MIMETS EXPLORATION PTY. LIMITED

EXPLORATION LICENCE NO. 1240 "FLAPPER HILL"

ANNUAL REPORT FOR YEAR ENDED JULY 26, 1979

MINES BRANCH
GEOLOGICAL LIBRARY
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APPENDIX - REPORT ON GEOPHYSICAL TRAVERSING BY AQUITaine AUSTRALIA MINERALS PTY. LTD.
1. TENURE

Exploration Licence No.1240, situated near Legune Homestead in the north-west of the Northern Territory, was granted to Mimets Exploration Pty. Limited from July 27, 1976, for a period of 12 months. The same area (151.8 km²) was renewed for a further 12 months from July 27, 1977, while an extension of 50% of the area was granted from July 27, 1978.

Application for renewal over an area of 33 km² for a further 12 months has been submitted.

2. REGIONAL GEOLOGY

The Licence covers portion of the eastern margin of the Bonaparte Gulf Basin where the Lower Carboniferous clastic/carbonate sequence is in fault contact with Precambrian basement.

3. EXPLORATION

3.1. Introduction

The area forms part of a joint venture agreement between Mimets Exploration Pty. Limited and Aquitaine Australia Minerals Pty. Ltd., which covers exploration over the entire Bonaparte Gulf Basin. Under this agreement Aquitaine are responsible for exploration, and have supplied the details for the report.

3.2. Gridding

Field work this year commenced with the pegging of a survey grid using an old seismic line. A total of 13.2 km of grid
3. **EXPLORATION (CONT.)**

was surveyed, which was tied into the Australian Map Grid.

3.3. **Geophysics**

A Crone Pulse Electromagnetic survey was carried out over the licence which was designed to cover the subcropping contact between the dark grey silty shales of the Enga Formation and underlying sand-carbonates in the hope that conductive shear zones, such as those known to exist in the Flapper Hill outcrops, might give some response.

Data are difficult to interpret due to a highly conductive surficial layer, but there are no prominent P.E.M. anomalies in the area. Low amplitude anomalies appear to be edge effects between zones of contrasting conductivity-thickness product, but a weak relationship to anticipated fracture patterns is noted.

Details of the survey and full interpretation of the results are included with this report as an appendix.

3.4. **Drilling**

Two attempts were made to drill a stratigraphic hole to the north-west of Flapper Hill itself, with the aim of locating the zone of interest and correlating previous shallow holes, some of which had indicated anomalous geochemical lead values. Both holes failed to reach the objective.

**NBL 1002** was drilled on seismic line SNBL 5 at 950W to test a zone of faulting indicated by both seismic and resistivity data (Ferrand, 1977). At 26 m the hole encountered a highly chertified brecciated rock which was extremely abrasive, wearing out 4 drill bits to penetrate 1.7 m. After a similar
3. **EXPLORATION (CONT.)**

experience during drilling of NBL 1001 in 1976, it was decided to abandon the hole and to drill an alternative site 400 m down-dip.

NBL 1003 was collared 400 m north-west along SNBL 5 from NBL 1002 to test a 3800 m/sec. seismic refraction thought to be the sand-carbonate unit. The hole had reached 122 m, still in the dark grey Enga Siltstones, when a large cavity developed at 60 m. Numerous drill rods were broken due to flexing of the stem in the cavity. Neither reaming of the casing nor cementing were successful and the hole was abandoned.

Both holes were gamma logged and selected samples assayed. Detail logs of the holes are attached at the end of the report.

..............................
for E.M. Bennett
APPENDIX

REPORT ON GEOPHYSICAL TRAVERSING

BY AQUITAINE AUSTRALIA MINERALS PTY. LTD.
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1. INTRODUCTION

2. FIELD OPERATIONS

3. THE LOCALITY OF THE SURVEY

4. RESULTS

5. REFERENCES

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MAP : PEM CONTOURS CHANNEL 5
      FLAPPER HILL : MAP 4
1. INTRODUCTION

The subject matter of this report is extracted from Aquitaine Australia Minerals Pty. Ltd. Report MG 978 entitled "PEM Surveys in the NT side of the Bonaparte Basin, 1978" by P.M. McInerney, January 1979, which treats work in other areas as well.

The Crone PEM system has been used extensively in the Sorby Hills area on the Western Australian side of the Bonaparte Basin, and has proved particularly well suited to delineating structural features. Since structures are considered to be an important factor in localizing mineralization along the eastern margin of the Bonaparte Basin, 2 areas were surveyed with the method during 1978. One of these was in the Flapper Hill area, (Exploration Licence No.1240), where 12 km of line were traversed.

