Northern Gold NL

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ANNUAL EXPLORATION REPORT
YEAR ENDING DECEMBER 31ST 2004

MT BONNIE GROUP

MLN342, 346, 405, 459, 811, 1033 and 1039
MCN504, 505 and 3161

Burrundie (14/6-IV) 1:50,000

Title Holder:- Territory Goldfields N.L.

Managed by:- Northern Gold N.L.

Distribution

DBIRD Darwin NT

Northern Gold NL Perth Office

Compiled by John Shaw

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SUMMARY

The Mt Bonnie Project tenements are located 145km SE of Darwin. NT

The area covers the vicinity of the Mount Bonnie Mine, south of the Yam Creek gold mining centre,

Historically exploration was focused on a linear gossanous outcrop enriched in base metals. Underground exploration and development was carried out in the early part of the 20th century and several exploratory diamond core holes were commissioned by the NT Government.

From the mid 1970s exploration identified a polymetallic resource estimated at 480,000t @ 7.67% Zn, 1.8% Pb, 0.4% Cu, 186.0g Ag/t, and 1.5g Au/t.

With the increase in gold price the deposit was re-assessed and the gold-silver enriched oxide zone was open pit mined by Henry and Walker in 1983. A reported 110,000t @ 7.0g Au/t and 286g Ag/t was mined and treated on site.

Territory Goldfields NL acquired the prospect in the mid nineties and conducted several literature reviews, rankings and rehabilitation of the prospect up to the end of 2001.

In April 2002 Territory Goldfields NL (parent Northern Gold NL) entered into a joint venture agreement with Buffalo Creek Mines NL (now owned by Harmony Gold (Australia) Ltd.) This agreement (Burnside Joint Venture) jointly managed certain gold mining tenements of each party and included the treatment plant at Brocks Creek. The gold component of the Mt Bonnie deposit is included in the joint venture agreement, but potential base metal resources were excluded.

The net present value of the Mt Bonnie prospect is closely tied to the gold component of the polymetallic deposit. The base metal potential, while significant, requires a strong upgrade in terms of sulphide tonnage to become viable in its own right. The remaining gold resource is an integral part of the base metal sulphide body and they need to be mined conjointly and concentrated in a mill flotation circuit.

The metallurgical linking of the gold component to base metal sulphide has caused the prospect to be ranked lower than other gold deposits held by Northern Gold NL in the Burnside Region. The purchase of the Union Reef treatment plant by the joint venture in August 2004 has generated a technical re appraisal of all advanced stage gold resources in the Brocks Creek region. Expenditure during the year related to review and technical reporting. This totalled $550.00.

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1.0 INTRODUCTION

The Mt Bonnie tenements are centred near the Mt Bonnie Mine 145km SE of Darwin, NT. The tenements cover an area of South Alligator Group rocks prospective for syn-sedimentary lenses of exhalative base metal and gold-silver mineralisation. Previous explorers have drilled extensively for zinc-lead-silver concentrations and more recently near surface oxide gold enrichments were exploited by open pit mining. This report discusses previous work and that carried out during 2004.

2.0 TENEMENT DETAILS

The tenement group totals 108.75 hectares and is located between latitudes 13°32' south and 13°33'30" south and longitudes 131°32'30" east and 131°34' east, on the Burrundie 1:50,000 sheet. (Figures 1, 2). The titles are situated within Pastoral Lease No. 903, Douglas, held by Tovehead Pty. Ltd.

The titles were originally granted to Zapopan N.L. and subsequently transferred to Dominion Gold Operations Pty. Ltd.

The ground is now held by Territory Goldfields N.L. and managed by Northern Gold N.L. The gold content of the tenements is subject to the terms of the Burnside Joint Venture.

Table 1 **Mount Bonnie Group Tenement Details**

Tenement	Grant Date	Expiry Date	Area (ha)
MLN 342	07/06/76	31/12/06	13.75
MLN 346	02/11/76	31/12/06	16.00
MLN 405	01/12/77	31/12/07	12.00
MLN 459	27/02/79	31/12/20	15.00
MLN 811	14/10/75	31/12/05	8.09
MLN 1033	26/08/87	31/12/11	4.75
MLN 1039	26/08/87	31/12/11	1.23
MCN 504	19/03/84	18/03/04*	13.06
MCN 505	19/03/84	18/03/04*	18.49
MCN 3161	06/12/89	05/12/04	6.38
Total			108.75

*Renewal applications lodged.

