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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Record No. 1969 / 90

Minor Metalliferous Investigations, Northern Territory Resident Geological Section

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

MINOR METALLIFEROUS INVESTIGATIONS
NORTHERN TERRITORY RESDIENT GEOLOGICAL SECTION.

RECORDS 1969/90

Contents

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REPORT ON GEOCHEMISTRY OF THE MARY RIVER AREA, N.T.

1967 RESULTS

by

J.W. Shields

CONTENTS

LIST OF PLATES

SUMMARY

High lead and zinc geochemical anomalies found during 1967 in the Government Mining Reserve Area No. 275 warrant further investigation. The anomalies are not closed off and further geochemical work using the auger rig and mattock sampling is recommended.

INTRODUCTION

The gossanous outcrop known as Gubberah Gossan was found in 1966 (Shields & Taube 1967). Assay results showed anomalous lead, zinc and copper values.

A Government Mining Reserve (No. 275) of 25 square miles was placed over the area.

During 1967, a geochemical survey was carried out using an auger drill made available by the Mines Branch, Northern Territory Administration. Assays of the samples were completed at the Northern Territory Administration East Point Laboratory, Darwin, during April, 1968.

LOCATION AND ACCESS

Plate 1 shows the location of the area.

The area can be reached through Grove Hill, Mount Wells and past Jessop's Lode, but tracks to the area need grading after every "wet season" to make access possible.

HISTORY

Lead mineralization was found to the east of the Gubberah Gossan in 1954 by Enterprise Exploration Company prospectors (Patterson, 1959). The prospect, known as Namoona is about 9½ miles to the east of Gubberah Gossan. Minglo, a lead prospect about 4½ miles east of Gubberah Gossan was found while prospecting the country around the Namoona prospect. Lead mineralization was also noted by Enterprise Exploration while prospecting about half a mile south of the Gubberah Gossan outcrop.

The Gubberah Gossan outcrop was located in 1966 (Shields & Taube 1967). Samples from the outcrop were analysed by the Northern Territory Administration East Point Laboratory with the following results:

Sample No.	Pb%	Cu%	Zn%	Sn%	Ni%	Au (dwts/ton)	As%
2787	1.76	0.06	0.1	nil	nil	0.6	0.24
1788	0.68	0.15	0.05	nil	nil	0.5	0.40

A Government Mining Reserve (No. 275) of 25 square miles was taken out over the area, and in 1967 a grid was laid out and auger drilling was undertaken for a geochemical survey of part of the area surrounding the Gubberah Gossan outcrop.

GRID LAYOUT

The grid layout is shown on Plate 2.

Theodolite and chain were used to survey the grid, which is marked by wooden pegs 200 feet apart on east-west traverses which are 400 feet apart.

Steel pegs at coordinates 60S 18W, 36S 18W, 16S 18W, and 00S 18W are designed to serve as permanent markers for the grid lay-out.

SAMPLE COLLECTION

A Gemco auger drill was used where possible to obtain samples of weathered rock beneath alluvial and black soil cover.

In many instances the drill failed to penetrate the alluvial cover and in these cases a sample of alluvium from the drill bit was taken.

Only one bit sample was taken from each hole and submitted for analysis.

SAMPLE ANALYSIS

Samples were analysed at the Northern Territory Administration East Point Laboratory using Atomic Absorption techniques.

RESULTS

1) Lead

Inspection of the cumulative frequency distribution diagram for lead (Plate 6) shows that samples of more than 100 p.p.m. lead are anomalous.

On Plate 3, lead contours are presented at 100, 200, 400, 800 and 1600 p.p.m. values.

The 100 p.p.m. contours partially outline two areas; further work is necessary to "close off" the anomalies. Within the 100 p.p.m. contours, peak values are 480 and 1900 p.p.m. in the southern and northern areas respectively.

The northern anomaly is "open" on three sides and further work is necessary to assess the size and shape of the anomaly. As outlined from the analyses obtained to date, it would seem that the anomaly might have a north-south trend and could link up with the outcrop of the Gubberah Gossan to the north.

The southern anomaly has a northwest - southeast trend and is closed off to the north west. Closer sampling in the area of the anomaly and further sampling to the south-east is necessary to determine the final size and shape of the anomaly.

2) Zinc:

The zinc anomalies (see Plate 4) are contoured at 75, 150, 300, 600 and 1200 p.p.m. values.

There are three main anomalies with peaks of 2200, 500 and 200 p.p.m.. Two of the anomalies are roughly coincident with the lead anomalies, taking into regard the higher mobility of zinc when compared with lead. The third anomaly is not associated with lead except at the peak where a lead value of 100 p.p.m. is present.

As in the case of lead, further sampling is necessary to determine the size and shape of the anomalies.

3) Copper

Only one small copper anomaly is apparent in the area covered by the 1967 geochemical survey.

The anomaly has a peak of 230 p.p.m..

Further work, in the form of closer spacing of samples is needed to assess the anomaly.

DISCUSSION OF RESULTS

The geochemical results obtained from the 1967 survey indicate that there is a possibility of a large anomalous lead and zinc zone. Further work is necessary to confirm this.

Geochemical sampling north of the Gubberah Gossan outcrop might reveal further lead anomalies as the general strike of the rocks is north-south with a steep dip to the west. This work could also indicate whether the lead anomalies are associated with any particular rock type.

The lead anomalies already found do not appear to be associated with a northeast - southwest fracture zone, as the direction of outcrop of the Gubberah Gossan had originally suggested.

CONCLUSIONS AND RECOMMENDATIONS

The 1967 geochemical survey has established the fact that lead mineralization in the Government Mining Reserve extends beyond the outcrop area of the Gubberah Gossan.

Further geochemical work together with detailed geological mapping is recommended to further assess the potential of the area.

REFERENCES

PATTERSON, G.W., 1959 - Namoona Area, Northern Territory, Summary and Conclusions. Company Report. Enterprise Exploration Company Pty Ltd. Unpublished Report No. N.T. 55.

SHIELDS, J.W., and TAUBE, A., 1967 - Iron Ore Reconnaissance Survey, Ban Ban and Woolwonga 1 mile Sheet areas, Northern Territory. Bur. Miner. Resour. Aust. Rec. 1967/128 (unpubl.).

ATOMIC ABSORPTION ANALYSIS OF AUGER SAMPLES AND LITHOLOGY OF AUGER CUTTINGS

Analyses carried out by Northern Territory Administration East Point Laboratory, Darwin. N.T.

