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Asset report

Sunbeam – Ukalunda EPM 18019
Historic high-grade silver mine
with substantial silver and
polymetallic ore stockpiles.
Mining licence application
pending.

Key data

Metals: silver, gold, copper, lead,
zinc and antimony.
Drilling results: best 27.2m
@290.7g/t silver and 13m at
214g/t silver

Website

www.nqminerals.com

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SUNBEAM - UKALUNDA

Processing highly cash generative silver stockpiles & testing the extensions of the rich silver lodes mined in the past

37kg/t silver mined at historic Sunbeam mine. Out of the 33 prospects within the Ukalunda licence area, the most advanced prospect is Sunbeam. This is not surprising given the presence of the historic Sunbeam mine which has produced 600,000 ounces of silver with bonanza grades of up to 37 kilograms per ton. As for future potential, geologists believe that the mineralisation at Sunbeam strongly points to the veins being of mesothermal origin. This is an important factor as such veins are well-known for their large size and continuation at depth and are a major source of the world's gold production.

High-grade silver stockpiles valued at US\$5-15m.

Close to the historic Sunbeam Mine, the company has identified sizeable stockpiles of silver/lead and copper in 2015, which are the result of mining activity in the 1980s. Subsequently, the company has undertaken a comprehensive programme of rock chip sampling, mapping of the ore stockpiles, mineralogy and metallurgy. This work has indicated that the ore stockpiles contain minerals including: gold, silver, copper, lead, zinc and antimony which all have commercial value. The work program on the high-grade stockpiles will require no excavation as the piles of ore sit in rows above ground.

Mining lease expected to be granted soon. This will allow the processing of the approximately 48,000t of mineral stockpiles at Sunbeam which contain potentially commercial grades of silver and other minerals. Metallurgical test results have demonstrated that good recovery rates for all metals can be obtained using purely gravity separation without the need for chemicals which reduces costs and the environmental impact.

Underground potential at the Sunbeam mine.

Information from past operators suggests that the high-grade silver mineralisation remains open to the south and is also likely to continue down plunge at depth. Work by Como Engineers in 1987 led to them outlining an area of the mine that could contain 18 million ounces of silver with a current in-situ value of \$293 million. There is also the potential of the currently undrilled lodes and the possible extensions of known mineralised lodes. Drilling is planned at the mine on a series of targets identified from previous resource data.

Driving Sunbeam rapidly up the value curve.

The easiest way to add value at Sunbeam is by drilling and upgrading the previous data which is too old to be JORC compliant. Drilling could really determine the underground mining potential of the high-grade mineralisation. As further drilling is carried out on a tighter matrix, the quality of the resources under JORC standards can improve as geological certainty improves which acts to increase the value of this asset. The work would allow comprehensive planning to be undertaken in order to truly optimise the economic potential of the future mining operation at Sunbeam.

Bonanza grades of up to 37kg/t silver

20+Moz gold mined from Charters Towers gold province

INTRODUCTION

NQ Mineral's Ukalunda project lies in the Charters Towers gold province in Queensland, Australia. The Ukalunda tenement EPM 18019 is located halfway between the Burdekin Falls Dam and the historic Wirralie gold mine where 1.1 million ounces have been mined. In the permit there are 23 sub-blocks which cover an area totalling 64.4km². Access to the tenement is good and Ukalunda lies not far away from the mining town of Charters Towers for most supplies and services.

So far, 33 prospects have been identified across the tenement area by wide spread exploration of stream sediments together with rock chip sampling. Follow-up drilling has produced highlights which include: 27.2m @ 290.7g/t silver and 13m at 214g/t silver. Both these assay results came from Sunbeam where exploration work is currently at the most advanced stage of all these prospects.

The Sunbeam prospect includes the historic Sunbeam Mine which produced 600,000 ounces of silver with bonanza grades of up to 37 kilograms per ton. This equates to a staggering 37,000 grams per ton which was reported as native silver (pure silver in its metallic form) within the formation. Near to the old mine are high grade silver and base metal stockpiles left over from past mining. The plan is to process these stockpiles upon approval of the Mining Lease ML 100040, which is expected to be granted soon.



