

# OPEN FILE

CR1971-0047



**MCINTYRE**  
MINES (AUSTRALIA) PTY LTD

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ORMAC ABORIGINAL JOINT VENTURE

PRELIMINARY EXPLORATION PLANS

ARNHEM LAND URANIUM AREAS

EL ~~135~~ 130

By : T.E. Bates,  
G.B. Darling

31st May, 1971

PRELIMINARY EXPLORATION PLANS

FOR THE

ARNHEM LAND URANIUM AREAS

(JOBS 162, 163, 164 AND 165)

- (1) Only 3 areas namely A.P. 2859 consisting of the East Alligator River Uranium Prospect (Job 162) and the Junction Bay Uranium Prospect (Job 163) as well as A.P. 2836 consisting of the Maningrida Uranium Prospect (Job 164) should be tested by aerial geophysics. Of these areas, sections covered by deep wet alluvium will not be flown, only portions which are expected to respond to geophysics will be surveyed from the air. Approximately 20% of the total area is not expected to respond and will therefore be eliminated.  
  
Canadian Aero Services have been engaged to do the flying at quarter mile spacings and provide radiometric, aeromagnetic and V.L.F. electromagnetic data at a price of \$11.65 per line mile. The total cost of flying the areas including mobilisation is calculated at \$38,960 and is the largest single expenditure expected during the forthcoming field season. The flying is expected to start during the latter part of June when the areas should be reasonably dry.
- (2) Base maps are currently being prepared on a scale of 1" = 1,000'. Aerial photographs are available and have been enlarged to a scale of 1" = 1,000' from which photographic interpretations are presently being made. The aerial geophysics (interpretative data provided by Canadian Aero Services will also be presented on a scale of 1" = 1,000' on the same system of base maps.
- (3) Two four wheel drive vehicles and 2 caravans plus camp equipment will be shipped by barge from Darwin to Maningrida. One caravan will be towed via bush road from Maningrida to Maningrida Uranium Prospect (Job 164) and a base camp established. A geologist and field assistant shall start geologic mapping and stream sediment sampling using aboriginal labour where possible.
- (4) Once work has started on Maningrida Uranium Prospect (Job 164) a second camp will be established on Junction Bay Uranium Prospect (Job 163) where any aerial anomalies will be investigated on the ground by a field assistant plus aboriginal helpers.
- (5) A fly camp will be established on Millingimbi Bauxite Prospect (Job 165) probably by helicopter to make a preliminary reconnaissance of the area and advise on a future programme. If access can be made by vehicle it is proposed to take auger samples of lateritic soils for bauxite analysis using aboriginal helpers under the supervision of a field assistant. We understand that access is difficult and this area will be expensive to operate.

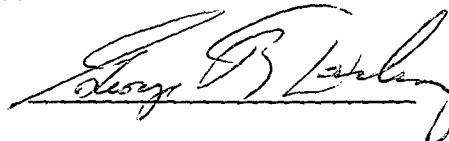
It is not held in high regard by our consulting geologist nor by company geologists. However, if initial work this year shows any encouragement a heavier expenditure may be warranted for the second field season.

- (6) It is not proposed to explore the East Alligator River Uranium Prospect (Job 162) on the ground during the early part of the season unless a cluster of highly radioactive anomalies is located by the aerial survey.
- (7) Personnel will consist of John W. Smith, chief geologist for the company, assisted by geologist Brian Purdie who will be based in the Maningrida Area and geologist Terry Bates who will provide technical assistance from Sydney as well as field liaison when required. Additional geologists are available as the work expands. Trained field assistants will be provided and aboriginal helpers will be necessary.

