

# ASX ANNOUNCMENT

17 November 2011

ASX Code: DTM

**Investment Data** 

Shares on issue142.1mListed options15.4mUnlisted options8.35m

**Shareholders** 

Top 20 Hold **38.5**%

#### **Key Projects / Metals**

- Unicorn Porphyry Mo-Cu-Ag
- Morgan Porphyry Mo-Ag-Au
- Mountain View Lode Au

#### Mo – Molybdenum

- Cu Copper
- Au Gold
- Ag Silver

#### **Board & Management**

Chairman

Mr Chris Bain

Managing Director

Mr Lindsay Ward

**Executive Directors** 

Mr Dean Turnbull Manager – Exploration

Non-Executive Directors

Mr Stephen Poke Mr Richard Udovenya

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# METALLURGICAL REPORT IMPROVES UNICORN DEVELOPMENT POTENTIAL

- High recoveries achieved for Mo + Cu + Ag to concentrate
  92.3% Mo / 96.1% Cu / Ag 82.6%
- Separate saleable concentrates (51% Mo + 23% Cu/Ag) produced
- Recoveries achieved at 75 micron grind coarser grind whilst maintaining recoveries appears achievable
- Ball Mill work index confirmed as being low to medium
- Mineralogically simple, with Mo and Cu minerals being unrelated

Dart Mining NL (Dart Mining) recently announced its maiden JORC resource for the Unicorn deposit – 105 million tonnes at 0.07% Molybdenum Equivalent (MoEq). This included an outcropping JORC compliant Indicated Resource of approximately 29 million tonnes at 0.09% MoEq with very low strip ratio. (Refer ASX announcement dated 11 October 2011).

Dart Mining engaged Australian Minmet Metallurgical Laboratories Pty Ltd (AMML) to undertake ongoing scoping study metallurgical test work for the Unicorn Deposit. The metallurgical test work is ongoing, however a summary report has been received from AMML (refer attached) that highlights:

- The two representative ore samples utilised were very amenable to high Mo and Cu recoveries by flotation with recoveries of up to 92.3% Mo / 96.1% Cu / Ag 82.6% achieved
- Mo and Cu are two distinctly separate phases, both are relatively coarse and not mineralogically linked in any way
- Reagent suite for Mo and Cu flotation was simple and relatively inexpensive
- Grind size of 75 microns was used to achieve these recoveries. This is a typical grind size but a coarser grind, while maintaining high metal recoveries, appears achievable
- Saleable grades of Mo and Cu / Ag concentrates were produced and with further test work it is expected that the metal percentages (especially Cu) can be improved
  - o 51% Mo metal in concentrate
  - o 23% Cu metal in concentrate plus Ag
- Ore was indicated to be amenable to upgrading by dense media separation.

"Dart Mining is very pleased with the test results from this scoping study metallurgical progress report. When combined with an outcropping deposit, low strip ratio, available land tenure, close proximity to hydro power, water and sealed roads, an established logistics chain to market, supportive community and available work force, the Unicorn Deposit appears increasingly likely to move into development phase in the future," said Dart Mining's Managing Director Lindsay Ward.

Based on this initial scoping study metallurgical test work and the JORC resource, the Unicorn deposit is estimated to contain approximately 38,000 tonnes of recoverable Mo metal, 58,000 tonnes of recoverable Cu metal and 8.6 million ounces of recoverable Ag metal.

It should also be noted that the resource remains open at depth, with Hole 8, the only hole through the middle of the deposit, intersecting 40 metres of 0.09% MoEq, including 18 metres at 0.11% MoEq from 342 to 387 metres. The potential for resource upgrade remains strong once drilling below 400 metres is carried out.

Further test work is proposed for Q1 2012 to further improve recoveries and increase saleable concentrate grades by trialling varying grind sizes, differing pH levels and alternative reagents. It is expected that once this further test work is completed, it will be used as the basis to complete a scoping study for the flotation plant design and cost.



