GEOPAKO LIMITED

CENTRAL AUSTRALIA

ANNUAL REPORT

ON

EXPLORATION LICENCE NO. 861

Compiled

by

J.R. Reynolds

CR 75/92

TENNANT CREEK, N.T.

May, 1975.
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1. **INTRODUCTION.**

Exploration Licence No. 861 held by Peko Mines Limited was granted on the 16th March, 1973. It covers an area of 48.7 square kilometres and its south east corner is situated 28 kms on a true bearing of 316 degrees from Tennant Creek. Access to the Exploration Licence is via a bitumen road from Tennant Creek to Warrego Mine of Peko Mines Limited. The location, access and boundaries of the Exploration Licence are indicated on Fig. 1.

This report covers the exploration activities of Geopeko Limited on the Exploration Licence for the year ended 16th March, 1975.

Aeromagnetic surveys carried out in 1966 and 1967 by the Bureau of Mineral Resources, covered most of the Exploration Licence. No further airborne surveys were undertaken. Regional geological mapping was completed in the previous year and no further regional geological mapping has been carried out. Reconnaissance ground magnetics using the vehicle magnetometer navigator over areas of interest within the Exploration Licence delineated from the aeromagnetics continued in the twelve months covered by this report.

Prospect evaluation continued on three prospects designated Explorer 117, Explorer 118 and Explorer 151. Geomagnetic total force surveys were carried out over the prospect grids within the Exploration Licence.

Diamond drilling is in progress on the Exploration Licence. One hole has been completed.
2. **TENURE.**

The following Mineral Leases exist within the Exploration Licence.

**Mineral Leases.**

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<td>ML820E</td>
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<td>15</td>
<td>Peko Mines Limited</td>
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</table>
3. REGIONAL GEOLOGY.

No further regional geological mapping was carried out on the Exploration Licence, the previous 1:12,000 scale mapping being considered adequate to determine the geological environment and delineate areas warranting further investigation. The bulk of the work carried out on the Exploration Licence this year, has been prospect evaluation.

The previous description of the regional geology therefore stands.

3.1 Stratigraphy

The Warramunga Group was subdivided as follows (Dunnett and Harding 1967).

Carraman Formation
Bernborough Formation
Whippet Sandstone
Monument Beds.

The rocks within the Exploration Licence were found to lie within the Carraman Formation. A further subdivision was possible within the area of investigation. The subdivision is as follows:

Upper Carraman Member
Middle Carraman Member
Lower Carraman Member

The Middle Carraman Member rocks cover the majority of the area within the Exploration Licence. The exception being a small section in the north-western corner which consisted of sediments of the Upper Carraman Member and the axial zone of an anticline in the south of the Exploration Licence which is comprised of sediments of Lower Carraman Member.
**Upper Carraman Member**

The Upper Carraman Member consists of interbedded greywacke, siltstone, shale hematitic shale, chert and cherty sediments. It is differentiated from the Middle Carraman Member in that it contains chert and cherty sediments and has little or no disseminated hematite or magnetite. The boundary between the Upper and Middle Carraman Member is defined by the appearance of the first chert outcrop (see Fig.2).

**Middle Carraman Member**

The sediments of the middle member are predominantly greywacke, siltstone, minor shale and occasional hematite shale. The member also contains numerous ironstones and is cut by a broadly conformable quartz feldspar porphyry band (see Fig.2).

The sediments of the middle member contain an average 5% magnetite and/or hematite. This is either disseminated through the sediments as small octahedra or concentrated into blotches along bedding plane interfaces.

The occurrence of ironstone within the Exploration Licence is restricted to the Middle Carraman Member. Mapping has shown that these ironstones fall into two groups. The first being discrete ironstone pods composed of quartz and hematite or quartz and maghemite. The best examples are those found in the Great Western Area. The second is a group termed the conformable ironstones. This type of ironstone was first recognised by Taube (1967) in the area south of the Great Western Mine, but geological mapping has shown that they also occur in the hills to the south of Black Eye Mine (see Fig.2). The ironstones vary from a hematite impregnated greywacke to a massive quartz hematite and thickness ranges from 0.5m on the limbs of folds to about 3.0m in the axial zones.
Lower Carraman Member

Sediments of the Lower Carraman Member do not outcrop within the Exploration Licence but consist of greywacke, siltstone and shale. They can be differentiated from the Upper Carraman Member in that they do not contain any siliceous units and from the Middle Carraman Member in that they contain no hematite and/or magnetite.

3.2 Structure.

Developments this year have not changed the structural picture from that previously reported. However, bedding-cleavage relationships revealed by diamond drilling has increased our knowledge of the nature of the small-scale folding.

The structure of the sediments within the Exploration Licence is dominated by two major folds. The Great Western Syncline is situated in the northern half of the Exploration Licence and in the south is an equally large anticline whose axis is approximately 6 km south of the axis of the syncline. The folds plunge to the west at approximately 20 degrees and are isoclinal in character.

