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CENTRAL AUSTRALIA

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ANNUAL AND FINAL REPORT ON
EXPLORATION LICENCE NO. 953.

Compiled
By
G. J. Bajtor

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TENNANT CREEK, N.T.
OCTOBER, 1971

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ANNUAL AND FINAL REPORT ON EXPLORATION LICENCE NO. 953.

CONTENTS

1. INTRODUCTION 1
2. TENURE 2
3. REGIONAL GEOLOGY 3, 4
4. REGIONAL GEOPHYSICS 5, 6
5. PROSPECT EVALUATION 7-14
   5.1 Explorer 153
   5.2 Explorer 154
   5.3 Explorer 155
   5.4 Explorer 156
   5.5 Explorer 157
   5.6 Explorer 159
   5.7 Explorer 160
   5.8 Explorer 161
   5.9 Explorer 167
   5.10 Explorer 168
   5.11 Explorer 169
   5.12 Explorer 170
   5.13 Explorer 171
   5.14 Explorer 172

6. EXPENDITURE 15, 16

APPENDICES

Appendix 1 Geological log of Hole D.D.H. 1, Explorer 154
Appendix 2 Geological log of Hole D.D.H. 1 Parent, Explorer 168
Appendix 3 Geological log of Hole D.D.H. 1 WRO 1, Explorer 168

LIST OF FIGURES

Figure 1 Location Plan of Exploration Licence No. 953, Scale 1:250,000
Figure 2 Location Plan of Prospects within E.L. 953, Scale 1:250,000
Figure 3 Geological Map of Exploration Licence No. 953, Scale 1:50,000
Figure 4 Plan and Profile, Explorer 154 D.D.H. 2
Figure 5 Plan and Profile, Explorer 168 D.D.H. 1 and D.D.H. 1 WRO 1.
1. INTRODUCTION

Exploration Licence No. 953 held by Peko Mines Limited was granted on the 29th September, 1973 and subsequently renewed on the 29th September, 1974. It was renewed for a further twelve month period on the 29th September, 1975 at which time the area held under licence was reduced from 495 sq. kms to 243 sq. kms.

This report outlines the exploration activities conducted by Geopeko Limited, on behalf of Peko Mines Limited, for the twelve month period from the 29th September, 1975 to the 28th September, 1976.

Access to the Exploration Licence is via the Stuart Highway to a point 26 kms north of Tennant Creek (Three Ways), thence approximately 37 kms east along the Barkly Highway to a graded dirt track that runs north for some 15 kms to the centre of the licence area. The south-east corner of the licence area is situated approximately 63 kms on a true bearing of 55 degrees from Tennant Creek (Fig. 1 and 2).
2. **TENURE**

Twenty one (21) mineral leases within the Exploration Licence are held by Peko Mines Limited. These are as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Area (ha)</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML 1008E</td>
<td>15</td>
<td>Explorer 154 No. 1.</td>
</tr>
<tr>
<td>ML 1009E</td>
<td>15</td>
<td>Explorer 154 No. 2.</td>
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<tr>
<td>ML 1010E</td>
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<td>Explorer 155 No. 1.</td>
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<td>ML 1011E</td>
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<td>Explorer 155 No. 2.</td>
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<td>ML 1012E</td>
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<td>Explorer 156 No. 1.</td>
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<td>ML 1013E</td>
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<td>ML 1014E</td>
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<td>Explorer 156 No. 3.</td>
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<tr>
<td>ML 1015E</td>
<td>16</td>
<td>Explorer 156 No. 4.</td>
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<tr>
<td>ML 1016E</td>
<td>16</td>
<td>Explorer 157 No. 1.</td>
</tr>
<tr>
<td>ML 1017E</td>
<td>16</td>
<td>Explorer 157 No. 2.</td>
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<tr>
<td>ML 1018E</td>
<td>16</td>
<td>Explorer 157 No. 3.</td>
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<tr>
<td>ML 1019E</td>
<td>16</td>
<td>Explorer 157 No. 4.</td>
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<td>ML 1021E</td>
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<td>Explorer 161 No. 1.</td>
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<tr>
<td>ML 1023E</td>
<td>15</td>
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<td>ML 1024E</td>
<td>16</td>
<td>Explorer 167 No. 1.</td>
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<tr>
<td>ML 1025E</td>
<td>16</td>
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<td>ML 1026E</td>
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<td>ML 1027E</td>
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<td>Explorer 167 No. 4.</td>
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<tr>
<td>ML 1028E</td>
<td>16</td>
<td>Explorer 169</td>
</tr>
</tbody>
</table>
3. REGIONAL GEOLOGY

The Exploration Licence is covered predominantly by sand and silt (bouldust). Outcrops of Cambrian and Lower Proterozoic rocks have been noted but are not significant in extent (Fig. 3).

The general geology and stratigraphy is as follows:

**Lower Middle Cambrian - Gum Ridge Formation**

The Gum Ridge Formation is poorly exposed along the western and southern margins of the licence area. (Fig. 3). The formation unconformably overlies the sediments of the Lower Proterozoic Warramunga Group and forms a gently dipping blanket cover that appears to thicken to the north and east. From surface exposure and drill hole data, the Cambrian cover is estimated to be approximately 200 metres in thickness on the eastern boundary of the licence area.

Surface exposure of the Gum Ridge Formation consists of chert, chert breccia, siltstone, shale, calcareous/dolomitic silts, minor sandstone, quartzite and grit, which crop out in creeks or sporadically on the tops and flanks of low rounded chert and silicified sediment scree covered hills. Dolomites, and dolomitic siltstones were intersected at the Explorer 154 prospect, and these dolomites are generally white to grey in colour, clean and often silicified in part.

