ASX: AVI



# DISCOVERY ZONE PROSPECT ACQUISITION INCREASES BASE CASE VISCARIA PROJECT NPV TO \$201M

## Highlights

- Economic assessment results indicate the acquisition of the Discovery Zone Mineral Resource has the potential to add up to US\$140M in NPV, increased from US\$100M, to the Viscaria Project;
- NPV of the 'Base Case' for Viscaria, including open pit mining operations at A Zone, D Zone and Discovery Zone, based upon the currently defined Mineral Resources, has been bolstered to US\$201M;
- By extending the proposed mine life to 9 years and increasing the production rate to 3.5Mtpa, the Discovery Zone will increase the overall project potential NPV to US\$342M (at US\$3.25/lb Cu) under Development Case 'D' (see ASX announcement 11 October 2012);
- Processing Cu-Fe mineralisation from the Discovery Zone in conjunction with the A Zone and D Zone Mineral Resources at Viscaria, will increase copper production to 28,800tpa and iron production to 963,000tpa;
- A 25,000-30,000m drill program, with the objective of extending the A Zone and D Zone Mineral Resources, will commence at the Viscaria Project within the next 1 to 2 weeks and continue for 5 to 6 months.

Australian resources company Avalon Minerals Limited ('Avalon' or 'Company') (ASX: AVI) is pleased to announce the results of an Economic Assessment of the Discovery Zone Mineral Resource following the recent successful institutional fundraising of A\$8.4 million and on the eve of commencing a 25,000-30,000 metre drill program. The Economic Assessment was completed by Xstract Mining Consultants ('Xstract') and assessed the impact of the acquisition of the Discovery Zone Mineral Resource on the overall economics of the Viscaria Project in northern Sweden.



The Economic Assessment was completed as a part of the due diligence process currently underway, following Avalon agreeing to buy Hannans Reward Limited's ('Hannans') Discovery Zone and Tributary Zone prospects (which are currently 100% owned by Hannans subsidiary, Kiruna Iron AB), as well as the exploration area surrounding the Discovery Zone located in the Kiruna district of Sweden ('Discovery Prospect') for A\$4 million. This acquisition is conditional upon the completion of legal and technical due diligence, to the satisfaction of Avalon by 23 November 2012 ('Condition Precedent').

The Company's Managing Director Mr Jeremy Read said, "Our initial assessment of the Discovery Zone indicated that it would add up to US\$100 million in value to the Viscaria Project. We have been able to upgrade this value addition to US\$140 million, as the Discovery Zone should produce more copper than we initially anticipated."

"The upgraded value addition from the Discovery Zone means that the Base Case NPV for the Viscaria Copper Project, based upon open pit mineral extraction from the currently defined Mineral Resources at the A Zone, D Zone and Discovery Zone Mineral Resources, is now US\$201 million," he added.

"However, Avalon is about to commence a large mineral extension drill program at Viscaria to define additional Mineral Resources and underpin our previously announced 'Development Cases'. This should deliver a Project NPV of US\$342 million and peak copper production of 28,800tpa, which will be a major upgrade for the Viscaria Project", said Mr Read.

#### Economic Assessment of the Discovery Zone Prospect

On 16 October 2012, Avalon announced it had signed a Heads of Agreement ('HOA') for the purchase of the Discovery Zone Cu-Fe Mineral Resource and the Tributary Prospect from Hannans. Under the HOA, Avalon will be required to make a series of payments to Hannans, amounting to a total of A\$4 million, of which A\$1 million will be able to be paid in Avalon shares.

The Discovery Zone Prospect is located approximately 6km southwest of Kiruna and approximately 10km from Avalon's Viscaria Project (Figure 1). It is a copper-gold-iron discovery originally made by Anglo American Exploration BV & Rio Tinto in 1999. The Discovery Zone Prospect has a current JORC Inferred Mineral Resource of 10.9Mt @ 0.31% Cu, 38.7% Fe and 0.08g/t Au, reported above a 20% Fe cut-off. The orebody is currently open at depth.

