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GEOLOGICAL LIBRARY

REPORT ON EXPLORATION WORK

CARRIED OUT ON EL 996,

ALICE SPRINGS AREA, N.T.

IN THE PERIOD FROM

7TH JULY 1974 TO 6TH JULY 1975

BY

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JULY, 1975

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S U M M A R Y

Work carried out on EL 996 during the term formed part of a major exploration programme in the Alice Springs area

The initial phase of the programme involved setting up a regional grid system as a basis for further work. Within EL 996, 96km of grid lines were established.

A regional Track-Etch survey was carried out in the area, 77 cups being placed on 1km spacing. Results of the survey were not encouraging.

A shallow vacuum drilling programme, to obtain geological and radiometric information, was carried out in the western part of the EL, with holes at 250 to 500m intervals on lines spaced 1km apart. A total of 669.5m was drilled in 113 holes. Results have defined the position of a regionally developed reduced zone within the otherwise oxidized Undandita sandstone.

A regional airborne spectrometer survey extending over 160 line km was carried out over part of the EL. The more encouraging airborne results were checked on the ground by follow-up carborne and footborne scintillometer surveys but little of interest was found.

As yet no concentrations of uranium mineralization similar to those found on EL 845 which adjoins EL 996 on the west have been discovered. However, further investigations are planned as an extension of the work done to date.

STATEMENT OF EXPENDITURE - 7TH JULY 1974 TO 6TH JULY 1975

Salaries and Wages	\$2,589.22
Drilling Contractor	2,307.34
Field operating costs, including consumables, rents, vehicle operating and repairs, freight, airfares etc., depreciation of vehicles and geophysical instruments, consultants fees, management and distribution of Head Office costs	<u>11,087.44</u>
Total	<u><u>\$15,984.00</u></u>

INTRODUCTION

EL 996 lies to the south-east of Alice Springs, near the northern margin of the Amadeus Basin, Northern Territory. The area is immediately east of EL 845, also held by the Company. (See Map 1).

The investigations were designed to extend knowledge of geology and mineralization controls to the east from EL 845 and to locate any surface expressions of uranium mineralization, with the object of defining targets for sub-surface testing by drilling.

GENERAL INFORMATION

TOPOGRAPHY, VEGETATION, CLIMATE

To the north of the area lie the E-W ridges of the MacDonnell Ranges, which are cut by the south flowing Todd River at Heavitree Gap. In this area the Ranges are, on average, 760m above sea level and rise approximately 215m above the flat terrain to the south in which the EL is located.

The main drainage, an extension of Roe Creek, flows from west to east along the northern margin of the EL. This joins, further east, with the Todd River.

Vegetation consists largely of scrub, mostly acacia and salt bush, with spinifex on the ridges. The density of the vegetation, especially herbs and flowers, is dependent on rainfall but is generally sparse. After the heavy rains of 1973/74 scrub density was much greater than usual and presented many difficulties in cross-country work.

In the south of the EL longitudinal sand dunes, trending roughly N-S, are common.

PREVIOUS UAL ACTIVITIES

The northern margin of the Amadeus Basin was incorporated in a general reconnaissance of Central Australia in 1972. From a geological point of view the Pertnjara Group provided a likely host rock for accumulation of uranium, and in this respect the relationship of the relatively porous mollasse sediments of this group to the nearby Arunta basement rocks was considered important.

Encouraging results from exploration on the adjoining EL 845 in 1973 led to the acquisition of EL 996 in 1974.

GENERAL GEOLOGY

The area is underlain by rocks of the Brewer Conglomerate, the upper formation of the Pertnjara Group. The rocks are of Upper Devonian to Lower Carboniferous age.

They were laid down during the Alice Springs Orogeny in an environment of interlocking alluvial fans and braided channel systems, the source of the sediment being in the orogenic centre to the north.

The Brewer Conglomerate has been divided into a lower massive conglomerate member and an upper conglomeratic sandstone unit, referred to as the Undandita Member.

Both of these units occupy the broad Missionary Syncline, the axis of which trends E-W between the MacDonnell Ranges in the north and the Waterhouse Range in the south. The lower massive conglomerate member which outcrops in a fairly narrow strip along the northern flank of the structure wedges out in depth and is not represented on the southern limb of the syncline.