(8) PRELIMINARY COST SCHEDULE

|  |               |
|--|---------------|
| Mobilisation   | 5,000         |
| Aerial geophysics (Jobs 162, 163 and 164)              | 38,960        |
| Geology and stream sediments geochemistry<br>(Job 164) | 12,000        |
| Supplies and provisions                                | 6,000         |
| Charter flying and transportation                      | 6,000         |
| Legal services   | 5,000         |
| Salaries, 5 months, 3 geologists                       | 12,000        |
| " 3 months, 3 field assistants                         | 6,000         |
| " Aboriginals  | 6,000         |
| Capital Expenditures - 2 caravans                      | 3,500         |
| camp equipment   | 5,000         |
| Auger sampling - Job 165 - Millingimbi<br>Area (100)   | <u>8,000</u>  |
|  | 113,460       |
| Direct costs Sub-total                                 |               |
| Contingencies 10%                                      | 11,346        |
| Administration   | 20,000        |
| Option payments  | <u>50,000</u> |
|  | \$194,806     |

McIntyre - \$97,403  
Ocean Resources -\$97,403



G.B. DARLING

COST OF AIRBORNE GEOPHYSICAL SURVEYS

ARNHEM LAND URANIUM PROSPECTS

- (1) All costs based on quarter mile flight line spacing.
- (2) Total flight line miles includes tie lines.
- (3) Price "A" indicates cost of flying and compilation for magnetometer and spectrometer survey.
- (4) Price "B" also includes VLF E.M. Survey - and separate maps.
- (5) Add positioning costs of \$1,950.  
Price "A" \$9.85 per line mile. Price "B"  
\$11.65 per line mile.

JOB 162 - EAST ALLIGATOR RIVER

To be flown in 4 blocks approximately 3 x 11, 4.5 x 15,  
5 x 20 and 5 x 26 miles.  
Total line miles 1407.0 miles

|                 |             |
|-----------------|-------------|
| Total Price "A" | \$13,858.95 |
| Total Price "B" | \$16,391.55 |

JOB 163 - JUNCTION BAY

Area to be flown 14 x 11 miles  
Total line miles 655.0 miles

|                |            |
|----------------|------------|
| Total Cost "A" | \$6,451.75 |
| Total Cost "B" | \$7,630.00 |

JOB 164 - MANINGRIDA

Area to be flown 18 x 18 square miles.  
Total line miles 1,350.00 miles

|                |             |
|----------------|-------------|
| Total Cost "A" | \$12,264.75 |
| Total Cost "B" | \$14,937.50 |

MEMO TO : G.B. DARLING

FROM : T.E. BATES

20th May, 1971

SUBJECT : SUMMARY OF PROGRESS TO DATE ON  
ARNHEM LAND URANIUM JOBS.

(1) Road Access

The Roads Department, B.M.R., Mines Department and Forestry Department were all consulted regarding use of roads to the areas in which we are interested. General opinion is that it would be at least 4 weeks, (from 12.5.71) before four wheel drive vehicles could gain access to Oenpelli via the Goodparla Road. For vehicles towing caravans another two weeks would be needed. The more direct route through Mt. Bundy would probably be unusable for an even longer period.

From Oenpelli graded roads give access to Queensland Mines Nabarlek area, and a branch road of this gives direct access to Namilmil's Myra Falls area (161). It will probably be possible to use these roads very shortly.

A very rough track runs from Oenpelli to Maningrida through our Junction Bay area (163). This track links with another track to Gove. Information suggests this track is very rough and should not be used at any time by vehicles towing caravans or trailers. It has been suggested that an alternative route through Katherine, to Mainoru, the Bulman Mine and up the Bulman River is used. Although much longer this route is supposedly much better and Forestry are expecting to travel in four wheel drive vehicles along this track to Maningrida in the next few weeks. Alternatively vehicles and caravans could be barged to Maningrida and driven south - probably in about 3 weeks. The grade track passes some 5 miles east of Job 164 - and vehicles have travelled across the north east corner of Job 164 although the track is not formed. However, it would be longer until this would be possible. The track to Oenpelli branches off the Maningrida Bulman track and passes through the Junction Bay block (Job 163). However, the track crosses low-lying ground in the lower reaches of the Liverpool and Mann rivers and would not be open for at least 6 - 8 weeks.

No tracks enter the Milingimbi area (Job 165) and general opinion regards this area as inaccessible to vehicles unless roads were built.