The unconformity between Warramunga Group sediments and the Gum Ridge Formation is well exposed 50 metres south east of Trig Station N.M.H. 62. Here, steeply dipping Warramunga sediment and porphyroid is overlain by flat lying Helen Springs Volcanics, which in turn are overlain conformably by Gum Ridge Formation siltstone and grit followed by brecciated chert and silicified siltstone.

**Lower Cambrian - Helen Springs Volcanics**

The Helen Springs Volcanics crop out along the western and northern margins of the licence area. (Fig. 3).
The volcanics occur at the base of the Gum Ridge Formation and unconformably overlie the Lower Proterozoic Warramunga Group. The rocks consist of highly weathered, red and brown vesicular basalts and are horizontally layered.

**Lower Proterozoic - Warramunga Group**

Warramunga Group sediments are very poorly exposed to the south of the main Cambrian outcrops (Fig. 3). They consist of interbedded greywacke, siltstone, impure feldspathic sandstone, minor shale and quartz feldspar porphyroid. Some silicification of the sediments tends to be present near the unconformity with the Gum Ridge Formation. The sediments are generally well bedded, striking approximately north-east and dipping from 5° - 70° to the south west. Cleavage also strikes approximately north-east and dips steeply to the north west or is vertical in attitude.

Small north-east and north-west trending quartz veins and associated photo linear occur approximately 2.5 kms west and 4 kms to the south-east of Trig Station N.M.H. 62, respectively. These trend directions are interpreted to be similar to the major fault orientations in the central field around Tennant Creek.

Warramunga Group sediments are interpreted to underlie the whole of the licence area.
Two low level aeromagnetic surveys have been conducted over Exploration Licence 953. The first survey was carried out by the Bureau of Mineral Resources in 1960 when the whole of the Tennant Creek 1:250,000 sheet was flown. However, this survey did not give sufficient definition of the magnetic features and the licence area was relawn at a lower altitude and closer flight spacing by Geometrics International Incorporated in May, 1974. The results of the survey were a series of fourteen (14) contoured plans displaying the residual magnetic intensity at a scale of 1:12,000. These were presented in the Annual Report on E.L. 953 for the year ending 28th September, 1974.

A detailed analysis of the low level aeromagnetics resulted in the selection of forty (40) anomalies for further follow-up work. These anomalies were located on the ground and covered with reconnaissance magnetic traverses using the vehicle magnetometer-navigator. A total of 180 reconnaissance traverses were carried out within the licence area, and these are fully documented, together with chart records, in the Annual Report on E.L. 953 for the year ending 28th September, 1975.

Of the 40 anomalies selected for follow-up work, fourteen (14) were considered to be of sufficient interest to warrant detailed ground magnetics. The anomalies were designated as Explorers 153 to 157, Explorer 159 to 161 and Explorers 167 to 172 (Fig. 3). All the prospects were covered with a close spaced survey grid for a total of approximately 130 line kilometres of gridding. The grids were subsequently read with a Geometrics Total Force Magnetometer employing an elevated sensor. Results of the total force survey as well as the location of grid traverses have been previously reported in the Annual Report for the year ending 28th September, 1975.

Detailed geophysical analysis and evaluation of the total
force ground magnetic data has continued throughout the current term of the Exploration Licence. The results were analysed using computer modeling techniques to determine if the anomalies represent discrete bodies of the Tennant Creek type and to also determine the optimum position of diamond drill holes to adequately test the anomalies. Drill hole targets have been determined for the Explorer 154, 156 and 168 Prospects.
5. PROSPECT EVALUATION

Detailed prospect evaluation has continued throughout the current term of the Exploration Licence. This has involved mainly geophysical analysis of the geomagnetic data and diamond drilling of selected anomalies, namely Explorer 154 and 169. Work carried out previously to the current year is briefly outlined under "Summary of Previous Activities". This includes the results of the low level aeromagnetic survey (Annual Report on E.L. 953 for year ending 28th September, 1974), results of the 180 reconnaissance magnetic traverses over 40 selected anomalies (Annual Report on E.L. 953 for year ending 28th September, 1975), and the positioning of survey grids together with results of the geomagnetic total force surveys conducted over 14 of the anomalies (Annual Report on E.L. 353 for year ending 28th September, 1975).

5.1 Explorer 153

(i) Location

The explorer 153 Prospect is situated approximately 4 kms on a true bearing of 165° from Trig Station N.M.H. 62 at the intersection of latitude 19° 16' 55" with longitude 134° 27' 23". (Fig 3).

(ii) Summary of Previous Activities

The aeromagnetic anomaly was located and seven reconnaissance vehicle magnetometer - navigator traverses were conducted over it. A grid was established over the prospect and covered by a geomagnetic total force survey. No mining tenements are held over the prospect.

5.2 Explorer 154

(i) Location

The Explorer 154 Prospect is situated approximately 9.9 kms on a true bearing of 95° from Trig Station N.M.H. 62 at the intersection of latitude 19° 15' 40" with longitude 134° 32' 45" (Fig 3).
(ii) **Summary of Previous Activities**

The aeromagnetic anomaly was located and nine reconnaissance vehicle magnetometer – navigator traverses were conducted over it. A survey grid was established over the prospect and covered by an elevated sensor ground magnetic survey. The prospect is covered by two 15 hectare mineral leases (ML 1008E and ML 1009E).

(iii) **Summary of Activities for the Year Ending 28th September, 1976**

**Diamond Drilling**

One hole, D.D.H. 1, has been drilled into the Explorer 154 anomaly.