All PEM data have been plotted in profile form and photoreductions of these are included in the appendix. Contour plans have also been prepared, and these include P.M. McInerney's interpretation.

2. FIELD OPERATIONS

The field operations were carried out with an instrument operator and 2 field assistants. The transmitter loop (diameter = 15 m) was constructed in 2 halves such that it could be towed between stations by a vehicle. The transmitter and battery were mounted on the vehicle, and the receiver operator followed behind so that the vehicle was never between the 2. Tests
2. **FIELD OPERATIONS (CONT.)**

carried out prior to the commencement of the survey showed that the proximity of the vehicle did not affect the results. The transmitter-receiver separation was 100 m, and reading interval was 50 m. The speed of surveying was between 3.5 to 5.0 km/day. Data quality was generally very good.

3. **LOCALITY OF THE SURVEY**

Flapper Hill lies north-east of the Wicklow Claims Block and was formerly part of Exploration Licence No.675. The area was relinquished in late 1975 following poor results in a bedrock geochemical survey (d'Auvergne, 1976), and was subsequently acquired by Mimet Exploration Pty. Limited now joint venture partners, as Exploration Licence No.1240. As in other areas, the survey covers the geological contact between the dark grey silty shales in the north-west (e.g. NBL 1003) and the underlying sand carbonate unit to the south-east (e.g. NBL 1002). The hill itself is highly fractured and silicified sandstone. The PEM survey was conducted in order to detect any conductive shear zones through the area.

4. **RESULTS**

The data are difficult to interpret because the hill is surrounded by a highly conductive surficial layer (viz. soils containing saline water) which affects the PEM response markedly. The early channels (1-4) change from negative to highly positive over the conductive material (see profiles, Appendix). The loci of these changes are marked on Map 4, and clearly delineate the hill. Channel 5 data have been contoured in Map 4, since these remain negative throughout the survey area.
4. RESULTS (CONT.)

There are no prominent PEM anomalies in the area. A low amplitude anomaly extends along the western side (and north from) the hill, and also there are some anomalous responses along the eastern side. These anomalies may be partly edge effects between zones of contrasting conductivity – thickness product, as noted above. It is not unlikely, however, that the more westernly anomaly (AB, Map 4) also represents a zone of faulting with north-easterly trending faults offset by north-westerly fractures, although a suite of north-westerly faults has been interpreted from bedrock geological data. This interpretation is very tenuous, however, and also the overall prospectivity of the area is doubtful because of the low lead and zinc values.
5. REFERENCES


FLAPPER HILL

(83) 22400N
  22500N
  22600N
  22700N
  22800N
  22900N
  23000N
  23100N
  23200N
  23300N
  23400N
Hole located on seismic line SNBL5 (ex line 16) at 950NW.

0 - 26m  tricone
26 - 27.7m  NQ core

ALLUVIUM

Mixture of red-brown medium grained surrounded poorly sorted quartz sand and whitish very fine grained quartz silt.

26-27.7

CHERTIFIED BRECCIATED ROCK

White to cream intensely chertified rock. Very fine texture suggesting this was originally either a siltstone or a carbonate rock.

Local small clusters of fine, subangular, moderately sorted quartz grains. These do not appear to be in a natural accumulation and may be the result of some faunal activity, or the remaining infill of a fossil test after dissolution of the test. Occasional silicified crinoids occur, usually in well defined levels. However much of any original biota population would be expected to have been destroyed during chertification.

No bedding features remain.

Intense steeply dipping (60-70°) conjugate fracturing throughout with intense yellow-brown to red earthy iron oxide staining of host rock. Some fractures contain specular iron oxides, others are silica infilled, others remain weakly open. Black earthy iron and possibly manganese oxides are common on fracture faces.

Although the original rock type cannot be identified, stratigraphically it must lie either at the base of the Enqa Sandstone or at the top of the Sand-carbonates.

This rock proved to be very abrasive and very expensive on drill bits. After experience during 1976 with NBL 1001 where a similar rock-type proved to be virtually impossible to drill economically, NBL1002 was abandoned after three bits were used to drill 1 metre.