The northern margin of the syncline is the MacDonnell Range monocline occupied by Proterozoic and Palaeozoic sediments of the Amadeus Basin. The southern margin of the syncline is the anticlinal Waterhouse Range in which the lower sedimentary units of the Amadeus Basin are again exposed.

The maximum thickness of the Brewer and Undandita members is probably of the order of 3000m at the axial position of the syncline.

In the Tertiary, a series of fluviatile and lacustrine sediments were laid down in the area, deposition being interrupted by a period of laterisation.

Present soil cover in the area is thought to be essentially alluvial and of Quaternary age.

PROSPECTIVE TARGETS

Work on EL 845 in 1973 defined the Undandita Member as the host rock of uranium mineralization in the area.

Mineralization was found to be closely associated with the margins of a reduced zone in the generally oxidized sandstone. This reduced zone extended into EL 996 and this became the main target for further work. Emphasis was placed on the surface expression of the marginal areas of the zone.

INVESTIGATIONS AND RESULTS

PROGRAMME

Operations in 1974/75 were carried out from a base in Alice Springs as part of a regional exploration programme in the area.

Work on EL 996 commenced in 1974 with the setting up of a regional grid to serve as control in an auger drilling programme and a broad-scale Track-Etch survey. These phases of the programme were followed up by an airborne radiometric survey from Alice Springs airport, covering approximately half of the EL. Later, carborne and footborne scintillometer surveys were carried out in areas of interest. Vacuum drilling for additional geological and radiometric information was extended on to the western part of the area from EL 845.

Personnel engaged in this programme comprised the project geologist, field supervisor, 3 geologists, contract driller, cook and one to three field assistants as required in the various phases of the work. Another driller and offsider employed by the Company, mainly on EL 845, did occasional survey work on EL 996.

CONTRACTORS

Vacuum drilling contractors in 1974 were Drilling and Prospecting Services Pty. Ltd. of Midland, W.A. who provided a tractor-mounted rig and an operator. In 1975 the same equipment was taken over by Vacuum Drilling Specialists of Kalamunda, W.A.

Track improvement was contracted to a local operator who used a D4 bulldozer.

Terradex, a division of the General Electric Company, based in California, market the Track-Etch survey technique and did the processing of the films and presentation of the results.

Jayrow Helicopters of Melbourne supplied a Bell 47J Alpine helicopter.

Chemical assaying was done by Associated Laboratories of Australia Pty. Ltd., Labtech Pty. Ltd., Amdel and the Australian Atomic Energy Commission.

INSTRUMENTS

A Scintrex GAM-2 spectrometer was used for airborne and carborne radiometric surveys.

Three Saphymo SRAT scintillometers were used extensively in both carborne and footborne work. Two McPhar TV5 spectrometers were also used occasionally in the footborne work.

GRIDDING

Prior to all other activities, a regional grid was set up to provide accurate control of surveys.

All lines were surveyed by topofil and compass. The closing error averaged 50m in either co-ordinate direction over 10km of line. This error did not seem to increase with further line length so that it was possible to set up frameworks for large areas of grid, accurately, by this method.

Within EL 996, a total of 96km of grid lines was established in this way, the lateral extension of the grid being from OE to 8000E (8km).

All lines were marked with pegs at 1km intervals and with coloured flagging in between. Co-ordinates were marked on the pegs and also on metal permatags. In the latter part of 1974 grids were improved by the addition of metal pegs on base-lines and tie lines with stout, electric etched metal tags.

A topographic map at 1:20,000 scale with contour intervals of 10m was compiled from Government aerial photography.

AUGER DRILLING

An auger drilling programme was preliminary to the regional Track-Etch survey in the area. The drilling was done by post-hole digger mounted on the tray of a Toyota long wheelbase vehicle.

Holes were drilled to a depth of 1m, with a scintillometer reading being recorded and a sample for assay being taken from each hole. The holes were cased with 10cm plastic casing and sealed with a plastic bag preparatory to the Track-Etch survey. Hole spacing was 1km on 1km spaced lines and a total of 100 holes was drilled.