Hole Number	Coordinates of Hole	Depth of Hole (ft.)	Bottom Hole Lithology	Analyses Cu	Pb	Zn
				Results in p.p.m.		
1	0S 16W	20	Slate	10	200	35
2	0S 18W	22	Greywacke	10	20	120
3	0S 20W	16	Slate	5	40	15
4	0S 22W	10	Slate	15	90	30
5	0S 24W	16	Slate	15	140	65
6	0S 26W	22	Slate	10	120	50
7	4S 16W	13	Slate	10	240	65
8	4S 18W	10	Slate	15	50	55
9	4S 20W	22	Slate	5	10	65
10	4S 22W	10	Greywacke	5	40	25
11	4S 24W	14	Slate	25	120	15
12	4S 26W	22	Alluvium	20	70	75
13	8S 12W	14	Greywacke	5	30	70
14	8S 14W	6	Greywacke	20	170	35
15	8S 16W	16	Greywacke	5	50	35
16	8S 18W	6	Slate	25	150	30
17	8S 20W	8	Greywacke	20	120	15
18	8S 22W	7	Slate	5	20	30
19	8S 24W	25	Slate	10	30	20
20	8S 26W	40	Slate	5	50	30
21	12S 8W	4	Slate	30	30	60
22	12S 10W	12	Slate	5	130	25
23	12S 12W	26	Greywacke	5	20	150
24	12S 14W	34	Greywacke	5	20	150
25	12S 16W	36	Greywacke	5	<10	85
26	12S 18W	40	Greywacke	10	<10	120
27	12S 20W	38	Slate	100	20	105
28	12S 22W	28	Slate	10	60	40
29	12S 24W	52	Slate	10	40	30
30	12S 26W	16	Slate	15	40	35
31	12S 28W	46	Alluvium	10	30	30
32	12S 30W	39	Slate	15	40	45
33	16S 6W	8	Greywacke	10	60	30
34	16S 8W	6	Greywacke	5	90	45

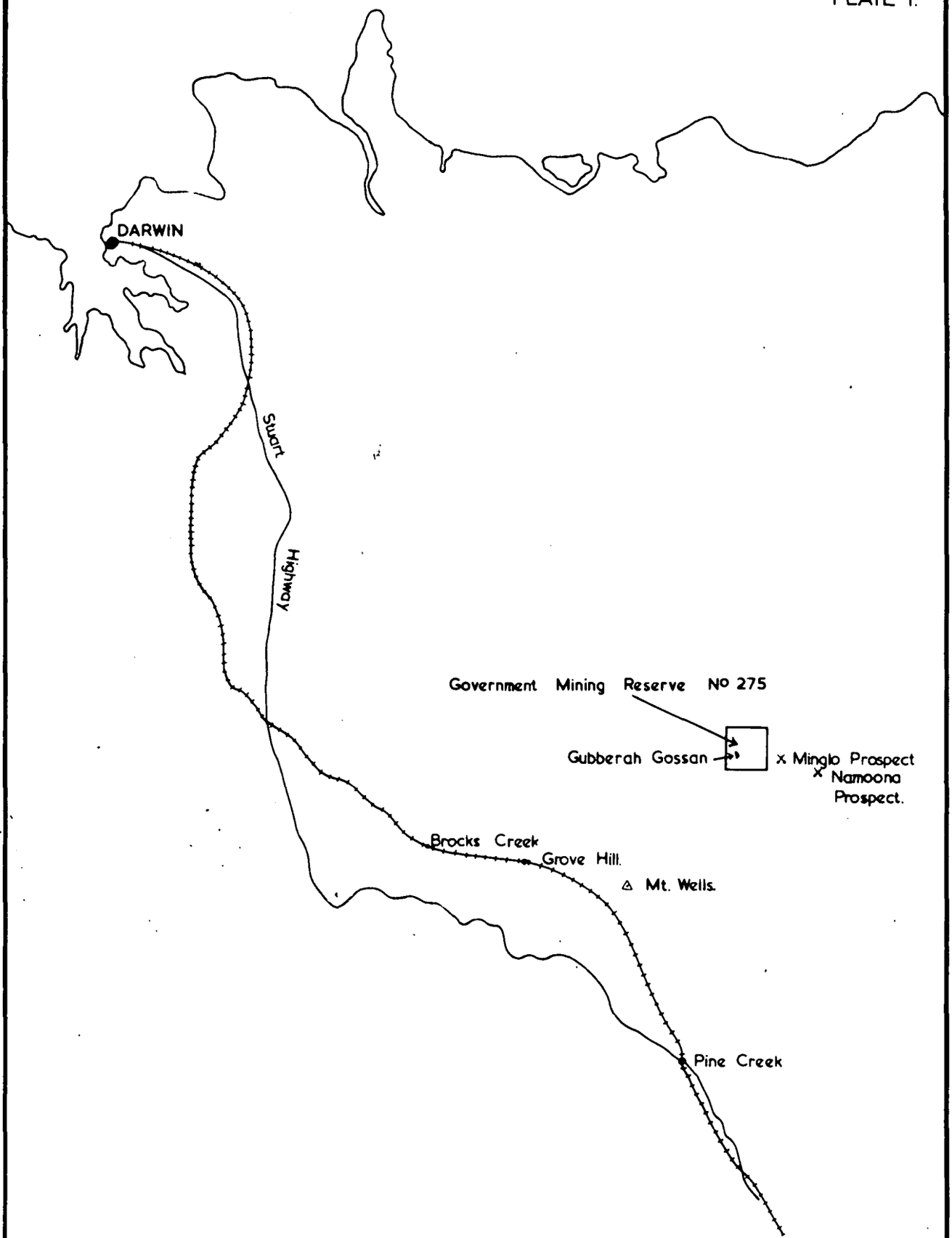
35	16S	10W	6	Greywacke	5	120	50
36	16S	12W	28	Greywacke	35	30	45
37	16S	14W	46	Greywacke	5	<10	55
38	16S	16W	4	Greywacke	15	90	25
39	16S	18W	8	Slate	10	50	25
40	16S	20W	28	Slate	35	90	55
41	16S	22W	28	Alluvium	35	50	65
42	16S	24W	20	Alluvium	5	20	25
43	16S	26W	34	Alluvium	<5	10	10
44	16S	28W	52	Alluvium	5	50	40
45	16S	30W	52	Alluvium	10	50	45
46	16S	32W	52	Alluvium	15	50	45
47	16S	34W	52	Slate	5	20	25
48	20S	58W	16	Slate	20	20	30
49	20S	56W	50	Slate	10	20	35
50	20S	54W	52	Slate	10	30	20
51	20S	52W	26	Alluvium	<5	20	15
52	20S	50W	64	Alluvium	15	20	35
53	20S	48W	42	Slate	10	30	25
54	20S	46W	52	Slate	25	20	25
55	20S	44W	62	Slate	35	20	50
56	20S	43W	64	Slate	60	20	70
57	20S	40W	52	Alluvium	10	20	40
58	20S	38W	44	Alluvium	35	30	35
59	20S	36W	64	Alluvium	5	20	30
60	20S	34W	52	Alluvium	5	20	25
61	20S	32W	44	Alluvium	5	20	15
62	20S	30W	58	Alluvium	15	10	45
63	20S	28W	52	Alluvium	<5	10	15
64	20S	26W	67	Slate	10	50	30
65	20S	24W	60	Alluvium	5	50	65
66	20S	22W	58	Alluvium	10	60	35
67	20S	20W	34	Greywacke	5	20	60
68	20S	18W	32	Alluvium	10	90	65
69	20S	16W	28	Alluvium	10	70	65
70	20S	14W	24	Alluvium	5	90	50
71	20S	12W	24	Alluvium	5	70	60
72	20S	10W	24	Alluvium	10	150	70
73	20S	8W	28	Alluvium	15	130	120
74	20S	6W	24	Alluvium	25	250	80
75	20S	4W	16	Alluvium ?	25	180	80
76	20S	2W	14	Alluvium ?	20	230	65
77	20S	00	12	Alluvium ?	15	130	50
78	20S	2E	12	Alluvium?	20	260	40
79	20S	4E	60	Slate	30	20	70
80	20S	6E	48	Alluvium	10	30	65

