REPORT ON EXPLORATION FOR COPPER DEPOSITS
EXPLORATION LICENCE EL 6346
VICTORIA RIVER REGION

FOR TRINITY AMBER PTY LTD

BY M. SAKURAI
CONSULTING GEOLOGIST
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ABSTRACT

Exploration Licence EL 6346 is situated in the Victoria River Region which is characterized by undeformed Proterozoic rocks. The Antrim Plateau Volcanics are tholeiitic plateau basalt having erupted during the Lower Cambrian time.

The licence area is situated southeastern margin of the region and the Antrim Plateau Volcanics outcrop. The volcanics are overlain by the middle Cambrian Montejinni limestone.

Oxide copper ore in the licence area occurs within basalt of the Antrim Plateau Volcanics near the boundary between the basalt and the overlying Montejinni Limestone.

Four costeans were excavated and 28 samples were collected from the costeans. Oxide copper ore was found in Costeans 1, 2 and 3, which are lined up along a 25-degree striking line and a distance from Costean 1 to 3 is 120 metres. The best ore was seen in Costean 2, with 4.5% to 7.24% Cu.

The copper mineralization has a very close relationship with amygdules at the basalt flow tops. The copper mineralization in the EL area may have similarities to the Michigan native copper deposits which are unique stratiform ore deposits occurring as open-space fillings and replacements in amygdaloidal flow tops and conglomerate beds.

A stratiform sheet-like orebody, with a gentle dip and a 25-degree-strike of the intersection between the surface and the plane of ore (reef) is assumed based on the results of study contained in this report, although it could soon be proved wrong as exploration programme is made progress.

In the first instance, many number of shallow and inexpensive drilling is proposed as follow-up exploration programme.
2 INTRODUCTION

The writer was asked by the majority shareholder in the tenements, Trinity Amber Pty Ltd, to carry out exploration work in EL 6346 and to submit a work programme in February 1991 (attached as Appendix 1).

Because of the record rain in the northern Australia in general and the Victoria River region in particular, the field work could not be commenced until late March 1991.

The work was conducted during the short period between 20th and 31st March 1991 and consisted of grid layout and pegging, geological mapping, bulldozer csteaning and logging, and sampling and assaying.

The licence area contains unique type of mineralization which may have resemblance to the native copper deposits of Northern Michigan and the exploration programme in the licence area may be able to be proceeded with reference to the model of the Michigan native copper deposits which have been the subject of intensive geologic study for more than a century.

The work was scheduled and carried out and this report was prepared by the writer undersigned.

M. Sakurai

31/3/91
3 LOCATION AND ACCESS

EL 6346 is located in the Victoria River District and is situated to the west of Lonely Spring, 22 km southwest of Top Springs (Fig 1).

Top Springs is a small settlement of roadside inn along Buchanan Highway. It is linked to Darwin and Katherine by Stuart Highway, Victoria Highway and Delamere Road, all bituminous sealed.

The road distance from Darwin to Top Springs is Darwin-Katherine 324 km through Stuart Highway, Katherine-Willeroo 126 km through Victoria Highway and Willeroo-Top Springs 162 km through Delamere Road.

Various sites in the EL are accessible with a four-wheel drive vehicle during the dry season. The access and road distance from Top Springs to the sites of work are Top Springs - Lonely Spring 22 km through Buchanan Highway and Lonely Spring - the sites of work 10 km through partly station track and partly bulldozer pass (Fig 2).

4 TENURE

Exploration Licence EL 6346, covering 40 blocks or 129 sq km (Fig 3), was granted on 1st March 1989 to P. Piromanski and a 15% interest in the EL was transferred to Aboriginal Exploration and Development Pty Ltd on 28th September 1989.

On 12th February 1991, 70% interest of Vikki Piromanski (P. Piromanski) was transferred to Trinity Amber Pty Ltd and 15% to Freewill Pty Ltd.