Due to the broad spacing, the results of the scintillometer survey show only regional trends and indicate areas where outcrop is close to the surface. No strong anomalies were picked up in the area.

TRACK-ETCH SURVEY

The Track-Etch survey is a method whereby concentrations of radon gas in the soil or weathered rock horizons can be measured. Radon is a mobile daughter product of uranium and, since its half-life time is short (3.8 days), its presence would indicate a uranium source close by, i.e. below. Thus, the method can be used to detect uranium material which has no surface radiometric expression and which is overlain by material through which radon gas could percolate.

The method involves placing plastic cups which contain radon sensitive film at the bottom of holes 1m deep for a period of about 5 weeks. The film is sensitive to alpha radiation from the radon gas. This has the effect of marking tracks for each emanation on the film. The films are processed by etching the tracks which can then be counted, hence the name Track-Etch.

The regional survey in EL 996 employed 77 cups which were placed in holes 1m deep located at 1km centres on the grid system. Cups were left in position for a period of 2 months.

Results were generally low, with no concentrations of high readings. Only two higher readings were obtained, one to the north in basement derived recent alluvium and one at 4000E/4000N. Neither showed good correlation with the results of other survey methods, except that the 4000E/4000N anomaly was close to some airborne spectrometer kicks. A slight Track-Etch rise at 2000E/5000N corresponds with weak vacuum hole radiometric response. See Map 5.

VACUUM DRILLING

In the vacuum drilling programme which had been carried out previously in EL 845, it was established that, within the generally oxidized Undandita Member, there was a zone of reduced sediments identifiable by a change in colour from a typical reddish-brown to a light greenish-grey sandstone. It was also found that the margin of this reduced zone was a locus for uranium occurrence with significant concentrations of mineralization in two localities within EL 845.

In both EL 845 and 996, normal geological mapping is handicapped by the general lack of outcrop, but delineation of the reduced zone was aided to some extent by colour changes which were apparent on high quality colour air photographs of the area. From an interpretation of the aerial photography, it was evident that the reduced zone extended eastwards beyond EL 845 into EL 996 and, as vacuum drilling had proved effective in tracing the colour change, it was decided to use this method in establishing the position on the reduced zone within EL 996.

The vacuum rig is tractor-mounted, giving good mobility in the scrub. A geologist and a field assistant are always present so that a continuous record of information from each hole is kept. Material being brought to the surface falls into a

clear plastic container, is described every ½m and a reading taken with a scintillometer. A sample is taken from the bottom of each hole and from any interesting zones intersected. Interesting holes are logged with a McPhar TV5 downhole gamma probe after being cased with plastic casing.

In the programme carried out on EL 996, holes were spaced at 250 to 500m intervals on lines 1km apart. The average depth of hole was about 6m. 113 holes were drilled, giving a total of 669.5m. 91 samples were taken and assayed for U₃O₈.

Results of this drilling disclose that the reduced zone terminates about 4km east of the western boundary of EL 996, this termination being the eastern side of a north-trending tongue of reduced sandstone. See Maps 3 and 4.

The radiometric results showed a fairly low general background with only one slightly anomalous hole at 1000E/2750N.

Assay results from samples were also low (see Maps 3 and 4). Neither of these techniques showed good correlation with the surface expression of the reduced zone margin.

Due to the N-S arrangement of the grid lines and the trend of the reduced zone margin, comprehensive coverage of that feature was not obtained. Further drilling in the coming term will remedy this.

AIRBORNE RADIOMETRIC SURVEY

Two survey flights totalling about 160 line km were made in a Bell 47J Alpine 2a helicopter at a height of between 30 and 50m. A GAM-2 spectrometer was used with settings as follows : time constant 0.5 sec, chart speed 5mm/sec, broadband 1K and other channels 30.

The GAM-2 and sensor were both set up in the cabin of the helicopter. While the geologist navigated using air photographs, a second geologist or field assistant was able to read

the instrument and mark the chart where necessary. "Kicks" were called out at the time of recording for accurate plotting of anomaly locations. The air photographs used were at a scale of 1:41,666 and the flight lines and recorded anomalies have been plotted on maps at the same scale.