There are two scales of smaller parasitic folding superimposed on the limbs of the broader structures. One has an amplitude and wavelength of 1 km, the other is extremely isoclinal in character and has an amplitude of up to 50 m and a wavelength as small as 5 m. The parasitic folding occurs predominantly within the Middle Carraman Member away from the axial zones of the larger folds.

A well developed axial plane cleavage was observed throughout the Exploration Licence. It strikes predominantly east west and the dip varies from 75 degrees to the north to 75 degrees to the south.

Faulting is prevalent throughout the area but the amount of movement is small. A large fault, the Phillip Creek fault is located in the north-eastern corner of the Exploration Licence. The faulting postdates the folding and it appears to be related to the faulting in the Upper Proterozoic Tomkinson Creek Beds.
4. REGIONAL GEOPHYSICS

At the time of writing the previous Annual Report, the Bureau of Mineral Resources low level aeromagnetic surveys (see Fig.4) were considered sufficient to determine areas of interest within the Exploration Licence. However, the vehicle magnetometer traverses over the area previously not covered by an airborne survey, have shown that several anomalies are present. In addition, there is some difficulty in matching the two existing surveys so it has been decided to refly the area.

Analysis of the aeromagnetic results from the two Bureau of Mineral Resources surveys delineated nine anomalous areas which warrant further investigation.

They are as follows:

1. An anomaly situated at the intersection of latitude $19^\circ 26' 50"$ and longitude $133^\circ 57' 05"$. The anomaly was called Explorer 113 (Black Eye South). Four reconnaissance traverses using the vehicle magnetometer-navigator were conducted over the anomaly during the previous year.

A geomagnetic total force survey has been carried out over the Explorer 113 grid and over grid extensions to the north designated Explorer 151 (see Fig.14).

2. An anomaly located at the intersection of latitude $19^\circ 26' 35"$ and longitude $133^\circ 58' 35"$. During the previous year, three reconnaissance traverses using the vehicle magnetometer-navigator were conducted over the anomaly area. The results from the survey indicated that the anomaly did not merit any further investigations.

3. A broad magnetic anomaly located at the intersection of latitude $19^\circ 28' 10"$ and longitude $133^\circ 57' 15"$. Two reconnaissance traverses using the vehicle magnetometer navigator were carried out over the anomaly area during the previous year. No further work is planned.
4. A low intensity anomaly located at the intersection of latitude 19° 28' 05" and longitude 133° 58' 05". During the previous year, one reconnaissance traverse using the vehicle magnetometer-navigator was conducted over the centre of the anomaly. No further work is planned.

5. A flexure in the magnetic contours located at the intersection of latitude 19° 26' 45" and longitude 133° 57' 50". Two vehicle magnetometer-navigator traverses were carried out over the flexure during the previous year. Two more vehicle magnetometer-navigator traverses were carried out during the twelve months covered by this report (for chart records see Figs.5, 6 and 7). No further work is planned.

6. A broad flexure in the magnetic contours located at the intersection of latitude 19° 27' 00" and longitude 133° 53' 45". Eight vehicle magnetometer traverses were conducted over the magnetic feature during the previous year. No further work is planned.

7. Two flexures in the magnetic contours located at the intersection of latitude 19° 27' 30" and longitude 133° 59' 20". During the previous year, six reconnaissance traverses using the vehicle magnetometer-navigator were carried out over the flexure. During the twelve months covered by this report, one of these traverses was extended north and another one was carried out (for chart records see Figs.8 and 9). No further work is planned.

8. The flexure in the magnetic contours in the area of latitude 19° 27' 10" and longitude 133° 38' 00". Four reconnaissance traverses were conducted during the previous year. No further work is planned.

9. Three reconnaissance traverses using the vehicle magnetometer-navigator were conducted during the previous year over the area not covered by the aeromagnetic surveys. The reconnaissance work located a small magnetic anomaly south of the Great Western Mine. The anomaly was called Explorer 117 (Great Western South).
A grid survey and a total force magnetic survey were carried out over the prospect. The results are shown in Fig.15.

Four more reconnaissance traverses using the vehicle magnetometer-navigator were carried out during the twelve months covered by this report (for chart records see Figs.10, 11, 12 and 13). Two anomaly centres were located in the vicinity of latitude 19° 25' 52" and longitude 133° 59' 47". This prospect was designated Explorer 118 and a grid survey and total force magnetic survey carried out over it. The results are shown in Fig.16.
5. PROSPECT EVALUATION

5.1 EXPLORER 117 (Great Western South)

1. Location: Explorer 117 Prospect is located 0.5 km south of the Great Western Trig Station at intersection of latitude 19° 27' 00" and longitude 133° 59' 00". Access to the prospect is via a bush track from the Great Western Mine which is located on the Warrego road 6.7 km east of the Peko WallSEND Metals Ltd., Tennant Creek Smelter.