EL 6346 is held at the time of this reporting by:–

<table>
<thead>
<tr>
<th>Company</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trinity Amber Pty Ltd</td>
<td>70%</td>
</tr>
<tr>
<td>Aboriginal Exploration and Development Pty Ltd</td>
<td>15%</td>
</tr>
<tr>
<td>Freewill Pty Ltd</td>
<td>15%</td>
</tr>
</tbody>
</table>
FIG 2  ACCESS TO THE SITES

- Top Springs
- EL 6346
- Sites
- Buchanah Highway
- Lonely Spring

SCALE 1:100,000
0  5  10 KM
FIG 3 MAP SHOWING TENURE
SCALE 1: 100,000

[Map image with grid and markings]
5 REGIONAL GEOLOGICAL SETTING

The Victoria River Region is the Plateau and mesa country situated southwest of the Pine Creek Geosyncline.

The region is occupied by a sequence of dolomite, sandstone, siltstone, carbonaceous siltstone and shale, having been deposited in three overlapping basins during the upper Proterozoic time under shallow marine and lagoonal environments. It is characterized by undeformed Proterozoic rocks as against the highly deformed, metamorphosed and intruded rocks of the Pine Creek Geosyncline. The three overlapping basins are the Birrindudu and Victoria River Basins and younger unnamed basin and are together called as the Stuart Block.

At the beginning of the Cambrian time, vast quantities of tholeitic lavas erupted by which at times the entire region was flooded (Antrim Plateau Volcanics).

The licence area is situated southeastern margin of the region where the Antrim Plateau Volcanics outcrop and the Antrim Plateau Volcanics are overlain by the middle Cambrian Montejinni Limestone.

Geological sketch map showing the above regional geological setting is given as Fig 4.

6 TOPOGRAPHY

The Victoria River Plateau is a geomorphic subregion divided into three units.

1) Ridges, hogbacks, mesas and structural plateau formed by gently folded Proterozoic sedimentary rocks.

2) The Victoria River Plains and benches formed by the Antrim Plateau Volcanics and the Montejinni Limestone.

3) The Stuart Plateau - an extensive undulating plain.
The EL area fall under the above category (2) and is generally flat with the greatest elevation difference of only 60 metres. In the EL area, the Montejinni Limestone has formed a benched escarpment and the Antrim Plateau Volcanics gentle ridge and plains (Fig 5).

The drainage system represent tributaries of the Armstrong River and, in the EL area, the directions are predominantly from SE to NW.

7 GEOLOGY OF THE LICENCE AREA

Only two units outcrop in the area, consisting of the Antrim Plateau Volcanics (Lower Cambrian) and the Montejinni Limestone (Middle Cambrian) - Fig 6.

The Antrim Plateau Volcanics are composed of massive porphyritic basalt, vesicular and amygdaloidal basalt, and interbedded agglomerate, sandstone and chert lenses within the basalt. It contains copper minerals.

The Montejinni Limestone is correlated with the Tindall Limestone in Daly River Basin. It consists of light brown and grey calcitute - limestone composed of calcareous sediment of silt size - (top 10-30 m), red and buff argillaceous limestone (middle 10-40 m) and mottled calcitute (bottom 0-30 m).

Copper showings occur within basalt of the Antrim Plateau Volcanics near the boundary between the basalt and the overlying Montejinni Limestone.

The licence area consists of flat plateaux forming nesas on the southern side and gentle ridges and plains on the northern side, the former is occupied by the Montejinni Limestone and the latter Antrim Plateau Volcanics.
FIG 5  TOPOGRAPHIC MAP OF THE LICENCE AREA
FIG 6 GEOLOGICAL MAP OF THE LICENCE AREA

MONTEJINNI LIMESTONE

ANTRIM PLATEAU VOLCANICS

SCALE 1:100,000
The licence area includes the prospect called as Crowson's Prospect. This prospect was originally found by W. Crowson and B. Crowson of Montejinni station sometime before 1969. It is located approximately 11 km on bearing 267 degrees from the station homestead.

Workings, consisting of 3 shallow bulldozer trenches and two deeper ones, extended over a distance of 100 metres and a width of 30 metres, and are situated approximately 300 metres north from the limestone escarpment. The mineralization levels with the base of the escarpment.

Copper specimens better than 20% Cu were said to have been yielded.

Zimmerman (1969) reported that the host rock was identified as quartz trachyte under a microscope and the following assemblage was seen on a polished section.

