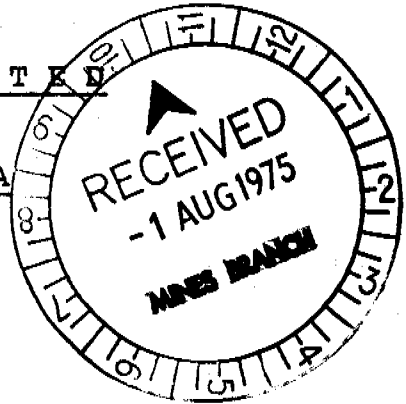


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CENTRAL AUSTRALIA



ANNUAL REPORT ON

EXPLORATION LICENCE NO. 632

Compiled

by

P.L. KITTO

TENNANT CREEK, N.T.

April, 1975.

OPEN FILE

ANNUAL REPORT ON EXPLORATION LICENCE NO. 632.

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East

1. INTRODUCTION

Exploration Licence No. 632 held by J. Weir was granted on 9th January, 1973 for a period of 12 months. It was renewed for a further twelve months period on the 9th January, 1974.

The Exploration Licence covers an area of 233 sq.kms (90 sq. miles) and whose north-east corner is situated approximately 372 kms on a true bearing of 268.5 degrees from Tennant Creek (see Fig.1).

Access to the Exploration Licence is via a bitumen road to the Warrego Mine of Peko Mines Limited, thence 14 kms in a westerly direction along a graded dirt road to the Wiso Bore, thence approximately 276 kms along a graded track which follows the Old Tanami Track to a point where the track runs in a south-westerly direction for approximately 106 kms to the northern boundary of the Exploration Licence. A 1000 m airstrip was constructed 25 kms north of the northern boundary of the Exploration Licence to service exploration parties in the area.

In November, 1973 Geopeko Limited commenced negotiations with Mr J. Weir on a proposed Option Agreement. The Agreement was lodged with the Mines Branch on 20th December, 1973 for approval under Section 38U and 75A of the Northern Territory Mining Ordinance. A part of the Agreement grants Geopeko Limited the option to purchase Exploration Licence No.632 at the expiration of the two (2) year option period. The two (2) year period to commence on receipt of the Administrator's approval. Approval was granted on 30th April, 1974.

This report outlines the exploration activities conducted on the Exploration Licence by Geopeko Limited on behalf of J. Weir for the 12 months ending 9th January, 1975.

Initial prospecting was carried out by Mr J. Weir during the first term of the Exploration Licence. The Goddard's Copper Prospect was discovered on one of Mr Weir's excursions to the Tanami East Area.

In July, 1973 Geopeko Limited were approached to determine whether they wished to participate in the exploration of the area. Field parties inspected Goddards Prospect and the adjacent area in July and September, 1973. Preliminary geological investigations were undertaken and the mineralised outcrop at Goddards was sampled. An aeromagnetic survey was conducted over a trial strip in the Tanami East area.

During the current term of the Exploration Licence several reconnaissance trips using a light aircraft were flown to determine the access to the area following an exceptional wet season. A field party attempted to reach the area in June, 1974 but were forced to return when one of the vehicles was destroyed by fire.

An access track was graded from the Wiso Bore to the northern boundary of the Exploration Licence in August, 1974. Geological reconnaissance of the area was carried out and the mineralised outcrop at Goddards was systematically sampled. A photographic interpretation using the RC10 Photography was undertaken.

Geosearch Pty Ltd., conducted a low level aeromagnetic survey over the Exploration Licence in November, 1974 on behalf of Geopeko Limited.

2. TENURE

One (1) Mineral Lease is located within Exploration Licence No. 632, the leasee is J. Weir.

<u>Number</u>	<u>Area</u>	<u>Name</u>	<u>Status</u>
ML12G	12 ha	Goddard's No.1	Granted

3. REGIONAL GEOLOGY

Geological mapping was accomplished by photogeological interpretation in conjunction with ground traversing. The RC10 photography with a nominal scale of 1:84,000 was used and the data was transferred subsequently to a base sheet prepared by Geospectrum Australia (see Fig.3).

A stratigraphic sub-division established for the Tanami East 1:250,000 geological sheet by Milligan and Nicholls, (1965) was adopted (see Table 1).