2. Tenure: The prospect is covered by one mineral lease held by Peko Mines Limited. Details are as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML816E</td>
<td>Explorer 117</td>
<td>16</td>
</tr>
</tbody>
</table>

3. Grid Survey: The following additional cross traverses were constructed:

<table>
<thead>
<tr>
<th>8600m E</th>
<th>from 1100m N to 1700m N</th>
</tr>
</thead>
<tbody>
<tr>
<td>8650m E</td>
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<tr>
<td>8700m E</td>
<td>&quot;</td>
</tr>
<tr>
<td>8750m E</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

4. Geology: Outcrop is sparse in the immediate prospect area, consisting predominantly of greywacke, siltstone and shale. Narrow bedded ironstone outcrops in the centre of the prospect area define small-scale, tight folds. Diamond drilling has subsequently shown the existence of an anticline with a narrow ironstone lode in the southern limb.

5. Geophysics: A total force magnetic survey has been carried out over the Explorer 117 grid. The results are shown in Fig. 15.

6. Drilling: Geophysical analysis determined a target for a diamond drill-hole to test the anomaly. One hole has been drilled.

(a.) Explorer 117 DDH 1

Collar co-ordinates: 8447m E; 1345m N.

Approximate geographical co-ordinates: Latitude 19° 27' 08", Longitude 133° 59' 40"
Bearing: 013° Grid 009.5° Magnetic
Target: 120m vertically below co-ordinates 8465m E; 1435m N

Summary Results: Two talc-magnetite lode zones were encountered from 149.70m to 163.70m and from 167.85m to 176.50m separated by barren chloritic slate. The predominant lithologies encountered were bedded greywacke and siltstone and sediment breccia. The relationships between bedding, cleavage and younging features in the core indicated an anticlinal axis at about 216m.

No economic assay results were obtained.

A plan and profile of the drill hole displaying the detailed geology and structures is shown on Fig.17.

5.2 EXPLORER 118

1. Location: The Explorer 118 prospect is located approximately 2 km north of the Great Western trig station at intersection of latitude 19° 25' 52" and longitude 133° 59' 47". Access to the prospect is via a bush track from the Great Western Mine which is located on the Warrego Road 6.7km east of the Peko Wallsend Metals Limited, Tennant Creek Smelter.

2. Tenure: The prospect is covered by four mineral leases held by Peko Mines Limited. Details are as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Area (ha)</th>
</tr>
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<tbody>
<tr>
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<td>Explorer 118 No.2</td>
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</tr>
<tr>
<td>ML820E</td>
<td>Explorer 118 No.1</td>
<td>15</td>
</tr>
</tbody>
</table>

3. Grid Survey: Traverse 8550m E on the Explorer 117 grid was extended to 2800m N and a subsidiary base line cut at 2800 N from 8550m N to 8400m E. The 8400m E traverse was then cut from 2800m N to 4300m N and base lines cut at 3400m N and 4000 N from 8400m E to 8900m E.
Traverses were surveyed at:-

8450m E from 3700m N to 4300m N
8500m E " 3700m N " 4300m N
8550m E " 3100m N " 4600m N
8600m E " 3100m N " 4300m N
8650m E " 3100m N " 4300m N
8700m E " 3100m N " 4300m N
8750m E " 3100m N " 4300m N
8800m E " 3100m N " 4300m N
8850m E " 3100m N " 4300m N
8900m E " 3100m N " 4300m N

4. Geology: Sparse outcrop occurs in the south of the prospect only. Outcrops consist of porphyry and a little sediment. The north of the prospect consists of alluvium.

5. Geophysics: A total force magnetic survey has been carried out over the Explorer 118 grid. The results are shown in Fig.16.

6. Drilling: The geophysical analysis determined two drilling targets. One hole designated DDH 2, is in progress. DDH 1 has not yet been drilled.

5.3 EXPLORER 151

1. Location: The Explorer 151 prospect is located 2.5 km north-east of the Peko WallSEND Metals Limited, Tennant Creek Smelter at the intersection of latitude 19° 26' 42" and longitude 133° 56' 58".

2. Tenure: The prospect is covered by two mineral leases held by Peko Mines Limited. Details are as follows:-

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<tr>
<th>Number</th>
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<th>Area (ha)</th>
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<td>ML811E</td>
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</tr>
<tr>
<td>ML815E</td>
<td>*Explorer 151 No.1</td>
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</tbody>
</table>

*Note: This lease is outside Exploration Licence 861.

3. Grid Survey: The prospect is covered by the existing Explorer 113 Grid.
4. Geology: Outcrop in the prospect area is sparse with some greywacke, siltstone and shale to the west.

5. Geophysics: A total force magnetic survey has been carried out over the prospect. The results are indicated in Fig.14. Further geophysical analysis will be carried out in order to determine a drilling target when the results of drilling at Explorer 113 are known.
6. **EXPENDITURE.**

The total expenditure on Exploration Licence 861 for the 12 months ending 18th March, 1975 was $26,575.00. The following is a dissection of the expenditure:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<td>Field Surveying</td>
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<tr>
<td>Unallocated Field Expenses</td>
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</tbody>
</table>

$ 26,575.00

(a.) Expenditure is costed directly, the exception being administration costs and the field expenses.