Cuprite (Red copper ore) Cu2O 30%
Chalcocite Cu2S 1-2%
Malachite CuCo3.Cu(OH)2 10%
Covellite CuS Trace
Limonite 2FeO3.2H2O 5-10%
Hematite Fe2O3 1%
Gangue

The copper deposits of Northern Michigan are unique stratiform ore deposits occurring as open-space fillings and replacements in amygdaloidal flow tops and conglomerate beds of the Portage Lake Lava Series (late Precambrian).

The copper mineralization in the EL area may have similarities to the Michigan copper deposits as both mineralizations are associated with the host rocks of the amygdaloidal basalt at the top of lava flow.
Exploration programme in the licence area may be able to be proceeded with reference to the model of the Michigan native copper deposits which have been the subject of intensive geologic study for more than a century.

From the above standpoint, the Michigan copper deposits are briefly discussed in this chapter.

Mining in Lake Superior region is said to have been conducted by Indians as early as 3,000 BC.

The first post-USA National Founding mine was opened in 1845. Ever since, the district has produced about 5,400,000 tons of copper, of which about 58 per cent have derived from native copper dissemination in the amygdaloidal tops of lava flows. Of the rest 42 per cent, the Calumet and Hecla conglomerate was by far the largest ore body and produced about 39.1 per cent of all the copper. Its production began in 1865 and large-scale production ceased in 1939. Later discoveries since 1900 mainly by diamond drilling have given some additional production.

The host rocks of the native copper deposits are certain amygdaloidal flow tops and conglomerate beds. The lava flows are predominantly basalt or basaltic andesite containing calcic plagioclase, augite and minor olivine. The top of most individual lava flows is conspicuously amygdaloidal, containing 5 to 50 per cent visicles filled with secondary minerals. The abundance of amygdules decreases downward and the middle and lower part of flow contain no amygdules. Copper deposits in conglomerate beds occupy lenticular bodies of conglomerate interbedded between the basalt flows.

The principal ore deposits are stratiform because their host rock is either a conglomerate bed or an amygdaloidal flow top of the basalt lava. Thickness of ore deposits is generally 3 to 5 metres, although it is difficult to assign a meaningful average thickness to many deposits because of irregularity of fragmental amygdaloid distribution and copper distribution in the fragmental amygdaloid.
For practical purpose, native copper is the only ore mineral of the district. The native copper occurs primarily as small to large grains disseminated in amygdaloidal or conglomerate. Most of the copper fills irregular discontinuous fractures in host rocks or replaces the primary minerals of host rocks, while some fills amygdules and interfragmental spaces together with secondary minerals.

The minerals associated with the native copper consist of the primary rock-forming minerals of the basalt and the conglomerate, and secondary minerals occurring in amygdules and interfragmental spaces, the latter of which include microcline, chlorite, epidote, pumpellyite, prehnite, quartz and calcite.

10 GRID LAYOUT AND PEGGING

The survey base map with a 100 metre grid has been prepared in the following procedure, which is shown as Fig 7.

A survey grid was established with a tape and a compass.

The origin of coordinate was designed at one of the old bulldozer trenches (Crowson's Prospect) and the base lines were designated for due NS direction and due EW direction from the origin.

The points at 100 metre intervals along the base lines were pegged, from which various lines, parallel to the base lines, were made.

The points of intersections with two sets of parallel lines (NS direction and EW direction) represent points on the coordinate (grid).

The limestone escarpment was surveyed with relation to the above coordinate.
11 COSTEANING AND COSTEAN LOGS

Details of four costeans having been excavated are set forth below and the locations are plotted on the map (Fig 7).

Costean 1

The peg of costean 1 is located at 30 degrees true 32 metres of the coordinate origin (0,0). It is 14 metres long and 9 metres wide with the maximum depth of 1.9 metres and runs, from the costean peg, to the direction of 42 degrees true. Photograph of costean 1 is given on Fig 8 and the section is shown on Fig 9. Soil thickness of 0.6 to 0.7 metres is recognized.

Costean 2

The peg of costean 2 is located at the coordinate origin (0,0). The direction of this costean is 172 degrees from the costean peg. The size is 3.3 metres wide and 27 metres long, with the maximum depth of 1.9 metres. Photograph of costean 2 is given as Fig 10 and the section is shown on Fig 11.