TABLE 1

		Alluvium
	Quaternary	Older Alluvium
CAINOZOIC		Laterite Gravels
		Laterite
	Tertiary	Travertine
	Devonian	Dulcie Sandstones
PALAEOZOIC		
	Lower Palaeozoic	Calcilutites, Dolomites
PRECAMBRIAN	Undifferentiated Metasediments	

Quaternary - Alluvium:

Recent alluvial deposits are restricted to creek tracts, playa lakes and saltpans. The alluvium consists of sand, silt, gravel and minor black soil. It generally displays a light tones photogeological character and occurs in flat lying areas or present-day topographic lows. These are devoid of vegetation or are only sparsely vegetated.

Quaternary - Older Alluvium:

Older alluvium occurs along the edges of present day, topographical lows but primarily represents past topographic lows and is interpreted as indicating palaeo-drainage courses. It consists of sand, alluvium, some laterite and chert gravel and sand-dunes. The older alluvium can be differentiated from the recent alluvium on vegetation distribution and pattern. It is characterised by heavy vegetation with arcuate growth patterns but where vegetation is less dense it displays a medium photo tone.

Quaternary - Laterite Gravels:

The laterite gravels have a restricted distribution. They encompass the Tertiary laterite caps and consist of ferruginous pisolitic gravel and sand. The lateritic gravels are moderately vegetated and have a medium to dark photo tone.

Tertiary - Laterite:

Laterite outcrops as caps in the older rocks. The cap consists of resistive ferricrete, this weathers to a distinctive scarp which forms the periphery to the outcrop.

Laterite surfaces have a dark photo tone and although normally well vegetated display a smooth photo texture.

Tertiary - Travertine:

Travertine or calcrete deposits have developed on the surfaces of the Lower Palaeozoic Calcareous sediments. Unless the development of the calcrete capping has been significant it has not been differentiated from the calcareous sediments on the accompanying geological plan (Fig,3). Outcrops of travertine occurring as small topographic rises situated in the central low areas of broad valleys have been observed in the area adjacent to the Exploration Licence.

Calcrete deposits on surfaces of calcareous sediments display a smooth photo texture and white to light grey photo tones. Outcrops of travertine elsewhere have a white to medium photo tone with a characteristic brain-like texture and have a distinctive "negative" photo relief.



Devonian - Dulcie Sandstone:

The Dulcie Sandstone is an argillaceous sandstone but varies to a tough quartzites. It does not outcrop within the Exploration Licence but large outcrops of the flat lying sandstone are situated approximately 7 kms east of the north-western corner of the Exploration Licence where they are observed in the form of prominent mesas.

Lower Palaeozoic - Calcareous Sediments:

This sequence of rocks include some quartzose units with calcilutite, pelletal dolomite and aphanitic dolomite, the latter of which is most abundant.

The sequence exhibit weathering features which are indicative of Karst topography. Solution channels are the most common feature although mass sumping and sinkholes are not uncommon.

The dolomite is dark grey, aphanitic and contains an occasional chert nodule. It exposed in various forms:

1. As flat hills with a calcrete capping of variable thickness and sides either heavily dissected by solution channels or covered by colluvium deposits.
2. As low rounded deeply eroded hills which often contains sinkholes.
3. Low rises with sub-outcrops of relatively unweathered limestone, the rises constitute part of a gently dip slope.

The low mesas and to a lesser extent the low rounded hills reach a maximum relief of approximately 40m but average 10-20m above the level of the plain. The Tertiary capping of calcrete and silcrete and the scree covered mesa slopes result in very little actual outcrop of the dolomite. The best exposures are observed on the low rises of sub-outcrop extending away from the mesa slopes.

Outcrops of the dolomite are generally massive to blocky and accurate dip readings are difficult to obtain. This can be attributed to a number of slumping features including hill creep, dis-orientation of flag-stone blocks by weathering

settling and possibly early sedimentary slumping. The tertiary mesa cappings are horizontal which leads to confusion in the interpretation of the regional dip, however, it has ascertained that the overall dip on the dolomite sequence is near horizontal.

The dolomite sequence is of probable Cambrian age and unconformably overlies ?Precambrian metasediments in the south western quadrant of the Exploration Licence and in turn are unconformably overlain by the Devonian Dulci sandstone to the east of the Exploration Licence.

The calcareous sediments have a very light to light photo tone and display a typical dendritic solution channel texture.

