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# **ASX Release**

27 May 2015

# UNICORN LONG TERM VALUE REDEFINED BY MINING AND PROCESSING BREAKTHROUGH

- Integrated 12 month Project Definition Study of Unicorn has achieved:
  - o Enhanced project definition and business case
  - Pre-tax IRR ~20%; ~3 year payback; 20+ year mine life
  - Capital expenditure slashed by more than one-third to less than \$200m
  - Investment readiness for substantial long-term commodity consumers and investors
  - A processing rate of 10 million tonnes per annum (Mtpa) of preconcentrate material, delivering 2Mtpa of higher grade feed
- This Unicorn program is underpinned by a clear pathway to complete a Definitive Feasibility Study, with significantly improved project definition and business case
- Plans for a strategic farm-out package of other Dart NE Victorian tenements – both gold and base metals – to increase exploration, and accelerate the realisation of the region as a new and significant minerals province; and
- Raising of \$2.4m through an accelerated non-renounceable 1-2 rights issue at 2 cents per share. For detail, please see separate ASX announcement

The Board of Dart Mining today released the results of a comprehensive 15-month Project Definition Study of the Unicorn molybdenum, copper, silver, zinc Project in NE Victoria. Dart's Chairman Bruce Paterson said: "Conclusion of the revised Project Definition Study (PDS) is a massive milestone for the Company, delivering significant potential benefits to Dart and its shareholders considerably exceeding market expectations.

The Project team's efforts, experience and professionalism from March 2014 has not only rescued a Project assigned to abandonment by the previous Board, but brings it within striking distance of development reality. We have stuck to realistic evaluation, injected hard work and applied extensive industry and technical enterprise not only to Unicorn, but also to Dart's broader NE Victorian tenements in the context of a new and exciting minerals province".

In providing detail today of a non-renounceable Rights Issue, Mr Paterson said: "Continued funding is necessary to maintain methodical progress and refinements of the critical Unicorn Project while at the same time positioning Dart and its shareholders for upside when the commodity cycle turns positive."

#### **Results set framework for Dart's future**

### **Unicorn Project Definition Study (PDS)**

The PDS which had been foreshadowed to be concluded by mid-year, brings together Pre-Feasibility Study level external and internal analyses and reports. Recent metallurgical test work and refinement of mining and mineral processing alternatives indicate that the Unicorn Project can be commissioned with less than \$200m capital investment. Key aspects of the PDS are:

- Open cut mining with a processing plant near the pit, thereby minimising risk and maximising operational flexibility
- Very low mining waste to ore ratios plus pre-concentration after crushing, resulting in greatly improved plant feed grades that will improve economic outcomes; and
- The identification of focussed future drilling requirements and metallurgical testwork targeted to improve project economics even further

#### Unicorn Mo, Cu, Ag, Zn PDS

 Improved Economics. Internal economic assessment indicates Internal Rate of Return (IRR) of ~20%; payback ~3 years (before depreciation and tax); and initial capital expenditure A\$185m (compared to the Scoping Study October 2012 estimate of \$304m)

Mining & Mineral Processing; Mine 10Mtpa and pre- concentrate after crushing to 2Mtpa, process – 300 micron material without using ball mills.	Pre-tax IRR (all equity	20%
	basis)	
	Initial Capital Investment	\$A185 million
	Payback Period based on	3.2 years from
	processing sulphide only	commissioning
	Total net cash flow over first	\$A206 million
	5 years (pre-tax)	
	Total net cash flow over first	\$A354 million
	10 years (pre-tax)	
	Total net cash flow over 20 years (pre-tax)	\$A850 million

These results are based on fixed prices from 2019-2023: Molybdenum US\$12.50/lb; Copper US\$3.50/lb; Silver \$25/oz.; Zinc – US\$1.25/lb, then escalating from 2024 at 3.5% p.a. Molybdenum and Copper sulphide concentrates provide over 90% of net smelter return (NSR). NSR takes into account concentrate transport to overseas customers, treatment and refining charges. Costs include land offsets and royalties but do not include post closure and rehabilitation fund allocations. The potential residual value of the process plant and site (including the Tailings Storage Facility - TSF) has not been taken into account – either for deeper Unicorn resources or satellite deposits.