EPM 18019 showing the location of the Sunbeam containing ML 100040

GEOLOGY

More than 20 million ounces of gold have been mined in the Charter Towers gold province, the tenement boasts many mineral discoveries and is the site of a number of historic mines. In addition, the permit area is peppered with many polymetallic mineral shows (gold, silver, copper, lead, zinc etc). Combined together these two important factors suggest the right geological setting for a major orebody to be discovered in the future.

EPM 18019 is part of the Ukalunda District, which covers the northern end of the Anakie Metamorphics Group of central Queensland, which is bounded by deep seated structures along which much of the Drummond Basin gold mineralisation is located. Certainly, the Drummond Basin, is a prominent region in Australia for finding large world class epithermal vein and stockwork style (lying in a solid mass rather than veins) gold. This basin hosts a number of significant epithermal gold, the most notable of which is probably the 3 million ounce Pajingo Field.

Extensions can be traced several hundred metres.

27.2m@ 290g/t silver

SUNBEAM MINE

Work by geologists is suggesting that the old Sunbeam Mine maybe one of just a few polymetallic vein systems which lies outside the Walhalla Granodiorite. The vein system is hosted by a porphyritic andesite (an intrusive igneous rock) which is either a dyke (body formed when magma has been forced to flow through the cracks of a host rock) or probably more likely a flow.

The main pit of the Sunbeam Mine exposes two broad, east-trending zones of intense silica-pyrite-sericite alteration plus brecciation (formation of breccia, or masses of rock composed of fragments of older rock fused together) similar to the innermost zone observed at the Spaniard Mine (which lies within the EPM 18019 amongst the Walhalla Diorite Prospects to the west of Sunbeam). Mineralisation at Sunbeam occurs as blebs (small bubble-like inclusions) and highly irregular veinlets of silver-rich sulphosalts and massive crystalline barite (barium sulphate) veins.

To both the East and the West, extensions of the zone can be traced several hundred metres. Geologists believe that the quartz textures and the characteristic alteration mineral assemblages at Sunbeam strongly suggest that the veins are mesothermal in origin. This is important, as mesothermal veins are well-known for their large size plus continuation at depth and are seen as a major source of the world's gold production.

The team is benefiting from 35 years' worth of exploration history on the Ukalunda EPM. This data is being used to fast track exploration in the most prospective parts of the tenement which includes many old mines. In all there are 14 historic drill holes at the Sunbeam prospect which show proven mineral endowment of gold, silver, copper, lead, zinc, bismuth and stibnite. As mentioned earlier on, the best drill-core samples include 27.2 metres at 290 grams per ton silver and 13 metres at 214 grams per ton silver. There have also been impressive intersections of gold as well as anomalous zones of copper, lead and zinc.

ORE STOCKPILES

Close to the historic Sunbeam Mine, the company has identified sizeable stockpiles of silver/lead and copper in 2015, which are the result of mining activity in the 1980s. Subsequently, NQ has undertaken a comprehensive programme of rock chip sampling, mapping of the ore stockpiles, mineralogy and metallurgy. This work has served to indicate that the ore stockpiles contain minerals such as: gold, silver, copper, lead, zinc and antimony which all have commercial value.



High grade silver stockpile at Sunbeam and samples of the ore

48,000t of ore

The Sunbeam Mining Lease ML 100040 project area covered by the EPM 18019 is centred over the Sunbeam mine and the ore stockpiles. This material is thought to result from a previous operator which in 1986 excavated an open cut and stockpiled around 48,000t of mineralisation. Most of this material is thought to remain on site, but there were a number of shipments of selected ore to the Port Pirie smelter, South Australia, with grades as high as 156oz/t silver, 6.3% lead, 2.8% copper, 0.57% zinc, 1.6% Sb and 0.25% As. Gross value in 1987 was \$159,000 which works out an average value per tonne of US\$1,049.