?Precambrian - Undifferentiated:

Outcrops of ?Precambrian rocks have been observed in the south-west quadrant of the Exploration Licence. The sequence consists of crystalline dolomite containing chert concentrations and possibly stromatolites, black micaceous metaquartzites and minor quartz-mica schist. They strike north-west and are steeply dipping. There is no resemblance between these rocks and those of the Arunta complex but the quartzites are not dissimilar to those observed in the Granites - Tanami area and although no carbonates have been recognised in the Tanami sequence they could well exist. (Williams 1973) The sequence in Granite-Tanami Area has been correlated with the Halls Creek Metamorphics of the Billiluna 1:250,000 Sheet. (Simpson 1971).

The ?Precambrian sediments have a light phototone and display a diagnostic wavy trend line texture.

Several prominent photo linears lie within the Exploration Licence but are more prevalent in the adjacent areas. The photo linears have a strong northerly to north-westerly component and interpretation indicates little post-Cambrian movement associated with the linears. It is possible that the linears may represent post-Cambrian structures but it is more probable that they represent basement structures reflecting through the then Cambrian cover either by minor later movement or by draping of the dolomites over basement ridges.

4. REGIONAL GEOPHYSICS

A low level aeromagnetic survey was conducted over the Exploration Licence by Geosearch Pty Ltd.

A study of the aeromagnetic results (see Fig.4) indicates a line of low order magnetic highs transecting the Exploration Licence from the north-west corner to the south-east corner. An obvious contrast exists between the magnetic character west of zone defined by the magnetic gradient situated on the eastern boundary of the Exploration Licence and the magnetic character of the area to the east which is more intense and complex. The area of diversified character falls outside the Exploration Licence and the magnetic character of the area to the east which is more intense and complex. The area of diversified character falls outside the Exploration Licence. No anomalies that can be attributed to discrete ironstone bodies are apparant.

The excercise of comparing the aeromagnetics with the photogeological interpretation has yet to be undertaken. Further relationships between the geology and the magnetic character may result, however the magnetic character most likely reflects the ?Lower Proterozoic rocks underlying the Cambrian dolomites and little will be gained from the comparison. A number of linear features in the magnetics have been observed and these may be related to the photolinears and the comparison with the photo-mapping may confirm this.

## 5. PROSPECT EVALUATION

### 5.1 GODDARD'S PROSPECT

#### 5.1.1 Location and Access

Goddard's Prospect is situated approximately at the intersection of latitude  $19^{\circ} 43' 12''$  with longitude  $130^{\circ} 35' 24''$  (666720 E; 7818750 N A.M.G.)

Access is via a bitumen road to Warrego Mine thence approximately 280 kms along a graded track which follows the Old Tanami Track to a point where the track runs in a south-westerly direction for approximately 106 kms to the prospect.

#### 5.1.2 Tenure

One (1) mineral lease is situated on Goddard's Prospect, the leasee is J. Weir.

<u>Number</u>	<u>Area</u>	<u>Name</u>	<u>Status</u>
ML12G	12 ha	Goddard's No.1	Granted

#### 5.1.3 Grid Survey

A reconnaissance traverse was surveyed in over the mineralised outcrop using the vehicle odometer and a prismatic compass, stations were marked off every 100m by means of flagging tape.

#### 5.1.4 Geology

The copper mineralisation at the Goddard's Prospect consists of flecks, veinlets and fracture coatings of malachite in a bedded limestone / dolomite which has lens or horizons of very vugy colloidal chert. The mineralised dolomite outcrops as a low platform (2-3m above the plain level) extending out from a flat top hill whose slopes are heavily dissected by solution channels. The hill is capped with silcrete and calcrete (see Fig.5).

The malachite mineralisation occurs only within the unweathered dolomite core of the platform, the width of which varies from 10m to 150cm. The dolomite outcrops as massive flagstone like blocks which are often disorientated. This phenomena may have brought about by weathering settling or by

early sedimentary slumping. The overall dip of the dolomite sequence is near horizontal.

Extending away from the core is an area of sub-outcrop of dolomite in which the dolomite is substantially masked by a silcrete / calcrete capping. There is no evidence of copper mineralisation in the dolomite sub-outcrop.