The numbers presented only take into account processing the sulphide proportion of the current resource. There is over 10Mt of near surface oxide material that can be stockpiled near the processing plant and made available for future processing.

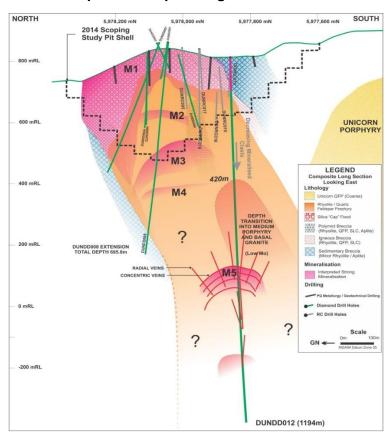


By application of conventional open pit mining, relocation of the processing plant and delivering a pre-concentration material as a first-stage in value adding mineral processing, the Project's capital expenditure to bring the Unicorn Project to first-production has been slashed by more than one-third (as determined in 2012 Scoping Studies) to under \$200 million.

The IRR is negatively impacted by royalties negotiated by the previous Dart Board with the Company's founders and Orion Mine Finance. Further work is underway to minimise these impacts.

- 2. Drilling The most recently announced drilling programs of up to 10,000 metres have been largely deferred, with some 900 metres having been drilled by late 2014. The Board, due to the above re-assessment of mining methods and mineral processing refinements, has recognised the need for drilling to target the economic extension of the area more likely to be mined during the initial five years of production. This revised drilling program will focus on the initial open cut mining zones, particularly the north-west sector, which had drill access roads prepared in late 2014. This will enable a revised resource assessment, mine plan and schedule to be developed to further optimise project economics, particularly in the early years.
- 3. Open Cut Mining. 200Mt is expected to be mined at an average 10Mtpa from a conventional open pit over a nominated 20-year mine life. The open cut approach enables mining output flexibility ramp-up or easing using contractors particularly to maximise sulphide processing in the early years. It also enables separate oxide and sulphide stockpiling for campaign processing.

#### Unicorn deposit mine planning



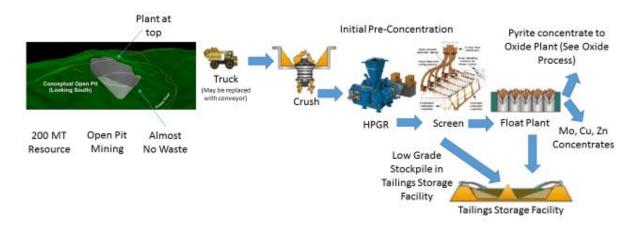
Reference: Dart AGM 20 November 2014 Panel discussion



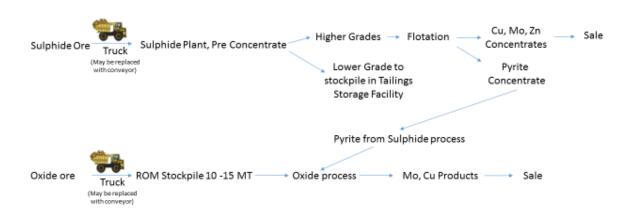
Unicorn is amenable to conventional open cut mining with a processing plant adjacent to the pit. Planned location of the processing plant will also facilitate beneficial environment aspects and access to the Tailings Storage Facility.

**4. Proven Metallurgy.** Pre-concentration after crushing results in higher Mo, Cu and Zn in both oxide and sulphide as feed to the subsequent oxide or sulphide processing steps. This results in lower capital and operating costs per tonne of metal output.

# Sulphide Process



# Oxide and Sulphide Process



**5. Processing with pre-concentration upgrading circuit.** Crushing of 10 Mtpa to -4mm with the tertiary crushing by High Pressure Grinding Rolls (HPGR). -75 micron fines and gravity pre-concentrate from the -300+75 micron fraction provide around



2Mtpa at higher feed grade to the flotation plant. This will facilitate staged development by initially deferring installation of a ball mill, thereby reducing start-up capital. The remaining 8 Mtpa pre-concentration plant reject material will be sent to and stored within a separate part of the TSF as a low grade stockpile for later reprocessing.