When tested over known anomalies, rises on U, K and broadband channels were registered by the instrument. However, during the survey few kicks on the U channel were detected on the other channels, rendering the results slightly suspect. Many of these kicks, however, were repeated or followed obvious trends. As a general guide it seemed that broadband response was slight and erratic and not a good indicator where the anomalous zone was small or not very strong.

A large number of these U channel kicks were recorded in the area, two also showing broadband response (see Map 2). All of these were followed up by ground survey.

CARBORNE RADIOMETRIC SURVEY

Carborne scintillometer surveys were carried out to check airborne results on the ground. Scintillometers were used on the floors of vehicles and average readings taken every 10m. The surveying was done using air photograph control. Any areas of interest were followed up on foot.

FOOTBORNE RADIOMETRIC SURVEY

This was carried out on areas of interest, occasionally gridded but usually in an uncontrolled manner. Scintillometers were held at waist height and set at '150cps slow.' Few anomalies were repeated on the ground and those that were confirmed were too weak to be of significance.

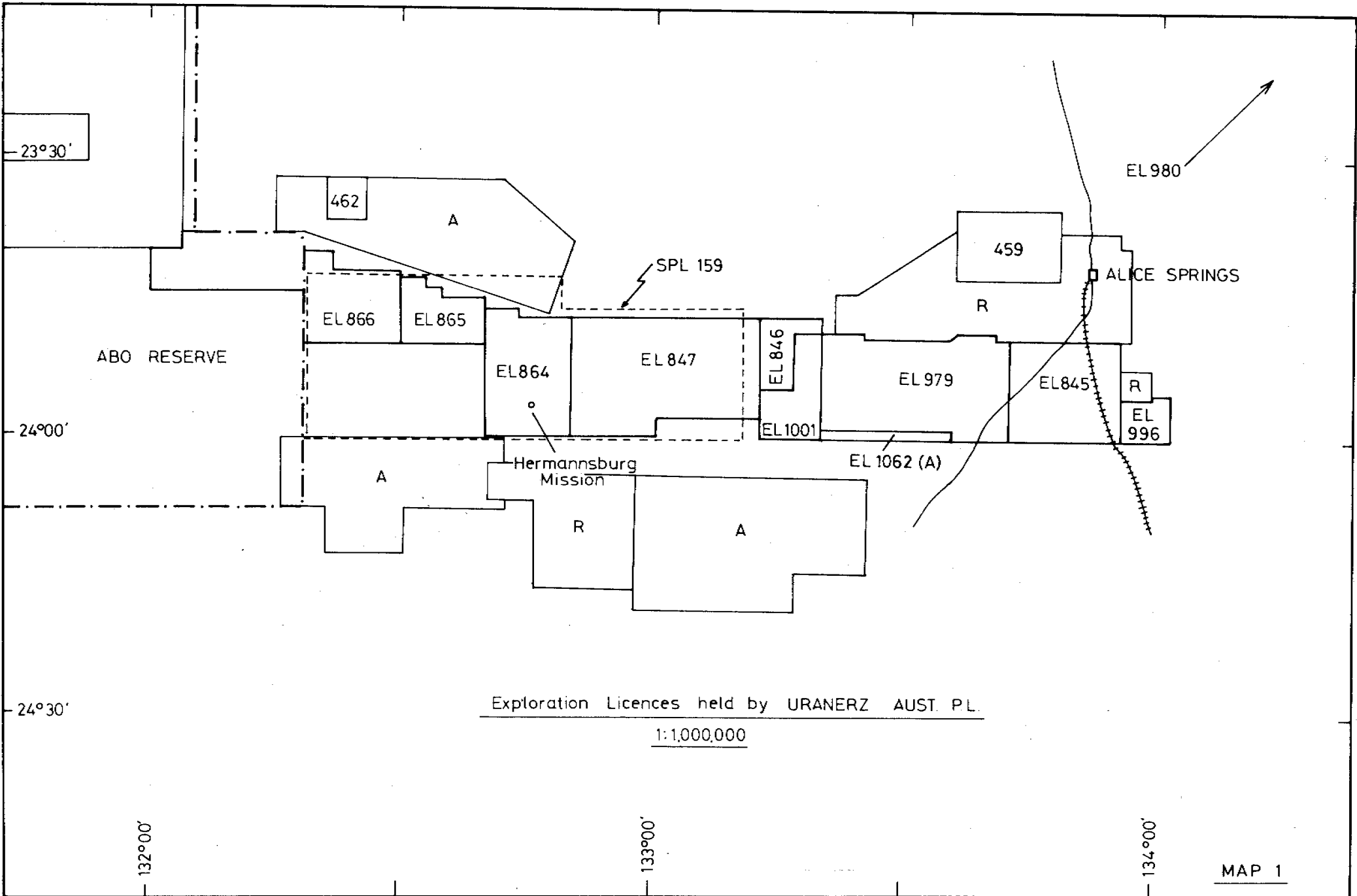
CONCLUSIONS AND FURTHER WORK PLANNED

