits.)
- Metallica is currently targeting (Exploration Target)\* a mineable resource base of > 2.5Mt @ >1.5% NiEq and >50g/t Sc, and from this, 1.8 Mt at 1.8% NiEq, 50 g/t Sc of processed ore at a rate of 180,000 tpa for 10 years starting in 2013, has been assumed for the financial model. (\*Under the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (Paragraph 18) the Company is required to make the following statement with regard to Exploration Targets - the potential quantity and quality is conceptual in nature, and that there has been insufficient exploration to define a Mineral Resource or Reserve at the targeted size and that it is uncertain if further exploration will result in the determination of additional Mineral Resources or a Reserve.)
- Producing around 2,700 tpa Ni in nickel sulphate (12,100tpa), 160 tpa Co in cobalt sulphide and 11,600 kg per annum of Sc oxide (99.9% purity).
- Using base case assumptions, the scoping study estimated total Stage 1 capital cost of A\$132 million (including EPCM 10% and 15% contingency) and the average total operating cost was \$250/t ore. The study used long-term metal price assumptions of US\$9/lb Ni, US\$18/lb Co and US\$1,750/kg Sc oxide and A\$ exchange rate of US\$0.85.
- Based on the above assumptions, the financial model calculated a project NPV of A\$75M and project IRR

of 23%, using a 10% discount rate & project life of 10 years.

- Total operating costs estimated to be in the order of US\$6.20/lb Ni or US\$5.10/lb Ni with Co credits or

- Due to potential improvements identified on the proposed processing flow sheet, the scoping study will be revised (Mark II) to incorporate a more efficient iron removal step (with a potential reduction in reagent consumption) which will also potentially allow the increased ability to process higher iron bearing ores, particularly the high grade (>200g/t Sc) scandium ores discovered at Lucknow earlier this year.

- The revised Scoping Study (Mark II) will also allow for further resource drilling to further enhance and define the Greenvale Ni-Co resource base in preparation for mining studies before the expected commencement of a full feasibility study in early 2011.

#### **Comment - Metallica Managing Director, Andrew Gillies:**

'....The tri-metal (Ni-Co-Sc) processing opportunity that NORNICO presents is unique in Australia's minerals sector, and is further enhanced by Metallica's access to high grade Ni-Co-Sc ores, an excellent processing site and infrastructural setting. We are well advanced in developing an innovative and highly efficient flow sheet for simultaneous metal recovery of Ni-Co and Sc, thereby effectively reducing unit operating and capital costs. Metallica also has the potential for boosting revenues by incorporating very high Sc ore in to the feed, as we expect the global scandium market to grow substantially'.

'Our discovery earlier this year at NORNICO of the Lucknow Scandium deposit, containing an Indicated and Inferred resource of 4.1 Mt at 205 g/t Sc (80% MLM/20% SRL) close to Greenvale, significantly underpinned NORNICO's development options. The Lucknow mineralisation has emerged as larger and higher grade than our existing Kokomo scandium resource to its north, and it is not unreasonable to expect that the NORNICO Stage 1 plant could ultimately, within the decade, convert from a Ni-Co-Sc ore facility to a predominantly Sc ore operation and a major long term world supplier of scandium oxide'.

'We envisage that NORNICO Stage 2 will be a much larger Ni-Co +/- Sc operation, hosting its own acid and power plant. It would be established at the northern end of the NORNICO project, at the Bell Creek Ni-Co project near Mt Garnet, with supplementary ore feed trucked from the Minnamoolka and Kokomo deposits'.

'Metallica's mining and processing intent is to start modestly, then scale-up later with a much larger Stage 2 operation while increasing Stage 1 scandium production. The latter is subject to the expected growth in the scandium market and NORNICO's performance in delivering secure, long-term scandium supply.'

'Our NORNICO processing operations will be technologically advanced and non conventional and cannot be compared to most previous nickel laterite projects. Large scale, huge capital cost nickel laterite operations in remote or difficult locations are not the way to go - the Metallica pathway is focused on margins and maximising returns from the flexibility of three simultaneous revenue streams from nickel, cobalt and scandium depending on variations of the metal prices and markets at a given time. We plan to be a significant supplier of nickel and cobalt, and expect to emerge as the major world supplier of scandium.'

#### **SUMMARY**

Metallica Minerals' personnel, together with specialist external consultants, undertook the initial scoping study based on the heated and agitated atmospheric acid leach (AAL) processing option, focusing predominately on the operating and capital costs. The capital cost estimate is based on an accuracy of -15% +30%. The operating cost estimate is based on an accuracy of -10% +30%.

NORNICO Stage 1 Base Case study incorporates a modest size (180,000 tpa) heated agitated Atmospheric Acid Leaching (AAL) plant located on the Greenvale Mine Site and processing high grade Ni-Co ores from simple shallow free dig open pit mining at Greenvale, supplemented with Ni-Co-Sc ores from nearby Lucknow and in later years Kokomo (55km distance). The operation would use an estimated 100,000 tpa sulphuric acid (single biggest operating cost) purchased and trucked from Townsville.