(2) Barge Access

Barges can be chartered at a daily rate of \$500.00 for sailing and \$400.00 for loading and unloading. A charter to the old Oenpelli landing would work out at about 5 days maximum (i.e. \$2,300). A regular two weekly barge service connects Darwin to Maningrida. Cargo rates are \$34.00 per ton or cubic ton (i.e. short wheel base Toyota about 14 cubic tons and a caravan about 20 cubic tons). Barges travel at about 6 knots hence daily range about 140 knots.

(3) Air Access

A number of chartered firms operate out of Darwin. As well as this regular twice weekly charter flights serve the licensed strips at Oenpelli, Maningrida and Milingimbi settlements. Queensland Mines has a strip near Nabarlek. An old unused strip which could possibly be used occurs near the middle reaches of the Goomadeer River - west of Job 163.

Arnhem Air Charter Pty. Ltd. has provided the following charter rates for various aircraft from Darwin to the following strips.

Oenpelli

|              |        |          |                |
|--------------|--------|----------|----------------|
| Cessna 337   | V.M.C. | \$124.32 | load 900 lbs.  |
| Cessna 310j  | V.M.C. | \$124.32 | load 1100 lbs. |
| Beach Baron  | V.M.C. | \$124.32 | " 1300 lbs.    |
| Piper Navajo | V.M.C. | \$177.60 | " 1600 lbs.    |

Maningrida (fuel available)

|              |        |          |               |
|--------------|--------|----------|---------------|
| Cessna 337   | V.M.C. | \$192.36 | load 800 lbs. |
| Cessna 310j  | V.M.C. | \$192.36 | " 1000 lbs.   |
| Beach Baron  | V.M.C. | \$192.36 | " 1200 lbs.   |
| Piper Navajo | V.M.C. | \$274.80 | " 1600 lbs.   |

Milingimbi (fuel available Maningrida)

|              |        |          |               |
|--------------|--------|----------|---------------|
| Cessna 337   | V.M.C. | \$229.32 | load 800 lbs. |
| Cessna 310j  | V.M.C. | \$229.32 | " 1000 lbs.   |
| Beach Baron  | V.M.C. | \$229.32 | " 1200 lbs.   |
| Piper Navajo | V.M.C. | \$327.60 | " 1600 lbs.   |

Note : Piper Navajo loading 1500 lbs. if passenger seats in.

Helicopters are not readily available from Helicopters Utilities. They only have two in the area, one on full time charter to service the oil rig the other an Aolluette on full time charter to Queensland Mines. Another company may have a small helicopter available but range and fuel positioning would be a problem.

(4) Location of Known Uranium Finds

The location of the various uranium finds by Peko, Noranda and Queensland Mines was obtained from the Bureau. In addition the location of two other sets of claims pegged over other radioactive areas by Peko and also two by Queensland Mines was obtained.

All finds are known to occur beneath the unconformity between the Archaean and Lower Proterozoic, and most are near outcrops, of the Proterozoic or remnants of these younger beds remain.



(5) Caravans

One 15' x 7" three berth caravan in good condition has been purchased from B.M. Auto Sales Pty. Ltd. A deposit of \$50.00 was paid on the van and a balance of \$1,300 is payable.

A second 19' x 7' caravan is being held while we decide whether to buy or rent it. Two week holding deposit (\$160.00) has been placed on it from 12/5/71. Rental while in town will be \$30.00 per week. When the van moves into the bush rental will be \$150.00 per week. Purchase price will be approximately \$2100. The van is in good condition.

(6) Vehicles

The short wheel base Toyota is undergoing overhaul and having an extra fuel tank and a water tank fitted. The long wheel base vehicle should have the extra tanks fitted on arrival in Darwin.

(7) Accounts

A cheque account has been opened at the Bank of N.S.W., Smith Street, Darwin. Arrangements have been made for T.E. Bates, B.R. Purdie and J.W. Smith to be able to draw on the account.

Arrangements have been made for Dalgetys to act as our purchasing agents in Darwin on the authority of J.W. Smith, B.R. Purdie and T.E. Bates, also D.W. Bates and R. Brooks.

Bridge Auto Services who are repairing the Toyota have agreed to handle our work on the following conditions :

- (a) Cheque payments on receipt of finished work.
- (b) Alternatively account to Sydney office and cheque to be returned in seven days.