81	24S	4W	10	Alluvium	15	130	290
82	24S	6W	31	Greywacke ?	25	70	110
83	24S	8W	34	Greywacke ?	35	160	160
84	24S	10W	31	Alluvium	20	70	80
85	24S	12W	40	Alluvium	20	50	85
86	24S	14W	40	Alluvium	25	60	150
87	24S	16W	42	Alluvium	25	40	50
88	24S	18W	38	Alluvium	25	30	35
89	24S	20W	40	Alluvium	45	50	35
90	24S	22W	34	Alluvium	35	40	55
91	24S	24W	78	Slate with pyrite	105	30	20
92	24S	26W	82	Alluvium	15	20	20
93	24S	28W	82	Greywacke ?	25	40	65
94	24S	30W	76	Greywacke	10	30	40
95	24S	32W	70	Slate	15	30	60
96	28S	2W	52	Alluvium ?	20	730	160
97	28S	4W	12	Alluvium ?	5	220	270
98	28S	6W	36	Alluvium	20	120	270
99	28S	8W	38	Alluvium	15	100	120
100	28S	10W	34	Alluvium ?	15	90	110
101	28S	12W	37	Alluvium ?	20	70	110
102	28S	14W	36	Alluvium ?	15	60	65
103	28S	16W	32	Alluvium ?	10	50	40
104	28S	18W	22	Alluvium ?	15	50	35
105	28S	20W	22	Alluvium ?	10	40	35
106	28S	22W	48	Alluvium ?	5	30	30
107	28S	24W	60	Alluvium ?	5	40	35
108	28S	26W	66	Alluvium ?	5	40	30
109	28S	28W	72	Slate ?	10	50	35
110	28S	30W	76	Slate with pyrite	65	40	40
111	28S	32W	67	Alluvium ?	15	100	50
112	28S	34W	62	Alluvium ?	15	30	35
113	32S	4E	24	Greywacke ?	10	170	110
114	32S	2E	46	Greywacke ?	15	160	1400
115	32S	00	32	Greywacke ?	25	100	600
116	32S	2W	42	Greywacke ?	15	1900	2200
117	32S	4W	32	Greywacke ?	5	70	260
118	32S	6W	77	Greywacke ?	5	50	230
119	32S	8W	40	Greywacke ?	5	30	720
120	32S	10W	34	Greywacke ?	10	110	180
121	32S	12W	30	Slate	20	200	70
122	32S	14W	44	Slate	20	140	120
123	32S	16W	43	Alluvium	15	50	45
124	32S	18W	28	Slate	5	20	25
125	32S	20W	40	Alluvium	15	40	30
126	32S	22W	73	Slate	40	30	55

127	32S	24W	46	Alluvium	15	40	20
128	32S	26W	52	Alluvium	5	30	15
129	32S	28W	59	Alluvium	5	40	30
130	32S	30W	66	Alluvium	5	40	30
131	32S	32W	64	Slate	20	50	45
132	32S	34W	62	Slate	25	40	35
133	32S	36W	46	Alluvium	15	40	35
134	36S	12W	40	Alluvium	20	70	100
135	36S	14W	40	Alluvium	15	50	50
136	36S	16W	32	Alluvium	20	50	35
137	36S	18W	24	Alluvium	10	40	25
138	26S	20W	78	Slate	230	70	180
139	36S	22W	66	Slate	40	380	300
140	36S	24W	78	Alluvium	15	30	45
141	36S	26W	72	Slate	25	10	40
142	36S	28W	52	Alluvium	10	40	32
143	36S	30W	72	Slate	50	40	75
144	40S	12W	40	Alluvium	10	50	70
145	40S	14W	40	Alluvium	25	40	65
146	40S	16W	32	Alluvium	15	40	50
147	40S	18W	31	Greywacke	10	40	22
148	40S	18W	28	Alluvium	35	330	330
149	40S	20W	36	Slate ?	2	10	35
150	40S	22W	47	Alluvium	25	40	45
151	40S	24W	70	Alluvium	25	20	45
152	40S	26W	78	Slate	100	20	70
153	44S	8W	34	Slate	20	40	72
154	44S	10W	34	Alluvium	25	100	120
155	44S	12W	15	Alluvium	55	380	400
156	44S	14W	40	Alluvium ?	30	110	320
157	44S	16W	22	Slate	45	480	500
158	44S	18W	79	Slate	55	40	80
159	44S	20W	40	Alluvium	10	40	60
160	44S	22W	72	Slate	10	20	45
161	44S	24W	82	Alluvium	10	20	80
162	48S	26W	96	Alluvium	10	40	45
163	48S	24W	19	Alluvium	10	40	40
164	48S	22W	22	Alluvium	10	40	40
165	48S	20W	22	Alluvium	20	70	60
166	48S	18W	22	Alluvium	20	70	95
167	52S	18W	28	Alluvium	10	90	45
168	52S	20W	24	Alluvium	2	40	20
169	52S	22W	28	Alluvium	10	40	25
170	52S	24W	18	Alluvium	10	20	10
171	52S	26W	46	Alluvium	10	20	30
172	52S	28W	25	Alluvium	10	40	35
173	52S	30W	26	Alluvium	10	40	25

174	52S	32W	28	Alluvium	10	20	40
175	56S	18W	24	Alluvium	45	100	200
176	56S	20W	24	Alluvium	25	50	90
177	56S	22W	20	Alluvium	10	10	5
178	56S	24W	16	Alluvium	10	10	10
179	56S	26W	18	Alluvium	20	40	40
180	56S	28W	22	Alluvium	20	40	35
181	56S	30W	24	Alluvium	10	40	30
182	56S	32W	22	Alluvium	10	20	35
183	56S	34W	16	Alluvium	10	20	15
184	56S	36W	22	Alluvium	10	40	20
185	60S	18W	28	Slate	5	5	5
186	60S	20W	20	Alluvium	30	60	95
187	60S	22W	18	Alluvium	15	40	40
188	60S	24W	19	Alluvium	10	20	35
189	60S	26W	82	Slate	10	20	35
190	60S	28W	22	Alluvium	10	50	30
191	60S	30W	19	Alluvium	10	40	30
192	60S	32W	12	Alluvium	5	20	10
193	60S	34W	18	Alluvium	5	20	25
194	60S	36W	32	Alluvium	10	50	30

PLATE 1.