3.0 LOCATION AND ACCESS

The Mt Bonnie Prospect is located 145km SE of Darwin NT and 11km ENE of the Hayes Creek road house.

Access is via the Stuart Highway, past Hayes Creek and then northwards along the Grove Hill road, turning off right onto the Mt Bonnie Mine Road.

4.0 GEOLOGICAL SETTING

4.1 Regional Geology

The Mt Bonnie Group is situated within the Pine Creek Geosyncline, a tightly folded sequence of Lower Proterozoic rocks, 10km to 14km in thickness, laid down on a rifted granitic Archaean basement during the interval ~2.2-1.87Ga. The sequence is dominated by pelitic and psammitic (continental shelf shallow marine) sediments with locally significant inter-layered cherty tuff units. Pre-orogenic mafic sills of the Zamu Dolerite event (~1.87Ga) intruded the lower formations of the South Alligator Group.

During the Top End Orogeny (Nimbuwah Event ~1.87-1.85Ga) the sequence was tightly folded, faulted and pervasively altered with metamorphic grade averaging greenschist facies with phyllite in sheared zones

The Cullen intrusive event introduced a suite of fractionated calc-alkaline granitic batholiths into the sequence in the period ~1.84-1.80Ga. These high temperature I-type intrusives induced strong contact metamorphic aureoles ranging up to (garnet) amphibolite facies, and created regionally extensive biotite and andalusite hornfels facies.

Less deformed Middle and Late Proterozoic clastic rocks and volcanics have an unconformable relationship to the older sequences. Flat lying Palaeozoic and Mesozoic strata along with Cainozoic sediments and proto-laterite cementation overlie parts of the Pine Creek Geosyncline lithologies. Recent scree deposits sometimes with proto-laterite cement occupy the lower hill slopes while fluviatile sands, gravels and black soil deposits mask the river/creek flats areas.

There is a tendency for gold mineralisation to be focused in anticlinal settings within strata of the South Alligator Group and lower parts of the Finniss River Group. This sequence evolved from initial low energy shallow basinal sedimentation to higher energy deeper water flysch facies. Dated at ~1740Ga (Sener 2004) the gold events post dated the Pine Creek Orogeny and Cullen intrusive events and has favoured suitable litho-structural sites in the biotite-hornfels contact facies.

4.2 Local Geology

The Mt Bonnie base metal and gold Mine is situated on the eastern limb of the Margaret Syncline. This is at a similar stratigraphic level to the analogous Iron Blow deposit some 3km to the north. Fig 2.

The deposit is hosted by Mt Bonnie Formation rocks that lie within the upper part of the South Alligator Group. Rock types associated with the mine sequence are interbedded shale, siltstone, greywacke, dolomite and minor pebble breccia.

A major stratigraphically concordant sill of the Zamu Dolerite event underlies the mine sequence. At the mine, fold axes trend north-south and are tight. There has been significant hornfelsing of the sequence due to regional and contact metamorphism of the Cullen intrusive event.

The topography of the area comprises a series of low hills with subcrop present on the flanks and ridges. Incised seasonal creek systems form the headwaters of the Margaret River.

The Mt. Bonnie lode system dips 40 degrees west and is up to 15m thick. Originally a surface gossan could be traced discontinuously for 100m and comprised limonite, haematite, clay and minor mimetite, duftite, cerussite, coinchalite, malachite, plumbojarosite and scorodite. The upper 70m of the deposit was enriched in gold, silver, lead, bismuth, arsenic, antimony, mercury and tin with a chalcocite-rich zone near the base of oxidation. (Rich 1984)

Open pit mining showed that the gossanous lode was the product of two stacked stratabound sulphide lenses. These comprise lenticular pods of massive sulphide with dominant pyrrhotite-sphalerite and subordinate pyrite, galena, chalcopyrite, arsenopyrite and tetrahedrite. The gangue minerals are dominated by chlorite, talc, actinolite and quartz. The principal explorers in the area concluded that Mt. Bonnie and Iron Blow, 3km to the north, are metamorphosed syn-sedimentary sulphide deposits of volcanic exhalative origin.

5.0 PREVIOUS EXPLORATION

Exploration and mining of the Mt. Bonnie area has been conducted sporadically since the 19th century as a lead-zinc-silver prospect. It was first worked in **1902**, when Northern Territory Goldfields of Australia sank a 15m shaft, which penetrated oxide lead mineralisation.