**Summary Details are as follows:**

**Collar Co-ordinates** 9915m E / 10051m N grid. Geographical co-ordinates: latitude 19° 15' 13"/longitude 134° 32' 44".

**Bearing** 90° grid, 85.5° magnetic

**Target** 200 metres vertically below 9990m E / 10050m N.

**Summary Geological Results**

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 99.8m</td>
<td>Gum Ridge Formation – dolomite, dolomitic siltstones and siltstones</td>
</tr>
<tr>
<td>99.8m</td>
<td>Unconformity</td>
</tr>
<tr>
<td>99.8 - 350.0m</td>
<td>Warramunga Group – quartz feldspar porphyroid</td>
</tr>
</tbody>
</table>

No economic mineralisation was intersected. A plan and profile of the hole displaying the detailed geology is shown in Fig 4.

5.3 **Explorer 155**

(1) **Location**

The Explorer 155 prospect is situated approximately 10 kms on a true bearing of 121° from Trig Station N.M.H. 62 at the intersection of latitude 19° 17' 35" with longitude 134° 31' 55". (Fig 3).

(11) **Summary of Previous Activities**

The aeromag...
The aeromagnetic anomaly was located on the ground and seven reconnaissance vehicle magnetometer - navigator traverses were conducted over it. A grid was established over the anomaly and a geomagnetic total force survey carried out. The prospect is covered by two 15 hectare mineral leases ("ML 101E" and "ML 101L").

5.4 Explorer 156

(i) Location
The Explorer 156 Prospect is situated approximately 19.8 kms on a true bearing of 98.5° from Trig Station N.M.R. 62 at the intersection of latitude 19° 16' 3" with longitude 134° 38' 20" (Fig. 2).

(ii) Summary of Previous Activities
The aeromagnetic anomaly was located and six reconnaissance vehicle magnetometer - navigator traverses were conducted over it. A grid was established over the anomaly and an elevated sensor ground magnetic survey carried out. The prospect is covered by four 16 hectare mineral leases (ML 1012E - ML 1015E).

(iii) Summary of Activities for the Year Ending 28th September, 1976
Detailed geophysical analysis of the total force ground magnetic results together with computer modeling techniques, was used in the determination of a drill hole target for the Explorer 156 anomaly.

5.5 Explorer 157

(i) Location
The Explorer 157 Prospect is situated approximately 11.8 kms on a true bearing of 70.5° from Trig Station N.M.R. 62 at the intersection of latitude 19° 12' 41" with longitude 134° 33' 30". (Fig. 3.).

(ii) Summary of Previous Activities
The low level aeromagnetic anomaly was located and six
reconnaissance vehicle magnetometer-navigator traverses conducted over it. A grid was established over the anomaly and a geomagnetic total force survey carried out. The prospect is covered by four 16 hectare mineral leases (ML 1016E - ML 1019E).

5.6 Explorer 159

(i) Location
The Explorer 159 Prospect is situated approximately 2 kms on a true bearing of 140° from Trig Station N.M.E. 62 at the intersection of latitude 19° 15' 20" with longitude 134° 27' 50". (Fig. 3).

(ii) Summary of Previous Activities
The aeromagnetic anomaly was located and seven reconnaissance vehicle magnetometer - navigator traverses were conducted over it. A grid was established over the anomaly and a geomagnetic total force survey carried out. No mining tenements are held over the prospect.

5.7 Explorer 160

(i) Location
The Explorer 160 Prospect is situated approximately 16 kms on a true bearing of 114° from Trig Station N.M.E. 62 at the intersection of latitude 19° 10' with longitude 134° 35' 30" (Fig. 3).

(ii) Summary of Previous Activities
The aeromagnetic anomaly was located and five reconnaissance vehicle magnetometer - navigator traverses were conducted over it. A grid was established over the anomaly and a geomagnetic total force survey carried out. Two 16 hectare mineral leases cover the prospect (ML 1020E and ML 1021E).

5.8 Explorer 161

(i) Location
The Explorer 161 Prospect is situated approximately 16.7 kms on a true bearing of 115° from Trig Station
N.M.H. 62 at the intersection of latitude 19° 18' 30" with longitude 134° 35' 30". (Fig. 3).

(ii) **Summary of Previous Activities**

The low level aeromagnetic anomaly was located on the ground and five reconnaissance vehicle magnetometer-navigator traverses were conducted over it. A grid was established over the anomaly and a geomagnetic total force survey carried out. The prospect is covered by two 15 hectare mineral leases (ML 1022E and ML 1023E).

5.9 **Explorer 167**

(i) **Location**

The Explorer 167 Prospect is situated approximately 10 kms on a true bearing of 81° from Trig Station N.M.H. 62 at the intersection of latitude 19° 14' 00" with longitude 134° 32' 45" (Fig. 3).

(ii) **Summary of Previous Activities**

The aeromagnetic anomaly was located and two reconnaissance vehicle magnetometer-navigator traverses were conducted over it. A survey grid was established over the prospect and covered by a geomagnetic total force survey. The prospect is covered by four 16 hectare mineral leases (ML 1024E - ML 1027E).

5.10 **Explorer 168**

(i) **Location**

The Explorer 168 Prospect is situated approximately 10 kms on a true bearing of 142° from Trig Station N.M.H. 62 at the intersection of latitude 19° 19' 10" with longitude 134° 30' 40" (Fig. 3).

(iii) **Summary of Previous Activities**

The aeromagnetic anomaly was located and four reconnaissance vehicle magnetometer-navigator traverses conducted over it. A grid was established over the prospect and covered by an elevated sensor ground magnetic survey. No mining tenements are held over the prospect.
(iii) Summary of Activities for the Year Ending
28th September, 1976

Diamond Drilling

One parent hole, D.D.H. 1, and one wedge run-off, D.D.H. 1 WRO 1, were drilled into the Explorer 168 anomaly. Both holes intersected weakly magnetic sediments of the Warramunga Group. Summary details are as follows:

D.D.H. 1 Parent (Appendix 2)

Collar Co-ordinates 10091mE/9862mN grid. Geographical Co-ordinates: latitude 19° 19' 15", longitude 134° 30' 44".

