NORTHERN GOLD N.L.

COMBINED ANNUAL REPORT - EXPLORATION LICENCES 4021 - 4022

FOR THE YEAR ENDED DECEMBER, 1983

LICENCEE: TALMINA TRADING PTY LTD
OPERATOR: NORTHERN GOLD N.L.
 LICENCES: EL 4021 - 4022
LOCATION: PINE CREEK 1:250,000  #52-8
HATCHELOR: 1:100,000  5171
PERIOD: 29th DECEMBER 1982 to 29th DECEMBER 1983.
DATE SUBMITTED: 
AUTHOR: B.D. RICHARDSON
EXPLORATION LICENCES 4021 and 4022 are located in the HOWLEY area and are operated by NORTHERN GOLD. N.L. EL4021 covers the northern extension of the HOWLEY GOLD LINE and the old workings of Bridge Creek area. Three mineral claims cover the majority of these workings and negotiations are underway to secure these leases.

Typical rock units of the Koolpin, Gerowie, Tuff, Mt. Bonnie and Burrell Creek formations occur within EL4021, and the area has potential for economic gold mineralisation associated with the Koolpin formation and the Howley anticline. There is a possibility that the mineralised horizons of the Cosmopolitan and Metropolitan Howley re-occur in this licence. Geological mapping has indicated 500,000m$^3$ of alluvials with an average depth of 2m.

A geophysical survey using the RRMIP technique was carried out over part of EL4021 and the preliminary results have located graphitic horizons within the Koolpin and Gerowie Tuff formations.

EL4022 occurs to the east of the Howley Line and contains sediments and volcanics of the Mt. Bonnie and Burrell Creek formations. The licence holds potential for gold mineralisation associated with the alluvials in channels draining the Howley Line and within the bif units of the Mt. Bonnie formation. To date only limited work has been conducted on this E.L.

In the 1984 seasons, the Bridge Creek area will be extensively explored using corteleaning and percussion drilling. A shallow auger drilling programme will be carried out over the alluvials on EL4022.
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1 STATEMENT OF EXPENDITURE 1982 - 83 EL 4021 - 4022
INTRODUCTION

Exploration Licences 4021 and 4022 are located in the Howley area, approximately 150 kilometres north of Darwin. Each licence covers an area of 6.6 square kilometres and both were granted to Talmina Trading Pty Ltd on the 29th November 1982.

On the 18th May, 1983, Northern Gold N.L. was incorporated in the Northern Territory and this Company has taken over these and 13 other Talmina licences in the Howley area. (figure 1).

The Northern Gold tenements contain large areas of the South Alligator Group rocks which are hosts to the gold mineralisation in the Howley area. Several extensive gold reef systems occur within the tenements, marked by lines of old shafts and many square kilometres of shallow alluvial gold workings occur nearby.

Active mining ceased in the area before the first World War, after recorded production of several tonnes of gold from reefs and unknown gold production from alluvial workings in the Howley area.

Exploration Licence 4021 is one of the Northern leases and covers the Bridge Creek alluvial and shallow hard rock workings. Three mineral claims, MCN 545, 546 and 764 occur in this licence and cover most of the Bridge Creek workings. An agreement has been reached between Northern Gold N.L. and Mr Leslie McGill for the sale of MCN 545 and 546 and negotiations are underway between the Company and the other lease holder, Mr Joe Fisher.

Exploration Licence 4022 occurs to the south of Exploration Licence 4021 and the lease straddles the Stuart Highway.

On the 22nd December 1983, Northern Gold N.L. is to be listed on the Sydney and Adelaide stock exchanges and after that date money will be made available to commence an extensive exploration programme over the large number of tenements in the Howley area. To date, only limited work has been carried out on these licences but Exploration Licence 4021 will be the first area to be explored upon listing of the company.
INTRODUCTION (1)

Exploration Licence 2450, located in the Howley area was first granted to J.W. Benger and N. Wigg in December 1980 and two square minutes were relinquished in December 1982. The area now consists of one square minute, 3.3 square kilometres (figure 1) and is operated by Northern Gold N.L.

In 1982, four shallow auger holes were drilled in the south west corner of Exploration Licence 2450 and the gold grade from these holes was visually estimated at 1 gramme per tonne (see annual report 1982). In 1984, once Northern Gold N.L. has been listed, shallow auger drilling and some mapping will be carried out over this area to assess the alluvials as a potential gold deposit. The estimated expenditure is $6,400.

In 1983 the only work carried out was the compiling of the 1982 and 1983 Annual Reports by the author. The Statement of Expenditure for this period is presented in Appendix 1.
The host rocks of all the gold in the Howley area are the Koolpin, Gerowie Tuff and Mt Bonnie Formations of the South Alligator Group. These types of rocks are siltstone, shales, tuffs and minor iron formations. They contain many quartz veins both parallel to, and cross cutting the sediments, along hinge lines of anticlines, the most prominent of which is the Howley Line that runs from cosmopolitan Howley to Bridge Creek, a distance of 16 kilometres. Gold is contained in the quartz lodes, but also in the graphitic shales, siltstone, laminated acid volcanics and iron formations.

Exploration Licences 4021 contains rocks of the Gerowie Tuff on the western side, with the overlying units of the Mt Bonnie and Burrel Creek Formations occurring to the east (figure 2). The fold axis of the Howley anticline strikes in a northerly direction along the western boundary and the antcline is overturned to the east and plunges steeply south. The hinged area, north of the Stuart Highway, and within the main Bridge Creek workings contains carbonaceous shales and possible olomites of the Koolpin Formation. Dolerite silts of the Zamu Dolerite have intruded along the hinged line.

