

Copy 3
COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

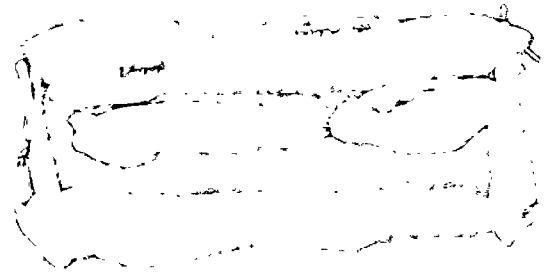
1955/56

REPORT ON RADIOMETRIC GRID SURVEY AT

ADELAIDE RIVER PROSPECT, N.T.

by

G. F. Clarke.



C O N T E N T S

	<u>Page</u>
ABSTRACT	(ii)
1. INTRODUCTION	1
2. GEOLOGY	1
3. PURPOSE OF SURVEY	1
4. METHOD OF RADIOMETRIC GRIDDING	2
5. RESULTS	2
6. CONCLUSIONS	2
7. REFERENCE	2

ILLUSTRATIONS

Plate 1. Locality plan.

Plate 2. Radiometric contour plan.

A B S T R A C T

A Geophysical Survey was undertaken by the Darwin Uranium Group on an area, south of Adelaide River, held under option by Uranium Development and Prospecting Co. N.L. The work consisted of radiometric gridding of an area of approximately forty acres.

The results indicate the presence of several radioactive anomalies which are clearly defined within the three times background contour.

1. INTRODUCTION

In March of this year a weekend prospecting party led by a prospector, Gardner, found a highly radioactive area approximately two miles south of the Adelaide River Township. Negotiations between the party and the Uranium Development and Prospecting Co. N.L., led to the latter securing an option over the area. Since obtaining the option, extensive development work has been undertaken by the company to prove the find. Early in May, 1954, the company approached the Darwin Uranium Group with a request for a radiometric grid survey of the area.

The gridding programme was initiated by R. Crawford, W. Burns, P. Mayman, and completed by G. Clarke.

2. GEOLOGY

A geological survey of the area was carried out by Geosurveys of Australia Ltd., consultant geologists to the company, and a copy of the geological map prepared by them was given to the Darwin Uranium Group.

The country rocks belong to the Brocks Creek Group of Lower Proterozoic Age (Noakes, 1949) and consist of a conformable sequence of conglomerates, sandstone and slates. The beds strike north-north-west and dip at approximately 65 degrees to the west. A noticeable feature of the strike is its gradual change to the north-west at the south end of the prospect.

Numerous faults, which trend approximately 075 degrees, occur at the north end of the prospect. The apparent displacement on each fault is north block east and the faulting appears to be post-mineralisation.

Many minor fractures occur in the conglomerates and sandstones and these are filled with iron stained quartz and show pyritic casts.

North trending shears, produced by intense folding are roughly parallel to the strike of the beds and it is in these shears that the uranium mineralisation occurs. The secondary uranium mineral torbernite has been found throughout these shears and is associated with pitchblende, chalcopyrite and arsenopyrite at depth.

3. PURPOSE OF SURVEY

The purpose of the geophysical work was to determine, by means of radiometric gridding, the degree and extent of radioactivity in the area.

4. METHOD OF RADIOMETRIC GRIDDING

The position of the baseline for the radiometric grid is shown on Plate 1. The baseline extends for a distance of 2,325 feet and at 25-foot intervals along the baseline cross traverses were run for a distance of 600 feet to the east and 400 feet to the west.

By carrying a Geiger counter along these traverses integral multiples of the background count of the instrument were recorded.

The counter used was a Harwell Carpet Sweeper, type 1277B, the background of which was three. This background value represents 150 counts per minute and was measured near the Adelaide River Hotel. It was noted during one of the weekly background checks that the background value had changed from three to four and one half; daily checks along the baseline stations indicated that their values had remained constant. As this change occurred during the cartage of uranium ore from the mine, it was assumed that the change in the background count was due to contamination of the area. Later background checks have been made at the Botanical Gardens, Darwin, where the background value for 1277B has remained at three.

5. RESULTS

On obtaining a detailed geological map from Geosurveys of Australia Ltd., the radiometric contours were superimposed on it. This correlation is shown on Plate 2. Contours less than three times background have been omitted because of the uncertainty of their position and because they have no bearing on the location of the high spots.

Several zones of high activity are apparent within the three times background contour. Some of these highs correlate well with the shear zones from which uranium bearing minerals have been won.

The many localised high spots on the eastern side of the area are due to floaters. The high counts associated with these floaters appear to be due to thin veins of a black iron manganese material, the true composition of which is not known.

On Plate 2, the large "bulges" apparent in the three times background contour on the east and west side of the area mark the trend of the radioactivity down the slope of the hill. A probable explanation of this is the creep of the surface soil which carries with it radioactive material from a source higher up the slope. On the east side the source is probably the same as that responsible for the highly radioactive floaters, namely, the black iron manganese material. On the west side no source is apparent on the surface.