Bearing 345° grid, 340.5° magnetic

Target 200 metres vertically below 10070mE/9940mN.

Summary Geological Results
0.0 - 174.0m Warramunga Group - interbedded chloritic siltstones, shales and greywackes.

D.D.H. 1 WRO 1 (Appendix 3)

Wedge run commenced off the parent hole at 98.0m

Summary Geological Results
98.0 - 280.0m Warramunga Group - interbedded chloritic siltstones, shales and greywackes; slightly magnetic.

No economic mineralisation was intersected. A plan and profile of the holes displaying the detailed geology is shown in Fig. 5.

5.11 Explorer 169

(i) Location

The Explorer 169 Prospect is situated approximately 8.7 kms on a true bearing of 171° from Trig Station N.M.H. 62 at the intersection of latitude 19° 19' 30" with longitude 134° 28' 00" (Fig. 3.).

(ii) Summary of Previous Activities

The aeromagnetic anomaly was located and five reconnaissance vehicle magnetometer - navigator traverses were conducted over it.
A survey grid was established over the prospect and a geomagnetic total force survey carried out. The prospect is covered by one 16 hectare mineral lease (ML 1028E).

5.12 Explorer 170

(i) Location

The Explorer 170 Prospect is situated approximately 12.5 kms on a true bearing of 110° from Trig Station N.M.H. 62 at the intersection of latitude 19° 17' 20" with longitude 134° 33' 50" (Fig. 3).

(ii) Summary of Previous Activities

The aeromagnetic anomaly was located and ten reconnaissance vehicle magnetometer - navigator traverses conducted over it. A grid was established over the prospect and covered by an elevated sensor ground magnetic survey. No mining tenements are held over the prospect.

5.13 Explorer 171

(i) Location

The Explorer 171 Prospect is situated approximately 12.5 kms on a true bearing of 101° from Trig Station N.M.H. 62 at the intersection of latitude 19° 16' 16" with longitude 134° 34' 05" (Fig. 3).

(ii) Summary of Previous Activities

The aeromagnetic anomaly was located and eight reconnaissance vehicle magnetometer - navigator traverses conducted over it. A grid was established over the prospect and a geomagnetic total force survey carried out. No mining tenements are held over the prospect.

5.14 Explorer 172

(i) Location

The Explorer 172 Prospect is situated approximately 13 kms on a true bearing of 127° from Trig Station N.M.H. 62 at the intersection of latitude 19° 19' 10" with longitude 134° 33' 05" (Fig. 3).

(ii) Summary of Previous Activities

The aeromagnetic anomaly was located and five reconnaissance vehicle magnetometer - navigator traverses
were conducted over it. A grid was established over the prospect and covered by an elevated sensor ground magnetic survey. No mining tenements are held over the prospect.
6. EXPENDITURE

The total expenditure on Exploration Licence No. 953 for the twelve month period from 29th September, 1975 to 28th September, 1976 was $64,094.00. (This total is not equal to the sum total of the four quarterly reports due to an incorrect posting of $360.00 in the first quarter). The expenditure committed as prescribed under Section 1 of the Terms and Conditions Schedule of the exploration licence document was $10,000.00. The breakdown of expenditure is as follows:

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>Diamond Drilling</td>
<td>43,109.00</td>
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<tr>
<td>Assaying</td>
<td>68.00</td>
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<tr>
<td>Field Surveying &amp; Drafting</td>
<td>1,780.00</td>
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<td>Leasing</td>
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<td>3,953.00</td>
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<td>Geophysics</td>
<td>8,678.00</td>
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<tr>
<td>General Field Expenses</td>
<td>3,005.00</td>
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<tr>
<td>Administration Costs</td>
<td>2,792.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$ 64,094.00</strong></td>
</tr>
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(i) The various subdivisions are costed directly, the exception being General Field Expenses and Administration Costs.

(ii) Administration Costs are proportioned period by period on the basis of man hours worked on the project to the total man hours worked for the period.

(iii) General Field Expenses are spread on the same basis as Administration Costs and consist of the following field overheads -
- Field Messing
- Field Supplies
- Vehicle Operation
- Workshop Supplies
- Depreciation - field plant

The total expenditure on E.L. 953 since the initial granting of the licence on the 29th September, 1973 is as follows:

- **1st Year**: 29th September, 1973 to 28th September, 1974
  - 10,827.00

- **2nd Year**: 29th September, 1974 to 28th September, 1975
  - 63,282.00
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<tr>
<td>3rd Year 29th September, 1975 to 28th September, 1976</td>
<td>64,094.00</td>
</tr>
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**Total $** 138,203.00
APPENDIX 1

Geological Log of Hole D.D.U. 1 - Explorer 154
PROSPECT/MINE: EXPLORER 154 D.D.H. 1
Log of Hole: D.D.H. 1 EXPLORER 154 PROSPECT
Location: EXPLORER 154 PROSPECT
Purpose of Hole: TO TEST REVERSE POLARISED MAGNETIC ANOMALY

Proposed By: L. FARRAR Date: 3.6.76
Proposed Target: E: N: R.L.
Hole Planned By: Date: Checked:
Hole Approved By:
Hole Logged By: G.J. BUJTOR