No indications of strong uranium mineralization, similar to that on EL 845, have been found as yet on EL 996. Backgrounds are low and anomalies weak. This may partly be due to the spacing and orientation of the traverse relative to significant features.

To offset this, further shallow vacuum drilling is planned over the margin of the reduced zone in this area. The margin runs roughly north-south at its eastern limits and could best be defined by east-west traverses about 500m apart. This will be supplemented by intermediate lines, again concentrating over the reduced zone margin. Hole spacing on these traverses would be between 100 and 250m.

Deeper exploration vacuum holes would then be drilled on any anomalous zones and also to obtain information about the configuration of the reduced zone margin at depth.

Finally, deeper diamond/percussion holes would be drilled along the margin on any zones of interest defined by the vacuum work.



23°30'

462

A

EL 980

SPL 159

459

ALICE SPRINGS

EL 866

EL 865

R

ABO RESERVE

EL 864

EL 847

EL 846

EL 979

EL 845

R

24°00'

Hermannsburg Mission

EL 1001

EL 1062 (A)

EL 996

A

R

A

24°30'

Exploration Licences held by URANERZ AUST. PL.

1:1,000,000

132°00'

133°00'

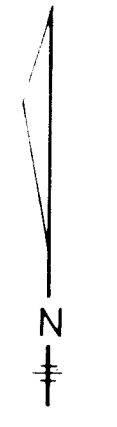
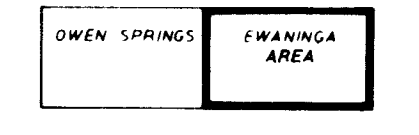
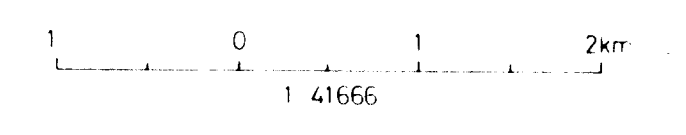
134°00'