The alluvial diggings and hard rock workings of the Bridge Creek area straddle the hinge area of the anticline. Walpole in BMR Bulletin 82 reported that a group of small but very rich leaders, ranging in width from 1 to 18 inches were intermittently worked in this area since 1873. A small number of shafts were sunk, the deepest of which was 40 metres.

The total reported production is 1190 oz but this does not include production from alluvial workings.

Exploration Licece 4022 occurs to the east of the Howley Line and contains shales, siltstone and greywackers of the Burrel Creek Formation with siltstone and acid volcanics of the underlying Mt Bonnie Formation restricted to the south west corner. Laminated volcanics and nodular bifen units have been observed and hold some potential for gold mineralization. Outcrop is restricted to the low ridges running along the tenements western boundary and the majority of the area is covered by alluvium.
AIM OF EXPLORATION (3)

Throughout the Howley area gold mineralisation is generally structural controlled, occurring along or near the hinged lines of anticlines. This is true for the larger mines such as Cosmopolitan and Metropolitan Howley and there is a strong possibility that the mineralized horizons of these mines re-occur within and to the south of Exploration Licence 4021. The rocks of the Koolpin Formation clearly hold the most potential for economic gold mineralization. The aim of the first phase of exploration will be to assess the Koolpin Formation, the hinge line area and the alluvials within Exploration Licence 4021 using geological mapping, costeaming and percussion drilling.

Exploration Licence 4022 has the potential for economic gold concentrations associated with the alluvials that have shed from the nearby Howley Line. The aim for exploration on this lease is to test, by costeaming, auger drilling and bulk sampling, the extensive area of alluvial.
WORK DONE AND RESULTS (4)

EXPLORATION LICENCE 4021 - WORK DONE (4.1)

RRMIP

A geophysical technique termed Rapid Reconnaissance Magnetic Induced Polarisation (RRMIP) was recently used on five of the Howley tenements. A total of 11 arrays, including three over Exploration Licence 4021 were gridded and surveyed. A total of 12.6 kilometres of gridding was carried out with cross generally every 100 metres. Readings were taken every 25 metres. Scintrex conducted survey and one Geophysicist and one technical assistant were employed.

At the time of the survey no agreement had been reached between the holders of the mineral claims and Northern Gold N.L. which meant that the survey was not conducted over the most prospective area, the central zone of the Koolpin Formation.

A limited grid Geological Mapping (6.5km) with cross lines every 200 metres was run across the Bridge Creek workings and two days were spent traverse mapping the central area. Recent coloured photography at 1:15 000 was used.
To date only the preliminary results have been compiled Scintrex. A significant chargeability anomaly occurs along the eastern margin of the northern most array, which corresponds to the horizons of the Koolpin Formation. A second lesser anomaly occurs along the western boundary of Exploration Licence 4021 and again corresponds to a narrow graphatic unit within the Gerowie Tuff.

**GEological Mapping**

The dominant structure is the tightly folded anticlines, the axis strikes northerly through the main area of the Bridge Creek workings (figure 2). The anticlines plunges approximately 50° to the south and both limbs dip between 60° and 80° to the west indicating and overturned structure. Carbonaceous shales and interbedded of the Koolpin Formation are exposed in the centre of the fold and these have been intruded by sills of the Zamu Dolerite. The overlying shales, siltstone and tuffaceous units of the Gerowie Tuff from the ridges flanking the Bridge Creek workings.

The majority of the alluvial/elluvial workings and shafts occur over the Koolpin Formation and the gold minerisation is clearly related to this Formation and the fold axis. Mapping has indicated approximately 500,000 cubic metres of alluvial/elluvial material with an average depth of 2 metres.

**EXploration Licence 4022 - Work Done and Results**

General prospective, sampling and panning has been carried out over the western area of the lease. The results have been encouraging enough to warrant further work.

A statement Expenditure for the 1982/83 period is presented in appendix 1.
EXPLORATION LICENCE 4021

The Bridge Creek area will be gridded with cross - lines every 100 metres. The alluvial will be slotted and costeanean using an Excavator and vertical samples taken, panned and signified concentrated analysed. The Koolpin Formation and the axis area will be extensively costeanean and each costean mapped and channel sampled. A limited percussion drilling programme is planned to the most prospective area. The estimated expenditure for the 1983/84 period is in the vicinity of $50 000.

EXPLORATION LICENCE 4022 (5.2)

The alluvials on Exploration Licence 4022 will be assessed using the tractor mounted auger rig and if results prove to be significant costeaning and bulk sampling will be carried out. The out cropping units of the Mt Bonnie Formation will be explored in conjunction with exploration on adjoining licences.
APPENDIX 1

STATEMENT OF EXPENDITURE 1982/83

EXPLORATION LICENCE 4021 and EXPLORATION LICENCE 4022
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<tr>
<th>Description</th>
<th>EL4021</th>
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<td>Running Cost of Bridge Creek Camp</td>
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<td>Wages and Salaries</td>
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| Total                                           | $17,300 | 9,300  |
LEGEND

Pg3- Zama Dolomite - rills

Pg2- Lassie Tuff - Undifferentiated

Pg1- - - - Felic Tuff

Pg0- - - - Gray silstone, phylite

Psk- Koolpin Formation - calcareous

shales interbedded dolomite

EL 4021- BRIDGE CREEK AREA