(8) Office Space and Housing

The possibility of renting a house to provide temporary office space and accommodation for field personnel when in Darwin was considered. Good three to four bed roomed house can be had in the range \$70 - \$120 per week, depending on location. Inspection of properties below this level indicated that they were in very poor condition.

Cost of renting a room permanently in the Darwin Motor Inn would be about 90% of normal charges i.e. about \$70.00 per week.

(9) Geiger Counter and Scintillometers

Inquiries were made from the B.M.R. regarding the possible purchase of old geiger counters from them. None are available.

Mr. C. Pritchard - senior geologist B.M.R. made the following comments regarding these instruments.

Geiger Counter - Austral : G.M.1B. A very unsatisfactory instrument - very difficult to read - unreliable.

Scintillometer - Scintex : BGS-1S. A very good and reliable instrument. Has very good correlation between scales. Scale range 30 - 10,000. Gives very steady reading. Expensive.

Spectrometer - McPhar : GV1 and GV5. Has three channels.

- (1) Uranium and Potassium and Thorium.
- (2) Uranium and Thorium.
- (3) Uranium only.

Expensive instrument but very useful for detailed work.

(10) Radio Communication

Radio communication is readily available. Initially mobile stations would be required - these are fairly easy to obtain. Under this arrangement all communication is through a 24 hour operated P.M.G. radio branch. Each mobile arranges to be placed on a schedule at convenient times of the day to receive and transmit to Darwin. Several periods of general transmission are also held each day. There is a 24 hour emergency medical service operating. The service would operate on two frequencies. These would not be available for direct communication between different mobile stations. One weak frequency with very limited range is reserved for communication between different mobile stations.

Special application would be required if we wished to set up a radio office in Darwin that would be in direct communication with our field crews. There are not many frequencies available for this service - they almost certainly would have to be shared.

There seems little point in communicating through the mission stations, although they have their own frequencies.

One of the following sets should be used by mobile stations. A.W.A. model SS 70A, EILCO 6924 or TRAEGER SSB50, (not (SSB 50A).

(11) Geochemistry

Use of soil and stream sediment geochemistry to detect uranium was discussed with Dr. A. Mather and Mr. R. Bartlett of Geomin. Uranium can be highly soluble and travel long distances or form very insoluble compounds.

There appears to be little point in extensive soil sampling until radioactive anomalies have been established on the ground. The possibility of using pathfinder elements was discussed but apparently there are no known consistently occurring minerals with uranium deposits in the Northern Territory. Selenium was mentioned as a possibility but it was pointed out that this would need initial research. Also the analytical technique is difficult and expensive (i.e. about \$5.00 sample).

Mather's suggestion is that we should rely on detecting uranium deposits by analysing for uranium. He feels that stream sediment sampling probably will work in this area. However, he made the following comments.

- (a) Uranium in water is usually very mobile.
- (b) It is generally but not always precipitated by organic material. Hence in any sampling programme for uranium the reverse procedure to that usually adopted in geochemical stream sediment sampling must be used, i.e. fine organic ooze is collected in preference.
- (c) Because of (a) and (b) Above stream sediment consisting of fine silt only may not show anomalous values even close to uranium mineralization. However, in the upper faster reaches of streams this silt may be all that is available for sampling.
- (d) Because of (a), (b) and (c) it follows that uranium anomalies detected may have migrated some distance from their source.
- (e) It was recommended that where possible samples of silt and organic ooze are collected from the same locality.

The estimated charges for a geochemical stream sediment survey over each area calculated for different sample densities are attached. Calculations based on analysis for Cu, Pb and Zn, for uranium alone, and for Cu, Pb, Zn and U, together are included.

Mather is prepared to give a 35% reduction on the cost of Cu, Pb and Zn but is unable to give a reduction on uranium analysis unless we can guarantee about 50,000 samples.

Calculation for samples assayed for available alumina are not included. These are available from Geomin at \$5.00 sample and \$3.40 depending on method used.

