EL6496
MT. SHOOBRIDGE AREA NT
ANNUAL REPORT TO 8 JUNE 1991
YEAR TWO OF TENURE

Distribution:

NTDME, DARWIN
DOMINION MINING LTD, DARWIN
DOMINION MINING LTD, PERTH
R M BIDDLECOMBE

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EL6496

N R BURN
JULY 1991

CR91/441
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### TABLES

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<td>EARLY PROTEROZOIC STRATIGRAPHY OF THE PINE CREEK/ADELAIDE RIVER REGION</td>
</tr>
</tbody>
</table>
1. SUMMARY

This report details the 1990/91 exploration activities completed on EL6496 in Year 2 of tenure, ending 8 June 1991.

This licence, comprising three (3) blocks, was granted to Northern Gold NL on 9 June 1989 for a period of four (4) years. Under a farm-in agreement with R M Biddlecombe, Northern Gold retained 85% of the title and management of the joint venture.

Dominion Gold Operations Pty Ltd purchased a tenement package from Northern Gold, including the 85% holding in EL6496, on 8 Feb 1991 with the transfer registered on 7 May 1991.

Reduction to one (1) block has been deferred to 9 June 1992.

Previous exploration completed by Northern Gold included regional mapping, rock chip and stream sediment sampling in the search for Au, base metal and Sn-Ta mineralization. Results from this first pass programme indicated one low order Au drainage anomaly.

Due to the extended wet season and delays to transfer of ownership registration, the Dominion exploration programme is only now in progress. This currently comprises regional mapping 1:25,000 scale and stream geochemistry (sills and pan concentrates) sampling. An aerial photography survey was flown in April 1991 by Airesearch Pty Ltd to produce a series of 1:25,000 scale colour photographs covering the licence area.
2. LOCATION AND TENURE

EL6496 is located 160km south of Darwin, approximately 11km W of Cosmo Howley Mine, and is located on the Fenton 1:50,000 (14/5-1) sheet. See Figs. 1 and 2.

Access is via the Stuart Highway, Dorat Road and station tracks. Climatically, EL6496 experiences a wet season (November to April) and a dry season (May to October). Average annual rainfall is 1249mm and the mean temperature is approximately 28°C.

Local relief is generally rugged, ranging from 140 to 260m above sea level.

The licence was granted to Northern Gold NL on 9 June 1989 for four (4) years. A deferral of reduction after the second year of tenure to retain three blocks until 9 June 1992 was granted on 21 May 1991.

The EL6496 is now conditionally surrendered to be incorporated into amalgamated application SEL7513.
3. GEOLOGY

3.1 Regional Geology

The geology of the Pine Creek Basin has been well documented by the BMR [Wallace et al (1985), Needham, et al (1980)].

The Early Proterozoic sequence was deposited by alternating shallow marine and continental environments in an intracratonic basin setting. Following intrusion by conformable sills, a major period of deformation and regional metamorphism, related to granite intrusion, produced a series of tight, upright folds.

Early Proterozoic stratigraphy of the Pine Creek/Adelaide River area is listed in Table 1 and shown in Fig. 3.

3.2 Local Geology

Within EL6496 outcrop is dominantly Burrell Creek Formation sediments overlain conformably by partly lateritised sandstones of the Cretaceous Petrel Formation. See Fig. 4.

Mapping by Northern Gold interpreted a series of interbedded mudstones and greywackes which increase in metamorphic grade to micaceous schists toward the east where the Fenton and Shoobridge Granites have intruded the Early Proterozoic sequence. Prominent foliations within the schists trend 290°M with S_o generally striking between 350°M and 010°M.

NTGS mapping shows a large N–S trending shear system through the licence with a number of smaller sub-parallel shears and splays.
<table>
<thead>
<tr>
<th>GROUP</th>
<th>FORMATION</th>
<th>MEMBER</th>
<th>LITHOLOGIES</th>
<th>THICKNESS m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zamu Dolerite</td>
<td></td>
<td></td>
<td>Massive, medium to coarse grained. Quartz actinolite, tourmaline</td>
<td></td>
</tr>
<tr>
<td>Finniss River</td>
<td>Burrell Creek</td>
<td></td>
<td>Greywacke, siltstone, mudstone, rare chert iron formation and conglomerate</td>
<td>3000</td>
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<tr>
<td>South Alligator</td>
<td>Mt Bonnie</td>
<td>Upper</td>
<td>Mudstone, siltstone, chert, iron formation</td>
<td>100–250</td>
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<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>Greywacke, mudstone, siltstone, chert, carbonaceous mudstone, rare conglomerate</td>
<td>50–150</td>
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<tr>
<td>Gerowie Tuff</td>
<td></td>
<td></td>
<td>Chert, mudstone, siltstone, minor carbonaceous mudstone</td>
<td>200–400</td>
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<tr>
<td>Koolpin</td>
<td>Upper</td>
<td></td>
<td>Carbonaceous mudstone, mudstone, siltstone</td>
<td>50–150</td>
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<td></td>
<td>Middle</td>
<td></td>
<td>Iron formation, mudstone, minor siltstone</td>
<td>130–150</td>
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<tr>
<td></td>
<td>Lower</td>
<td></td>
<td>Micaceous mudstone, siltstone, minor carbonaceous mudstone</td>
<td>0–250</td>
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<tr>
<td>Mt. Partridge</td>
<td>Wildman Siltstone</td>
<td></td>
<td>Mudstone, phyllite, siltstone, carbonaceous mudstone, sandstone</td>
<td>200–400</td>
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<tr>
<td></td>
<td>Mundogie Sandstone</td>
<td></td>
<td>Quartzite, arkose, pebble conglomerate, mudstone, siltstone</td>
<td>500</td>
</tr>
</tbody>
</table>
STRATIGRAPHIC COLUMN