(b.) Administration costs are proportioned on the basis of the payroll costs for the project to the total payroll.

(c.) Unallocated field expenses is comprised of the following field overheads which are spread on the same basis as the administration costs.

Field Messing
Vehicle Operating
Field Supplies
Workshop Supplies
Depreciation - Field Plant.
PROSPECT/MINE: EXPLORER 117
Log of Hole: EXP.117 No.1
Location: Explorer 117 Prospect—Great Western Locality
Purpose of Hole: To test

Proposed By: L.Farrar Date: 21/11/1974
Proposed Target: 8465m E:1435m N: -120m R.L.
Hole Planned By: J.Ackland Date: Checked: P.L.Kitto

Hole Approved By: 
Hole Logged By: J.R.Reynolds.

Collar Co-Ordinates:
Proposed: 8447m E: 1345m N: -- R.L.
Surveyed: 8447m E: 1345m N: -- R.L. Surveyed in By: P.L.Kitto Date: 29/1/75
Actual: 8447m E: 1345m N: -- R.L. Picked up By: 

Collar Bearing:
Proposed: Grid: 013° Magnetic: 009.5°
Surveyed: Grid: 013° Magnetic: 009.5° Surveyed in By: P.L.Kitto
Actual: Grid: 013° Magnetic: 009.5° Picked up By:

Collar Inclination:
Proposed: -55°
Surveyed: -55° Surveyed in By: P.L.Kitto
Actual: -55° Picked up By:

Target Depth: 152 m.
Proposed Final Depth: 180 m.
Actual Final Depth: 220.5 m. Hole Terminated By: P.Le Messurier.

Reason for Termination: Sufficiently past lode intersection.
Drilling: Date Commenced: 31/1/1975 Date Completed: 10/3/1975
Drilled By: Geopeko Limited Drilling Division.

Wedges Placed At: --
Remarks:

Economic Summary Result: No economic values obtained.
EXPLORER 117 DDH 1.

**SURVEYS.**

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* Affected by Magnetics

** Possibly affected by Magnetics

† E.O.H 220.50m
### EXPLORER 117 No. 1

#### ASSAYS

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### EXPLORER 117. No.1

**SUMMARY—GEOLOGICAL LOG.**

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<th>Depth Range</th>
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<td>31.00m - 120.65m</td>
<td>Bedded sediments</td>
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<td>120.65m - 144.20m</td>
<td>Sediment breccia</td>
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<td>144.20m - 149.70m</td>
<td>Chloritic slate</td>
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<td>149.70m - 163.70m</td>
<td>LODE (Talc-Magnetite)</td>
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<td>163.70m - 167.35m</td>
<td>Chloritic Slate</td>
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<tr>
<td>167.85m - 176.50m</td>
<td>LODE (Talc-Magnetite)</td>
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<td>176.50m - 178.40m</td>
<td>Chloritic slate</td>
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<tr>
<td>178.40m - 220.50m</td>
<td>Bedded and disturbed sediments.</td>
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EXPLORER 117 No.1

GEological Log.

By J.R. Reynolds.

31.00 - 35.15m

OXIDISED Siltstone.
Light pink fine sediment. No bedding present. Cleavage weakly developed about 30° to core axis.
Contains irregular fragments of fine sandstone below 33.90m.
Contact with unit below very irregular about 15° to core axis.
Minor black (?) Manganese staining on some fractures.
Fractures/metre 10
Recovery 97%

35.15 - 37.00m

OXIDISED SANDSTONE.
Pink, fine grained sandstone. No bedding present.
Contains numerous fragments of siltstone 1-4cm across, very irregular in shape.
Some are elongate and aligned at about 30° to core axis.
(?) Manganese staining on some fractures.
Fractures/metre 8
Recovery 97%

37.00 - 38.05m

OXIDISED Siltstone.
Light pink fine sediment. No bedding or cleavage discernible. Regular fractures (joints?) 60° to core axis. (?) Manganese staining on some fractures.
Fractures/metre 8
Recovery 97%
EXPLORER 17 No.

38.05 - 42.65m

OXIDISED SANDSTONE.

As above 35.15-37.00m. Below 40.00m contains irregularly shaped fragments of siltstone 1-4cm which increase in number towards base.
Lower contact 20° to core axis.
Fractures/metre  8
Recovery  98%

42.65 - 44.10m

OXIDISED SILSTONE.

Grey-yellow fine sediments. Core very broken 10cm at lower contact.
(?) Manganese staining on fractures.
Fractures/metre  7
Recovery  98%

44.10 - 47.75m

OXIDISED SANDSTONE.

Yellow-grey to pink fine sandstone.
Below 45.50m contains irregularly shaped siltstone fragments 1-10cm.
Some are elongated and aligned at 30° to sub-parallel to core axis.
Numerous (?) Manganese stains.
5cm broken core at lower contact.
Fractures/metre  7
Recovery  98%

47.75 - 51.70m

OXIDISED SILSTONE.