Due to its similar mineralogy, Avalon believes that it will be possible to process the Discovery Zone mineralisation through the same processing plant, which is being planned to process the ore from Avalon's existing D Zone Mineral Resource, hence limiting the amount of additional capital required to bring the Discovery Zone into the production profile for the overall Viscaria Project.



An initial high level Scoping Study review of the potential economics of using mineralisation from the Discovery Zone Prospect, as additional feed for the planned Viscaria processing plant, suggested that the value addition to an expanded Viscaria Project could potentially be as much as US\$100 million. As a part of the due diligence process for the purchase of the Discovery Zone, a more detailed Economic Assessment of the Discovery Zone was completed by Xstract.

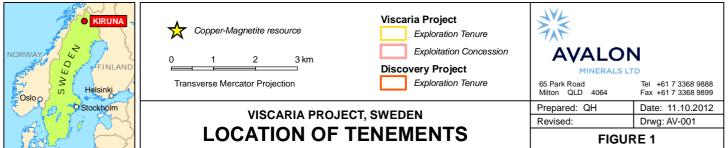
Xstract undertook an open pit optimisation for the Discovery Zone Mineral Resource using the parameters detailed in Table 1.

| Parameter                 | Unit             | Value    |  |  |
|---------------------------|------------------|----------|--|--|
| Overall pit slope angle   | Deg              | 55       |  |  |
| Copper price              | USD/t            | USD7,165 |  |  |
| Magnetite price           | USD/t            | USD150   |  |  |
| Mining cost (ore)         | USD/t            | USD4.55  |  |  |
| Mining cost (waste)       | USD/t            | USD4.55  |  |  |
| Ore trucking cost to mill |                  |          |  |  |
| Mining Recovery           | %                | 95%      |  |  |
| Mining Dilution           | %                | 5%       |  |  |
| Metallurgical Recovery    | %Cu              | 90%      |  |  |
|                           | %Fe              | 76%      |  |  |
| Concentrate Grade         | %Cu              | 25%      |  |  |
|                           | %Fe              | 69%      |  |  |
| Processing Costs          | USD/t ore        | USD12.04 |  |  |
| Processing Rate           | Mtpa             | 1.5      |  |  |
| Admin Costs               | USD/t ore        | USD3.08  |  |  |
| Payable Copper            | %Cu<br>contained | 98%      |  |  |
| Payable Magnetite         | %Fe<br>contained | 98%      |  |  |

### Table 1 - Open Pit Optimisation Parameters

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The results of the open pit optimisation showed that a total of 8.0Mt @ 0.54% Cu and 38.4% Fe could be extracted from an open pit at the Discovery Zone and a further 1.4Mt @ 0.48% Cu and 35.1% Cu may be able to be extracted using underground mining methods (Table 2). However, at this stage no value is being ascribed to the underground mining potential of the Discovery zone and hence this represents upside for the Discovery Zone prospect.

|             | Tonnes<br>Ore (Mt) | % Cu | % Fe |
|-------------|--------------------|------|------|
| Open Pit    | 8.0                | 0.54 | 38.4 |
| Underground | 1.4                | 0.48 | 35.1 |
| Total       | 9.4                | 0.53 | 37.9 |

## Table 2 - Discovery Zone Tonnage and Grade

It must be noted that the tonnage and grade detailed in Table 2 above, includes material which is in the Inferred Mineral Resource category. As such there has been insufficient drilling to define an Indicated Mineral Resource, which is needed in order to define a Mining Reserve. It is uncertain if further drilling will result in an Indicated Resource being defined.

Xstract's economic evaluation indicated that the Discovery Zone pit has a higher value than the Viscaria D Zone open pit and will support the capital cost of a process plant on a standalone basis. However, there is likely to be additional synergy value to be realised by processing the Discovery Zone Cu-Fe mineralisation through the processing plant planned to be built at Viscaria to process the A and D Zone mineralisation.