Surrounding the hill and platform is a belt of recent alluvium consisting of coarse calcareous sand and colluvium, this grades into the older alluvium in which the particle size of the sand is considerably finer. The development of older alluvium is characterised by the increase in the amount of vegetation.

#### 5.1.5 Geochemistry

Selected samples submitted by Mr J. Weir in July, 1973 were analysed and gave copper values ranging from 0.16% Cu to 1.10% Cu (see Appendix 1a).

Selected samples collected by Mr W. Maehl on inspection of the mineralised outcrop were assayed and gave copper values ranging from 0.03% Cu to 0.47% Cu (see Appendix 1b).

The malachite occurrence was systematically sampled using a vehicle odometer and compass traverse. The outcrop was chip sampled for 100m either side of the traverse and sampling stations were at 100m intervals. The results are appended (see Appendix 2). The copper values varied from 0.009% Cu (90 ppm) to 0.11% Cu and the average was 0.026% Cu (258 ppm).

#### 5.1.6 Results

The rock chip samples show a geochemically significant concentration of copper, however the mineralisation is secondary and could be the result of supergene enrichment. The grades may increase with depth and change into primary sulphide mineralisation. This would be the minimum requirement if a viable copper deposit was to eventuate from the prospect.

The Cambrian dolomite sequence may only be tens of metres thick at this location, which would considerably limit the depth potential.

The observed mineralisation could be the result of secondary remobilisation from a copper source in the underlying basement.

Either alternate is encouraging and the prospect has been scheduled for exploratory drilling to test the depth potential of the mineralisation.

6. EXPENDITURE

The total expenditure incurred on Exploration Licence No.632 for the twelve (12) months ending 9th January, 1975 was \$9,938.00.

Details of the expenditure is as follows:-

Field surveying and Drafting	\$	2,411.00
Leasing	\$	1,552.00
Geological Services	\$	803.00
Geophysical Services	\$	1,754.00
Field Supplies - Direct	\$	1,404.00
Unallocated Field Expenses	\$	1,038.00
Administration Costs	\$	976.00
		<hr/>
TOTAL	\$	9,938.00
		<hr/>

The dissection of the expenditure was determined as follows:

- (a) The various sub-divisions are costed directly, the exception being unallocated Field Expenses and Administration Costs.
- (b) Administration Costs are proportioned on the basis of the payroll costs for the projects to the total payroll.
- (c) Unallocated Field Expenses consist of the following field overheads which are spread on the same basis as the Administration Costs.

Field Messing  
 Vehicle Operating  
 Field Supplies  
 Depreciation - Field Plant.

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Report - Geopeko Limited



APPENDIX 1a

GEOCHEMICAL RESULTS - Goddard's Prospect Sampler - J. Weir

	Au g/mt	% Cu	% Bi	% Pb	% Zn	Ag g/mt	% Co
F12107	<0.01	0.16	0.01	<0.01	<0.01	3	0.01
F12108	0.1	0.33	0.01	<0.01	<0.01	<1	0.01
F12109	<0.01	0.41	0.01	<0.01	<0.01	3	0.01
F12110	0.1	1.10	0.02	<0.01	<0.01	3	0.01
F12111	0.1	1.10	0.02	<0.01	<0.01	3	0.01

APPENDIX 1b

GEOCHEMICAL RESULTS - Goddard's Prospect Sampler - W. Maehl

	% Cu	% Bi	% Pb	% Zn	Ag g/mt
F12401	0.03	0.01	-	-	<1
F12402	0.47	0.01	-	-	<1
F12403	0.47	0.01	-	-	<1
F12404	0.05	0.01	0.01	0.01	<1