- **6.** Tailings Storage Facility (TSF). A preferred TSF location at Bull Paddock has been selected after reviews of a number of options. As the main flotation process is alkaline at a pH of around 9, the tailings in the TSF would have acid neutralisation capability.
- **7.** Water delivery by pipeline. Based on current analyses, a water pipeline will be required and there is water available to be purchased.
- **8. Onsite CNG or hydro power.** Depending upon the development ramp-up specifications, the power requirements of the project could be provided from on-site compressed natural gas (CNG) generation or by a transmission line from the nearby hydro-electric system.
- **9. Environment.** Dart will be required to complete an Environment Effects Statement (EES) process in compliance with Victorian and Commonwealth government requirements, and will then need to apply for the required operating licences. The Company has adopted the Equator Principles, the international financial community measureable standard of environment compliance.
- **10. Community**. A Community Reference Group (CRG) is being formally established with reference to all of Dart's activities in NE Victoria. Dart has also adopted the Equator Principles to identify, assess and manage social risks and impacts.
- 11. Infrastructure available. The Unicorn work force will be drawn from and housed where possible in local communities such as Corryong and Khancoban within 20km of the mine site. Roads are available for transporting a maximum of 600t per week of concentrates to the Ettamogah rail hub with access to ports at Melbourne and Port Kembla.
- **12. Concentrate Sales and Marketing.** Dart has a current Offtake-right of first refusal agreement for Copper and Silver with MF2 Investment Company 1 LP an Orion Resource Partners (Aus) Pty Ltd company.
- 13. Commodity Prices Molybdenum (Mo). The projected price used in the PDS for Mo in 2019 2023 is US\$12.50/lb (Scoping Study October 2012 projection was US\$15.40/lb), internal models have metal prices escalated by 3.5% per annum from 2024 to 2038. The 2038 Mo price is projected to be US\$21/lb in real terms but if 2.5% inflation is added for 15 years it becomes US\$30/lb. The average Mo price between 2005 and 2008 (before the GFC) was around US\$30/lb, but the current Mo price is USD\$7.70. However LME warehouse levels are at low levels and historically Mo consumption has increased at the same rate as world GDP growth.
- **14. Future Drilling to define Resource.** Drilling will target near surface resources based on the revised open cut mining approach particularly in the sparsely drilled north west of the deposit.



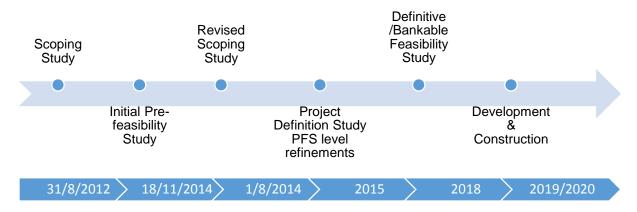
- **15. Move to Definitive Feasibility Studies.** Refinement and enhancement of all aspects of the PDS will continue as Dart moves the project constructively towards a Definitive Feasibility Study.
- 16. Project Funding. While evaluation and studies continue on refining critical Project elements in concert with achievement of the PDS an Information Memorandum seeking project funding will shortly be available soon. Dart can then more effectively market long term investment in the Project to substantial commodity consumers and the broader investment community.



# **UNICORN** PROJECT DEFINITION STUDY

#### **Detailed Metrics**

#### **Project Timeline**





# **ECONOMICS**

The Project Definition Study (PDS) indicate that a robust Internal Rate of Return (IRR) and payback period to be attractive to potential joint venturers, development partners and financiers can be achieved with use of what are conventional processes and methodologies.

Previous estimates of Capital Expenditure to establish the Unicorn development of \$304 million (Scoping Study October 2012) have been slashed to less than \$200 million, primarily by the innovative application of proven equipment and experience in mining and mineral processing.