Metallica is developing a laterite ore processing flow sheet that efficiently recovers Ni, Co and Sc into high value end products. While the processing flow sheet is proprietary, it includes standard and individually accepted processes and components including wet screening and beneficiation, heated agitated AAL tank leaching using sulphuric acid, selective precipitation, iron reduction and solvent extraction (SX) steps to produce the three separate high purity metal products. Nickel production is expected to be in the order of 2,700tpa within approximately 12,100 tpa of high purity nickel sulphate, an end product used in industry and which is expected to achieve at least 100% contained LME nickel price paid.

The respective metal recoveries are expected to be approximately 90% Ni, 90% Co and 85% Sc. There is scope to increase scandium recovery and this is expected to be confirmed in the current enhanced scoping study (Mark II).

The base case assumed plant feed grade\* (after wet screening) averages approximately 1.8% NiEq (Ni+2Co) and 50g/t Sc. However, the actual nickel and cobalt grades could vary considerably, for example 1.5% Ni, 0.15% Co (1.8% NiEq) or 1.7% Ni, 0.05% Co (1.8% NiEq). The scandium grade could be substantially increased with the addition of high scandium (>100 g/t Sc) bearing Ni-Co ores from Lucknow and Kokomo. In the early years, the focus will be on maximising Ni-Co production, mostly from Greenvale (which is low in Sc) at least until the demand or market for scandium grows, at which point Metallica could easily scale up the Sc ore component. (\*Metallica is still completing resource drilling on Greenvale, and further resource evaluation work, and it should be noted that the resource base and assumed processed feed are not based on mineral reserves and do not have demonstrated economic viability. It is also uncertain if further exploration drilling will result in the determination of any or significant additional resources. The base case tonnes and grade for processing, the estimates of capital and operating costs are a component of a number of factors, including metal price assumptions and exchange rates, that are required to complete a preliminary assessment of the economic viability of the NORNICO project to help define and support a development path, and there is no guarantee that the company will proceed to achieve production from NORNICO's resources.)

## Resources

The current combined high grade resource at Greenvale, Kokomo (Mona deposit) and Lucknow is approximately 2.28Mt @ 1.22% Ni, & 0.18% Co (1.58% NiEq) and 53g/t Sc. Metallica is targeting (Exploration Target) a mineable resource base of > 2.5Mt @ > 1.5% NiEq\* and >50g/t Sc, and from this, 1.8 Mt at 1.8% NiEq, 50 g/t Sc of processed ore has been assumed for the financial model. (NiEq calculated using 1 Ni+2Co based on metal prices of US\$9/lb for Ni and US\$18/lb for Co, does not include Scandium credits.)

In addition, excellent potential exists to source very high grade (>200 g/t Sc) scandium rich ore from the Lucknow deposit which currently has an Indicated and Inferred Resource of 4.1Mt @ 205 g/t Sc (120g/t COG), this includes 0.98 Mt at 204 g/t Sc at lower iron content (18% Fe). No further Reverse Circulation (RC) drilling is required on the Lucknow SC resource as sufficient resource for potential processing plant has been defined.

## Additional Work Required

Due to the potential for improvements identified during the initial scoping study (Mark I) on the proposed processing flow sheet, the study will now be enhanced (Mark II) to incorporate a more efficient iron removal step (with a potential reduction in reagent consumption) which will also allow the increased ability to process higher iron bearing ores, particularly the high grade (>200g/t Sc) scandium ores discovered at Lucknow earlier this year.

The revised Scoping Study (Mark II) will also allow for further resource drilling to enhance and define the Greenvale Ni-Co resource base in preparation for mining studies before the expected commencement of a full feasibility study in early 2011.

Additional RC drilling to further define high grade Ni-Co mineralisation in areas which have not been included in the current resource model is planned for Greenvale. Drilling of 3 PQ core holes at Greenvale and 3 PQ holes at Lucknow are also planned to provide material for further Metallurgical test work and provide detailed Bulk Density (BD) data. The BD data is expected to lead to some of the resources at Greenvale and Lucknow being re-classified in to the Measured Resource category.

Shallow Aircore / RAB drilling on a close spaced grid (10m by 10m) is planned to test for high grade near surface Ni-Co mineralisation not currently considered in the previous drilling programme and therefore the current resource. Drilling is scheduled for late September.

Initial results from beneficiation test work have indicated that there is potential to increase the Ni and Co head grade by 20%, with 70% of the ore retained (rejecting 30% of the feed) on a high proportion of ore types. Additional beneficiation test work is being prepared.

Further metallurgical testwork will also be undertaken on material from Greenvale and Lucknow to investigate the processing of ore zones with higher than expected iron levels (>25% Fe) before committing to a full feasibility study. Both high cobalt and scandium ores are commonly associated with higher iron. The

added benefit of being able to treat higher level iron ores, either Ni-Co (with some Sc) and Sc ore (generally high iron bearing) laterite ore feed through the proposed NORNICO Stage 1 plant is to take advantage of any significant rises in either the cobalt or scandium price (when the scandium market develops) which could significantly increase the contained metal value revenue and operating margins.