Pink fine sediment. Bedding at 51.55m 15° to core axis.
Few highly irregular fine sandstone fragments 1-2cm. One fragment appears to be a thin, highly contorted sandstone bed.
Some (?) manganese staining on fractures.
Lower contact 15° to core axis.
Fractures/metre  6
Recovery  98%
EXPLORER 117 No.1

51.70 - 61.45m

**OXIDISED SANDSTONE.**

Yellow to pink fine sandstone.
Contains short lengths of siltstone up to 30cm. Contacts of these sometimes marked by broken core for 5 to 20cm. Good contacts at:
- 57.50m  45° to core axis
- 60.55m  15° to core axis
Numerous irregular siltstone fragments 1-10cm occur at intervals as in previous sandstone units.
Broken core at:
- 52.50m  5cm
- 53.50m  20cm
- 54.15m  10cm
- 55.15m  5cm
Fractures/metre 10
Recovery 98%

61.45 - 71.05m

**OXIDISED SILTSTONE.**

Pink to yellow fine sediment.
Cleavage weakly developed.
- 62.60m  35° to core axis
- 67.10m  35° to core axis
Contains short lengths of sandstone up to 30cm. Some are sub-parallel to core axis while contacts are marked by broken core for others. Also contains numerous irregular fragments of sandstone 2mm-5cm. Some resemble contorted beddings. Others are lensoid and aligned 30° to core axis.
Broken core at:
- 62.65m  5cm
- 65.10m  5cm
- 68.50m  20cm
- 71.00m  10cm
Fractures/metre 12
Recovery 93%
EXPLORER 117 DTM 1.

71.05 – 72.85m

**OXIDISED SANDSTONE.**

Fine grained, pink sandstone.
Contain few irregular siltstone fragments aligned 30° to 60° to core axis, more numerous towards lower contact.
Upper contact sharp, sub-parallel to core axis, lower contact appears gradational.

Fractures/metre 7
Recovery 85%

72.85 – 87.90m

**OXIDISED SILTSTONE.**

Yellow to pink fine sediment.
Contains few short lengths of sandstone.
Contact highly irregular. Numerous irregular fragments of sandstone 2mm to 10cm, in top 5m.
Some of these appear to be thin, contorted and disrupted sandstone beds 30° to 45° to core axis. Lower contact 15° to core axis.

Broken core at:-

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<td>86.00m</td>
<td>10cm</td>
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Fractures/metre 14
Recovery 72.85-79.00m 94%
79.00-85.00m 66%
85.00-87.90m 98%

87.90 – 89.75m

**OXIDISED SANDSTONE.**

Pink, fine-grained sandstone.
Contains one fragment of siltstone, irregular boundaries, 15° to core axis.
Lower contact irregular, sub-parallel to core axis.

Fractures/metre 7
Recovery 98%
EXPLORER 117 DDH 1

89.75 - 94.40m

OXIDISED SILTSTONE.

Pink, fine sediment.
Contains short lengths and irregular, small fragments of sandstone. Sandstone fragments more abundant in last metre.
Numerous lengths of broken core.

Fractures/metre 20
Recovery 86%

94.40 - 95.10m

OXIDISED SANDSTONE.

Pink, fine sandstone.
Contains irregular fragments of siltstone aligned 15° to core axis in last 30cm.
10cm broken core at 95.80m

Fractures/metre 10
Recovery 86%

96.10 - 113.50m

OXIDISED/SEMI-OXIDISED SILTSTONE.

Pink to green-grey fine sediment.
Lengths of sandstone 20cm-2m occur.
Few fragments of sandstone 2-3cm occur in siltstone. Contacts between sandstone and siltstone about 15° to core axis.
Numerous thin quartz veins 104-111m predominantly 60° to core axis, few 90° or sub-parallel to core axis.

Base of severe oxidation 110.60m
Two quartz-chlorite veins, 15cm and 25cm, occur in last 50cm. Both contain minor specular hematite.
Below base of oxidation, fractures are still frequently furruginised.

Fractures/metre 16
Recovery 96.10-106m 96%
106-112m 73%
(Broken core at 112m)
112-113.50m 95%
113.50 - 119.90m

**SANDSTONE.**

Grey, fine-grained sandstone containing few large, irregularly shaped fragments of siltstone 5-30cm. In lower 3m, siltstone is oxidised whereas sandstone largely is not. 25cm quartz-chlorite vein 65cm from top. Thin quartz veins in top 3m predominantly aligned 60° to core axis.

Fractures/metre 10  
Recovery 98%

119.90 - 120.65m

**SILTSTONE.**

Pink and grey fine sediment.  
(?) Bedding characterised by pink and grey alternation 5° to core axis. Finer grained size appears to be oxidised and coarser not.

Fractures/metre 8  
Recovery 98%

120.65 - 144.20m

**SEDIMENT BRECCIA.**

Fine chloritic matrix containing elongate, irregular fragments of siltstone, sandstone and chert, 0.5-10cm across. Fragments predominantly aligned 60° to core axis. Some highly irregular shaped fragments aligned sub-parallel to core axis. Cleavage developed for short lengths.