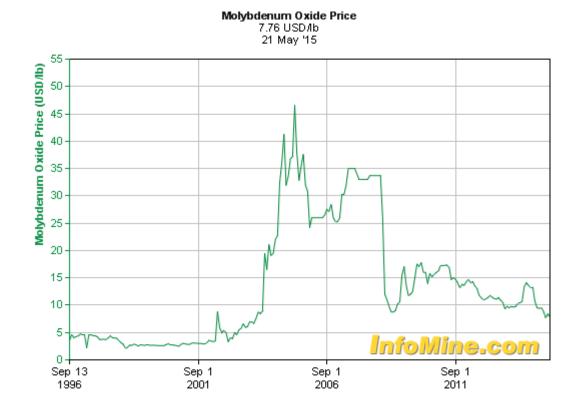




# **COMMODITY MARKETS**

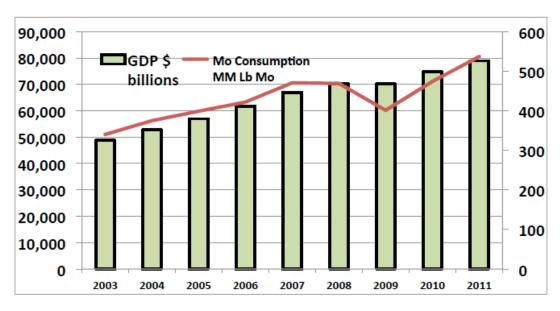
Internal economic studies have assumed that projected 2019 supply and demand will lead to prices of US\$12.50/lb for Molybdenum (Mo), US\$3.50/lb for Copper (Cu), \$27/oz for Silver (Ag) and \$1.25/lb for Zinc (Zn). The Mo price, in particular, is supported by independent advice, based on recent shutdowns of mines in the USA as well as long-term demand growth related to world GDP and steel demand. It is also significantly lower than the 2012 Roskill Molybdenum Report forecast for 2017 of US\$14.72/lb (low) to US\$17.32 (high) for Mo in molybdenum oxide.

As indicated in the following graph, the average Mo price was around US\$30/lb between 2005 and 2008 before the impacts of the Global Financial Crisis and slowdown in World GDP growth.



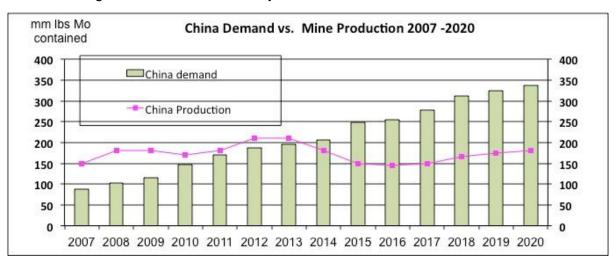


The following chart illustrates that the world GDP growth over the decade from 2003 - 2011 accounted for the growth of 200 million pounds in global Molybdenum consumption. (Reference: Molybdenum Market Review Report page 15; I Peng, Oriental International Enterprise Limited).



Source: IMF & IMOA

This indicates that when the world GDP growth rate increases again then Mo demand will increase at a greater rate than in recent years.



Source IMF and IMOA

Chinese Mo demand has been projected to exceed Chinese supply in the next few years. This would be expected to run down Chinese stockpiles and ultimately lead to imports of higher quality molybdenum concentrates.

#### India metals demand to 'explode'

As reported recently, Anil Agarwal, founder and Chairman of Vedanta Resources has said that India's metals demand is at an "infection point". He said that India's metals and energy demand is poised to explode as its GDP potentially doubles over the next decade. (Richard Wachman, Mining Journal May 15, 2015)





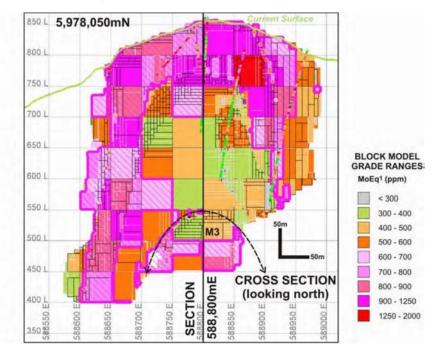
A Unicorn resource was previously announced to the ASX on 5 September 2012.