LOCALITY MAP

MARY RIVER GOVERNMENT RESERVE NO. 275

SCALE

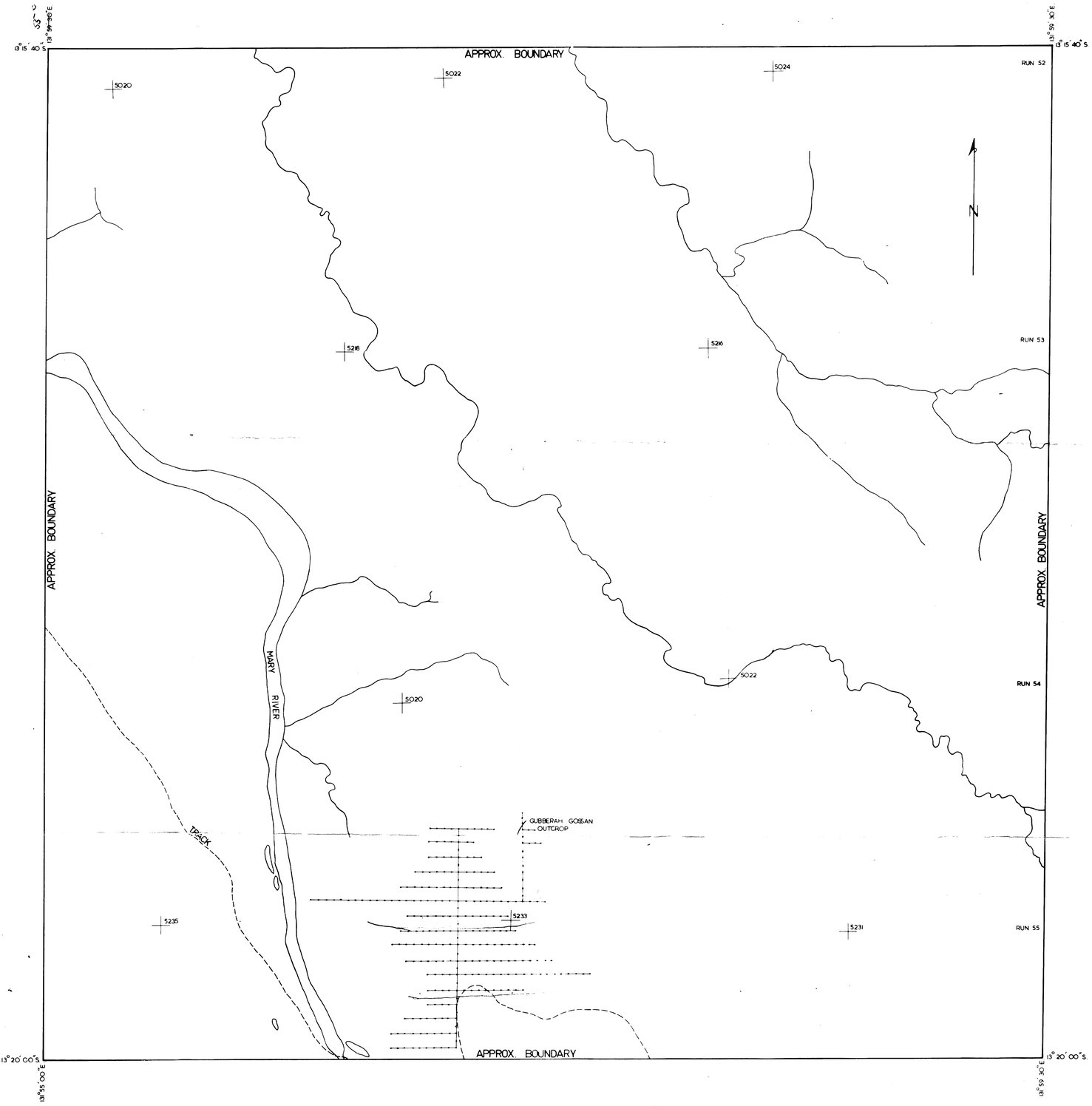
0 5 10 20 30 miles

To accompany Record 1969/90

D52/A8/391

COMPILED BY RESIDENT GEOLOGICAL SECTION.
DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, OCTOBER, 1968.

G68/86E



GOVERNMENT MINING RESERVE Nº 275

MARY RIVER AREA (PART BAN BAN 1 MILE)

SHOWING GUBBERAH GOSSAN OUTCROP AND GRID LAYOUT

UNCONTROLLED AIR PHOTO COMPILATION

0 500 1000 2000 3000 4000 feet

SCALE APPROX

COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, OCTOBER, 1968 To accompany Record 1969/90

D52/A8/394

~~G68/91B~~

PLATE 3.

GUBBERAH GOSSAN OUTCROP

N

LEAD GEOCHEMICAL CONTOURS

MARY RIVER AREA N.T.

SCALE

0 400 800 feet

LEGEND

• 20 Auger hole with lead assay of sample in p.p.m.

100 Geochemical contour with value in p.p.m.

MARY RIVER

BILLABONG

COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, OCTOBER, 1968. To accompany Record 1969/90

D52/A8/396

~~G68/88C~~

PLATE 4.

N

ZINC GEOCHEMICAL CONTOURS
MARY RIVER AREA N.T.

SCALE

0 400 800 feet.

LEGEND

• 20 Auger hole with zinc assay of sample in p.p.m.

75 Geochemical contour with value in p.p.m.

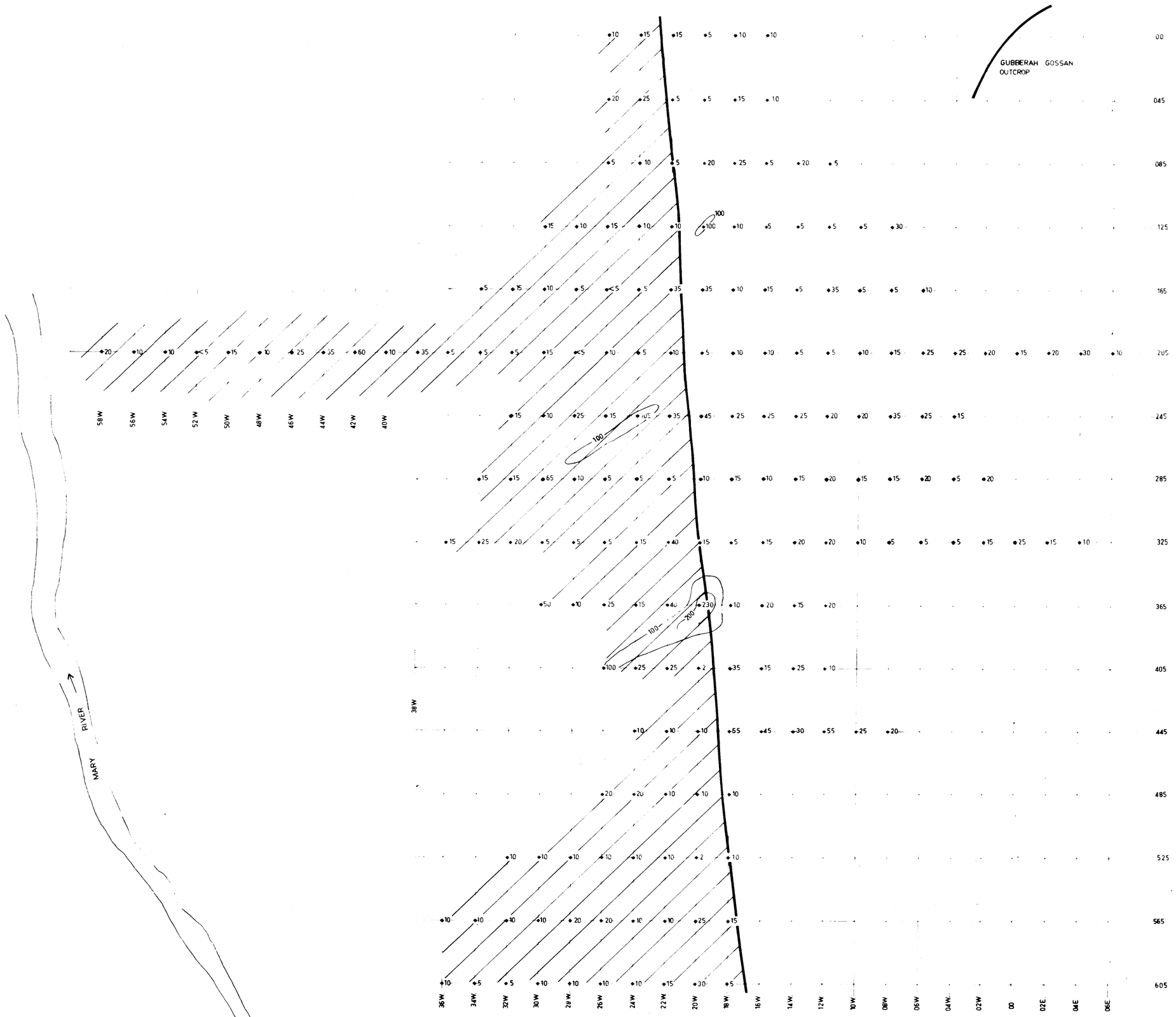
COMPILED BY RESIDENT GEOLOGICAL SECTION. DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, OCTOBER, 1968.