Costean 3

The peg of costean 3 is located at 287 degrees true 35 metres of peg 100 S 00 EW. It runs, from the costean peg, to the direction of 317 degrees for 29 metres, with the width of 4 metres and maximum depth of 2.7 metres. Soil thickness varies 0.3 to 0.7 metres. Photograph of costean 3 is given as Fig 12 and the section is shown on Fig 13.

Costean 4

The peg of costean 4 is located at 255 degrees true 32 metres of peg 100 S 200 W. It runs, from the costean peg, to the direction of 187 degrees for 20 metres with the width of 3.5 metres and the maximum depth of 2.5 metres. A soil thickness of 1.1 metres is observed. Photograph of costean 4 is given as Fig 14 and the section is shown on Fig 15.
FIG 9 SKETCH SECTION

COSTEAN 1

E SURFACE ----------------------------------------- W

SOIL

BOTTOM

0.7 m
C1L3
430 ppm

1.2 m
C1L2
620 ppm

1.15 m BASALT
C1L1
220 ppm

AMYGDOIDAL

LEGEND

3.5 m
C1L4
1470 ppm

FLOOR SAMPLE

C1L5
1.0 m

C1L6
2.90%

C1L7
1.0 m

2710 ppm

GRAB SAMPLE FROM DOZER HEAP
C1G1 11.5%

BOTTOM OTHER WALL

GRAB SAMPLE C1L5 6.28%

TO BE CONTINUED

0 1m 2m 3m 4m
SCALE
Fig 2  COSTEAN 2 - PHOTOGRAPH
FIG 11 SKETCH SECTION

COSTEAN 2

SURFACE:
- 9.5 m: NO SOIL

SECTION:
- 1.7 m: C2L2 (5.40% AMYGDALOIDAL BASALT)
- 1.9 m: C2L1 (7.24%)
- 1.9 m: C2L3 (4.50%)
- 1.7 m: C2L4 (4.94%)

BOTTOM:
- 1.3 m: C2L5 (8.80%)

LEGEND:
- FLOOR SAMPLE:
  - GRAB SAMPLE FROM DOZER HEAP: C2G2 (21.7%)
  - 1.3 m: C2L6 (10.2%)

SAMPLE NO
ASSAY Cu

BOTTOM: OTHER WALL

SCALE:
0 - 4 m (0 - 2 m, 2 - 4 m)
Fig 12  COSTEAN 3 - PHOTOGRAPH
Fig 14 COSTEAN 4 - PHOTOGRAPH
12 ASSAY RESULTS

A total 28 samples were collected from four costeans. The assay results are given on Table 1 and assay certificates are attached as Appendix 2.

<table>
<thead>
<tr>
<th>TABLE 1 ASSAY RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costean 1 Sample No (C1) L1 L2 L3 L4 L5 L6 L7 G1</td>
</tr>
<tr>
<td>Assay Cu % 0.147 6.28 2.9 0.271 11.5</td>
</tr>
<tr>
<td>Assay Cu ppm 220 620 430</td>
</tr>
<tr>
<td>Costean 2 Sample No (C2) L1 L2 L3 L4 L5 L6 G2</td>
</tr>
<tr>
<td>Assay Cu % 7.24 5.40 4.50 4.94 8.80 10.2 21.7</td>
</tr>
<tr>
<td>Assay Cu ppm</td>
</tr>
<tr>
<td>Costean 3 Sample No (C3) L1 L2 L3 L4 L5 L6 L7</td>
</tr>
<tr>
<td>Assay Cu % 0.359 0.355</td>
</tr>
<tr>
<td>Assay Cu ppm 320 280 150 190 81</td>
</tr>
<tr>
<td>Costean 4 Sample No (C4) L1 L2 L3 L4 L5 L6</td>
</tr>
<tr>
<td>Assay Cu %</td>
</tr>
<tr>
<td>Assay Cu ppm 110 130 190 160 100 100</td>
</tr>
</tbody>
</table>

Assay results on each costean are discussed below.