Extensive numbered stockpiles of high grade silver ore at Sunbeam

*US\$5 – 15m of
contained metals*

Preliminary assays for the stockpiles showed silver grades averaging 60g/t with one sample at 156g/t. However, metallurgical tests on samples from the Sunbeam stockpiles by specialists ALS Minerals (Adelaide) revealed even more impressive results with head silver grades of up to 8,520g/t (274oz/t) and copper grades up to 4.23%. Based on these various stockpiles containing 48,000t of ore, the contained metal is estimated to be worth US\$5 million – 15 million.

The work program on the high-grade stockpiles will require no excavation as the piles of ore sit in rows above the ground. A front-end loader is likely to be used to load the ore into a tandem 15 tonne truck and a 12 tonne dog trailer combination which will then be transported to a suitable processing site. All work is likely to be on a contract basis. Target minerals are: gold, silver, copper, lead, zinc and antimony.

*321+oz/t silver
concentrate*

The processing system selected will not only be used to process the 48,000t of stockpiled high-grade silver ore, but also the ore from underground mining operations. The mining lease when granted will also cover underground mining at Sunbeam. Although such a mining operation will only be permitted to commence once the required detailed mining plan, technical reports and environmental studies have been submitted and approved.

METALLURGICAL TESTING

Metallurgical testing on the rich silver ore and base metal stockpiles at Sunbeam has included work by Oro Industries Inc, California USA and Gekko Systems in Victoria, Australia.

321+oz/t silver concentrate

Two samples (58lbs and 60lbs) from the stockpiles were shipped to Oro Industries in California for tests which demonstrated that marketable concentrates could be produced from the ore. A high grade of silver was recovered as had been anticipated, but the surprise was the presence of free gold along with good copper grades. Early test runs were carried out on two types of Sunbeam mineralisation using new high-tech gravity concentration which resulted in silver concentrates at a grade of 227.2 oz/t and over 321 oz/t silver.

Good recovery rates using gravity separation alone

These test results clearly demonstrated that good recovery rates for all metals can be obtained using purely gravity separation without the need for chemicals which will reduce costs and the environmental impact. From its tests, Oro Industries believed that the two different types of Sunbeam mineralisation could be processed using the same overall concentration circuit with the addition of further concentration steps. Oro Industries manufactures mineral processing equipment and their work is having an input in the design of the crushing, milling and concentrating circuit for the processing ore in the stockpiles and subsequent mining activities.



Gekko Python processing technology

Gekko has also undertaken metallurgical test work on the ore from the stockpiles. Gekko seems to have re-invented and advanced traditional mineral processing flow-sheets and is seen as the technical world leader with processing and low-energy mining solutions like its Python system. The work by Gekko was aimed at utilizing their Python processing technology. This is a modular system which uses energy efficient comminution (crushing & grinding), gravity separation and flotation to produce a high value concentrate. Preliminary results suggest employing bulk flotation to produce a saleable concentrate on site in a modular processing plant and then shipping the concentrate to a smelter.

The application for the mining lease is in progress and has now proceeded to the stage of formal granting. With the ML in place, the company can embark on the monetising the ore stockpiles which will generate early cash flow to help fund the exploration and mining operations within the EPM.

600,000 ounces of high-grade silver mined

Silver with an in-situ value of \$293m

UNDERGROUND POTENTIAL

The real potential at Sunbeam lies underground in seeking the high-grade silver lodes that were mined in the past. Between 1891 and 1923, underground mining at Sunbeam produced 423,000 ounces of silver from 950t, which equates to a grade of 495oz/t silver.



Sunbeam Mine Pit looking south

A few years later on, between 1992 and 1993 House of Dare Pty Ltd sampled 16t of material from dump grading 11 oz/t silver, 5.3% lead, 1.9% copper which was sent it to Port Piries, South Australia.