End of Hole 27.7m.
<table>
<thead>
<tr>
<th>Depth</th>
<th>Pb %</th>
<th>Zn %</th>
<th>Ag. gr/T</th>
<th>Cu ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 - 27</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>5</td>
</tr>
<tr>
<td>27 - 27.7</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>5</td>
</tr>
</tbody>
</table>
**Hole No.** NBL 1003  
**Location** 0542240E - 8323160N  
**Drillers** D.C.S. LY 38  
**Permit** E.L.1240 - FLAPPER HILL  
**State** N.T.  
**Drillers**  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 21m</td>
<td>Rotary precollar - cased in HQ</td>
</tr>
<tr>
<td>21 - 39m</td>
<td>NQ core</td>
</tr>
<tr>
<td>39 - 122m</td>
<td>BQ core - NQ rods reamed to 45m.</td>
</tr>
<tr>
<td>0 - 30.5</td>
<td>OVERBURDEN SAND AND CLAYS</td>
</tr>
</tbody>
</table>

Sand: grey white and orange, oxidized, cleanly washed. Minor iron staining.
Clay: Dark grey, calcareous. Dominantly now a calcrete.
| 30.5 - 122.0 | ENGA SILTSTONES |

30.5 - 39.6m: No sample return.
39.6 - 44.0m: Grey green silty shale.  
Well bedded, CBA 80°. Lenses of silt-calcsiltite; quartz 60%. Overall quartz 10%.
44.0 - 47.3m: Grey green dolomitic siltstone.  
Argillaceous/marly matrix. Quartz 75%. Regular dark grey shale bands. Minor thin (2cm) sandstone bands.
47.3 - 52.2m: Cyclic interval.  
Dark grey shale passes down through a grey green siltstone with sand laminae to a sandstone base.  
Grey green siltstone, quartz 75%. Irregular disturbed laminae and lenses of sand.  
Sandstone, white, cleanly washed, spar cement. Individual cycles approximately 1 metre thick.
52.2 - 53.7m: Light grey brown siltstone.  
Fine grained. Spar cement. Minor sand. Slightly porous. Quartz 70%.
53.7 - 56.5m: Brown siltstone.  
Bimodal silt. Spar cement. Very porous. Porosity decreases downward Quartz 90%.
56.5 - 65.2m: Grey dolomitic siltstone.  
Minor argillaceous laminae. Quartz 80%. Thin (2cm) shale units. Bedding disturbed and slumped within these. Lenticular silt inclusions.
65.2 - 69.4m: As above.  
Argillaceous units more frequent.
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>69.4 - 76.3m:</td>
<td>Grey silty shale. Silt lenses. Regular 10 cm beds of light grey siltstone. Quartz 15%.</td>
</tr>
<tr>
<td>76.9 - 83.2m:</td>
<td>Dark grey shale. Silt lenses. Quartz 10%. Quartz content increases downward. Becomes a silty shale. (Quartz 40%).</td>
</tr>
<tr>
<td>83.2 - 84.3m:</td>
<td>Dark grey argillaceous siltstone. Quartz 70%.</td>
</tr>
<tr>
<td>84.3 - 84.8m:</td>
<td>Grey brown fine grained argillaceous silty calcisiltite. Quartz 10%.</td>
</tr>
<tr>
<td>84.8 - 96.7m:</td>
<td>Grey green very argillaceous silty calcisiltite. Quartz 20%. Millimetric bands of white intrasparite with minor pyrite (3%). Regular thin (5cm) shale units. Crinoids.</td>
</tr>
<tr>
<td>93.3m:</td>
<td>Fault. Calcite mass 10cm thick. CBA 40°.</td>
</tr>
<tr>
<td>96.7 - 98.6m:</td>
<td>Grey brown shale. Calcareous fissile.</td>
</tr>
<tr>
<td>98.6 - 106.2m:</td>
<td>Grey brown shale. Competant. Calcisilt clasts. Microspar cement. Passes down to a dark grey very argillaceous slightly silty calcisiltite. Quartz 5%.</td>
</tr>
<tr>
<td>106.2 - 122.0m:</td>
<td>Brown fine grained argillaceous calcisiltite. Gradational to a brown shale with microspar cement. Massive. Minor crinoids.</td>
</tr>
<tr>
<td>115.2m:</td>
<td>Fault. Thin (0.5cm) calcite band. CBA 40°.</td>
</tr>
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</table>

HOLE ABANDONED AT 122m.

A large cavity had developed at approx. 60 metres and flexing of the drill stem in this cavity resulted in the breaking of a number of drill rods. The HQ casing could not be reamed below 45 metres to seal the cavity and cementation was not possible because of extremely salty ground-water conditions.
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Pb %</th>
<th>Zn %</th>
<th>Ag gr/T</th>
<th>Cu ppm</th>
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