### **Ni-Co & Sc Laterite Mining**

The average strip ratio at Greenvale has been assumed to be 4 to 1 (waste plus low grade plus medium grade: high grade ore). All the laterite ore is 'free dig' and within 50m from surface.

Mining at Greenvale will mainly be from the Powerline and The Edge zones, plus a number of 'satellite' pits. Blending of ores will be important to maintain high Ni-Co plant feed grades (>1.6% Ni Eq).

Smaller quantities (likely

### **The Heated Agitated AAL Process**

The proposed NORNICO Stage 1 processing plant consists of a number of key sections:

- Ore Preparation (crushing, scrubbing/screening and beneficiation sections)
- Leach (AAL section)
- Iron Removal
- Scandium Recovery
- Refinery: Solvent Extraction (SX) / Crystallisation
- Process Services (including acid storage, limestone and lime)
- Water and Utilities

A blend of laterite ore from various open pit mine ore sources at Greenvale and Lucknow will be crushed to produce suitable ore blend for ore preparation. During ore preparation, a fraction of the ore is rejected as a low grade coarse or oversize reject material via a screen. The screen undersize high grade fraction will be pumped to the process plant leach feed thickener.

The proposed leaching process involves a heated agitated Atmospheric Acid Leach (AAL) circuit, leaching the ore slurry at approximately 90 degree celsius. This leach process is conducted in two stages, with the resulting pregnant leach solution (PLS) being sent to the scandium circuit, where scandium is recovered. The leach residue is filtered and washed to recover the soluble nickel, cobalt and scandium.

The raffinate from the scandium circuit is then neutralised with limestone to precipitate iron and aluminium, and lower the free acid concentration, in a 2 stage process. The slurry from first stage iron removal is filtered and washed to recover the soluble nickel and cobalt. The pregnant liquor from the second stage iron removal process reports to the refinery section. The residue from the second stage iron removal process is re-leached to recover co-precipitated nickel and cobalt.

The leach residue is repulped with excess solvent extraction (SX) raffinate solution and pumped to the final neutralisation circuit. The iron removal residue is also repulped with excess SX raffinate solution and pumped to the final neutralisation circuit. The two residue streams are neutralised with limestone and lime before being pumped to the residue storage facility (RSF).

The recovered pregnant liquor is treated by a solvent extraction (SX) and crystallisation circuit to produce a high purity nickel sulphate product. At this stage, the lower capital costs and relatively modest quantity of nickel (

The nickel sulphate produced will be dried and bagged for sale. A high purity cobalt sulphide is generated as a by-product. A high purity scandium oxide product is also produced as a by-product.

### **Remaining 2010 work program**

A list of activities planned for the next four months to progress the NORNICO Stage 1 project, is detailed

below:-

- Additional 3,000m of RC drilling and 2,000m of shallow Aircore drilling which is designed to increase the resource base, convert the Indicated and Inferred resources to Measured and Indicated status and to identify shallow high grade resources (in the top 10m of the laterite profile) which can be processed in the early years of the planned NORNICO Stage 1 Ni-Co-Sc processing plant.
- Drilling 6 PQ diamond drill holes at Greenvale and Lucknow for metallurgical, geological and bulk density purposes.
- Additional metallurgical testwork to investigate the possibility of treating high grade scandium ore (>200 g/t Sc which is mostly significantly higher in iron) in the proposed NORNICO Stage 1 plant.
- Beneficiation testwork on PQ core to further investigate and confirm the expected up-grade of the nickel and cobalt content of the Greenvale ores by simple screening.
- Incorporate the above additional information into the revised Scoping Study (Mark II) and updated financial model expected to be completed in December 2010.

In addition, excellent potential exists to source very high grade (>200 g/t Sc) scandium rich ore from the Lucknow deposit which currently has an Indicated and Inferred Resource of 4.1Mt @ 205 g/t Sc (120g/t COG), this includes 0.98 Mt at 204 g/t Sc at lower iron content (18% Fe). No further Reverse Circulation (RC) drilling is required on the Lucknow SC resource as sufficient resource for potential processing plant has been defined.

For the complete Metallica Minerals announcement including tables and figures, please refer to the following link:

<http://www.abnnewswire.net/media/en/docs/63748-ASX-MLM-224037.pdf>

#### **About Metallica Minerals Limited:**

Metallica Minerals Limited (Metallica) was incorporated in 1997 by Founding and Managing Director Andrew Gillies. Metallica was established with the primary objective of creating opportunity and wealth for its shareholders through the evaluation and development of mineral projects in Queensland. Metallica was listed on the Australian Stock Exchange November 2004 (ASX:MLM). Metallica's focus and flagship project is its North Queensland Nickel Cobalt (NORNICO)

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