In all there are 14 historic drill holes at the Sunbeam prospect which show proven mineral endowment of gold, silver, copper, lead, zinc, bismuth and stibnite. The best drill-core samples include 27.2 metres at 290g/t silver and 13 metres at 214g/t silver. There have also been impressive intersections of gold including 5 metres at 2.06g/t, 10 metres at 0.73g/t, and 6 metres at 0.7g/t, plus anomalous zones of copper, lead and zinc.

A survey of the mine and the stockpiles by Como Engineers dated 1987 included a calculation of the in-situ value of silver ore at the Sunbeam Mine. There are two old shafts at the mine, A and B which are 640 feet and 240 feet deep respectively. From a combination of taking the visible sulphide veining along with the sulphide ore calculated by the old shafts and records or veining oxides visible, Como Engineers identified an area of the mine which was 40m wide by 100m long and 100m deep, which equated to 400,000m³. At a density of 3 tonnes/m³, suggests a total tonnage of 1,200,000 tonnes. Using a grade of 15oz/t, Como estimated that such a block could contain 18 million ounces of silver. At current silver prices, this would equate to an in-situ value of US\$293 million.

A 7-hole 611 metres drilling program at Sunbeam in 1998 intersected 13 metres at 214g/t silver including 4 metres @ 494g/t silver (SRC-2) and 7 metres @ 131g/t silver (SRC-4). The report on the RC drilling programme by geologist Alan Wolstencroft pointed out that the mineralisation was open to the south. Three of the seven holes intersected underground workings which does show the sort of grade of silver ore that was mined.

The conclusion of the past operators is that the high-grade silver mineralisation remained open to the south and is also likely to continue down plunge at depth. Plus, there is the additional potential of the currently undrilled lodes and the possible extension of mineralised lodes beneath thin cover sediments beyond the Sunbeam mineralised zone.

Optimise the full economic potential

STRATEGY FOR GROWTH

Mining Lease ML 100080 is expected to be granted soon, which will allow the processing of the approximately 48,000t of mineral stockpiles at Sunbeam which have been contain potentially commercial grades of silver and other minerals. Certainly, NQ's estimated annual EBITDA of US\$42 million over the next ten years from the Hellyer tailing project should provide the capital to fund such developments within the Ukalunda Project EPM 18019. The short-term strategy is aimed at generating cash flow from processing these mineral stockpiles and increasing value by the targeted drilling, bulk sampling and associated work at this known deposit.

There is little doubt that the easiest way to add value at Sunbeam is probably by drilling and upgrading the previous data which is too old to be JORC complaint. Therefore, the processing of the stockpiles is likely to be coupled with drilling at the site of the historic Sunbeam mine to determine the extent and grade of targets identified from previous resource data. Information from past operators suggests highly likely extensions to the high-grade mineralisation exists along with the potential that lies within the undrilled lodes. Drilling could really determine the underground mining potential of the high-grade silver mineralisation.

This work is likely to be followed by infill drilling with the goal of defining a JORC-complaint resource, which will allow a more reliable value to be placed on Sunbeam by peer comparisons. As further drilling is carried out on a tighter matrix, the quality of the resources under JORC standards can improve as geological certainty improves taking more ounces/tonnes of resources from an inferred mineral resources category to an indicated or measured category which acts to increase the value of this asset still further. This would allow comprehensive planning to be undertaken in order to optimise the full economic potential of any future mining operation at Sunbeam.

About the author

Dr Michael Green is an independent analyst who specialising in growth companies and resources companies. He gained a BSc and PhD in Mining Engineering from Nottingham University. Having been involved in consultancy work, he began working in the London financial market in the 1980s as a Resources Analyst with stockbrokers Buckmaster & Moore and then HSBC-owned Greenwell Montagu Securities. Subsequently, he was involved in analysing a wide range of growth companies and became Head of Research at stockbroker Everett Financial which specialised in the small cap market. Since, 2006 Michael has been an independent analyst. UK-based DOC Investments Ltd provides research and investor relations.

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