MAP 1

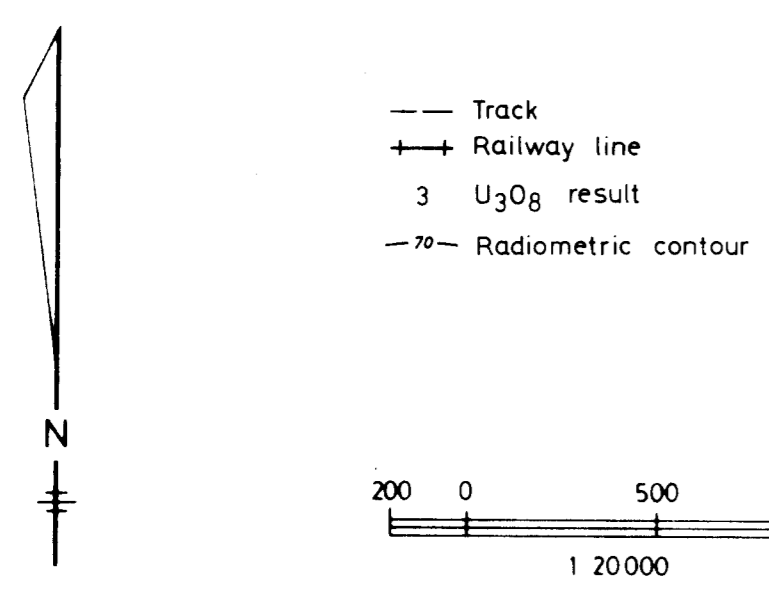
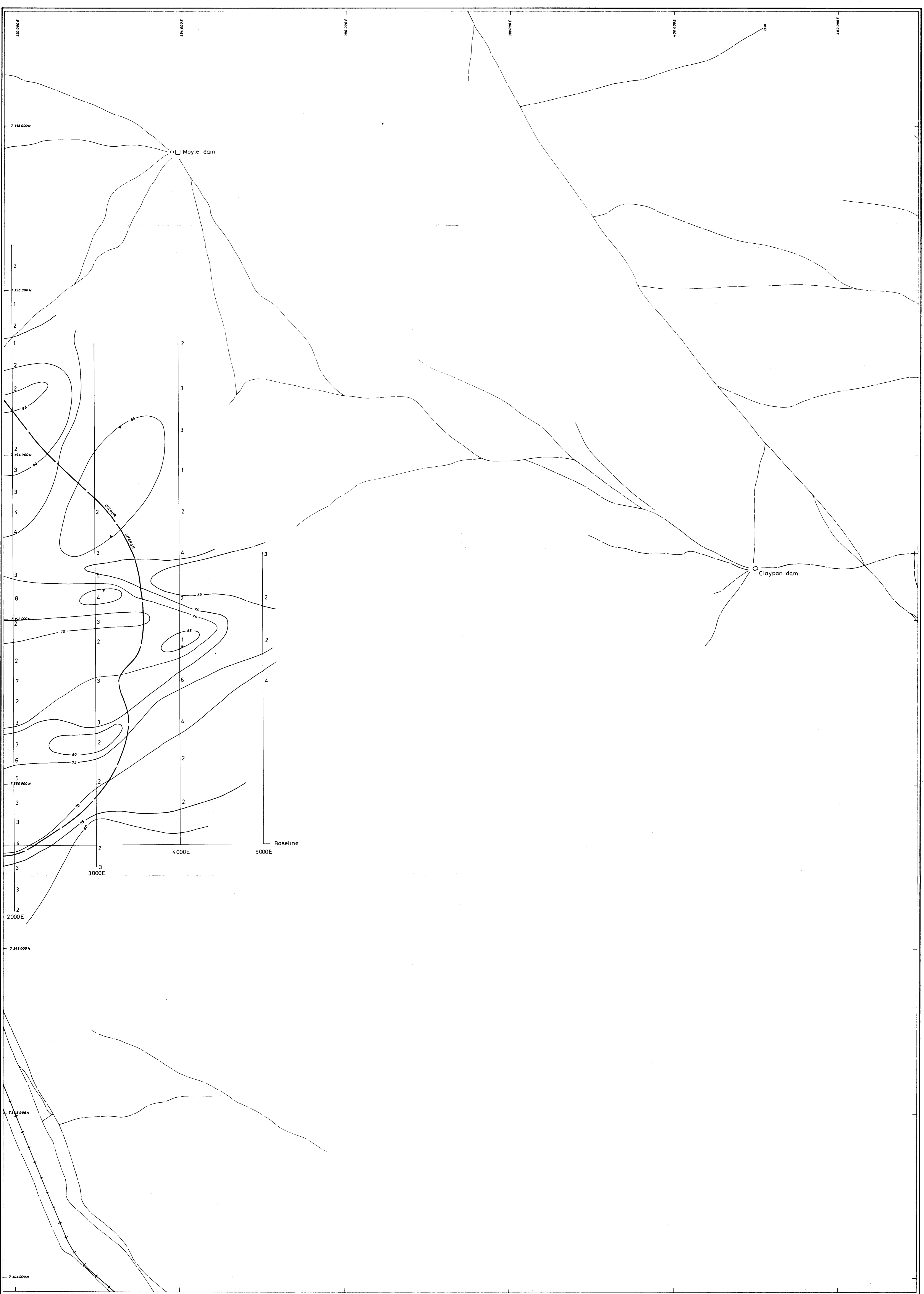
EWANINGA AREA