Collar Co-Ordinates:
Proposed: 9915 E: 10051 N: R.L.
Surveyed: 9915 E: 10051 N: R.L. Surveyed in By: G. BUJTOR Date: 9.6.76
Actual: 9915 E: 10051 N: R.L. Picked up By: J. WARD Date:

Collar Bearing:
Proposed: 90° Grid: Magnetic: G. BUJTOR
Surveyed: Grid: Magnetic: Surveyed in By: J. WARD
Actual: 90° Grid: 85.5° Magnetic: Picked up By:

Collar Inclination:
Proposed: -75°
Surveyed:
Actual: -75°
Surveyed in By: G. BUJTOR
Picked up By: J. WARD

Target Depth: 200 m.
Proposed Final Depth: 275 m.
Actual Final Depth: 350 m.
Hole Terminated By:

Reason for Termination:
Drilling: Date Commenced: 19.6.76 Date Completed: 21.7.76
Drilled By: GEOPEKO LIMITED
Wedges Placed At:
Remarks: Target depth 200m vertically below 9990E, 10050N.

Economic Summary Result: Negative: No lode zone intersected. Quartz feldspar Porphyroid occurs from 99.80 - 350.00m.
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<td>13.7.76</td>
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</tr>
<tr>
<td>15.7.76</td>
<td>274m</td>
<td>Photo</td>
<td>-71°</td>
<td>-71°</td>
<td>090.5°</td>
<td>090.5°</td>
<td>095°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.7.76</td>
<td>319m</td>
<td>Photo</td>
<td>-69°</td>
<td>-69°</td>
<td>090°</td>
<td>090°</td>
<td>094.5°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.7.76</td>
<td>347m</td>
<td>Photo</td>
<td>-68°</td>
<td>-68°</td>
<td>089.5°</td>
<td>089.5°</td>
<td>094°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E.O.H. 350m
EXPLORE 154 D.D.H. 1

GEOLOGICAL LOG

By: G.J. Bujtor

0.00 - 99.80m  CAMBRIAN GERM RIDGE FORMATION

0.00 - 6.00m  No Core

6.00 - 27.00m  WEATHERED SEDIMENTS - ?SILTSTONE

Highly oxidised and weathered, orange to cream coloured clay rich sediments containing numerous beds of very coarse grit or conglomerate. The rock fragments in the conglomerate consist of quartz pebbles and oxidised hematite stained sediment fragments averaging approximately 1cm in maximum dimension. The rock fragments are predominantly rounded to subrounded. (e.g. 6.0 - 7.5m, 8.9 - 10.0m) Broken clayey sediments occur from 15 - 21m where approximately 1m of core has been lost.

Fractures per metre 10 - >20
Recovery 92%  

27.00 - 39.00m  WEATHERED SEDIMENTS AND SILICEOUS RUBBLE

White and orange-grey coloured clay rich sediments with occasional interbeds of coarse siliceous rock fragments averaging 2cm in size. Siliceous rubble occurs from 33.0 - 39.0m. The siliceous rubble may represent silicified dolomites. The core is very broken with abundant core loss throughout.

Fractures per metre >20
Core recovery zero from 27.0 - 30.0m
50% from 30.0 - 33.0m
5% from 33.0 - 39.0m

39.0 - 92.00m  DOLOMITE MINOR WEATHERED SEDIMENTS

Fine grained, grey to white dolomite containing interbeds of weathered sediments. The dolomite is rather 'clean' and very siliceous in places. Some calcite lined cavities occur throughout.

Interbeds of weathered sediments are common at the top of the unit from 39.0 - 46.0m, 58.0 - 61.0m, These sediments are very clay rich and cream to orange in colour.

Badly broken and fractured core occurs from 39.0 - 73.0m
Bedding is well developed from 82.5 - 88.0m where it is 84º to long core axis at 82.9m and 78º to long core at 85m.
**EXPLODER 154 D.D.H. 1**

**GEOLOGICAL LOG**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Fractures/metre</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.0 - 73.0m</td>
<td>&gt;20</td>
<td>48%</td>
</tr>
<tr>
<td>73.0 - 92.0</td>
<td>5-10</td>
<td>95%</td>
</tr>
</tbody>
</table>

**792.0 - 799.80m**

**DOLOMITIC SILTSTONE**

- Minor siltstones and quartz feldspar porphyroid
- Fine to medium grained grey and chocolate brown siltstones showing some evidence of disturbance and slippage. The siltstones are grey to light brown in colour from 92.0 - 95.3m and contain some dark grey-black silty interbeds and lenses. Chocolate brown siltstones occur from 95.30 - 99.80m.
- Towards the base of the unit the sediment becomes coarser in grain size approaching a siltstone and conglomerate at the base of the unconformity where re cemented quartz feldspar porphyroid fragments abound.
- Quartz feldspar porphyroid fragments and rock fragments occur from 98.25m - 99.80m. The porphyroid fragments are both rounded and angular, averaging 3cm in size.

Fractures per metre 5
Recovery 98%

**99.80**

**UNCONFORMITY**

**LOWER PROTEROZOIC WARRAMUNGA GROUP**

**QUARTE FELDSPAR PORPHYROID**

- Fine to medium grained, reddish to grey black coloured porphyroidal rock containing quartz and feldspar megacrysts as well as numerous sediment fragments. The top of the unit from 99.80 - 106.0m is highly oxidised.
- In hand specimen the quartz megacrysts are rounded to elongate in outline, randomly orientated and average approximately 3mm-4mm in maximum dimension. The feldspar megacrysts/crystals are smaller than the quartz megacrysts, averaging only 1 - 2mm in maximum size. They are both anhedral and euhedral in shape and only rarely to they occur as large ovoid megacrysts with syneresis cracking (e.g. 1cm feldspar megacrysts at 104.0m and 156.55m). Some of the smaller feldspars have been noted to contain chlorite and/or formed from chlorite. Minor chlorite has also been noted within the groundmass.
Sediment fragments are common throughout the unit. They are both rounded and angular in outline and range from 1mm to 4cm in maximum dimension. They are often chloritised (particularly towards the top of the unit), irregularly distributed and randomly orientated. Some of the sediment fragments show some evidence of 'resorption'.