#### About Molybdenum

Molybdenum is both a traditional and new age / future metal with unique characteristics. Its primary use is as an essential metal in the manufacture of steel where it adds strength, hardness and toughness as well as increasing steels resistance to corrosion. Molybdenum also has a range of chemical uses including acting as s a catalyst to remove impurities, including sulphur, during crude oil production. Molybdenum is also used in the paint and plastics industry.

Molybdenum has a growing use in the renewable energy sector where it is used in the manufacture of solar panels and has a potential use as the electrode plate for the separation of hydrogen and oxygen to produce hydrogen energy. Molybdenum is also used in nano technologies to make electrical goods smaller.

Molybdenum is traded on the LME and has worldwide demand of ~ 220,000 tonnes pa that is growing at 5% pa.

#### **About Dart Mining**

Dart Mining NL (ASX:DTM), a Victorian-based exploration company, has discovered a new mineralised province hosting molybdenum (Mo) + copper (Cu) + silver (Ag) mineralised climax style porphyry igneous intrusive. The Dart Mining mineral province occurs within the Lachlan Fold Belt near Corryong in north east Victoria and is the only known Australian host of Climax style porphyries which are proven hosts of world class mines around the world. The Lachlan Fold Belt and Gilmore suture that cross from NSW into Dart Mining's tenements in Victoria are proven hosts of substantial porphyry mines including North Parkes, Cadia and Ridgeway in NSW and the Benambra VMS to the south of Dart Mining's tenements in Victoria.

Dart Mining recently announced its maiden JORC Resource for its principal project Unicorn, which has very strong geological similarities to the world class Henderson primary Mo mine in Colorado, USA. Dart Mining tenements remain largely underexplored and the potential for identifying additional mineralised porphyries is very strong.

Dart Mining also has two gold projects including Mountain View where drilling identified high-grade gold along a 150 metre strike with results including 6m @ 7.8 g/t Au (including 2m @ 19.3 g/t Au) and 4m @ 8.72 g/t Au (including 1m @ 18.75 g/t Au) as well as the Fairley's disseminated gold prospect where drilling has confirmed the presence of a very large (up to 22 metres in width) disseminated sulphide related gold system.

#### **COMPETENT PERSON'S STATEMENT**

Information in this report that relates to a statement of Exploration Results and Mineral Resources of the Company is based on information compiled by Dean Turnbull B.App.Sc.(Geol) Hons. M. AIG. Mr Turnbull is a Director and full time employee of Dart Mining NL and has sufficient experience relevant to the style of mineralisation and type of deposits under consideration and to the activity he has undertaken to qualify as a competent person as defined in the 2004 Edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves" (or "JORC Code"). Mr Turnbull has provided written consent to the inclusion in the report of the matters based on his information in the form and context in which it appears.



# SUMMARY OF METALLURGICAL TESTING RESULTS ON PROGRESS WITH THE SCOPING TESTWORK ON SAMPLES FROM THE UNICORN DEPOSIT

### FOR

## DART MINING LIMITED

Two core samples identified as Dunmet 1 and Dunmet 2 were tested by AMML for their metallurgical performance. The test work included:

- Mineralogical examinations by optical microscopy.
- Preliminary evaluation of the potential to upgrade the ore by dense media separations (DMS) and reject gangue prior to grinding and flotation.
- Rougher flotation tests to examine Mo and Cu recoveries.
- Preliminary cleaner flotation tests to examine the potential final concentrate grades. A blend or composite of Dunmet 1 and 2 was prepared for the cleaner flotation tests to provide sufficient sample for testing.
- Bond Ball Mill Work Index tests on similar drill core samples to determine the energy usage for grinding.