#### (12) Air Photographs and Maps

The aerial photographs have arrived. Areas of six photographs covering the Maningrida Block (Job 164) have been sent to Micro-reprographics for enlargement from a scale of 1:84,000 to 1:12,000. Base maps of this area at a scale of 1:12,000 are being prepared.

ESTIMATED COST OF GEOCHEMICAL ASSAYS. STREAM SEDIMENTS  
ARNHEM LAND.

Charges

|     |  |                   |
|-----|--|-------------------|
| (1) | Sample Preparation. Dry and seive to - 80                              | 0.15              |
| (2) | Analysis for Cu, Pb and Zn (include 35% discount)                      | 0.65              |
| (3) | Analysis for U.  | <u>2.00</u>       |
|     | Total per sample   | 2.80              |
| (4) | Handling charge \$4.00 per consignment.<br>Assume 1 consignment = 250. | <u>          </u> |

JOB 164 - MANINGRIDA 285 square miles

| Sample density<br>per sq. mile | Total<br>samples | Handling<br>Charge | Handling Prep.<br>Analysis Cu,Pb,Zn | Handling Prep.<br>Analysis U. | Handling Prep.<br>Analysis U,<br>Cu, Pb, Zn. |
|--------------------------------|------------------|--------------------|-------------------------------------|-------------------------------|--|
| 5                              | 1425             | 24.00              | 1,164.00                            | 3,087.75                      | 4,014.00                                     |
| 10                             | 2850             | 44.00              | 2,324.00                            | 6,171.50                      | 8,024.00                                     |
| 20                             | 5700             | 92.00              | 4,652.00                            | 12,347.00                     | 16,880.00                                    |
| 25                             | 7125             | 116.00             | 5,816.00                            | 15,434.75                     | 20,986.00                                    |
| 30                             | 8550             | 140.00             | 6,980.00                            | 18,522.50                     | 24,080.00                                    |
| 40                             | 11400            | 184.00             | 9,304.00                            | 24,694.00                     | 32,104.00                                    |
| 50                             | 14250            | 228.00             | 11,628.00                           | 30,865.00                     | 40,128.00                                    |
| 100                            | 28500            | 456.00             | 23,256.00                           | 61,731.00                     | 80,256.00                                    |

JOB 163 - JUNCTION BAY 207 square miles

|     |       |        |           |           |           |
|-----|-------|--------|-----------|-----------|-----------|
| 5   | 1035  | 20.00  | 848.00    | 2,245.25  | 2,918.00  |
| 10  | 2070  | 26.00  | 1,692.00  | 4,486.50  | 5,832.00  |
| 20  | 4140  | 68.00  | 3,380.00  | 8,969.00  | 11,660.00 |
| 25  | 5175  | 84.00  | 4,224.00  | 11,210.25 | 14,574.00 |
| 30  | 6210  | 100.00 | 5,068.00  | 13,451.50 | 17,488.00 |
| 40  | 8280  | 136.00 | 6,760.00  | 17,938.00 | 23,320.00 |
| 50  | 10350 | 168.00 | 8,448.00  | 22,420.50 | 29,148.00 |
| 100 | 20700 | 332.00 | 16,892.00 | 44,837.00 | 58,292.00 |

JOB 162 - EAST ALLIGATOR RIVER 393 square miles

| Sample density<br>per sq. mile | Total<br>Samples | Handling<br>Charge | Handling Prep.<br>Assay Cu,Pb,Zn | Handling Prep.<br>Assay U. | Handling Prep.<br>Assay U, Cu,<br>Pb, Zn. |
|--------------------------------|------------------|--------------------|----------------------------------|----------------------------|---|
| 5                              | 1965             | 32.00              | 1604.00                          | 4,256.75                   | 5,534.00                                  |
| 10                             | 3930             | 64.00              | 3208.00                          | 8,513.50                   | 11,068.00                                 |
| 20                             | 7860             | 124.00             | 6412.00                          | 17,203.00                  | 22,132.00                                 |
| 25                             | 9825             | 160.00             | 8020.00                          | 21,283.75                  | 27,670.00                                 |
| 30                             | 11790            | 192.00             | 9624.00                          | 25,540.50                  | 33,204.00                                 |
| 40                             | 15720            | 252.00             | 12828.00                         | 34,050.00                  | 44,268.00                                 |
| 50                             | 19650            | 316.00             | 16036.00                         | 42,563.00                  | 55,336.00                                 |