**HELICOPTER RADIOMETRIC SURVEY
FLIGHT LINES AND ANOMALIES LOCATED**

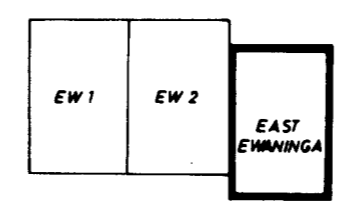
COMPILED: FE K	DATE: OCT 74	TENEMENT:	MAP No: 2
DRAWN: EA	DATE: NOV 74	PLAN No: NT-1176-2C	REPORT No: FR 36
LAST REVISION:		SCALE: 1:41666	PROJECT No: 2C
T.C. TO BONN:		REF:	



- Helicopter GAM-2 flight lines.
- Anomalies of up to 1 1/2 times background.
- Anomalies of 1 1/2 to 2 times background.
- ◻ Anomalies checked on ground without success or only weak response.
- Anomalies within this boundary have a surface expression.

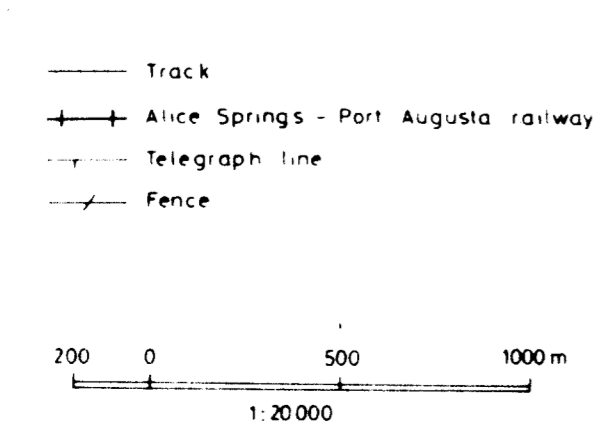
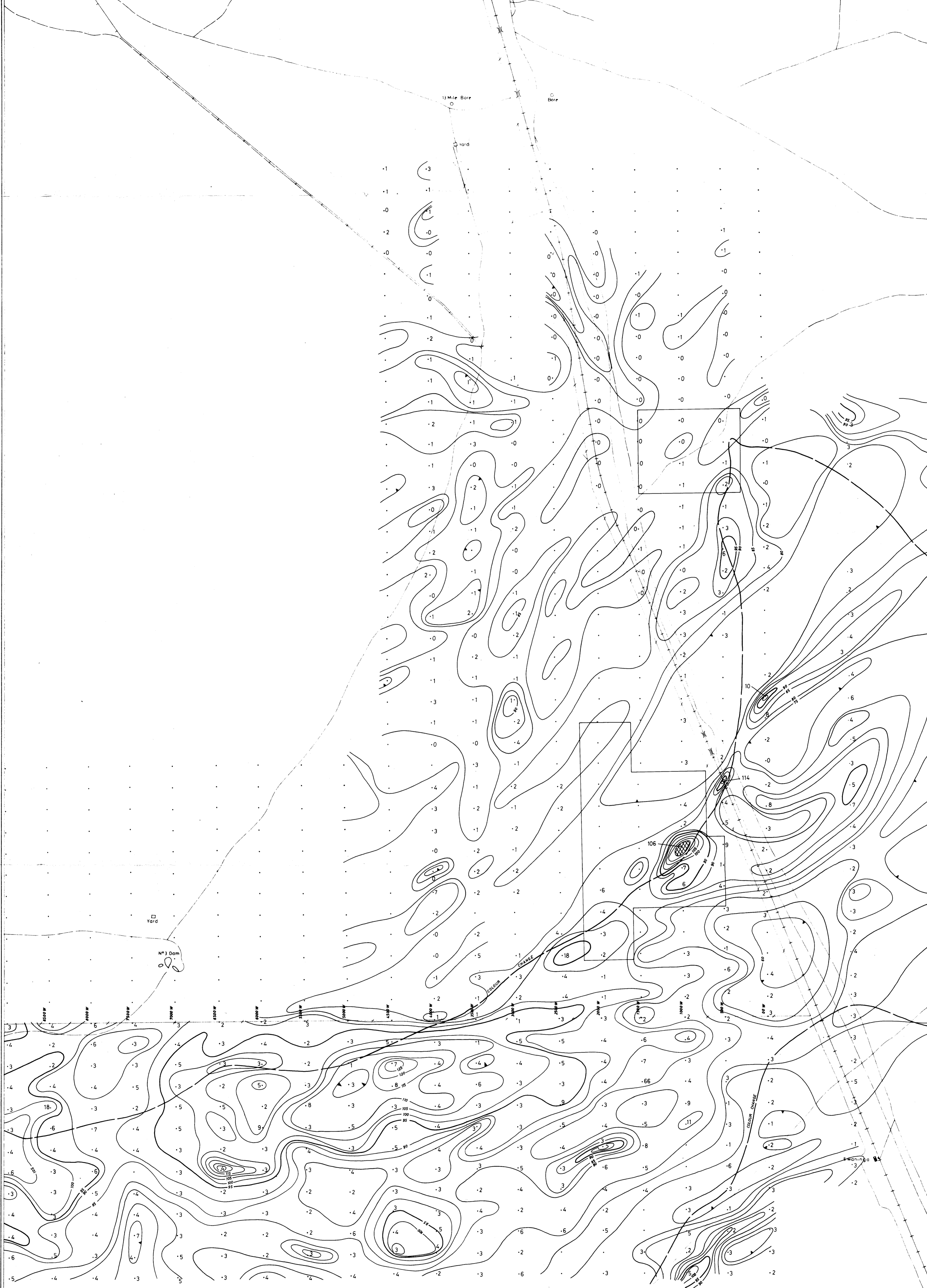