Chloritic sediment and quartz feldspar porphyroid intermixtures are common from 222.0 - 222.15m, 236.25 - 236.90m, 264.45 - 264.85m, 268.6 - 273.4m, 277.55 - 279.42m, and 338.55 - 340.10m. Some of these zones look very much like sediment breccias or conglomerates with abundant irregular sediment fragments and porphyroid fragments. (e.g. 268.6 - 273.4m and 277.55 - 279.42m). The sediment (and porphyroid) fragments are up to 10cm in maximum dimension. A complete intermixing of the two is common.

Irregular and thin calcite veining is common throughout the unit.
Cleavage or mineral foliation is absent.
Fractures per metre 5
Recovery 99%

E.O.H. 350.00m

G.J.B./C.W. 9.8.76
APPENDIX 2

Geological Log of Hole D.D.H. 1 Parent - Explorer 168
PROSPECT/MINE: EXPLORER 168
Log of Hole: D.D.H. 1 PARENT
Location: NORTH BARKLY
Purpose of Hole: TO TEST MAGNETIC ANOMALY

Proposed By: L. PARRAR  Date:
Proposed Target: 10070  E: 9940  N: 200m  R.L.
Hole Planned By: R. MAHER  Date:
Hole Approved By:  Checked:
Hole Logged By: G.J. BUJTOR

Collar Co-Ordinates:
Proposed: 10091  E: 9862  N:  R.L.
Surveyed: 10091  E: 9862  N:  R.L.  Surveyed in By: G.J. BUJTOR  Date: 15.7.76
Actual: 10091  E: 9862  N:  R.L.  Picked up By:

Collar Bearing:
Proposed: 345°  Grid: 340.5°  Magnetic:
Surveyed: Grid:  Magnetic:  Surveyed in By: G.J. BUJTOR
Actual: 345°  Grid: 340.5°  Magnetic:  Picked up By:

Collar Inclination:
Proposed: -75°
Surveyed:  Surveyed in By: G.J. BUJTOR
Actual: -75°  Picked up By:

Target Depth: 200m  m.
Proposed Final Depth: 250m  m.
Actual Final Depth: 174m  m.  Hole Terminated By: P. LEMESSURIER

Reason for Termination: EXCESSIVE DEVIATION IN BEARING TO THE EAST

Drilling: Date Commenced: 27.7.76  Date Completed: 10.8.76
Drilled By: CONTRACT DRILLING: GEOPEKO LIMITED
Wedges Placed At:
Remarks: INTERSECTED WEAKLY MAGNETIC SEDIMENTS

Economic Summary Result:  MEGATIV
<table>
<thead>
<tr>
<th>Date</th>
<th>Depth</th>
<th>Type</th>
<th>Read</th>
<th>Corr.</th>
<th>Mag.</th>
<th>Grid</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.8.76</td>
<td>20m</td>
<td>Photo</td>
<td>75°</td>
<td>75°</td>
<td>340.5°</td>
<td>345°</td>
</tr>
<tr>
<td>5.8.76</td>
<td>45m</td>
<td>Photo</td>
<td>75</td>
<td>75</td>
<td>341</td>
<td>345.5</td>
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<tr>
<td>5.8.76</td>
<td>70m</td>
<td>Photo</td>
<td>75.5</td>
<td>75.5</td>
<td>339.5</td>
<td>344</td>
</tr>
<tr>
<td>5.8.76</td>
<td>93m</td>
<td>Photo</td>
<td>76</td>
<td>76</td>
<td>338.5</td>
<td>343</td>
</tr>
<tr>
<td>9.8.76</td>
<td>125m</td>
<td>Photo</td>
<td>74</td>
<td>74</td>
<td>350</td>
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<tr>
<td>9.8.76</td>
<td>140m</td>
<td>Photo</td>
<td>74</td>
<td>74</td>
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<td>354.5</td>
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<td>11.8.76</td>
<td>160m</td>
<td>Photo</td>
<td>73</td>
<td>73</td>
<td>352.5</td>
<td>357</td>
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<tr>
<td>11.8.76</td>
<td>174m</td>
<td>Photo</td>
<td>72</td>
<td>72</td>
<td>356.4</td>
<td>001</td>
</tr>
</tbody>
</table>

Remarks: Affected by Magnetics

FOH 174 Parent
EXPLORE 168 DDH 1 PARENT

GEOLOGICAL LOG
0.00 - 174.0m

By: G.J. Bujtor
WARRAMUNGA GROUP SEDIMENTS

0.00 - 6.00

**No Core**

**INTERBEDDED SHALES, SILTSTONES & GREYWACKES**

Highly oxidised and weathered, interbedded shales, siltstones and greywackes which change in colour from white to yellowish to red-brown with depth down the hole. The majority of the core is clayey, soft and broken with abundant core loss.

Bedding at 60.0m is approximately 19° to long core axis.