Costean 1

Costean 1 was excavated parallel to the lode. Ore grade mineralization was not encountered on the wall but samples collected from the floor were returned as:

1) Sample representing a width of 3.5 metres, C1L4 ---- 0.147 % Cu
2) Sample representing a width of next 1m, C1L6 ---- 2.9 % Cu
3) Sample representing a width of next 1 m, C1L7 ---- 0.271 % Cu

An apparent width 5.5 metres (3.5 + 1 + 1) is estimated as 5 metres in the terms of a true width (Fig 16).
FIG16  APPARENT AND TRUE WIDTHS
COSTEAN 1

TH MN

4°

DIRECTION OF REEF STRIKE

25° 42°

DIRECTION OF COSTEAN

5m

5.5m

TRUE WIDTH

APPARENT WIDTH

SAMPLED FROM FLOOR
An average value over the apparent width of 5.5 metres is given by:

\[
\frac{(AV \times WI)}{AW} \quad \text{Where AV: Assay value}
\]

\[
WI: \text{Width of influence}
\]

\[
AW: \text{Apparent width}
\]

\[
= 0.147 \times 3.5 + 2.9 \times 1 + 0.271 \times 1
\]

\[
= 0.67 \% \text{ Cu over the apparent width of 5.5 metres being equivalent to the true width of 5 metres}
\]

In the meantime, one grab sample collected from the floor and one from dozer heap yielded 6.28 \% Cu and 11.5 \% Cu respectively.

Costean 2

This costean was intersected the lode. Samples C2L1, C2L2, C2L3 and C2L4 were collected from the wall and were returned as:

1) Sample representing width of influence 1.5 m C2L2 ---- 5.4 \% Cu (Fig 17)
2) Sample representing width of influence next 1.25 m C2L1 ---- 7.24 \% Cu
3) Sample representing width of influence next 1 m C2L3 ---- 4.5 \% Cu
4) Sample representing width of influence next 1 m C2L4 ---- 4.94 \% Cu

An apparent width of 4.75 metres \((1.5 + 1.25 + 1 + 1)\) is estimated as 2.4 metres in the terms of a true width (Fig 18).

An average value over the apparent width of 4.75 metres is given by:

\[
\frac{AV \times WI}{AW} \quad \text{Where AV: Assay value}
\]

\[
WI: \text{Width of influence}
\]

\[
Aw: \text{Apparent width}
\]

\[
= 5.40 \times 1.5 + 7.24 \times 1.25 + 4.50 \times 1 + 4.94 \times 1
\]

\[
= 5.6 \% \text{ Cu over the apparent width of 4.75 metres being equivalent to the true width of 2.4 metres.}
ZI: ZONE (WIDTH) OF INFLUENCE
WS: WIDTH (DEPTH) SAMPLED

SURFACE C2L2
Z1 = 1.5 m

C2L1
Z1 = 1.25 m

C2L3
Z1 = 1 m

C2L4
Z1 = 1 m

1.7 m WS

1.9 m WS

1.9 m WS

1.7 m WS

FIG 17 WIDTH OF INFLUENCE COSTEAN 2 BOTTOM

SCALE
0 1 m 2 m 3 m 4 m
FIG 16  APPARENT AND TRUE WIDTHS
COSTEAN 2

TN MN

DIRECTION
OF COSTEAN
352°

DIRECTION
OF REEF STRIKE
25°

2.4m

4.75m

TRUE WIDTH

APPARENT WIDTH
SAMPLED FROM WALL
In the meantime, two floor samples representing 1.3 linear metres each were returned as 8.80 % Cu (C2L5) and 10.2 % Cu (C2L6) respectively, and one grab sample from dozer heap as 21.7 % Cu (C2G2).

Costean 3

Of six channels sampled, samples from two adjacent channels, situated at NW end of the costean, were 0.359 % Cu and 0.355 % Cu respectively. A figure of 0.35 % Cu over a width of 2 metres minimum (as NW side of the channel C3L1 was not sampled) is indicated.

Costean 4

Because Cu-stained debris were seen on the surface, this costean was excavated. Although six samples collected from this costean indicates to be of anomalous, ore grade values are not detected.

Two samples were collected from outcrops during grid pegging, which were returned as 190 ppm Cu at 350 W 00 NS and 72 ppm Cu at 500 E 00 NS.

All the assay results are plotted on Assay Plan (Fig 19).