Drilling campaigns in 2013 and 2014 have intersected mineralisation consistent with earlier drilling, assisted materially in targeting mineralisation through development of the Company's Unicorn Hybrid Climax Model. The results of this drilling plus further campaigns will be incorporated in a new JORC 2012 compliant resource estimation.

Announced drilling programs of up to 10,000 metres have been largely deferred, with some 900 metres having been drilled by late 2014. The Dart Board, due to the re-assessment of mining methods and mineral processing refinements, has recognised the need to target drilling at an untested portion of the existing resource which will have to be mined in conventional open pit operation in the initial five years of production. The untested portion is at the surface at the highest grade end of the deposit. The revised drilling program will focus on the initial open cut mining zones, particularly the north-west sector, which had drill access roads prepared in late 2014. This will enable a revised resource assessment, mining plan and schedule to be developed to further optimise project economics.

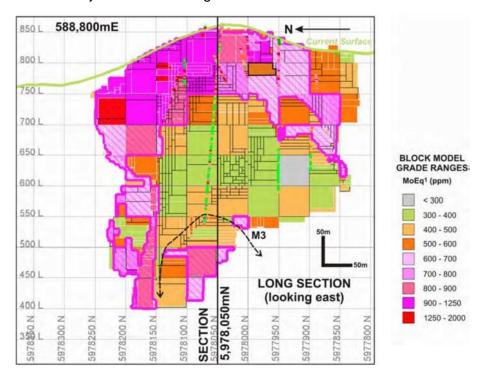
The late 2014 delays and subsequent, but associated, drilling company insolvency, provided scope for the Board to complete the recent mining method and minerals processing evaluations to enable optimisation of future drilling expenditure and return on that investment. A comprehensive and substantial drilling program will be deployed for the Definitive Feasibility Study (DFS).

#### Unicorn Project Resource cross section





#### Unicorn Project Resource long section





# **MINING**

Re-evaluation of the Scoping Study mining methods has been carried out with several underground and open pit methods modelled. These analyses included a comprehensive review of the raise bore/ore pass and adit decline method proposed by the previous Board of Dart, underground variations of block caving and long hole stope mining, as well as conventional open pit. These studies have shown that the conventional open pit method carries similar costs to the raise bore/adit approach but has a significant reduction in project technical and economic risk and provides improvements in operating flexibility.

With the open cut approach, it will be easier to separate oxide and sulphide resource zones in the pit, thereby facilitating separate oxide and sulphide process plant stockpiles near the process plant.



# **METALLURGY**

As announced to the ASX in September 2014, extensive metallurgical testing resulted in revitalising the Unicorn Project from virtual abandonment in November 2013 by the previous Board.

This testing demonstrated the capability of producing not only premium high-grade Molybdenum concentrates (>53% Mo and >600ppm Rhenium), saleable Copper-Silver



concentrates (>25% Cu, >300g/t Ag) but also a saleable zinc concentrate (>50% Zn). Chinese molybdenum mines generally produce a much lower grade Molybdenum Sulphide product (around 30-40% Mo).

As also announced at that time, independent laboratory testing has shown that Molybdenum and Copper can be extracted from the oxide resources by adapting a process utilised by Climax Molybdenum in the 1960s. Products from the intermediate steps in the oxide process could be either Sodium or Ammonium Molybdates – which can attract a significant price premium over Molybdenum Oxide and can also be produced as the final process product.

Laboratory testing has shown that pre-concentration after jaw/roll crushing to around – 4mm top size results in high-grade and lower-grade products. These tests showed that higher grade products - ranging from 0.064 to 0.096% Mo and 0.14% to 0.23% Cu from a feed of 0.034% Mo and 0.07% Cu were achievable depending on the recoveries targeted. Reports on High Pressure Grinding Rolls (HPGR) have shown that using these tertiary crushers can result in preferential crushing and liberation of softer sulphide materials. This indicates that the current pre-concentration results may be enhanced by HPGR and, accordingly, further testing is to be commissioned at an independent laboratory.