APPENDIX 2

GEOCHEMICAL RESULTS - Goddard's Prospect Sampler

Sampler - P. Kitto

Station	Cu	Pb	Zn	As	Ag	W	Bi	Mo	Mg	Al	Hg
A	100	8	12	<2	4	<10	<4	<10	4.50	0.72	<50
B	100	8	12	4	<4	<10	<4	<10	5.70	0.44	50
C	90	8	15	4	<4	<10	4	<10	4.60	0.51	50
D	70	5	12	2	<4	<10	4	<10	7.25	0.18	50
E	340	5	10	3	<4	<10	<4	<10	7.00	0.26	50
F	120	5	10	<2	<4	<10	<4	<10	6.45	0.31	<50
G	330	8	15	2	<4	<10	<4	<10	6.80	0.28	<50
H	1100	5	10	<2	<4	<10	<4	<10	5.85	0.22	<50
I	340	5	10	2	6	<10	<4	<10	4.70	0.31	50
J	80	5	10	<2	<4	<10	<4	<10	0.45	0.33	<50
K	390	8	10	<2	<4	<10	<4	<10	7.70	0.22	150
L	240	12	12	2	<4	<10	<4	<10	4.60	0.33	50
M	160	5	12	<2	<4	<10	<4	<10	6.20	0.14	100
N	520	5	10	<2	8	<10	<4	<10	5.00	0.35	<50
O	80	15	18	2	<4	<10	<4	<10	4.70	0.36	50
P	70	10	18	<2	<4	<10	<4	<10	5.25	0.39	100

Note: Stations Q - W inclusive were not sampled.

Cu, Pb, Zn, As, Ag, W, Bi and Mo are expressed in ppm.

Mg and Al are expressed in percent.

Hg is expressed in ppb.




FIG. 1.  
Scale 1:1 000 000



FIG. 2.  
Scale 1:250 000

- LEGEND**
- Major road
  - - - Graded track
  - ⊖ Floodout
  - ⊖ Sandhills
  - //// Area relinquished from EL
  - ~ Rivers, creeks
  - Claypan
  - - - Reserve boundary
  - EL
  - ⊖ A.L.S. Authorised landing area

UPDATED / AMENDED	
Date / Geologist	Date / Geologist

  
 DATE: 19 3 75  
 GEOLOGIST: P.L.K.  
 DRAWN: [Signature]  
 CHECKED: [Signature]

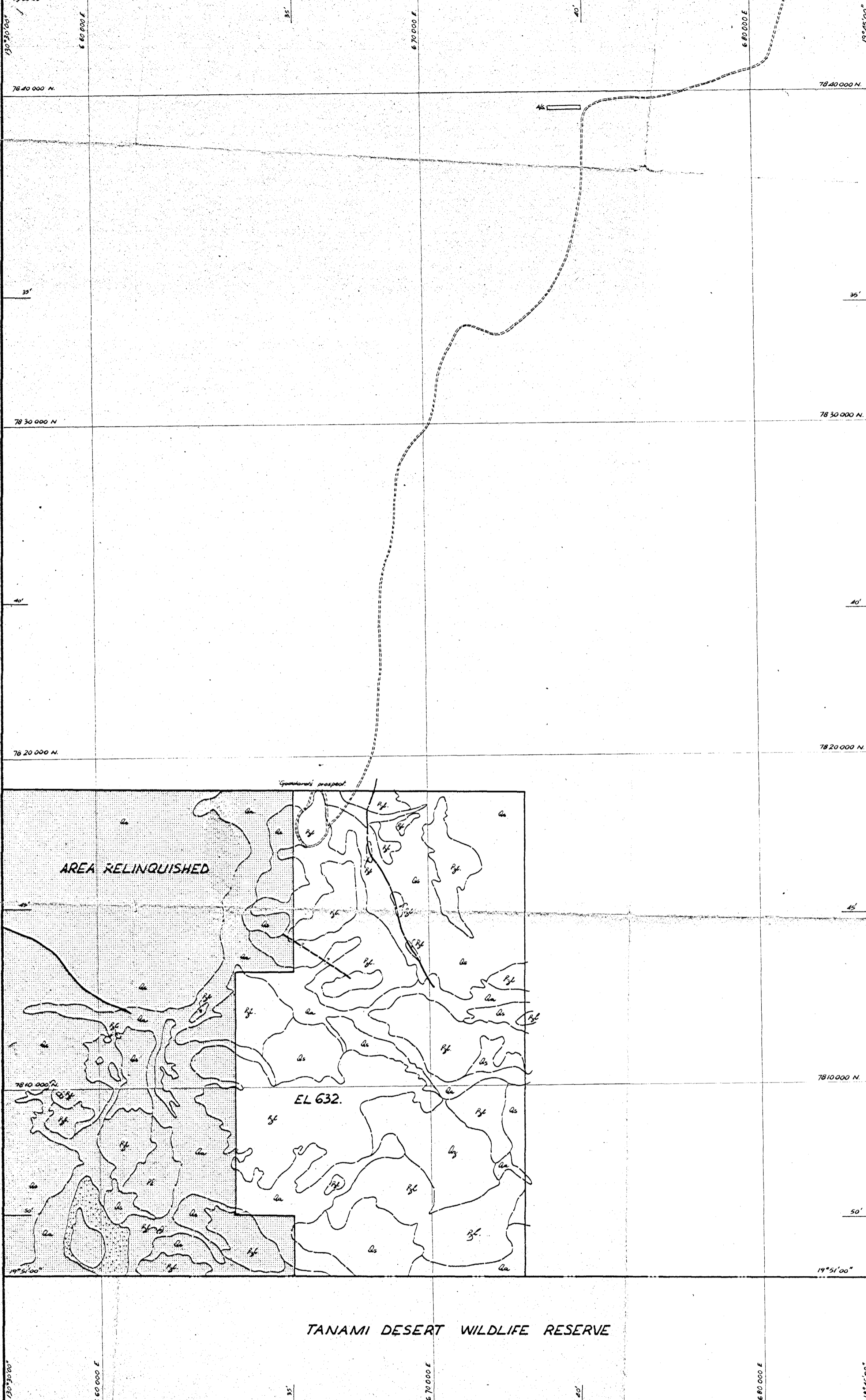
GEOPEKO LTD.  
CENTRAL AUSTRALIA TENNANT CREEK