UNDIFFERENTIATED LATERITISED SEDIMENTS

Daly River Group
- Ooloo Dolostone
- Jinduckin Formation
- Tindal Limestone
- Jindare Formation

Tolmer Group
- Hinde Dolomite
- Stray Creek Sandstone
- Depot Creek Sandstone

Cullen Granitoids
Composite I-type Batholith (1840-1780 Ma)
- Mc Minns Bluff Granite
- Fenton Granite
- Shoobridge Granite

Zamu Dolerite (? Maude)

Finniss River Group
- Burrell Creek Formation

- Mt. Bonnie Formation
- Gerowie Tuff
- Koolin Formation

- Wildman Siltstone
- Mundogie Sandstone

Namoona Group
- Masson Formation

Cullen Mineral Field
Stratigraphic Relations

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>STATE</th>
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<tbody>
<tr>
<td>ORIGINATOR F.F.</td>
<td>Date 5/91</td>
</tr>
<tr>
<td>DRAWN R.L.</td>
<td>Date 5/91</td>
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FIGURE NO: 3
PLAN NO: 2A - G100
4. PREVIOUS EXPLORATION

Northern Gold completed a first-pass exploration programme designed to test EL6496 for gold, base metal and Sn-Ta mineralization.

EL6496 was mapped and rock chip samples were collected and submitted to Australian Assay Laboratories (AAL) in Pine Creek for the following analysis:

- **Au**: Fire Assay
- As, Ag, Cu, Pb, Zn, Mo: ICP
- Sn, Ta: XRF

A total of 108 stream sediment samples were collected from EL6496. About 2kg of sediment, sieved to -6mm was collected from the best available trap site. Samples were submitted to AAL in Pine Creek for the following analysis:

- **Au**: Bulk Cyanide Leach
- As, Ag, Cu, Pb, Zn, Mo: ICP
- Sn, Ta: XRF

Results from this first pass program returned one low order drainage Au anomaly (3.8 ppb Au) with a number of isolated base metal and Sn values.

The anomaly trends north–south with elevated Cu (67 ppm) and Zn (58 ppm) values present.
5. **1990/91 WORK PROGRAM**

5.1 **Aerial Photography**

During April 1991, Airesearch Mapping Pty Ltd of Darwin flew the Shoobridge-Fenton tenements held by Dominion and produced sets of 1:25,000 scale air photos.

The relevant air photo runs are AM529, Runs 6 (No. 050-52) and 7 (No. 063-65)

5.2 **Geophysics**

In 1987 and 1988 Aerodata flew a large portion of the Western Pine Creek Basin.

The survey of 22,663 line kilometres was originally commissioned by Golden Plateau NL and completed in May 1988. It was subsequently made available for general sale and Dominion acquired the data in late 1988.

Specifications for the survey were:-

**Aircraft**    Rockwell Shrike Commander 500S

**Magnetometer**  Scintrex V201 split beam cesium vapour
Resolution: 0.04 nano Tesla
Cycle rate: 0.2 seconds
Sample interval: 14 metres

**Spectrometer**  256 channel geometrics exploranium GR800B
Processed channels:
Total count 0.40 - 3.01 MeV
K$_{40}$ 1.37 - 1.56 MeV
Bi$_{214}$ 1.67 - 1.86 MeV
Th$_{238}$ 3.02 - 6.00 MeV
Volume: 33.56 litres
Cycle rate: 1.0 second
Sample interval: 70 metres

**Data Acquisition**  Hewlett Packard 9000 series computer
Aerodata digital acquisition system

**Flight Line Spacing**  Traverse lines: 200 metres
Tie lines: 5000 metres

**Flight Line Direction**  Traverse lines: 090 - 270 degrees
Tie lines: 000- 180 degrees

**Survey Height**  70 metres - mean terrain clearance

**Navigation**  Syledis UHF positioning system

Aerodata supplied Dominion with three sets of aeromagnetic contour maps at scales of 1:10000, 1:25000 and 1:100000. Magnetic contours over EL 6496 are shown in Fig 5.
6. CONCLUSIONS AND RECOMMENDATIONS

During the 1990 field season, no exploration was completed by Northern Gold NL.

With the purchase of EL6496 Dominion initiated an exploration programme which re-evaluates the Northern Gold work and aims to thoroughly follow-up anomalous leads. Full use will be made of 1:25,000 aerial photo mapping and detailed stream and soil geochemistry. Geochemical exploration will include the search for radiometric minerals.
7. EXPENDITURE

Expenditure covenant for Year 2 was $5,000.

Expenditure for EL6496 recorded for the 12 months ending 30 June '91 as given below, is $7,700. Note that as the exploration program is in progress some recent expenditure items (e.g. assays), have not been included in these figures. These will be included next year with Year 3 Expenditure.

EL6496 EXPENDITURE TO 30 JUNE 1991

<table>
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<tr>
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<tr>
<td>Aerial Photography</td>
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<td>Geophysics</td>
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<td>Equipment</td>
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<tr>
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<td>Office</td>
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<tr>
<td>Administration</td>
<td>1024</td>
</tr>
</tbody>
</table>

| TOTAL                          | $7,700 |
6. REFERENCES

"EL6496 Annual Report to 8 June 1990"
Northern Gold NL

Needham RS, Crick JH & Stuart-Smith PB (1980)

Wallace DA, Stuart-Smith PG, Needham RS and Roarty MJ (1985)