JOB 161 - MYRA FALLS 20 square miles

|     |      |       |         |          |          |
|-----|------|-------|---------|----------|----------|
| 5   | 100  | 4.00  | 84.00   | 219.00   | 280.00   |
| 10  | 200  | 4.00  | 164.00  | 434.00   | 564.00   |
| 20  | 400  | 8.00  | 328.00  | 868.00   | 1,128.00 |
| 25  | 500  | 8.00  | 408.00  | 1,083.00 | 1,408.00 |
| 30  | 600  | 12.00 | 492.00  | 1,302.00 | 1,692.00 |
| 40  | 800  | 16.00 | 656.00  | 1,736.00 | 2,256.00 |
| 50  | 1000 | 16.00 | 816.00  | 2,166.00 | 2,816.00 |
| 100 | 2000 | 32.00 | 1632.00 | 4,332.00 | 5,632.00 |

JOB 165 - MILINGIMBI - 500 square miles

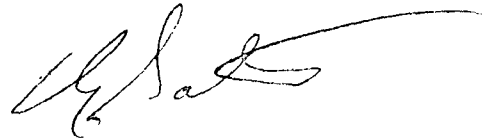
|     |       |        |          |            |            |
|-----|-------|--------|----------|------------|------------|
| 5   | 2500  | 40.00  | 2040.00  | 5,415.00   | 7,040.00   |
| 10  | 5000  | 80.00  | 4080.00  | 10,830.00  | 14,080.00  |
| 20  | 10000 | 160.00 | 8160.00  | 21,660.00  | 28,160.00  |
| 25  | 12500 | 200.00 | 10200.00 | 27,075.00  | 35,200.00  |
| 30  | 15000 | 240.00 | 12240.00 | 32,490.00  | 42,240.00  |
| 40  | 20000 | 320.00 | 16320.00 | 43,320.00  | 56,320.00  |
| 50  | 25000 | 400.00 | 20400.00 | 54,150.00  | 70,400.00  |
| 100 | 50000 | 800.00 | 40800.00 | 108,300.00 | 140,800.00 |

| No. Samples square miles | Total cost for all areas |              |
|--------------------------|--------------------------|--------------|
|                          | Uranium only             | U+Cu+Pb+ Zn  |
| 5                        | \$15,223.75              | \$19,786.00  |
| 10                       | \$30,435.50              | \$39,568.00  |
| 20                       | \$61,047.00              | \$79,960.00  |
| 25                       | \$76,086.00              | \$99,838.00  |
| 30                       | \$91,306.00              | \$118,704.00 |
| 40                       | \$121,738.00             | \$158,268.00 |

(13) Recommendations

It appears that the Maningrida Block (Job 164) is the most accessible and the roads in this area should be open about mid June. Caravans and vehicles should be freighted by barge to Maningrida shortly. This will probably be quicker and cheaper than driving via Katherine and Bulman. Ample fuel should also be sent in. Initially mapping and stream sediment sampling should be carried out at a density of 25 - 30 per square mile. On completion of this part of the programme the crews should move by road to the south end of the Junction Bay block (Job 163).

The airborne radioactive survey of these two blocks should be carried out as soon as conditions are suitable so that results can be followed up by the crews in the field.