To accompany Record 1969/90

D 52/A8/399

~~G68/89C~~

PLATE 5.



N

COPPER GEOCHEMICAL CONTOURS AND GEOLOGY MARY RIVER AREA N.T.

SCALE

0 400 800 feet

LEGEND

- • 20 — Auger hole with copper assay of sample in p.p.m.
- 100 — Geochemical contour with value in p.p.m.
- Slate grey to black micaceous.
- Greywacke minor slate bands.

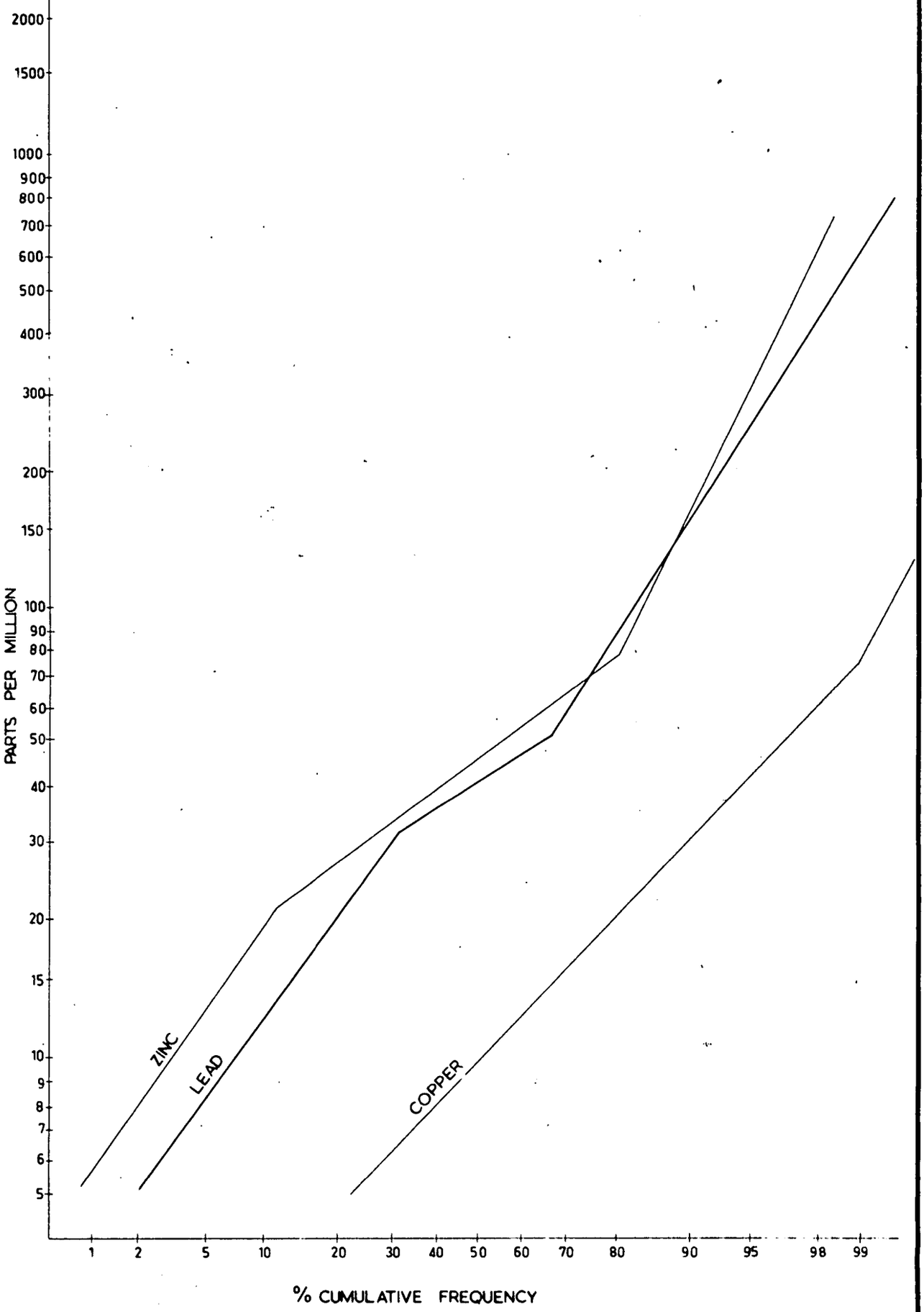
COMPILED BY RESIDENT GEOLOGICAL SECTION. DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, OCTOBER, 1968.

To accompany Record 1969/90

D52/A8/398

~~G68/90C~~

CUMULATIVE FREQUENCY DISTRIBUTION DIAGRAM
GEOCHEMICAL SURVEY
MARY RIVER AREA



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D52/A8/400

~~G68/87E~~

MARY RIVER AREA GEOPHYSICAL SURVEY, 1967

by

K. Duckworth

CONTENTS

PLATES

INTRODUCTION

This work was done at the request of the Resident Geologists, Northern Territory. The area includes a gossan containing anomalous lead, copper and zinc.

FIELD WORK

The work took one week in early November 1967. The methods used were Slingram (electromagnetic), Self Potential, Magnetic and Radiometric.

The field party consisted of K. Duckworth (Geophysicist), W. Fraser (Geophysical Assistant) and P. Maylor (Field Assistant).

A grid had previously been laid out over the area by J.W. Shields for a geochemical survey. It consisted of a number of east-west lines, spaced 400 feet apart, in a black soil plain just south of the gossan. All the lines were covered with Slingram and selected lines with the other methods.

RESULTS

Radiometric

It was found that there is no radio-activity associated with the gossan, so that this method was not used in the attempts to follow the gossan under the black soil flat.

Slingram

The profiles of Plate 1 and the contours of Plate 2 are of the Slingram Real Component. They show moderate to strong disturbances along two trends marked A and B in Plate 2. Of these features, A is typical of a good conductor of tabular form dipping almost vertically and striking north-south. This is probably a graphitic shale bed. Between A and B, a relatively undisturbed zone occurs. There is no evidence that mineralisation follows the north-east - south-west trend, displayed by the gossan outcrop, into the black soil plain.

Anomaly B probably represents an extension of the zone of the gossan which has changed to a north-south trend south of the outcrop. Plate 2 shows what is believed to be the concealed trend of this gossan zone. This interpretation is supported by the occurrence of small amounts of gossan-like material on two ridges just north and south of the ends of Anomaly B.