## **PROCESSING**

Dr Colin Seaborn, Unicorn Project Study Manager, has adapted modern and successful, proven processing and technologies to produce high-grade metal concentrates. Use of contract open pit mining, the application of HPGR to reduce process plant size - initially dispensing with a ball mill – have together taken around \$100m from capital expenditure costs (CAPEX). Operating costs (OPEX), including power and water, have also been reduced, thereby further improving IRR and payback economics.



Studies have shown that production water requirements for production can be purchased within the prevailing Victorian and NSW water systems. Further pipeline route analysis will be pursued in definitive studies. Pipeline routes having already been evaluated for environment and cultural heritage values with no impediment recognised to project progression.



# **TAILINGS**

After review of a number of options, the Bull Paddock area is favoured as the location for the Tailings Storage facility (TSF). The processing flowsheet currently preferred will deposit coarser quicker dewatering material (pre-concentration reject) in a defined section of the TSF. As the pre-concentration reject is likely to be less than the 400ppm Mo equivalent mine cut-off, the approval for reprocessing this reject in the future would not be sought at the



outset. This would only occur once project economics at a later time indicate positive outcomes.

Additionally, the finer alkaline tailings from the flotation plant, with acid neutralisation capability, will be sent to and separately stored in the TSF.

The TSF, post project completion with negligible acid levels, would be top dressed, contoured and revegetated through a sinking fund established for Project closure, including rectification of any reasonable future disturbance.



# **ENVIRONMENT**

Dart continues to build a comprehensive understanding and database of the flora, fauna, and aquatic species and of cultural heritage sensitive sites within the project footprint area. Constant water flow, dust and weather monitoring records are maintained and Biosis Pty Ltd has conducted extensive seasonal, day and night surveillance across the entire Project footprint.

Dart's Project Definition Study will form the platform for formal discussion with Government to proceed with the application for an Environment Effects Statement. This process is expected to take some two years to present to an Independent panel hearing and then obtain approval by the State Planning Minister. Following Ministerial approval Dart will be required to demonstrate its ability to meet technical and environment conditions imposed and to meet licencing requirements for those aspects of the project requiring Local, State Government and Department approvals.



# COMMUNITY

Dart has commenced a process of establishing a formal Community Reference Group covering Dart's activities in the Towong Victoria and Tumbarumba NSW Shires.

Dart has embraced the Equator Principles, recognising that large projects can have adverse impacts on people and on the environment and therefore the need to work in partnership to identify, assess and manage environmental and social risks and impacts in a structured way, on an ongoing basis. Such collaboration promotes sustainable environmental / social performance and can lead to improved financial, environmental social outcomes.



# **INFRASTRUCTURE**

The project requires truck access for concentrates haulage to market via the Ettamogah rail hub situated north of Albury, and possibly CNG delivery should that power alternative be adopted for the project. It is anticipated that the maximum total tonnage of concentrates to be trucked from the Unicorn processing plant would be 40,000t in any one year (800t per week).





Alternatives of transmission line hydro-power, or onsite Compressed Natural Gas (CNG) driven generation, are available to the project. Discussions have been held with on-site generation suppliers utilising CNG driven equipment, as well as hydro-power providers.



# **FUNDING**

As foreshadowed at the 2014 AGM in Albury, the Dart Board has now, through this PDS, reached the point of being able to compile and present "farm-out packages" (or Information Memorandums) designed to attract investment in Dart and its NE Victorian assets. To be targeted in particular are substantial commodity consumers and investors in Mo, Cu projects. Preliminary interest has been expressed in Japan, Korea, China and Taiwan. Much has recently been published in relation to funds available from Private Equity sources in and external to Australia, and this avenue will also be pursued.

# **Preparing for the future**

While evaluation and studies will continue on refining critical project elements, with a PDS now becoming available, the Board's focus on attracting substantial and long-term investors will be heightened.

The achievement of the Unicorn PDS provides a positive road map for Dart. The pathway to possible production in 2019/2020 as described above, whilst exciting, is by no means assured. To prepare for this exciting future, Dart's tenement holdings and activities will need to be restructured to facilitate capital inflows, preparatory work is well underway.