Xstract's revised economic assessment of the Discovery Zone Mineral Resource indicates that the net contribution to the overall Viscaria Project has increased from US\$100 million to US\$140 million, based upon the open pit tonnage and grade detailed in Table 2. As no value is being ascribed to the underground potential at the Discovery Zone, there remains further upside to the value addition the Discovery Zone can contribute to the Viscaria Project.

On 11 October 2012, Avalon announced to the ASX the results of a Scoping Study detailing the results of a number of 'Development Cases' for the Viscaria Project, based upon extending the Mineral Resources at the A Zone and D Zone prospects. 'Development Case C', assessed the impact of defining an additional 3Mt @ 2.5% Cu to be mined underground at A Zone and extending the D Zone Mineral Resource by 4.5Mt @ 0.46% Cu and 23% Fe, to be mined in an open pit, plus extending the D Zone Mineral Resource by 1.75 Mt @ 1.6% Cu at potentially underground minable depths. Development Case C for the Viscaria Project generated an NPV (10% Real) of US\$198 million using the parameters given in Table 3.



Table 3 - Economic Assessment of the Development Case C Mining Scenario

| Development Case C      |                             |                                     |
|-------------------------|-----------------------------|-------------------------------------|
| Tonnage and Grade       | 20.2 Mt @ 0.86% Cu 20.0% Fe |                                     |
| Optimum Mining Rate     | 3.1 Mtpa                    |                                     |
| Mine Life               | 5.6 years                   |                                     |
| Pre-Production Capex    | US\$212 M                   | Includes USD24.4 M pre-<br>strip    |
| Life-of-Mine Capex      | US\$350 M                   | Excludes closure costs              |
| NPV <sub>10% REAL</sub> | US\$198 M                   | USD3.25/Ib Cu USD150/t<br>Magnetite |

The economic value of the Discovery Zone to the overall Viscaria Project has been assessed in 'Development Case D', being 'Development Case C' plus the open pit tonnage and grade determined for the Discovery Zone as stated in Table 2 above. Development Case D assumes that the Discovery Zone Cu-Fe mineralisation will be trucked 10km over to a processing plant located at Viscaria and processed at an annual rate of 3.5Mt. The Operating Cost and Revenue assumptions for Development Case D are given in Table 4.

#### Table 4 - Discovery Zone Revenue and Cost Assumptions

Operating cost assumptions Value Parameter Comment Unit (USD) Mining Cost (ore) USD/t 4.55 Mining Cost (waste) 4.55 USD/t **Processing Costs** USD/t ore 12.04 Variable - assumes 40% fixed costs and USD12.04/t @ 1.5 Mtpa rate Admin Costs USD/t ore 3.08 **Discovery Trucking Cost** 10.00 USD/t ore **Copper Conc Freight** USD/DMT 15.75 Assumes local smelter conc Magnetite USD/DMT 1.50 Assumes slurry pipeline to LKAB conc

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| Revenue assumptions             |                  |          |   |  |  |
|---------------------------------|------------------|----------|---|--|--|
| Parameter                       | Unit             | Value    | Comment                                 |  |  |
| Overall pit slope angle         | Degrees          | 55       |   |  |  |
| Copper Price                    | USD/t            | 7,165    | USD3.25/Ib Cu                           |  |  |
| Magnetite Price                 | USD/t            | 150      | Assumed price at end of slurry pipeline |  |  |
| Mining Recovery                 | %                | 95%      |   |  |  |
| Mining Dilution                 | %                | 5%       |   |  |  |
| Metallurgical Recovery          | %Cu              | 90%      |   |  |  |
|                                 | %Magnetite       | variable | Mass recovery = %Fe x 1.4 -5            |  |  |
| Concentrate Grade               | %Cu              | 25%      |   |  |  |
|                                 | %Fe              | 69%      |   |  |  |
| Payable Copper                  | %Cu<br>contained | 98%      |   |  |  |
| Payable Magnetite               | %                | 98%      |   |  |  |
| Copper Conc Treatment<br>Charge |                  | 45       |   |  |  |
| Copper Conc Refining<br>Charge  | c/lb Cu          | 4.5      |   |  |  |
| Magnetite Conc TC               | USD/dmt          | 28       |   |  |  |
| Royalties                       | %                | 0.75     |   |  |  |

The NPV (10% Real) for Development Case D is US\$342 million and is detailed in Table 5.