Self Potential

Two traverses were surveyed with this method to cover Anomaly B (see Plate 3). The traverse along 20S crossed the anomaly, while a further run along 0 E up to the gossan was done to see if Self Potential effects intensified towards the gossan. The shaded profile in 20S displays a 200 millivolts negative anomaly at about OEW. This corresponds well with Anomaly B in the Slingram survey. The profile running north to the gossan along 0 E drops further to give a negative anomaly of 300 millivolts, at about 7S, so that there is a total fall of 400 millivolts from the centre of the black soil plain up to the gossan.

It seems probable that a full Self Potential survey would reveal an extensive Self Potential anomaly associated with the gossan. An anomaly of 400 millivolts is consistent with the existence of a sulphide body beneath the gossan.

Magnetic

A single traverse along 20S was done to see if magnetic effects accompanied the conducting features. The profile shown in Plate 4 is presented in scale-dial units as its only function was to indicate effects worth further investigation. In fact a feature occurs at 0 E W which corresponds quite well with Anomaly B, and there is also a slightly anomalous magnetic feature corresponding with Anomaly A. The feature at 40W is of unknown origin, but might be worthy of further investigation.

The fact that a magnetic feature occurs in a position corresponding to Anomaly B suggest that it would probably be worth undertaking further magnetic surveys in association with any S.P. surveys which might be planned for this area.

GENERAL

Some electromagnetic work was tried close to the gossan with negative results; weathering has probably removed primary sulphides to such a depth as to be undetectable. This is to be expected as the gossan is in the crest of a sharp ridge and primary sulphides are unlikely to be present above a depth of at least 150 feet below the gossan.

The strong dependance of Slingram results on terrain effects makes them useless in such rough terrain, so that the Slingram survey could not be carried right up to the gossan.

RECOMMENDATION

1. A full Self Potential survey around the gossan including Anomaly B is required.

2. A magnetic survey might also be useful.

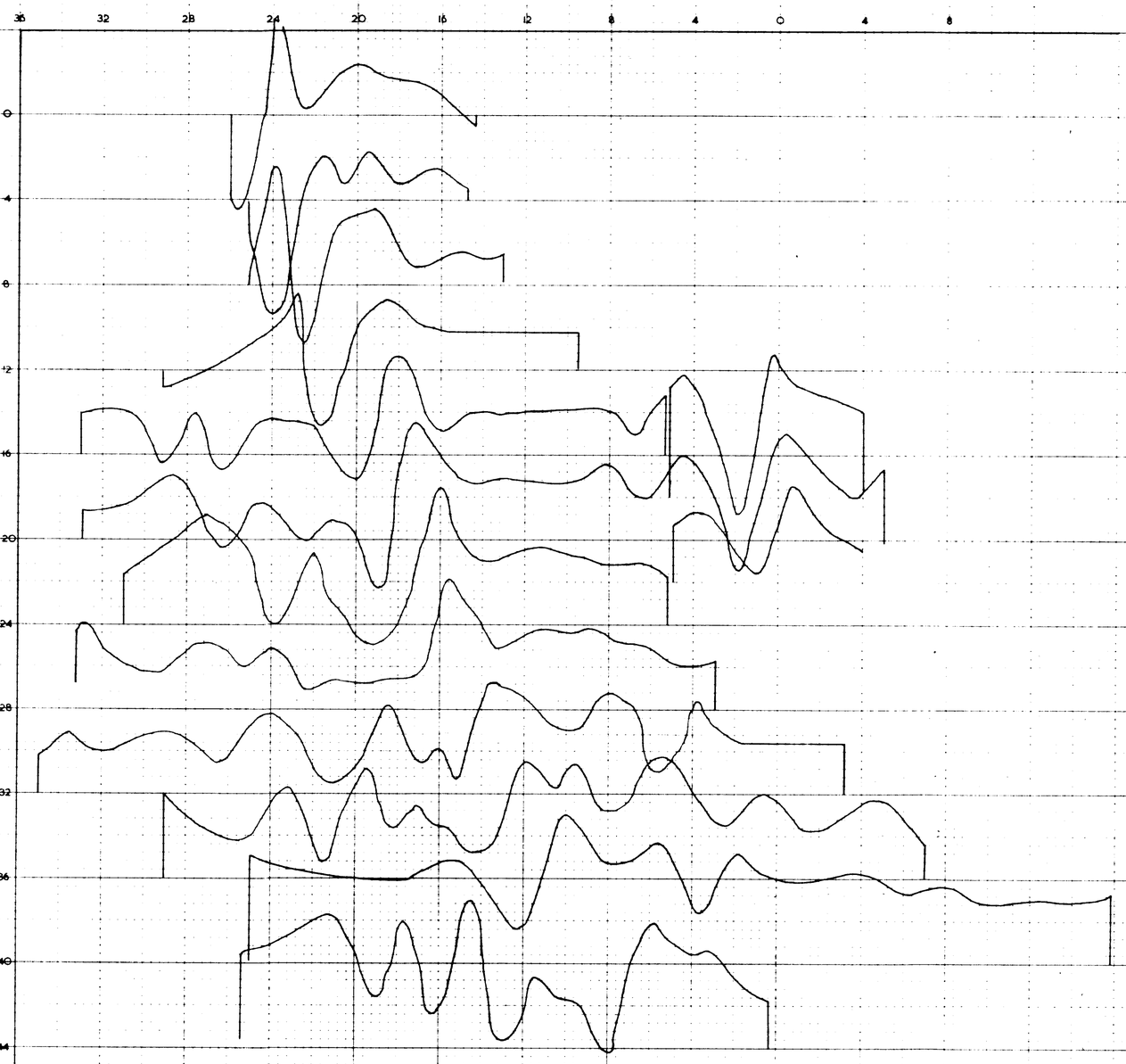
CONCLUSIONS

The limited geophysical work to date indicates a possible extension of the gossan to the south rather than the south west. There is also an indication from the Self Potential results that sulphides do exist beneath the gossan.

REFERENCE

SHIELDS, J.W., and TAUBE, A., 1967 - Iron Ore Reconnaissance Survey, Ban Ban and Wool Wagon 1-mile Sheet areas, Northern Territory. Bur. Miner. Resour. Aust. Rec. 1967/128 (unpubl.).

Plate 1



MARY RIVER AREA

SLINGRAM REAL COMPONENT PROFILES

SCALE 1in. = 400Ft.

400 200 0 400 800Ft.