The mineralized portions of costeans 1, 2 and 3 are recognized as lined-up on a same line running 25 degrees true, and are traced for 120 metres from costean 1 to 3 (see Fig 19).
13 FOLLOW-UP EXPLORATION PROGRAMME PROPOSED

The matters so far understood in the field include:-

1) Injection of the ore fluid, at least partly, postdated sedimentation of the Montejinni Limestone, since green copper stains are also seen on the limestone in places and saccharoidal limestone, agate and quartz crystals are common at the boundary between the limestone and underlying basalt (other skarn minerals such as garnet and epidote have not yet been identified).

2) Copper mineralization has a very close relationship with amygdales at the basalt flow tops, since high grade oxide copper ore and basalt with 40-50% amygdales occur together in Costeans 1 and 2.

3) For practical purposes, it appears that copper is the only ore mineral: according to the assay results on various other elements in samples collected previously by the title holder. (Appendix 3)

Nothing have been established in respect of a likely shape of ore body for the prospect in question, should it have planar features its attitude, and its possible size.

Even, it could be a pipe rather than a sheet with planar features.

Nevertheless, a stratiform sheet-like ore body, with a gentle dip and a 25-degree-strike is assumed based on the results of study contained in this report, although it could soon be proved wrong as exploration programme is made progress.

In the first instance, the above points should be clarified and, therefore, a many number of shallow and inexpensive drill holes around the costeans, along the 25-degree-striking line and also generally on the grid as scout drilling is proposed, particulars of which are:- 1,000 metres percussion vertical drilling, 10 metres each, 100 drill holes in total.
14 FUTURE DEVELOPMENT ENVISAGED - HYDRO-METALLURGICAL PROCESS OF OXIDE COPPER ORE

The ore in the licence area will be oxide ore and, therefore, is not amenable to concentration. It is necessary to leach the ore as mined, after crushing and grinding. Sulfuric acid readily dissolve copper oxides and has little effect on the gangue minerals.

The ore is agitated or soaked with sulfuric acid. Washing and filtering or settling are employed to recover copper. After use, the leaching solutions are usually subjected to some type of purification for removal of the soluble iron and other type of objectionable impurities. This often involves neutralization and oxidation followed by removal of the precipitated ferric salts.

Historically, after the beggining of the 20 century, hydrometallurgy has commenced from the great copper leaching plants in south America, the US and Africa, prior to application if its technique to aluminium extraction plants, the electrolytic industry, plants producing nickel and cobalt, the gold-producing plants of South Africa, Canada, Australia and the US, and the plants to extract uranium from ores.

The feasibility and successful conduct of a hydrometallurgical operation depend on a variety of factors, any or all of which may be critical.

1) Adequate supply of water
2) A source of energy is required to convert the ions to metallic form
3) The mineral must be soluble in the leaching solution.
4) The solvant must be such that it will dissolve selectively the desired metals.
5) The solution should be such that the metals can be readily separated from one another.
6) The solution must be such that the desired metals can be precipitated from it by one means or another, producing either pure metal, a mixture of metals, or a metal salt.

7) For economical reasons, it is usually necessary that the leach solution either be capable of being regenerated and used again or that it be susceptible of treatment to recover by-products.

15 REFERENCE

Sweet I.P. (1973)
Explanatory notes on the Victoria River Downs Geological Sheet B.M.R.
by A.G.P.S.

Sweet I.P. (1977)
The Precambrian geology of the Victoria River Region Northern Territory
Canberra, A.G.P.S.

White W.S. (1968)
The native copper deposits of Northern Michigan in "Ore deposits of the
New York

Zimmerman D.O. (1069)
Report on Prospecting Authority N 1980, Montejinni District N.T.
Tipperary Land Corporation (Unpubl)
EXPLORATION EXPENSES FOR EL 6346

AS AT JANUARY 1990-1991

CAPITAL ITEMS

Please refer to EL 6345

PERSONAL

Managing Director incorporated with EL 5345 26000-00
(Salary) 52000-00

Geologist 5640-00 x 1 trip 5640-00 31640-00

OPERATIONAL COST

Fuel 6865-28
Maintenance 1241-80
Consumables 1006-94
Equipment 480-42

Excavator hire 4000-00
Transportation of Float 3000-00

HEAD OFFICE OVERHEADS

Rental 1971-60
Power 383-88
Telephone 1548-98
Stationary 104-71
Postage 50-46
Miscellaneous 97-47
Photocopy & Binding 180-00 4337-10