Fracture per metre > 20

<table>
<thead>
<tr>
<th>Recovery</th>
<th>Between</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>16.0 - 21.0m</td>
</tr>
<tr>
<td>10%</td>
<td>21.0 - 24.0m</td>
</tr>
<tr>
<td>75%</td>
<td>24.0 - 27.0m</td>
</tr>
<tr>
<td>40%</td>
<td>27.0 - 30.0m</td>
</tr>
<tr>
<td>75%</td>
<td>30.0 - 36.0m</td>
</tr>
<tr>
<td>33%</td>
<td>36.0 - 42.0m</td>
</tr>
<tr>
<td>50%</td>
<td>42.0 - 45.0m</td>
</tr>
<tr>
<td>33%</td>
<td>45.0 - 48.0m</td>
</tr>
<tr>
<td>50%</td>
<td>48.0 - 51.0m</td>
</tr>
<tr>
<td>70%</td>
<td>51.0m - 55.3m</td>
</tr>
<tr>
<td>60%</td>
<td>55.3 - 58.5m</td>
</tr>
</tbody>
</table>

61.00 - 91.00m

**INTERBEDDED SHALES, SILTSTONES & GREYWACKES**

Oxidised and weathered, cream coloured shales, siltstones and greywackes, with shales and siltstones amounting to approximately 80% of the total unit. The sediments are fine grained and easily scratched. Fadly broken core is common and occurs from 66.0 - 68.0m, 76.5 - 81.0m & 85.0 - 88.0m.

Bedding angles to long core axis is as follows:-

<table>
<thead>
<tr>
<th>Fracture</th>
<th>Angle</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>So</td>
<td>15°</td>
<td>67.10m</td>
</tr>
<tr>
<td>So</td>
<td>14°</td>
<td>71.05m</td>
</tr>
</tbody>
</table>

Fractures per metre 5 - >20

Recovery 75%

91.00 - 174.00m

**CHLORITIC SHALES, SILTSTONES AND GREYWACKES**

Interbedded, green coloured shales-siltstones and greywackes showing abundant evidence of soft sediment mobilisation.

The fine grained shales and siltstones have a poorly developed cleavage while the coarser grained greywackes lack cleavage. Intermixing of shales and greywackes is common - siltstone fragments in greywackes and vice versa (i.e. 146.0m).

The greywackes are medium to coarse grained, and at 134.0m exhibits graded bedding which indicates that facing
is towards the top of the hole. The majority of the
graywackes are slightly magnetic, the magnetism being
produced by the small black detrital grains of magnetite.
Thin quartz veins are common throughout the unit and are
particularly abundant from 161.0 - 174.0m where the veins are
associated with chlorite, pyrite and possibly some
talc and epidote. Minor calcite veining is also present
in the unit (136.6m).
Bedding is well developed and may, in fact, be transposed
parallel to cleavage. The following bedding angles were
noted:

<table>
<thead>
<tr>
<th>So</th>
<th>7°</th>
<th>Long Core Axis</th>
<th>94.5m</th>
</tr>
</thead>
<tbody>
<tr>
<td>So</td>
<td>11°</td>
<td>Long Core Axis</td>
<td>96.15m</td>
</tr>
<tr>
<td>? So</td>
<td>Sub-parallel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>So</td>
<td>14-15°</td>
<td>Long Core Axis</td>
<td>113.2m</td>
</tr>
<tr>
<td>So</td>
<td>6°</td>
<td>Long Core Axis</td>
<td>126.6m</td>
</tr>
<tr>
<td>So</td>
<td>5°</td>
<td>Long Core Axis</td>
<td>142.0m</td>
</tr>
<tr>
<td>So</td>
<td>5°</td>
<td>Long Core Axis</td>
<td>146.5m</td>
</tr>
</tbody>
</table>

Cleavage is only poorly developed:

| S1   | 24° | Long Core Axis | 97.3m |
| S1   | 21° | Long Core Axis | 101.8m|
| S1   | 18° | Long Core Axis | 150.9m|

Fractures per metre 4 - 5
Recovery 99%

E.O.H. 174.00m

G.J.B./C.W. 21.09.76
APPENDIX 3

Geological Log of Hole D.D.H. 1 WRO 1 - Explorer 168
PROSPECT/MINE: EXPLORER 168
Log of Hole: DDH 1 WRO 1
Location: DDH 1 PARENT: WEDGE PLACED 98m
Purpose of Hole: TO TEST MAGNETIC ANOMALY
Proposed By: Date:
Proposed Target: 10070 E: 9940 N: 200 R.L.
Hole Planned By: Date: Checked:
Hole Approved By: 
Hole Logged By: G.J. RUIJTER
Collar Co-Ordinates:
  Proposed: E: N: R.L.
  Surveyed: E: N: R.L. Surveyed in By: Date:
  Actual: E: N: R.L. Picked up By: Date:
Collar Bearing:
  Proposed: Grid: Magnetic:
  Surveyed: Grid: Magnetic: Surveyed in By:
  Actual: Grid: Magnetic: Picked up By:
Collar Inclination:
  Proposed:
  Surveyed: Surveyed in By:
  Actual: Picked up By:
Target Depth: 200 m.
Proposed Final Depth: 250 m.
Actual Final Depth: 280 m. Hole Terminated By:
Reason for Termination:
Drilling: Date Commenced: 12.8.76 Date Completed: 31.8.76
Drilled By: CONTRACT DRILLING: GEOPEKO LIMITED
Wedges Placed At: 98m, 153m, 169m.
Remarks: INTERSECTED WEAKLY MAGNETIC SEDIMENTS
Economic Summary Result: NEGATIVE
<table>
<thead>
<tr>
<th>Date</th>
<th>Depth</th>
<th>Type</th>
<th>Read</th>
<th>Corr.</th>
<th>Mag.</th>
<th>Grid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.8.76</td>
<td>117m</td>
<td>Photo</td>
<td>74°</td>
<td>74°</td>
<td>342.5°</td>
<td>347°</td>
</tr>
<tr>
<td>13.8.76</td>
<td>123m</td>
<td>Photo</td>
<td>73.25</td>
<td>73.25</td>
<td>341</td>
<td>345.5</td>
</tr>
<tr>
<td>16.8.76</td>
<td>141m</td>
<td>Photo</td>
<td>73</td>
<td>73</td>
<td>344</td>
<td>348.5</td>
</tr>
<tr>
<td>18.8.76</td>
<td>147m</td>
<td>Photo</td>
<td>70</td>
<td>70</td>
<td>341</td>
<td>345.5</td>
</tr>
<tr>
<td>23.8.76</td>
<td>170m</td>
<td>Photo</td>
<td>66</td>
<td>66</td>
<td>342</td>
<td>352.5</td>
</tr>
<tr>
<td>30.8.76</td>
<td>180m</td>
<td>Photo</td>
<td>65</td>
<td>65</td>
<td>342</td>
<td>346.5</td>
</tr>
<tr>
<td>30.8.76</td>
<td>198m</td>
<td>Photo</td>
<td>63.5</td>
<td>63.5</td>
<td>342</td>
<td>346.5</td>
</tr>
<tr>
<td>30.8.76</td>
<td>216m</td>
<td>Photo</td>
<td>62</td>
<td>62</td>
<td>344</td>
<td>348.5</td>
</tr>
<tr>
<td>3.9.76</td>
<td>240m</td>
<td></td>
<td></td>
<td></td>
<td>345</td>
<td></td>
</tr>
<tr>
<td>3.9.76</td>
<td>260m</td>
<td></td>
<td></td>
<td></td>
<td>346.5</td>
<td></td>
</tr>
<tr>
<td>3.9.76</td>
<td>280m</td>
<td></td>
<td></td>
<td></td>
<td>348</td>
<td></td>
</tr>
</tbody>
</table>