127m  50° to core axis  
130m  55° to core axis  
140m  45° to core axis  

Broken core at upper contact, 134.50m; 141m; 143.10.  
Hematite zones at 142.30 and 142.50m

Fractures/metre 9  
Recovery 120.6-123m 65%  
123-135m 98%  
135-141m 20%  
141-144.20m 98%
EXPLORER 117 DDH 1

144.20 - 149.70m

**CHLORITIC SKEAT**

Fine chloritic sediment with well developed cleavage 50°-60° to core axis.
Fractures/metre 10
Recovery 90%

149.70 - 150.80m

**CHLORITE-TALC**

Chlorite-talc rock showing a sediment breccia texture with chloritic fragments aligned at 60° to core axis in talc matrix.
Few magnetite nodules present, aligned parallel to the chloritic fragments
Fractures/metre 20
Recovery 65%

150.80 - 162.00m

**TALC-MAGNETITE LODE**

Varies from massive talc with bands of magnetite nodules aligned at 60° to core axis to short lengths of massive magnetite with minor talc blobs.
The lode as a whole, is about 50% magnetite. Over short lengths, magnetite content varies from 20% to 90%.
Vein of secondary lead or zinc minerals noted at 159m. Minute blebs of tarnished chalcopyrite noted within vein.
No other sulphides or gold noted.
Fractures/metre 10
Recovery 150.80-153m 87%%-)
153 - 159m 98%%
159 - 162m 60%% at contacts.

162.00 - 163.70m

**CHLORITE-TALC**

Chlorite-talc rock showing a breccia texture with chloritic fragments in a talc matrix.
Fragments are 1-3cm, angular and equidimensional.
No alignment of fragments. Contains about
EXPLORER 117 DDH 1

40cm of dark grey, massive chlorite rock cut by thin talc veins 30° to core axis.
Magnetite present as nodules about 1mm in diameter in talc matrix and as thin, irregular veinlets in chloritic section.
Lower contact consists of 1cm wide carbonate vein.

Fractures/metre 7
Recovery 97%

163.70 - 167.85

CHLORITIC SLATE

Fine-grained chloritic rock showing well developed cleavage

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<td>47° to core axis</td>
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<td>167.75m</td>
<td>44° to core axis</td>
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Some irregular talc veinlets occur.
A magnetite aggregate 5cm in diameter occurs at 164.40m.
The rock is talcose with angular blocks of chloritic rock in it at 165.20 to 165.40m.
Core is more broken from 165.40 to 167m.

Fractures/metre 20
Recovery 70%

167.85 - 168.70m

CHLORITE-TALC

Massive talc rock with few chloritic bands aligned at about 45° to core axis. Short lengths of massive chlorite rock and chlorite-talc breccia near bottom contact. Magnetite occurs sparsely as lines of nodules 2mm in diameter and aligned about 30° to 45° to core axis.
Core very broken for 20cm in from upper and lower contacts.
Recovery 70%
EXPLORER 117 DDH 1

168.70 - 171.70m

**TALC-MAGNETITE LODE.**
Massive talc with bands of magnetite nodules 2-4mm in diameter aligned 45° to 60° to core axis. Magnetite about 30% of unit. No gold or sulphides visible.
Fractures/metre 10
Recovery 83%

171.70 - 176.65m

**CHLORITE-TALC**
Chlorite talc rock showing breccia texture with elongate, angular chloritic fragments 0.5-1cm wide aligned 30° to 45° to core axis. Magnetite nodules 2-4mm quite common in top 2m and occur more sparsely in rest of unit. 20cm of chloritic slate at 174.35m.
Fractures/metre 7
Recovery 97%

176.65 - 178.40m

**CHLORITIC SLATE**
Fine grained chloritic rock. Cleavage near top of unit 40° to core axis and near bottom 50° to core axis.
Contains two short lengths of fine sandstone, contacts 50° and 60° to core axis respectively.
Fracture/metre 12
Recovery 98%

178.40 - 179.00m

**SEDIMENT BRECCIA.**
Clasts 0.5-10cm, light-grey, fine grained massive and bedded sediment in a fine, dark-grey chloritic matrix. Angular quartz, blebs may fill interstices between fragments. 2cm wide quartz vein at 178.65m 20° to core axis. Smaller quartz veins also present.