Table 5 - Economic Assessment of the Development Case D Mining Scenario

| Development Case D      | Devt Case C plus Discovery Zone 8Mt @ 0.5% Cu 41% Fe |                                     |  |  |  |
|-------------------------|--|-------------------------------------|--|--|--|
| Tonnage and Grade       | 28.2 Mt @ 0.77% Cu 25.2% Fe                          |                                     |  |  |  |
| Optimum Mining Rate     | 3.5 Mtpa   |                                     |  |  |  |
| Mine Life               | 9.0 years  |                                     |  |  |  |
| Pre-Production Capex    | USD193 M   | Includes USD24.4 M pre-<br>strip    |  |  |  |
| Life-of-Mine Capex      | USD369 M   | Excludes closure costs              |  |  |  |
| NPV <sub>10% REAL</sub> | USD342 M   | USD3.25/lb Cu USD150/t<br>Magnetite |  |  |  |

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By including mineralisation from the Discovery Zone into the overall production profile for Viscaria, the mine life is increased to 9 years at an annual production rate of 3.5Mtpa. Peak copper production is 28,800tpa and peak iron production is 963,000tpa as detailed in Table 6.

| Year  | Tonnes<br>Mined<br>(kt) | % Cu | % Fe | Copper<br>Conc<br>Produced<br>(kDMT) | Contained<br>Copper<br>(kt) | Magnetite<br>Conc<br>Produced<br>(kDMT) | Contained<br>Iron<br>(kt) |
|-------|-------------------------|------|------|--------------------------------------|-----------------------------|---|---------------------------|
| 2013  |                         |      |      |                                      |                             |   |                           |
| 2014  | 1,750                   | 0.38 | 25.4 | 23.9                                 | 6.0                         | 535                                     | 372                       |
| 2015  | 3,500                   | 0.47 | 23.1 | 58.9                                 | 14.7                        | 956                                     | 664                       |
| 2016  | 3,500                   | 0.55 | 20.7 | 69.9                                 | 17.5                        | 841                                     | 584                       |
| 2017  | 3,500                   | 0.64 | 21.1 | 80.5                                 | 20.1                        | 860                                     | 597                       |
| 2018  | 3,500                   | 0.79 | 21.8 | 99.2                                 | 24.8                        | 893                                     | 620                       |
| 2019  | 3,500                   | 0.88 | 28.9 | 110.5                                | 27.6                        | 1,240                                   | 861                       |
| 2020  | 3,500                   | 0.91 | 31.9 | 115.2                                | 28.8                        | 1,386                                   | 963                       |
| 2021  | 3,500                   | 0.91 | 31.9 | 115.2                                | 28.8                        | 1,386                                   | 963                       |
| 2022  | 1,497                   | 1.41 | 23.0 | 76.1                                 | 19.0                        | 408                                     | 283                       |
| 2023  | 465                     | 2.16 | 9.9  | 36.1                                 | 9.0                         | 41                                      | 29                        |
| Total | 28,212                  | 0.7  | 23.8 | 785                                  | 196                         | 8,546                                   | 5,939                     |

## Table 6 - Development Case D Production Summary

It must be noted that the Development Cases C and D includes some material that are Exploration Targets and are conceptual in nature as there has been insufficient exploration to define a Mineral Resource and that it is uncertain if further exploration will result in the determination of a Mineral Resource.

The Economic Assessment of the value addition to the Viscaria Project by the Discovery Zone acquisition suggests that the 'Base Case' NPV, for the Mineral Resources that are currently defined on the Viscaria Project, is US\$201 million. By extending the Mineral Resources at the A Zone and D Zone prospects and delivering 'Development Case D', the overall Viscaria Project NPV can be increased to US\$342 million.