4

0 metres Scale: AS SHOWN No TF 1521

**TANAMI EAST AREA PROJECT**

Fig. 1. Locality plan of Exploration Licence  
Fig. 2. Location plan of prospects within EL632



**LEGEND.**

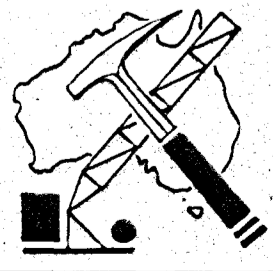
- |             |     |   |
|-------------|-----|---|
| CAINOZOIC   | a   | Sand, silt, gravel  |
|             | as  | Sand some laterite and chert gravel   |
|             | ag  | Laterite gravel, pisolite   |
| TERTIARY    | Tc  | Laterite, pisolite, concretion, ferruginous   |
|             | Tt  | Travertine, Chalcedony  |
| PALAEOZOIC  | Dud | Argillaceous sandstone  |
|             | Pgl | Quartzose, calcilutite, pelletal dolomite, apatitic dolomite, Silstone/calcrete capping |
| PRECAMBRIAN | Pf  | Quartzite, lithic sandstone, quartz, sericite schist, vein quartz                       |
- 
- Geological boundary
  - Fault
  - ?--- " , inferred concealed.
  - - - Sand dunes or hills
  - Lake
  - ⊖ Clay pan
  - - - - Vehicle track (approx)
  - ▭ ALA Authorized landing area.
  - ⋯ Reserve boundary
  - EL " "

Planimetric Base Sheet prepared by GEOSPECTRUM - AUST, from TANAMI EAST RC10 photography. Control supplied by the DIVISION OF NATIONAL MAPPING

GRID - 10000 metre grid  
 Transverse Mercator Grid (A.M.G.)  
 ZONE 6.