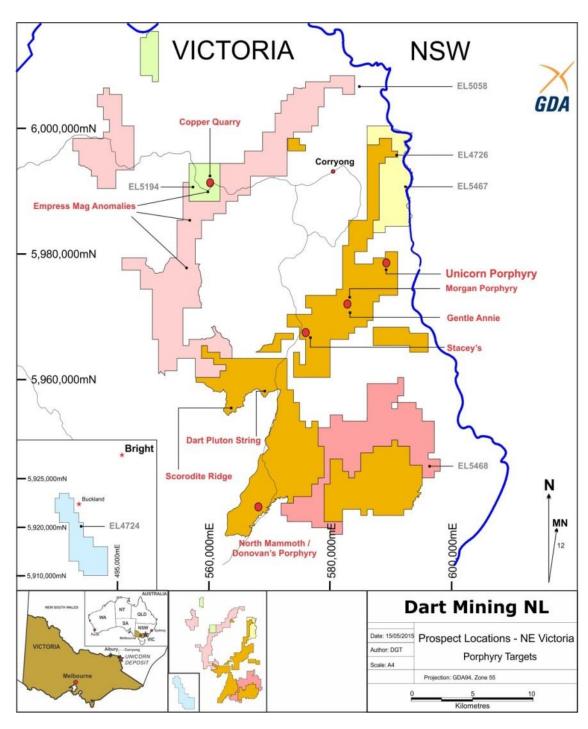


#### **NE REGIONAL EXPLORATION**

#### A NEW PORPHYRY PROVINCE IN NE VICTORIA

#### **Key Porphyry prospects are:**

- Unicorn
- Morgan
- Gentle Annie
- Copper Quarry
- Stacey's
- North Mammoth





Prior to listing on the ASX in May 2007, Dart had already recognised the potential of its tenements to contain an under explored mineralised porphyry field with potential for discoveries of national importance. The area was considered analogous to the arc / back arc porphyry systems found just to the north into NSW that host major porphyry Copper, Copper/Gold, Silver and Tin systems of state significance – e.g. Cadia / Ridgeway (Cu/Au), the Endeavour deposits (Cu - Northparkes) and Tin at Ardlethan. A string of other precious and base metals deposits run along the arc and back arc – with similarities to the Pacific Rim of fire – well known for its associated mineral wealth worldwide. The discovery of a Climax style mineralised porphyry system at Unicorn (Mo-Cu-Ag-Zn – a first outside the USA) and similar porphyry attributes at the nearby Morgan Porphyry Prospect were proof that previously unrecognised outcropping mineralisation was starting to define a new mineral field. These discoveries together with the growing number of classic porphyry related mineralisation signatures showing up in large geochemical programs further backs up claims of a new Porphyry Province in the far NE of Victoria. The area is very challenging to explore – but is starting to provide a glimpse of an un-tapped region of enormous mineral potential.

#### **Geological Setting**

The Unicorn porphyry Mo-Cu-Ag deposit and similar porphyry related mineralisation identified to date are located within the Lachlan Fold Belt (LFB) that covers an area of 200,000 km2 of south-eastern Australia. The LFB is composed of a variety of folded, faulted and metamorphosed volcanics and sediments, along with associated igneous intrusions of a large scale orogenic belt. The dominant structural feature of the LFB is the Gilmore suture and its associated splays, which run from northern-central NSW, to the Upper Murray border region within Victoria. New concepts on the formation of Eastern Australia (Caley Orocline Concept – 2013) are in keeping with recent dating of the Unicorn deposit to a period of high heat flow and tension associated with the Bindian Orogeny and a period of significant mineralisation along the back arc in NSW and now identified in Victoria.