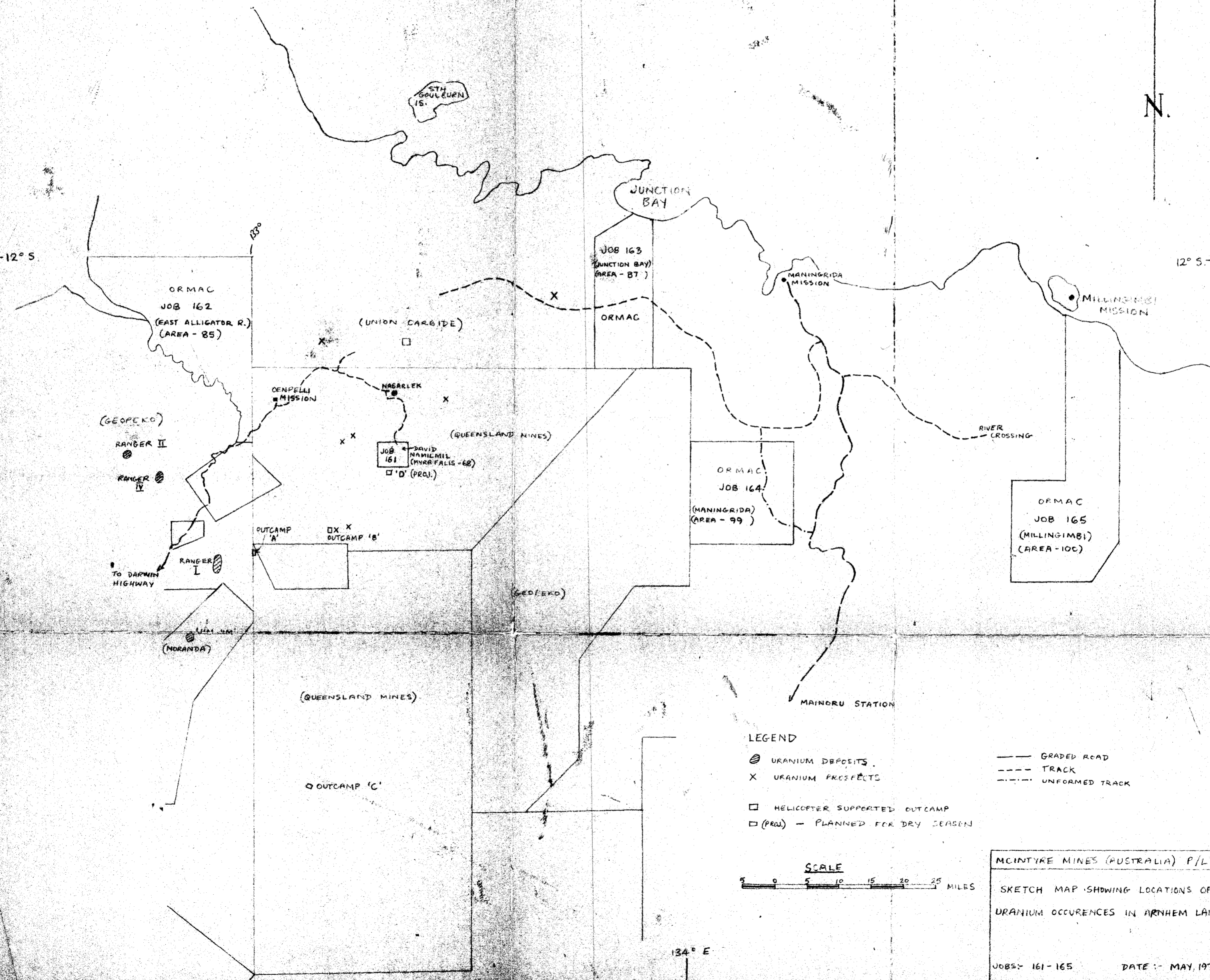
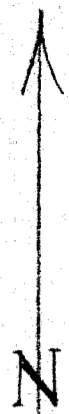


T.E. BATES

# ARAFURA SEA

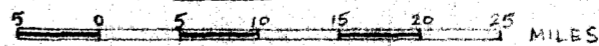
134° E.

135°



- URANIUM DEPOSITS
- X URANIUM PROSPECTS
- HELICOPTER SUPPORTED OUTCAMP
- (PROJ) - PLANNED FOR DRY SEASON
- GRADED ROAD
- - - TRACK
- · - · UNFORMED TRACK

### SCALE



MCINTYRE MINES (AUSTRALIA) P/L.

SKETCH MAP SHOWING LOCATIONS OF URANIUM OCCURENCES IN ARNHEM LAND

JOB 161-165

DATE: - MAY, 1971