In mid-November 2012, Avalon will commence a 25,000-30,000 metre drill program to extend the A Zone and D Zone Mineral Resources to allow delivery of 'Development Case D' and underpin the enhanced project NPV of US\$342 million. During the drilling program, regular updates will be announced to the market.



#### ABOUT AVALON

Avalon is an ASX listed mineral exploration company with high quality assets in Sweden, one of the leading metal producing countries in the European Union.

Avalon's flagship asset is the Viscaria copper-magnetite project located 1,200km north of Stockholm where the Company has delineated a global resource of 66.2 million tonnes of mineralisation, containing 51,000 tonnes of copper and 2.4 million tonnes of iron.

The Viscaria Project is surrounded by established infrastructure, lying immediately adjacent to LKAB's Kirunavaara Iron Ore operation and in close proximity to high-capacity rail and ports.

#### ABOUT SWEDEN

Sweden has a 1,000 year mining history, is the largest producer of iron ore in the European Union and is a leading producer of base metals (copper, zinc, lead) and precious metals (gold and silver).

There are excellent discovery opportunities with much of the country underexplored by modern standards. Furthermore, Sweden possesses a world-class geological database and favourable minerals legislation, is politically and economically stable and has mining knowhow, highly trained personnel and excellent infrastructure.

#### For further information please visit www.avalonminerals.com.au or contact:

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#### **Competent Persons Statement**

The information in this report that relates to Mineral Resources and exploration targets is based upon information reviewed by Mr Jeremy Read BSc (Hons) who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Read is a full time employee of Avalon Minerals Ltd 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 as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Read consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. The Mineral Resource estimate for the D Zone Prospect was compiled and prepared by Stefan Mujdrica (MAusIMM) of Xstract Mining Consultants who is a Competent Person as defined by the Australasian Code for the reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) 2004 Edition and who consents to the inclusion in this report of the matters based on the information in the form and context in which it appears.

The mineral resource estimate for the Discovery and Tributary Zones is effective from 13 January 2012 and has been prepared by Mr Thomas Lindholm, MSc of GeoVista AB, Luleå, Sweden acting as an independent "Competent Person". Mr Lindholm is a Fellow of the Australasian Institute of Mining and Metallurgy (Member 230476). Mineral resources of the Rakkuri iron deposits have been prepared and categorised for reporting purposes by Mr Lindholm, following the guidelines of the JORC Code. Mr Lindholm is qualified to be a Competent Person as defined by the JORC Code on the basis of training and experience in the exploration, mining and estimation of mineral resources of gold, base metal and iron deposits.

The Mineral Resource estimate for A Zone was compiled and prepared by Dr Bielin Shi (MAusIMM, MAIG) of CSA Global Pty. Ltd. who is a Competent Person as defined by the Australasian Code for the reporting of Exploration Results, Miner al Resources and Ore Reserves (JORC Code) 2004 Edition and who consents to the inclusion in this report of the matters based on the information in the form and context in which it appears.

The Scoping Study results were compiled and prepared by Tim Horsley (MAusIMM) of Xstract Mining Consultants who is a Competent Person as defined by the Australasian Code for the reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) 2004 Edition and who consents to the inclusion in this report of the matters based on the information in the form and context in which it appears.

The Base Case includes material from Inferred Mineral Resources and therefore, exploration drilling and reestimation may result in changes to the economically minable portion of the Mineral Resources.

Development Cases A, B and C includes material that has not yet been discovered or defined and is considered an exploration target.

#### **JORC - Exploration Targets**

It is common practice for a company to comment on and discuss its exploration in terms of target size and type. The information relating to exploration targets should not be misunderstood or misconstrued as an estimate of Mineral Resources or Ore Reserves. Hence the terms Resource(s) or Reserve(s) have not been used in this context. The potential quantity and grade is conceptual in nature, since there has been insufficient work completed to define them beyond exploration targets and that it is uncertain if further exploration will result in the determination of a Mineral Resource.