Hall Rowe wedge at 98m. Branch commenced at 98m.

E.O.H. 280m
EXPLORE 168 WRO 1

GEOLOGICAL LOG By: G.J. Bujtor

98.00-102.00m WEDGE: No Core

102.00-280.00m CHLORITIC SHALES, SILTSTONES & GREYWACKES

Interbedded, light green coloured chloritic shales, siltstones and greywackes. The shales and siltstones are fine grained and have a poorly developed cleavage. They generally contain good chlorite mineral banding. The greywackes are medium to coarse grained and consists of small grains of quartz, feldspar, rock fragments, minor chlorite masses and possibly some magnetite.

The sediments are generally somewhat disturbed and complete intermixing of shales and greywackes is common. Fragments of shale in greywacke and vice versa is also common. Bleached sediments containing abundant quartz veining occur from 162.0 - 185.0m. The sediments are a light 'epidote' green colour and contain abundant chlorite mineral banding. Chlorite with minor pyrite is also associated with the quartz veining.

Dolomite/calcite veins are well as thin quartz veins are irregularly distributed throughout the unit.

Bedding (So) is well defined throughout but may in fact be transposed parallel to cleavage. The following bedding angles were noted:

<table>
<thead>
<tr>
<th>So</th>
<th>6°</th>
<th>Long Core Axis</th>
<th>126.4 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>So</td>
<td>10°</td>
<td>Long Core Axis</td>
<td>133.35m</td>
</tr>
<tr>
<td>So</td>
<td>10°</td>
<td>Long Core Axis</td>
<td>144.1 m</td>
</tr>
<tr>
<td>So</td>
<td>57°</td>
<td>Long Core Axis</td>
<td>180.7 m</td>
</tr>
<tr>
<td>So</td>
<td>15°</td>
<td>Long Core Axis</td>
<td>205.65m</td>
</tr>
<tr>
<td>So</td>
<td>10°</td>
<td>Long Core Axis</td>
<td>208.7 m</td>
</tr>
<tr>
<td>So</td>
<td>15°</td>
<td>Long Core Axis</td>
<td>216.9 m</td>
</tr>
</tbody>
</table>

Cleavage is generally not well defined and is almost totally absent from the coarser grained greywacke. The following cleavage angle was noted:

S₁ 25-34° Long Core Axis 205.85m

The following angles of chlorite mineral banding to long core axis was noted:

<table>
<thead>
<tr>
<th>Smb</th>
<th>45-55°</th>
<th>Long Core Axis</th>
<th>162.6 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smb</td>
<td>49°</td>
<td>Long Core Axis</td>
<td>168.45m</td>
</tr>
<tr>
<td>Smb (7S₁)</td>
<td>35°</td>
<td>Long Core Axis</td>
<td>179.5 m</td>
</tr>
<tr>
<td>Smb</td>
<td>26°</td>
<td>Long Core Axis</td>
<td>191.85m</td>
</tr>
<tr>
<td>Smb</td>
<td>17°</td>
<td>Long Core Axis</td>
<td>257.5 m</td>
</tr>
</tbody>
</table>
Badly broken and fractured core occurs from 193.0 - 2
Fractures per metre 4 - 5
Recovery 99%
Wedges 153.0 - 162.0m (No Core)
        169.0 - 174.0m (No Core)

E.O.H. 280m

G.J.B./C.W. 21.9.76
AMENDED

Date / Geologist

---

Scale: 1:250 000

DATE: 4·11·76

GEOLOGIST M.C.L

DRAWN C.P.M

CHECKED

---

GEOPEKO LTD.
CENTRAL AUSTRALIA TENNANT CREEK

EXPLORATION LICENCE Nº 953

NORTH BARKLY

Fig. 1 Locality Plan.
Fig. 2 Location Plan of Prospects.

Fig. 1

1:1 000 000

Fig. 2

MT 15A

BARKLY HIGHWAY

TENNANT CREEK

E.L 953 (North Barkly)

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TF1672