Further work was conducted between **1912** and **1917** when the lode developed as an underground mine with several vertical and inclined shafts and a 92m adit. No ore was produced in this period.

The Northern Territory Geological Survey drilled three diamond holes between **1916** and **1918**, two of which met with lode material. The results are not available.

Modern exploration commenced in 1973 when Horizon Explorations Limited and Jingellic Minerals P/L completed programs including geological mapping, magnetic surveys, electromagnetic surveys, dewatering and sampling of the old workings and diamond drilling. This work outlined a possible resource of 480,000t grading 7.67% zinc, 0.4% copper, 1.8% lead, 186.0g Ag/t and 1.5g Au/t. (Ivanac 1974)

In **1975-1978** Geopeko Ltd and BP Minerals Ltd carried out a considerable amount of drilling on the sulphide deposits as part of a wider evaluation of the Grove Hill region.

From **1979-80** the gold potential of the Mt Bonnie field was investigated during a period of higher gold prices. Some 20 core holes and old workings were sampled for gold in the oxide zone. A reserve of 100,000t @ 8.0g Au/t and 230g Ag/t was reported (Rich 1984)

In **1983** the right to mine oxide ores was obtained by Henry and Walker Group Ltd who commenced open pit mining. Production of 110,000t of oxide was reported averaging 7.0g Au/t and 230g Ag/t up to 1985. (Nicholson and Eupene, 1990)

In **1987** Zapopan NL commissioned an aeromagnetic survey over the Pine Creek Inlier region. Intense magnetic anomalies were outlined for Mt. Bonnie and Iron Blow and several other highs were reported in the area.

In **1988** Dundas Gold NL completed a stream sediment program focusing on gold using bulk cyanide leach (BCL) sampling methods. A number of anomalous values were recorded in drainages from Mt. Bonnie and Iron Blow. Other elevated values were recorded in drainages flowing NNE.

In **1993** Zapopan NL carried out a geological mapping programme throughout the area.

Following acquisition of the tenements in **1995** from Dominion Mining NL, Northern Gold NL conducted literature reviews to assess the value of the property and rank it with its other prospects in the region. The data included geological, geochemical and geophysical reports. During the mid to late nineties the base metal markets were depressed and consequently the property was ranked lower than gold properties held by the company.

Rehabilitation was completed over MLN 459 in compliance with the conditions of the Mining Act and the Mine Management Act.

During April **2002** the finalisation of a joint venture agreement between Territory Goldfields NL and Buffalo Creek Mines NL provided access to the Brocks Creek gold

treatment plant. Since formation of the Burnside JV, substantial exploration expenditure led to an improvement in local infrastructure and enhancement of local gold resources. The economics of the Mt Bonnie deposit was reviewed in the light of this.

6.0 WORK PROGRAM YE 31ST DECEMBER 2004

Northern Gold NL has had a long history of gold exploration in the Burnside Region.

Through the Burnside Joint Venture, formed in 2002, Northern Gold NL has continued to jointly fund large gold exploration drilling programs that focused on advanced stage open pit and underground resources.

Following campaigns of RC drilling, open pits have been designed for the Rising Tide, Princess Louise, North Point, Mottrams, Chinese South Extension and Fountain Head deposits. Decline access was installed to the Zapopan Mine in 2003, developing two levels that produced 10,000t of ore and allowed extensive underground drilling programs that expanded the known high grade resource.

At Cosmo Howley the underground component of the deposit was subjected to campaigns of diamond drilling to 600m below surface. A global resource containing one million ounces of gold has been identified to date.

The acquisition of the Union Reefs mill and tenement package, and sale of the Brocks Creek mill in August 2004, has expanded the scope for renewing mining operations in the region.

Exploration at Mt Bonnie was focused on geological reporting and continuing economic assessment of base metal and gold price scenarios. This work was costed at $550.00

7.0 FORWARD WORK PROGRAM 2005

In view of the joint venture focus on the economic impact of the Union Reefs gold treatment plant on advanced stage gold resources in the Burnside and Pine Creek Regions, the Mt Bonnie deposit is expected to remain a lower priority, particularly in consideration of its metallurgical complexity.

At the same time the attractive base metal market may allow opportunities for suitable treatment arrangements with other parties that have an interest in sulphide mineralisation with gold and silver credits. This activity with reporting is expected to cost $600.00

8.0 REFERENCES

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APPENDIX ONE

Digital Copy of this Report