- Track
- +--- Railway line
- 3 U₃O₈ result
- 70- Radiometric contour




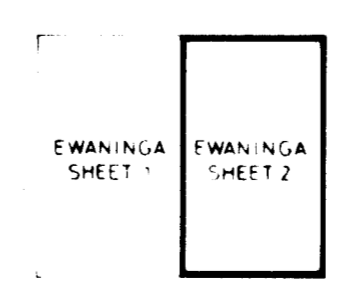
DRAWN FROM PHOTOGRAMMETRIC PLOT

URANERZ AUSTRALIA PTY. LTD.			
EAST EWANINGA			
VACUUM DRILLING RADIOMETRY GEOLOGY AND GEOCHEMISTRY			
COMPILED: FE K	DATE: DEC 74	TENEMENT:	MAP No: 3
DRAWN: EA	DATE: DEC 74	PLAN No: NT-4085-2c	REPORT No: FR 36
LAST REVISION:	SCALE: 1:20000	PROJECT No: 2c	
T.C. TO BONN:	REP:		



- Track
- Alice Springs - Port Augusta railway
- Telegraph line
- Fence

 Average reading 200cps
 5 U₃O₈ result ppm



DRAWN FROM PHOTOGRAMMETRIC PLOT
 FLOWN 24.5.77

URANERZ AUSTRALIA PTY. LTD.			
EWANINGA SHEET 2			
VACUUM DRILLING RADIOMETRY GEOLOGY AND GEOCHEMISTRY			
COMPILED: FE K	DATE: DEC 74	TENEMENT:	MAP NO: 4
DRAWN: EA	DATE: JAN 75	PLAN NO: NT-4086-2c	REPORT NO: FR 36
LAST REVISION:	SCALE: 1:20000	PROJECT NO: 2c-845	
T.C. TO BONN:	REF:		

EWANINGA - OWEN SPRINGS AREA

REGIONAL TRACK ETCH SURVEY RESULTS

COMPILED/TERRAZET	DATE: NOV 74	TENEMENT:	MAP NO: 5
DRAWN: "	DATE: "	PLAN NO: NT-1185-2c	REPORT NO: FR 36
LAST REVISION:		SCALE: 1:50000	PROJECT NO: 2c
T.C. TO BONN:		REF:	