179.00 - 185.07m

**BEDDED SILTSTONE.**
Light-grey, fine-grained sediment showing excellent bedding.
10cm of sandstone at 183.20m contacts 30° to core axis.
Cleavage weakly developed.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bedding to Core axis</th>
<th>Cleavage to core axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>179.60m</td>
<td>27°</td>
<td>48°</td>
</tr>
<tr>
<td>179.80m</td>
<td>26°</td>
<td>48°</td>
</tr>
<tr>
<td>180m</td>
<td>25°</td>
<td></td>
</tr>
<tr>
<td>181m</td>
<td>30°</td>
<td>52°</td>
</tr>
<tr>
<td>182m</td>
<td>32°</td>
<td></td>
</tr>
<tr>
<td>183m</td>
<td>30°</td>
<td>55°</td>
</tr>
</tbody>
</table>

Bedding is disrupted
183.50-183.90m where a thin fine-grained sandstone bed is off set several times by micro-faults 60° to 70° to core axis. Some talc is present in this zone.
Few quartz veins 2mm wide _b_-parallel and perpendicular to bedding.
Fractures/metre 5
Recovery 98%

185.07 - 188.42m

FINE SANDSTONE

Light-grey, fine grained sandstone some of which is bedded and the remainder massive. Contains bedded siltstone as above 186.04 to 186.45m.
Below 187m is interbed with minor amount of siltstone.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bedding to Core Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>186m</td>
<td>26°</td>
</tr>
<tr>
<td>186.20m</td>
<td>25°</td>
</tr>
<tr>
<td>187.20m</td>
<td>19°</td>
</tr>
</tbody>
</table>

Below 187.20m bedding between sandstone and siltstone beds is disrupted by microfaults 60° to core axis. Some mutual intrusion of sandstone into siltstone and vice-versa has taken place along micro-faults in this area.
Fractures/metre 5
Recovery 98%
EXPLORER 117 DDH 1

188.42 - 192.60m

BEDDED SILTSTONE.
Light-grey, fine sediment showing good bedding. Short lengths of fine bedded sandstone. Possible graded bedding towards bottom of unit fining down-hole. Possible ripple marks at 189.50m, sharp apices pointing down-hole. 10cm lengths of sediment breccia at 191m. Angular siltstone fragments in sandy matrix. Irregular blebs of interstitial quartz.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bedding to Core Axis</th>
<th>Cleavage to Core Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>188.50m</td>
<td>18°</td>
<td>49°</td>
</tr>
<tr>
<td>189m</td>
<td>27°</td>
<td>51°</td>
</tr>
<tr>
<td>190m</td>
<td>22°</td>
<td>54°</td>
</tr>
<tr>
<td>190.50m</td>
<td>24°32°</td>
<td></td>
</tr>
<tr>
<td>192.50m</td>
<td>22°</td>
<td>54°</td>
</tr>
</tbody>
</table>

Fractures/metre 5
Recovery 98%

192.60m - 200m

FINE SANDSTONE.
Light-grey, fine grained sandstone with short lengths of siltstone. Bedding present occasionally in both lithologies. Frequently, contacts between the two lithologies are irregular and limonite-filled. Possible breaks in sedimentation. 10cm length of sediment breccia at 198.50m. Siltstone clasts in a chloritic matrix with irregular blebs of interstitial quartz 2-3mm. Clasts are 5-10mm.

Thin veins of granular pyrite at 195.85m

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bedding to Core Axis</th>
<th>Cleavage to Core Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>193.50m</td>
<td>15°</td>
<td>55°</td>
</tr>
<tr>
<td>195.20m</td>
<td>15°</td>
<td>60°</td>
</tr>
<tr>
<td>199.35m</td>
<td>21°</td>
<td>60°</td>
</tr>
</tbody>
</table>

Fractures/metre 5
Recovery 98%
EXPLORER 117 DDH 1

GREYWACKE.

Alternating coarse and fine-grained sandstone. Light-grey colour. Short lengths of siltstone. Excellent graded bedding fining down-hole at 209.30m. Contacts between lithologies frequently irregular and limonite filled as in previous unit.

Short lengths of sediment breccia at 202.50m and 207m.

Upper contact limonite-filled fracture 10° to core axis. Similar fractures occur at 201.30m 207.45m and 208m.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bedding to Core Axis</th>
<th>Cleavage to Core Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>201m</td>
<td>14°</td>
<td></td>
</tr>
<tr>
<td>207.50m</td>
<td>17°</td>
<td></td>
</tr>
<tr>
<td>209.30m</td>
<td>30°</td>
<td>65°</td>
</tr>
</tbody>
</table>

Fractures/metre 6
Recovery 98%

SEDIMENT BRECCIA.

Clasts 2-10cm, irregular surrounded composed of fine sandstone and jasper in a silty matrix which is partly chloritic.

Part of matrix displays good cleavage 56° to core axis.
Recovery 98%

COARSE DARK GREY SANDSTONE (GREYWACKE?

Predominantly coarse grained, dark grey sandstone. Few short lengths of finer grain-size.

Grades continuously to siltstone from 214.75 to 215.50m where there is a sharp but irregular contact about 5° to core axis with dark-grey, fine grained sandstone which makes up last 10cm. No bedding present.

Dark colour is due to presence of chlorite throughout the unit.
EXPLORER 117 DDH 1.

Epidote nodules 1-3mm in diameter occur throughout parts of the rock. Epidote veins 5-10cm wide occur at 212.55, 212.80, 213.30, 213.45 and 213.50m. Thinner epidote veins occur elsewhere in the rock. The thicker epidote veins frequently have thin quartz-magnetite veins on their borders. The thicker epidote veins are aligned 30°-40° to core axis. Thin quartz veins occur throughout and frequently contain minor chalcopyrite, granular pyrite and epidote. Major quartz veins, 9 & 18cm respectively occur at 210.45 and 213.65m. The first is barren of sulphides while the second contains granular pyrite.