Office staff (Part time) 7800-00

ACCOMMODATION AND TRAVELLING EXPENSES

Accommodation 668-70
Bus travel 36-00 704-70

GENERAL EXPENSES

Maps 39-85
Cost EL 3095-00
Assay 1150-00
Legal Costs 845-16
Sample bags 150-00
100 Marathah Droppings 148-00
Photography 200-00 5628-01

Total 66704-25
APPENDIX 1

WORK PROGRAMME SUBMITTED TO THE DEPARTMENT PRIOR TO THE WORK
EXPLORATION WORK PROGRAMME IN THE AREA OF EXPLORATION LICENCE EL 6346 VICTORIA RIVER REGION

FOR Mr P. Piromanski

By M. Sakurai, Consulting Geologist

1 INTRODUCTION

The writer was asked by the title holder Mr. P. Piromanski to carry out exploration work in EL 6346 and to submit proposed work programme contained herein to a group of his associates. This programme is also submitted to the Northern Territory Department of Mines and Energy and to the pastoral lease owner (Montejinni Station) for the purpose of obtaining consent and approval for physical work (bulldozer costeanning) to be conducted in the pastoral lease.

2 TIME SCHEDULE

The work is to be conducted immediately upon and as soon as obtaining the consent and approval above-mentioned.

3 LOCATION AND ACCESS

EL 6346 is located in the Victoria River District and is situated to the west of Lonely Spring, 22 km southwest of Top Springs (Fig 1).

Top Springs is a small settlement of roadside inn along Delamere Road. It is linked to Darwin and Katherine by Stuart Highway, Victoria Highway and Dalamere Road, all bituminous sealed.

The road distance from Darwin to Top Springs is Darwin - Katherine 314 km through Stuart Highway, Katherine - Willeroo 126 km through Victoria Highway and Willeroo - Top Springs 162 km through Dalemere Road.
Various sites in the EL are accessible with a four-wheel drive vehicle during the dry season. The access and road distance from Top Springs to the sites of work are Top Springs - Lonely Spring 22 km through Delamere Road and Lonely Springs - the sites of work 10 km through partly station track and partly bulldozer pass (Fig 2).

4 TENURE

Exploration Licence EL 6346, covering 40 blocks or 129 sq km (Fig 3), was granted on 1st March 1989 to P. Piromanski and a 15% interest in the EL was transferred to Aboriginal Exploration and Development Pty Ltd on 28th September 1989.

5 GEOLOGY

The Antrim Plateau Volcanics (Lower Cambrian) and the Montejinni Limestone (Middle Cambrian) outcrop in the area.

The Antrim Plateau Volcanics are composed of massive porphyritic basalt, vesicular and amygdaloidal basalt, and interbedded agglomerate, sandstone and chert lenses within basalt. It contains copper minerals.

The Montejinni Limestone is correlated with the Tindall Limestone in Daly River Basin. It consists of light brown and grey calcilutite - limestone composed of calcareous sediment of silt size - (top 10 - 30 m), red and buff argillaceous limestone (middle 10 - 40 m) and mottled calcilutite (bottom 0 - 30 m).

6 WORK PROGRAMME

The following work is conducted in the area shown on the map (Fig 4).
A Grid layout and pegging (50 metres a side)
B Geological mapping on a scale of 1:5,000 in the pegged area
C Selection of sites for costeaning
D Bulldozer costeaning
E Sketching and photography on sections at all costeans sites
F Mineralogical investigation on associated minerals. Expected minerals include microcline, chlorite, epidote, pumpellyte, prehnite, quartz and calcite
G Sampling and assaying
H Report, plans and sections preparation

7 REHABILITATION

Upon completion of the work, all costeans will be filled in.

M. Sakurai
4/2/91
DISCUSSION - EXPLORATION CONCEPT AND OBJECTIVE

THIS PART IS SET FORTH MAINLY AS PRESENTATION TO THE OFFICER IN CHARGE OF THE NORTHERN TERRITORY GEOLOGICAL SURVEY AND SHOULD NOT BE SUBMITTED TO THE PASTORAL LEASE OWNER AND OTHER OUTSIDERS AT THIS STAGE.