### **Ore Grades of the Samples Tested**

Table 1	Head Grades

	Mo (ppm)	Cu %	Fe %	S %	Ag g/t
Dunmet Comp 1	375	0.06	2.92	1.135	5
Dunmet Comp 2	220	0.11	2.54	1.73	5
Comp 1-2	300	0.083	2.82	1.57	5

### Mineralogy

Mineralogically, the ore (Dumnet samples 1 and 2) contained Mo as molybdenite and Cu as chalcopyrite. Iron sulphides were present as pyrite and to a lesser extent, pyrrhotite were also present. Cu and Mo minerals were not associated with each other, and were generally reasonably coarse, with molybdenite up to 200µm clusters, and chalcopyrite around 75µm.

# AMML

The relatively coarse nature of the Mo and Cu minerals and the lack of any intergrown relationships between them suggest the ores would be suitable for flotation to produce separate concentrates of Mo and Cu.

# **Dense Media Separation**

Tests were completed to indicate for potential to reject gangue and upgrade the flotation feed before grinding and flotation. The benefit of successful DMS separation is reduced grinding costs and smaller flotation plant size and costs. The tests showed 37% of the ore could be rejected as gangue, while maintaining recoveries of 88% and 86% for Mo and Cu respectively, and 94% for Ag. Crush sizes for the test work were not representative of industrial DMS crush sizes due to limited sample availability for the tests.

## **Rougher Flotation Tests**

Rougher flotation tests were completed after a grind to 75µm, and with a simple low cost reagent scheme. A relatively short flotation time of 11 minutes produced high recoveries of Mo, Cu and Ag.

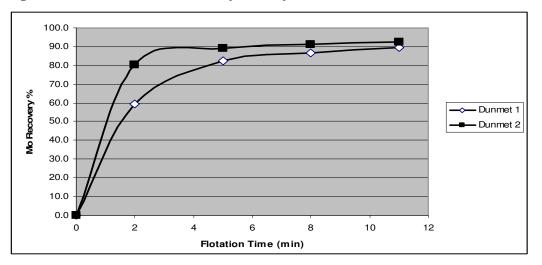
Recoveries to the rougher concentrates were as follows :

Comp	Test	Grind	Wt %	Recoveries % to Conc		
	No	P80 (μm)	Rghr	Мо	Cu	Ag
1	1	75	7.2	89.7	92.7	82.6
2	2	75	5.8	92.3	96.1	64.0

Table 2Rougher Flotation Overall Results

Molybdenum Recovery versus flotation time is shown in Figure 1.

Figure 1 Cumulative Recovery of Molybdenum



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# AMML

Several flotation tests completed on other samples indicated the potential for grinding to sizes coarser than 75µm, without loss in metal recoveries.

# **Final Concentrates**

Preliminary cleaner flotation tests were completed to examine the potential to produce saleable grade separate Cu and Mo concentrates using a traditional Cu-Mo flow sheet. The process involved bulk Mo and Cu roughing, followed by simple bulk cleaning, and finally a flotation separation of Cu and Mo minerals, by depressing the Cu minerals into a Cu stream or final concentrate, and allowing the Mo to float into a Mo final concentrate.

Results were pleasing, with a Cu concentrate grading 23% Cu, and a separate Mo concentrate grading 51% Mo. At these grades, both the Cu and Mo concentrates should be readily saleable.

Achieving good selectivity from pyrite was important in achieving saleable grade Cu concentrates, while achieving selectivity from a small content of free floating non sulphide gangue was important in producing saleable grade Mo concentrates.

Silver reported to the Cu concentrate, with grades over 350g/t in the Cu concentrate.

As these cleaner tests were only very preliminary, it is considered likely that with optimisation of the flotation process the metal grades and recoveries in the concentrates may be improved.

# **Grinding Energy**

The Bond Ball Mill Work Index tests on two samples gave results of 12.2 kWh/tonne and 16.4 kWh/tonne. These values are considered to be average to lower than average compared to other Cu and Cu-Mo porphyry ores.

Graeme Sheldon General manager AMML Pty Ltd 15<sup>th</sup> November 2011