Fractures/metre 6
Recovery 98%

215.60 - 216.05m

SEDIMENT BRECCIA.

Clasts are fine sandstone and range from very irregular shapes to sub-round. Matrix is siltstone. In first 10cm there appears to be quite intimate intermixing of sandstone and siltstone while in the centre of the unit sub-round clasts of sandstone occur in a siltstone matrix. Clasts in the last 10cm appear to be disrupted sandstone beds in a siltstone matrix and are aligned about 20° to core axis.

Recovery 98%

216.05 - 220.50m

BEDDED SILTSTONE.

Predominantly light-grey, fine grained sediment. Short lengths of fine grained sandstone.
EXPLORER 117 DDH 1.

Excellent bedding and cleavage throughout. Cleavage is dipping in opposite direction to bedding whereas previously it was dipping the same way.

Numerous examples graded bedding are present fining up-hole whereas graded bedding above was fining down-hole.

Bedding is frequently disrupted by micro-faulting.

Short length of broken core 217m.

Few irregular, limonite-filled contacts sub-parallel to bedding. These are probably minor breaks in sedimentation.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bedding to Core Axis</th>
<th>Cleavage to Core Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>216.25m</td>
<td>30°</td>
<td>60°</td>
</tr>
<tr>
<td>216.50m</td>
<td>35°</td>
<td>65°</td>
</tr>
<tr>
<td>217.25m</td>
<td>45°</td>
<td>50°</td>
</tr>
<tr>
<td>217.50m</td>
<td>33°</td>
<td></td>
</tr>
<tr>
<td>218.25m</td>
<td>26°</td>
<td></td>
</tr>
<tr>
<td>219.25m</td>
<td>18°</td>
<td>60°</td>
</tr>
<tr>
<td>220.25m</td>
<td>8°</td>
<td>60°</td>
</tr>
</tbody>
</table>

Fracture/metre 5
Recovery 98%

EOH 220.50m
JRR:alm
FIGURE 1

LAST HOPE MINE

WARREGO

19°24'00"

19°29'00"

ORLANDO

GECKO

E.L. 861

TENNANT CREEK

CENTRAL AUSTRALIA

TENNANT CREEK

GEOPEKO LTD.

LOCALITY PLAN OF E.L. 861

TF-1219

J.P. 20.8.73

Scale: 0 m

DATE: 20.5.1974

GEOLOGIST: M.C.L

DRAWN: F.W.T.

CHECKED
Fig. 5. - Vehicle Magnetometer Chart Record 5a (Repeat)
from 5300m E 1410m N to 5300m E 2340m N
referred to Great Western Regional Grid
horizontal scale 1 cm = 50m approx.
vertical scale 1 cm = 50m TESLAS
Fig. 6 - Vehicle Magnetometer Chart Record 5c
from 5200m E 2610m N to 5200m E 1410m N
referred to Great Western Regional Grid
horizontal scale 1 cm = 50m approx.
vertical scale 1 cm = 50n Teslas
Fig. 7 - Vehicle Magnetometer Chart Record 5d from 5110m E 1410m N to 5110m E 2590m N referred to Great Western Regional Grid horizontal scale 1 cm = 50m approx. vertical scale 1 cm = 50n Teslas
Fig. 8 - Vehicle Magnetometer Chart Record 7f - extended from 7950m E 1400m N to 7950m E 2220m N referred to Great Western Regional Grid horizontal scale 1 cm = 50m approx. vertical scale 1 cm = 50n Teslas
Fig. 9 - Vehicle Magnetometer Chart Record 7g  
from 8000m E 1400m N to 7990m E 2160m N  
referred to Great Western Regional Grid  
horizontal scale 1 cm = 50m approx.  
vertical scale 1cm = 50n Tesla
Fig. 10 - Vehicle Magnetometer Chart Record 9d
from 825m E, 1710m N to 625m E, 4030m N
referred to Great Western Regional Grid
horizontal scale 1 cm = 50m approx.
vertical scale 1 cm = 50m Tevelon
Fig. 11 - Vehicle Magnetometer Chart Record 9e from 8550m E 4590m N to 8570m E 3000m N referred to Great Western Regional Grid horizontal scale 1 cm = 50m approx. vertical scale 1 cm = 50m Teslas
Fig. 12 - Vehicle Magnetometer Chart Record 95
from 8650m E 4060m N to 8650m E 2250m N
referred to Great Western Regional Grid
horizontal scale 1 cm = 50m approx.
vertical scale 1 cm = 50n Talsas
Fig. 13 - Vehicle Magnetometer Chart Record 99
from 8750m E 3030m N to 8750m E 4330m N
referred to Great Western Regional Grid
horizontal scale 1 cm = 50m
vertical scale 1 cm = 50n Tesla