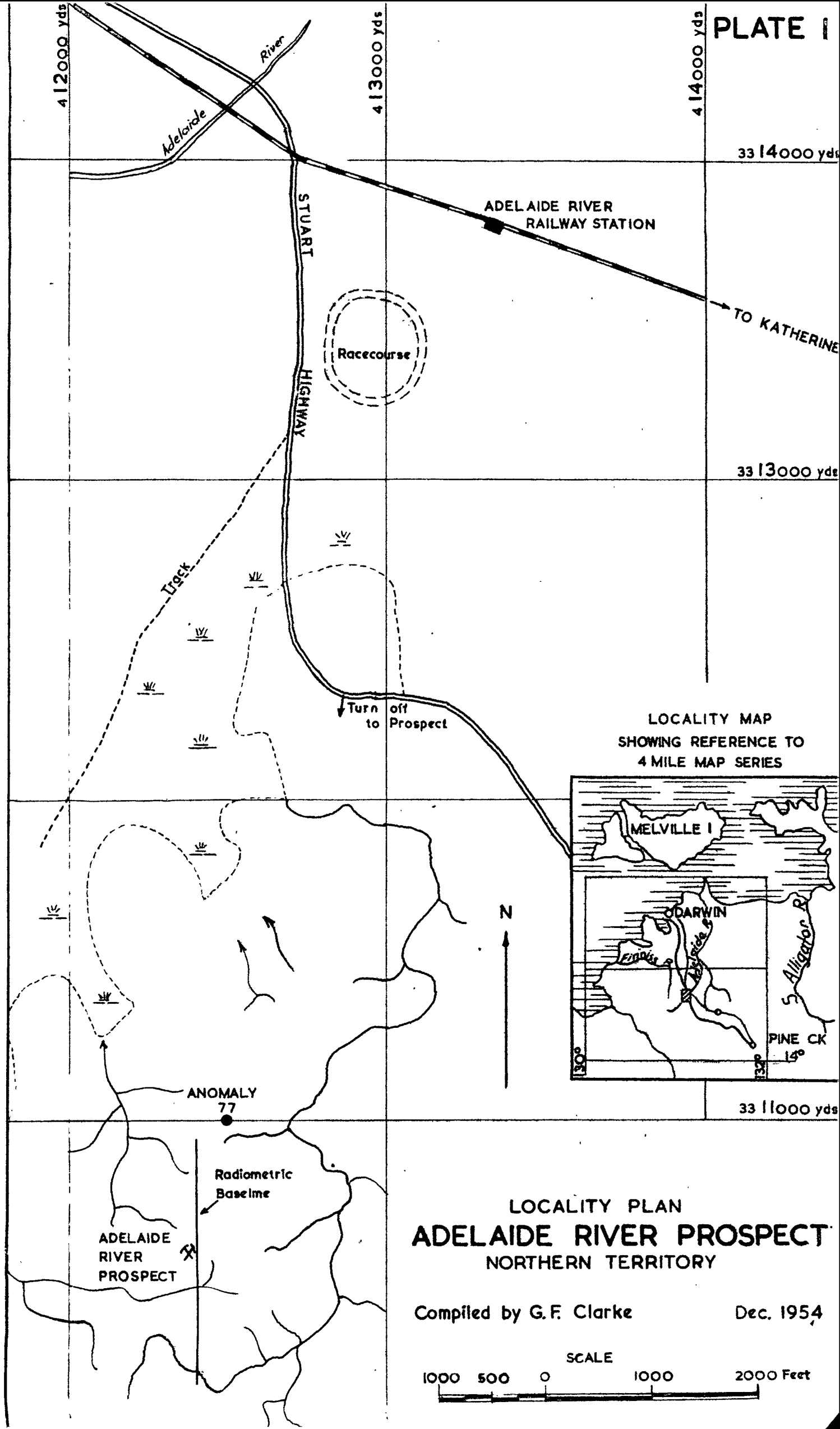
6. CONCLUSIONS

The result of the grid survey shows that the radioactive anomaly (i.e. greater than three times background) extends over an area of approximately 30 acres. Within this area there are zones of up to fifteen times background. Counts of the order of two and a half times background can be obtained over a wide area surrounding the prospect. This would suggest that only portion of the lease has been covered in the survey. Further investigation of the remaining areas held by Uranium Developing and Prospecting Co. N.L. in the vicinity of the prospect could lead to the location of additional high spots such as have been located during the present survey. It is suggested therefore, that further work along these lines be undertaken by the company.

It should be borne in mind that a radiometric grid survey gives an indication of radioactivity at the surface only. The radioactivity may or may not persist with depth. Further geophysical work in the form of a magnetic or a self-potential survey might be useful in obtaining a clear picture of this prospect.

7. REFERENCE

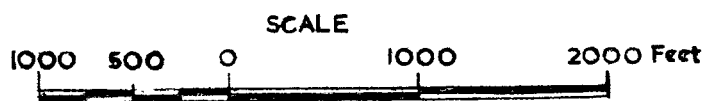
Noakes, L.C., 1949 - A Geological Reconnaissance of the Katherine-Darwin Region, N.T., Bur.Min.Res.Geol. & Geophys., Bull.16.



LOCALITY PLAN
ADELAIDE RIVER PROSPECT
NORTHERN TERRITORY

Compiled by G.F. Clarke

Dec. 1954





BUREAU OF MINERAL RESOURCES
Darwin Uranium Group
Radiometric Contour Plan
OF
ADELAIDE RIVER PROSPECT N. T.
Geology by Geosurveys of Aust. Ltd.
Geophysics by G. F. Clarke
Scale 40 0 40 80 Feet

- LEGEND
- SLATE SILTSTONE ETC.
 - SANDSTONE GRIT, ARKOSE ETC.
 - CONGLOMERATE
 - FAULT
 - RADIOMETRIC CONTOUR
 - LODE OR ORE CHANNEL

North Point?