TANAMI DESERT WILDLIFE RESERVE

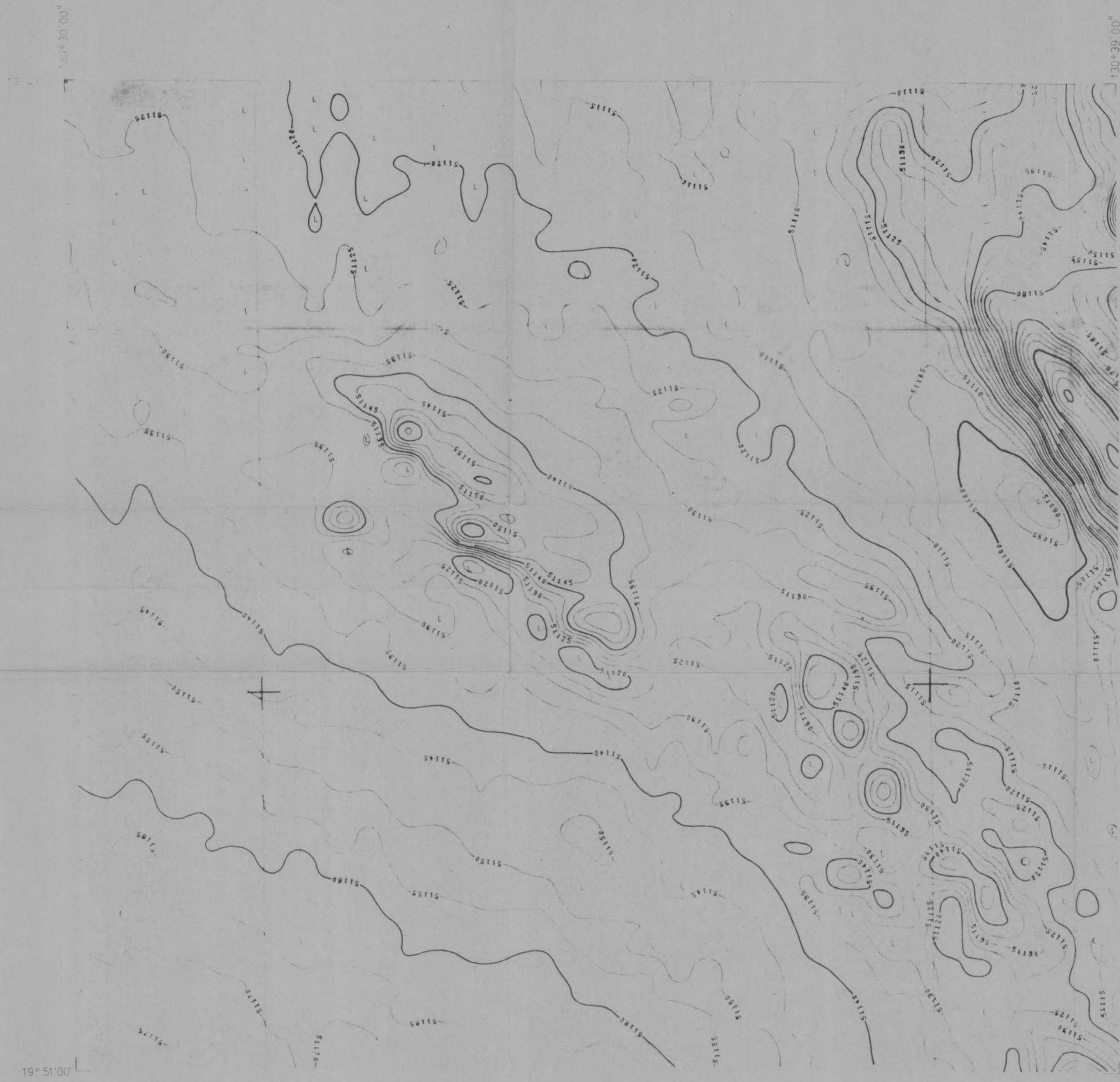
UPDATED / AMENDED	DATE / GEOLOGIST	DATE / GEOLOGIST



DATE. 20.3.75  
 GEOLOGIST. P.L.K.  
 DRAWN. J.D.S.  
 CHECKED. R.



GEOPEKO LTD  
 CENTRAL AUSTRALIA TENNANT CREEK  
 No TF 1516

**TANAMI EAST AREA PROJECT**  
**EL 632**  
**PHOTOGEOLOGICAL MAP.**



19° 51' 00"


75/112


GEOPEKO LTD. CENTRAL AUSTRALIA TENNANT CREEK 2			
Scale 1:50,000			
DATE 25.7.75	TOTAL MAGNETIC INTENSITY CONTOURS		
GEOLOGIST P.L.M.	EL 632		
DRAWN C.P.M.			
CHECKED			