Many small copper showings have been reported in the Antrim Plateau Volcanics.

The work is aimed to locate the copper deposits with an economic size and grade occurring as fillings in amygdaloidal flow tops of the Antrim Plateau Volcanics.

Amygdaloidal flow tops of the Antrim Plateau Volcanics contain numerous gas cavities (vesicles). These porous tops of lava flow might have acted as a favourable location for copper deposition from ascending copper-bearing solutions perhaps derived from a large concealed intrusive.

In the area of EL 6346, copper deposits with an economic size and grade might be located within a cupriferous horizon at the base of limestone or flow tops of the volcanics.

Close examination on sections of limestone escarpment, paying special attention to the boundary between the limestone and the basalt, might lead to a discovery of copper deposits containing the ore with economic quality and quantity.

To the south of the escarpment, the original basalt flow top appears to have retained beneath the limestone while the northern side underwent weathering and erosion by which a lens or sheet-like copper ore body, if any, on the basalt flow top may well have been removed.
REFERENCE

Sweet I.P (1973)
Explanatory notes on the Victoria River Downs Geological Sheet B.M.R.
by A.G.P.S.

Sweet I.P. (1977)
The precambrian geology of the Victoria River Region Northern Territory,
Camberra A.G.P.S.

White W.S. (1968)
The native copper deposits of Northern Michigan
in "Ore deposits of the United States, 1933 - 1967, Volume 1 (P 304 -
325)" A.I.M.M.& P.E. Inc, New York

Report on Prospecting Authority N 1980 Montejinni District NT,
Tipperary land Corporation (Unpubl)
APPENDIX 2

ASSAY CERTIFICATES
MR. M. SAKURAI
P.O. BOX 611
DARWIN
N.T. 0801

ANALYSIS REPORT :

Your Reference : D/S 8495
Our Reference : 1DN0354

Samples Received : 03/04/91
Results Reported : 05/04/91

Number of Samples : 28
Report Pages : 1 to 1

This report relates specifically to the samples tested in so far as the samples supplied are truly representative of the sample source.

If you have any enquiries please contact the undersigned quoting our reference as above.

Report Codes:
N.A. - Not Analysed
L.N.R. - Listed But Not Received
I.S. - Insufficient Sample

Approved Signature:

for

ALAN CIPLYS
Manager - Darwin
CLASSIC LABORATORIES LTD

*** RELIABLE ANALYSES AND SERVICE ***

Head Office: Perth Branches in Adelaide, Darwin, Kalgoorlie, Meekatharra, Townsville
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**UNITS** | **ppm**
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**SCHEME** | AAS1
**UPPER SCHEME** | AAS1C
MR. M. SAKURAI  
P.O. BOX 611  
DARWIN  
N.T. 0801

ANALYSIS REPORT:

Your Reference:  
Samples Received: 10/04/91  
Number of Samples: 2

Our Reference: 1DN0376  
Results Reported: 10/04/91  
Report Pages: 1 to 1

This report relates specifically to the samples tested in so far as the samples supplied are truly representative of the sample source.

If you have any enquiries please contact the undersigned quoting our reference as above.

Comments:

Additional assays as requested M. Smith

Report Codes:
N.A. -Not Analysed
L.N.R. -Listed But Not Received
I.S. -Insufficient Sample

Approved Signature:

for

ALAN CIPLYS  
Manager - Darwin  
CLASSIC LABORATORIES LTD

*** RELIABLE ANALYSES AND SERVICE ***
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Page 1 of 1
APPENDIX 3

PREVIOUS ASSAY RESULTS ON VARIOUS ELEMENTS
## ANALYSIS

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**METHOD:** FA3, AAS1, FA3  
* Re-assay on new split from bulks
## COMLABS LIMITED

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### UPPER SCHEME

- **AA10**: AA101

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Results in ppm unless otherwise specified.
T = element present; but concentration too low to measure.
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UNITs SCHEME: ppm, ppm, ppm, ppm, ppm

UPPER SCHEME: AAS1, AAS1, AAS1, AAS2, FA3, FA3, FA3

E.L. 6346
## Analysis

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**Method:** FA3  AAS1  FA3  
* Re-assay on new split from bulks