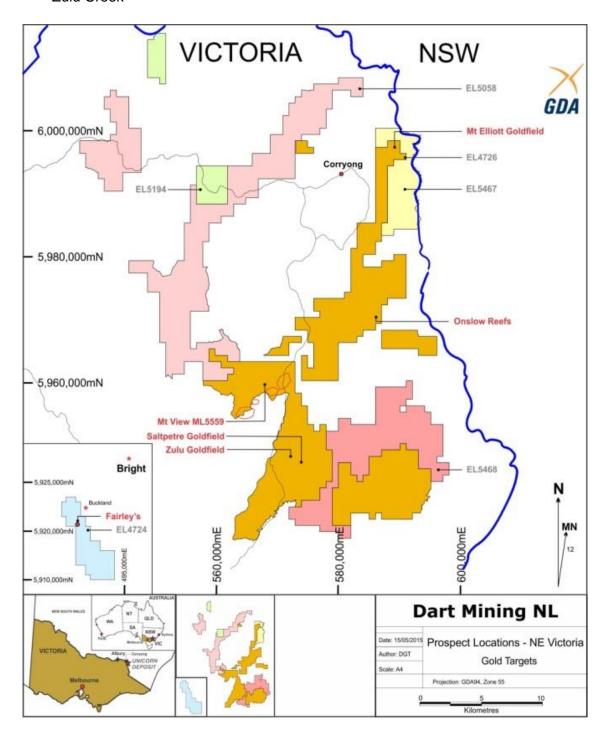


#### **GOLD PROSPECTS**

Dart has tenements that cover 6 historic Goldfields in the highlands of NE Victoria.

### Key prospects / Goldfields are:

- Mountain View
- Fairley's
- **Onslow Reefs**
- Mt Elliott Group
- Saltpetre Gap
- Zulu Creek





#### **Geological Setting**

The Goldfields of northeast Victoria are generally considered to be orogenic and are predominantly structurally controlled "reef" type quartz +/- sulphide and gold (with minor precious and base metal association).

Ordovician marine sediments host the majority of the mineralisation with the regional structural trend having a large control on the orientation of the dominant mineralisation. Dart has also highlighted large disseminated style mineralisation more related to regional shear systems than individual "reef" type structures, an example being the Fairley's Prospect (Buckland EL4724) where broad gold mineralisation has been defined up to several tens of metres associated with sulphides and silica alteration but not classic quartz reefs. Several other disseminated style gold occurrences have been identified in the Buckland EL4724, showing that systems similar in style to the Fosterville deposits in Central Victoria (Crocodile Gold Corporation) exist in the northeast, a style un-recognised until Dart began exploration in the region in 2007. The recognition of large-scale shear related disseminated gold and very encouraging recent exploration has greatly enhanced the prospectivity of the area.

The Dart / Onslow / Mt Elliott and Zulu-Saltpetre Goldfields are more typical narrow high grade gold system, with quartz and variable sulphide mineralisation showing both free and refractory gold styles, being different at each individual prospect. Drilling at the Mt View Project (ML5559) and a recent soil geochemistry program at the Onslow Reefs area have confirmed that strike and down-dip extensions to historically mined mineralisation are present and appear to show significant high grade gold shoots remain with potential to locate additional mineralisation.

The areas held under tenement by Dart remain only lightly explored with only limited modern exploration and very limited drill testing. Exploration by Dart has illustrated the further potential that exists for defining gold resources with high grades, typified by the Mt View prospect held under an approved Mining Licence (ML5559). With approved work plans to carry out additional drilling at a number of other gold targets, the potential of the region is being evaluated.

**DART MINING NL** 

**Bruce J Paterson** 

Chairman

27 May 2015



### **Competent Persons Statement**

The information in this report that relates to metallurgical results is based on information compiled by Colin Seaborn PhD, FAusIMM, GAICD, a Competent Person who is a Fellow of The Australasian Institute of Mining and Metallurgy. Dr. Seaborn is the principal of SOS Initiatives Pty Ltd. Dr. Seaborn has sufficient experience that is relevant to the style of mineralisation and type of deposits under consideration and to the activity being undertaken to qualify as a competent person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Dr. Seaborn consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

# **Important Information**

This document is intended to provide general information only. It is not a disclosure document under the Corporations Act. It is not intended that this presentation should be relied upon in order to make an investment decision in relation to Dart Mining NL. Neither Dart Mining NL, nor any of its Directors, guarantee the performance or a return of capital to shareholders. Investors should make their own enquiries in relation to Dart Mining NL prior to investing and seek independent financial and legal advice.

#### Further Information

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