**LEGEND.**

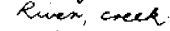
 Recent Alluvium and sand

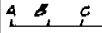


 Older Alluvium and sand

 Sub-outcrop Limestone

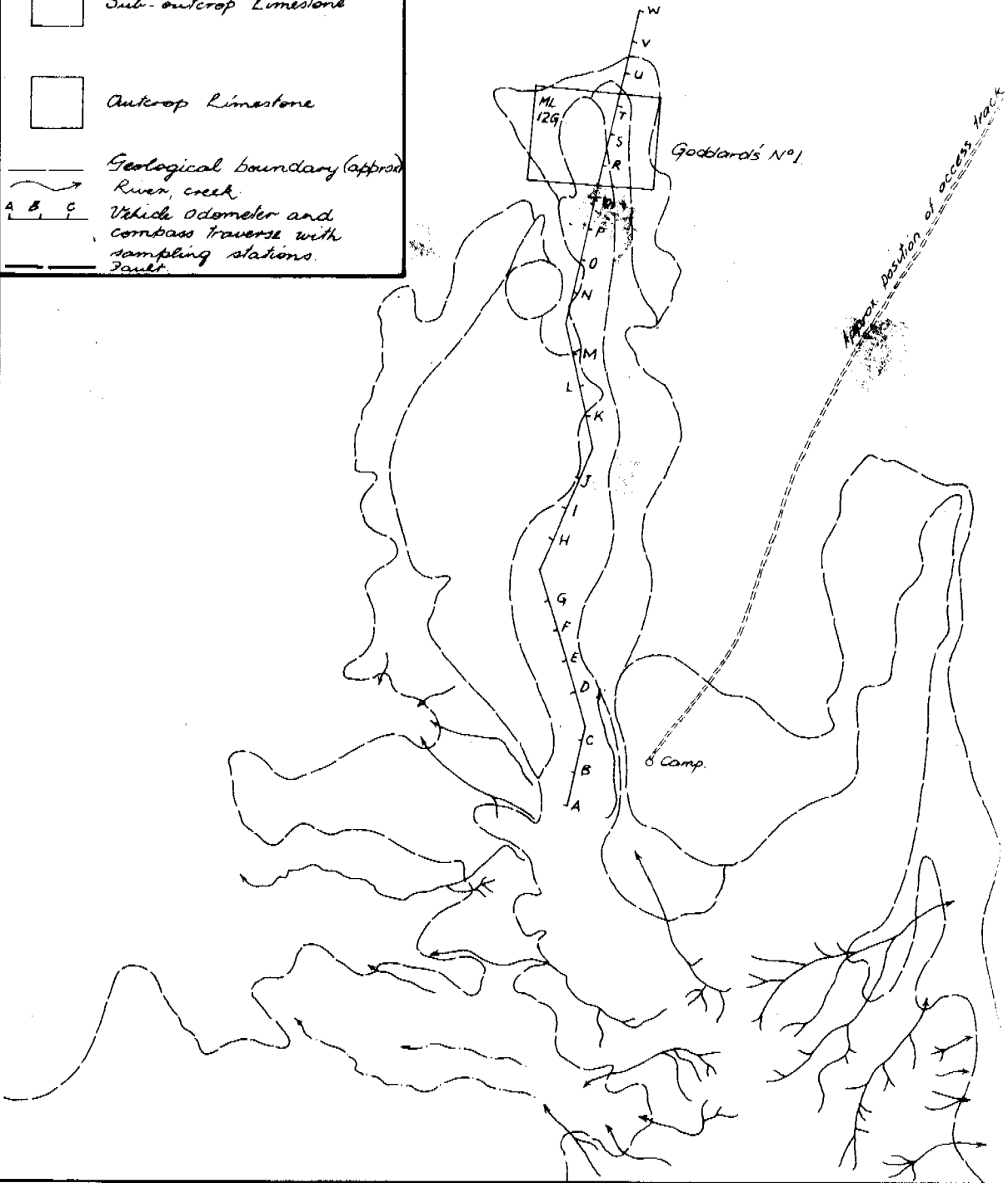
 Outcrop Limestone



 Geological boundary (approx)

 River, creek

 Vehicle Odometer and  
 compass traverse with  
 sampling stations.

 Fault



<p>AMENDED Date / Geologist</p>	<p>GEOPEKO LTD. CENTRAL AUSTRALIA TENNANT CREEK</p>		
	<p>Scale: 1:20 000 (Approx.)</p>		
	<p>DATE: 20.3.75</p>	<p>TANAMI EAST AREA PROJECT. GEOLOGICAL SKETCH MAP OF GODDARD'S PROSPECT - TANAMI EAST</p>	
	<p>GEOLOGIST <i>PLK.</i></p>		<p>Fig 5 TF 8</p>
	<p>DRAWN <i>[Signature]</i></p>		
	<p>CHECKED <i>[Signature]</i></p>		