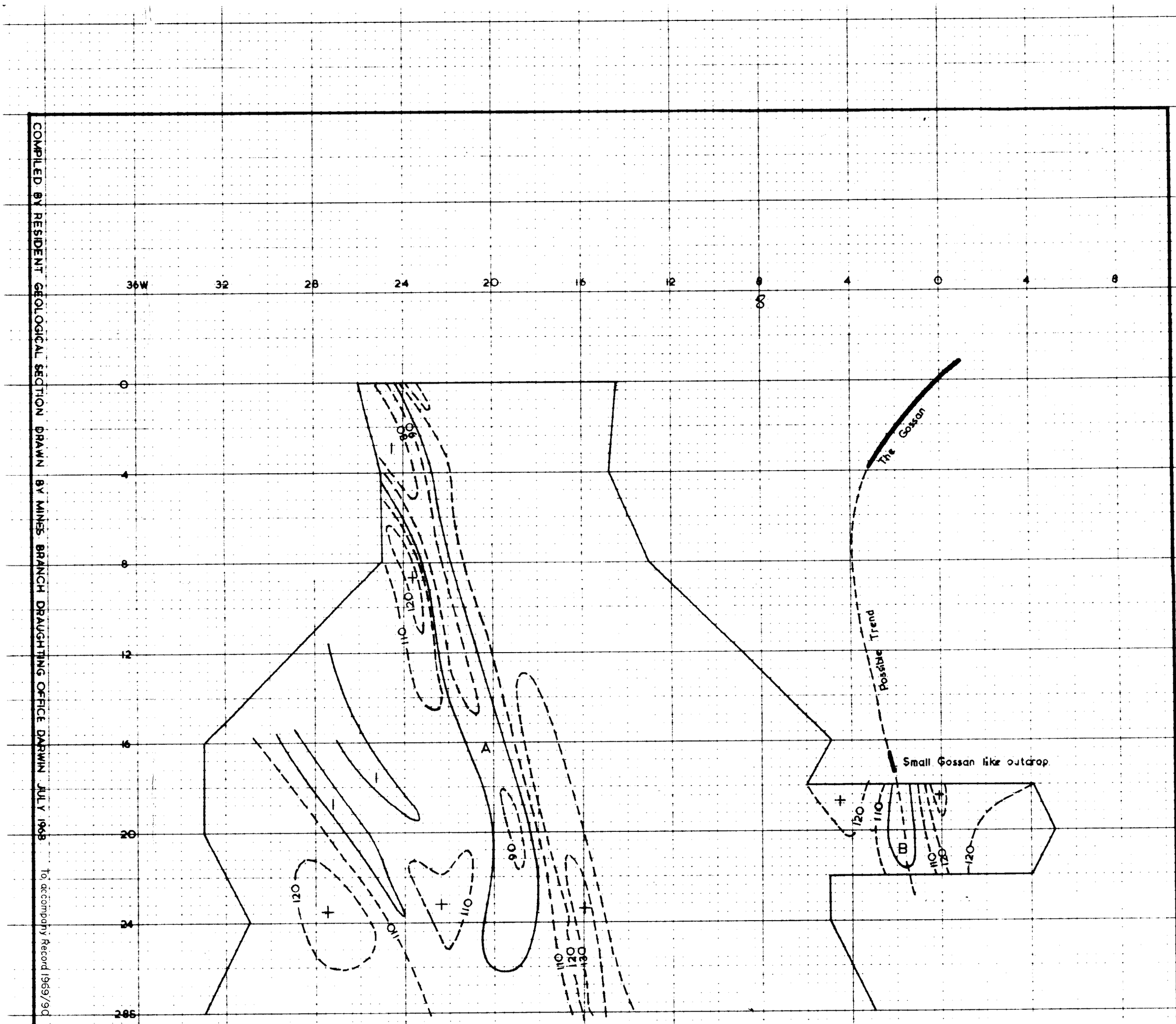
COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN JULY 1968 To accompany Record 1969/90

D52/A8/392

G68/96C

COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN JULY 1968

To accompany Record 1969/90



MARY RIVER AREA

SLINGRAM REAL COMPONENT CONTOURS

Contour Interval 10%
100% Contour

SCALE 1in. = 400 Ft

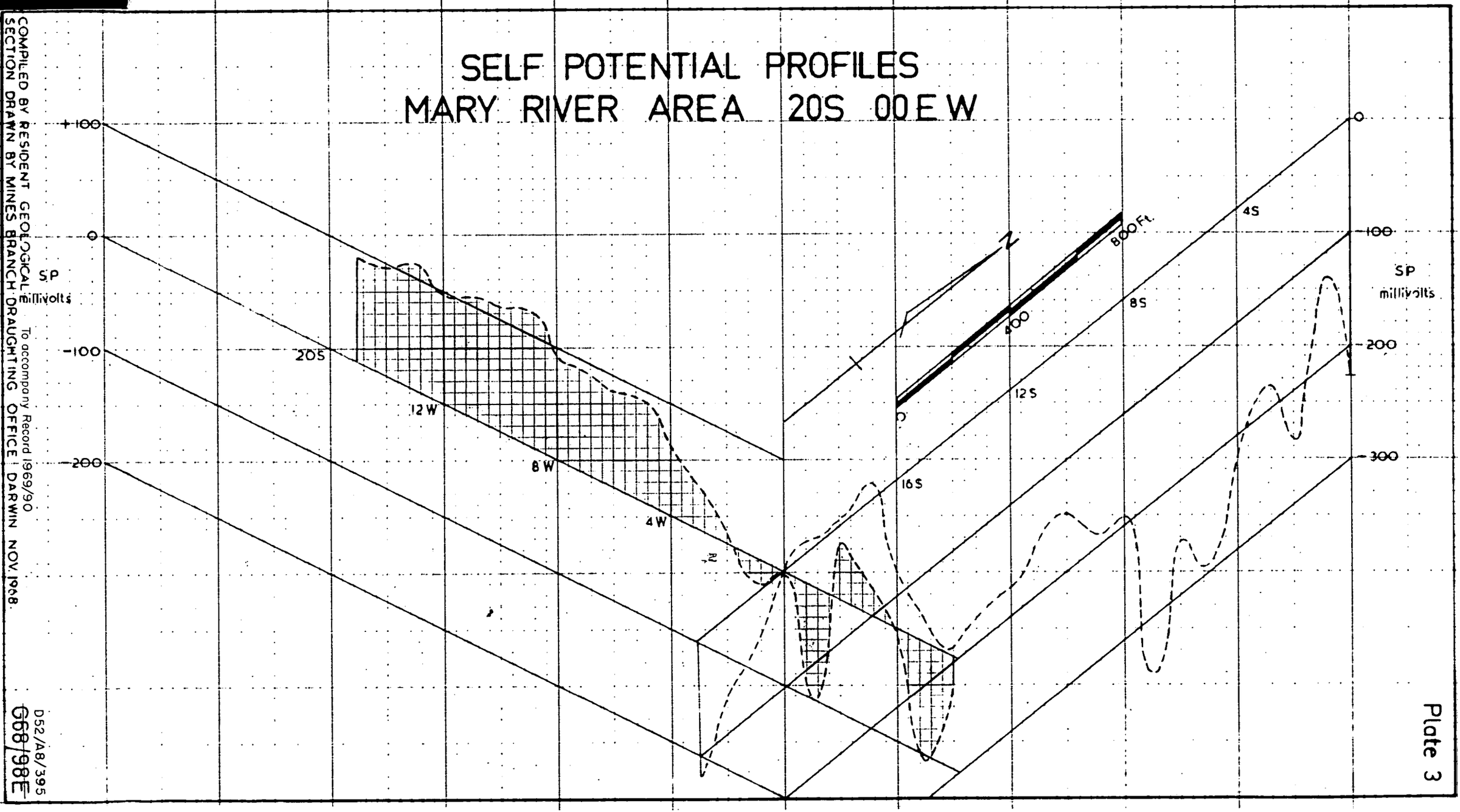
400 200 0 400 800 Ft.

Plate 2

D68/970

D52/A8/393

SELF POTENTIAL PROFILES
MARY RIVER AREA 20S 00E W



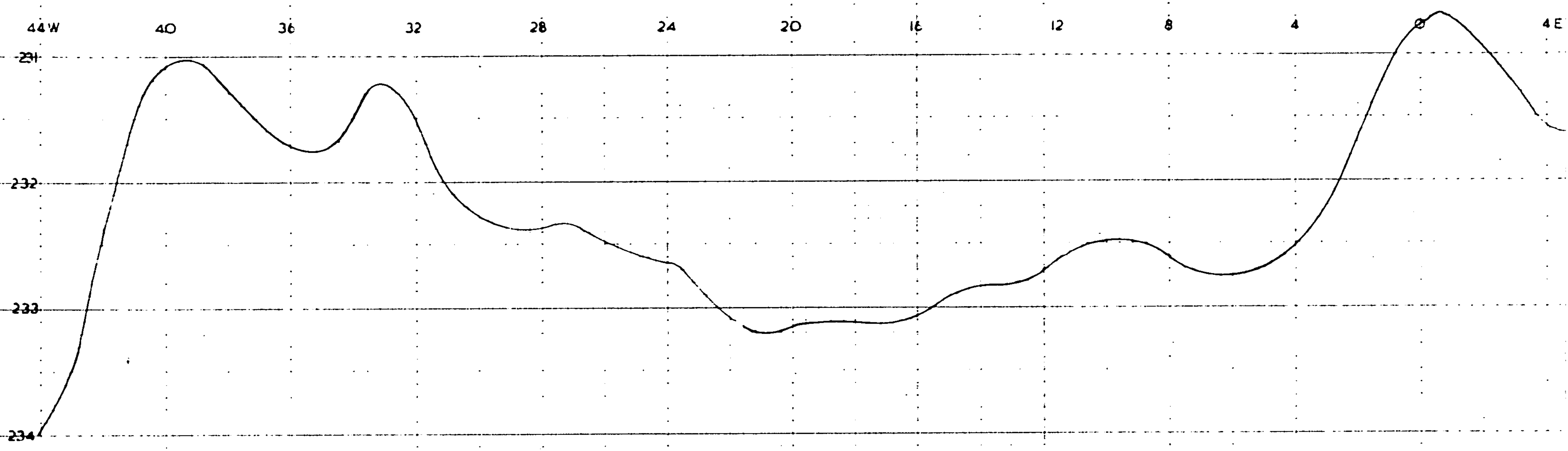
COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN NOV. 1968.

To accompany Record 1969/90

D52/A8/395

G68/98E

Plate 3



MAGNETIC TRAVERSE

MARY RIVER AREA 20S

SCALE

400 0 400 800 1200 Ft.

COMPILED BY RESIDENT GEOLOGICAL SECTION. To accompany Record 1969/90
DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN NOV. 1968

D52/A8/397
C68/99E

Plate 4

BARITE OCCURRENCE, PONY POCKET, DORISVALE, NORTHERN TERRITORY

by

J.W. Shields

CONTENTS

PLATES

SUMMARY

Two linear outcrops of barite at Pony Pocket, Dorisvale station, were briefly examined. The veins form discontinuous outcrops about 300 feet long, and average 7 feet in thickness, the measured thickness ranges from 2 feet to 15 feet.

The deposit is considered to be of low grade, and is in a remote area, the nearest point on the railway being about 70 miles away.

INTRODUCTION

A brief investigation was made of barite outcrops at Pony Pocket near Dorisvale Homestead. The outcrops were roughly mapped by compass traversing, and one representative chip sample across the lode was taken for assay.

LOCATION AND ACCESS

Dorisvale Homestead is situated in the centre of the area covered by the Fergusson River 1:250,000 sheet. Pony Pocket is about 10 miles south-west of the homestead.

Access to the area is via the Stuart Highway to a point about 170 miles south of Darwin, where a well-used road turns off to Claravale Homestead near the Daly River. Across the river, an unsurfaced track leads to Dorisvale and Pony Pocket. The distance by road from the highway to Pony Pocket is about 75 miles.

PREVIOUS GEOLOGICAL WORK

Hays (1961) described a galena-barite occurrence in the Pony Pocket area. He concluded that the barite contained a negligible amount of galena and that reserves of barite were between 500 and 1000 tons per vertical foot.

GENERAL GEOLOGY

Randal (1962) described the geology of the Fergusson River 1:250,000 sheet. In the Pony Pocket area the known succession is:-

Lower Cretaceous:	Mullaman Beds:	sandstone and siltstone
Lower Cambrian :	Antrim Plateau Volcanics:	basalt and tuffaceous sandstone
Upper Proterozoic:	Waterbag Creek Formation:	ferruginous sandstone and siltstone

The Cretaceous rocks in the area form mesas with flat tops of lateritised sediments; the slopes of the mesas are littered with laterite boulders.

The barite lodes crop out on the slopes of some of these mesas. Locally the lodes appear to be unconformably overlain by the Cretaceous sediments, and at the other localities scree partly obscures their outcrops (see Plates 2 and 3). At the surface, the barite is iron-stained. At the northern end of the Pony Pocket North barite outcrop, the host rock of the barite lode is exposed. It consists of tuffaceous sandstone veined with barite. The wall rock at the Pony Pocket South barite lode is covered by rubble.

GRADE

The barite at Pony Pocket appears to be of fairly uniform composition. At one location a small amount of galena is contained in the lode.

A chip samples across the northern end of the Pony Pocket South outcrop (Plate 3) yielded the following assay results:

Ba	Fe	Ca	Mg	CO_3	SiO
39%	3.7%	0.14%	0.00%	0.7%	4%

Assuming all barium is in the form of a sulphate, the barite content is 61.5%. Further sampling and assaying is necessary to determine the other constituents of the rock. Strontium has been reported in the lode but was not assayed for.

CONCLUSION

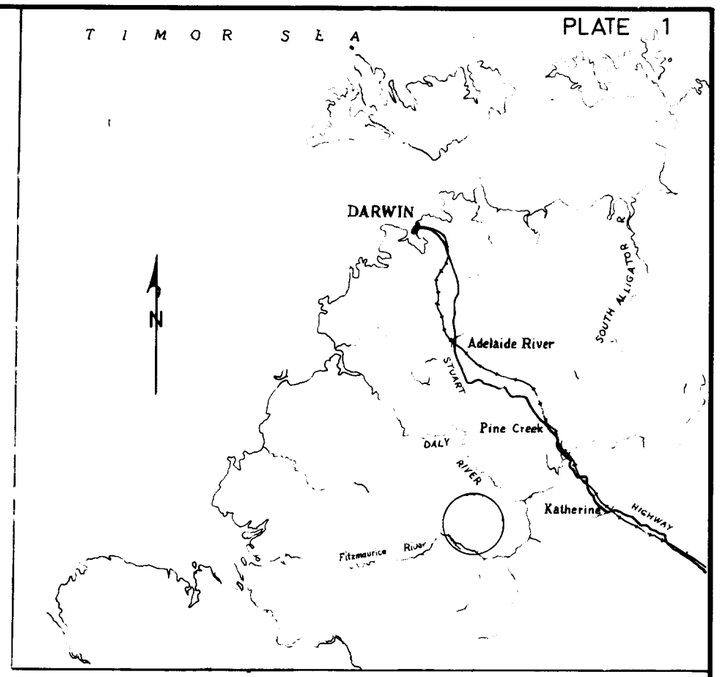
The barite is apparently not of high grade. Added to this disadvantage, the isolation of the prospect must be considered in assessing the economic potential. Further extensive sampling would be required to fully determine the grade of the barite.

REFERENCES

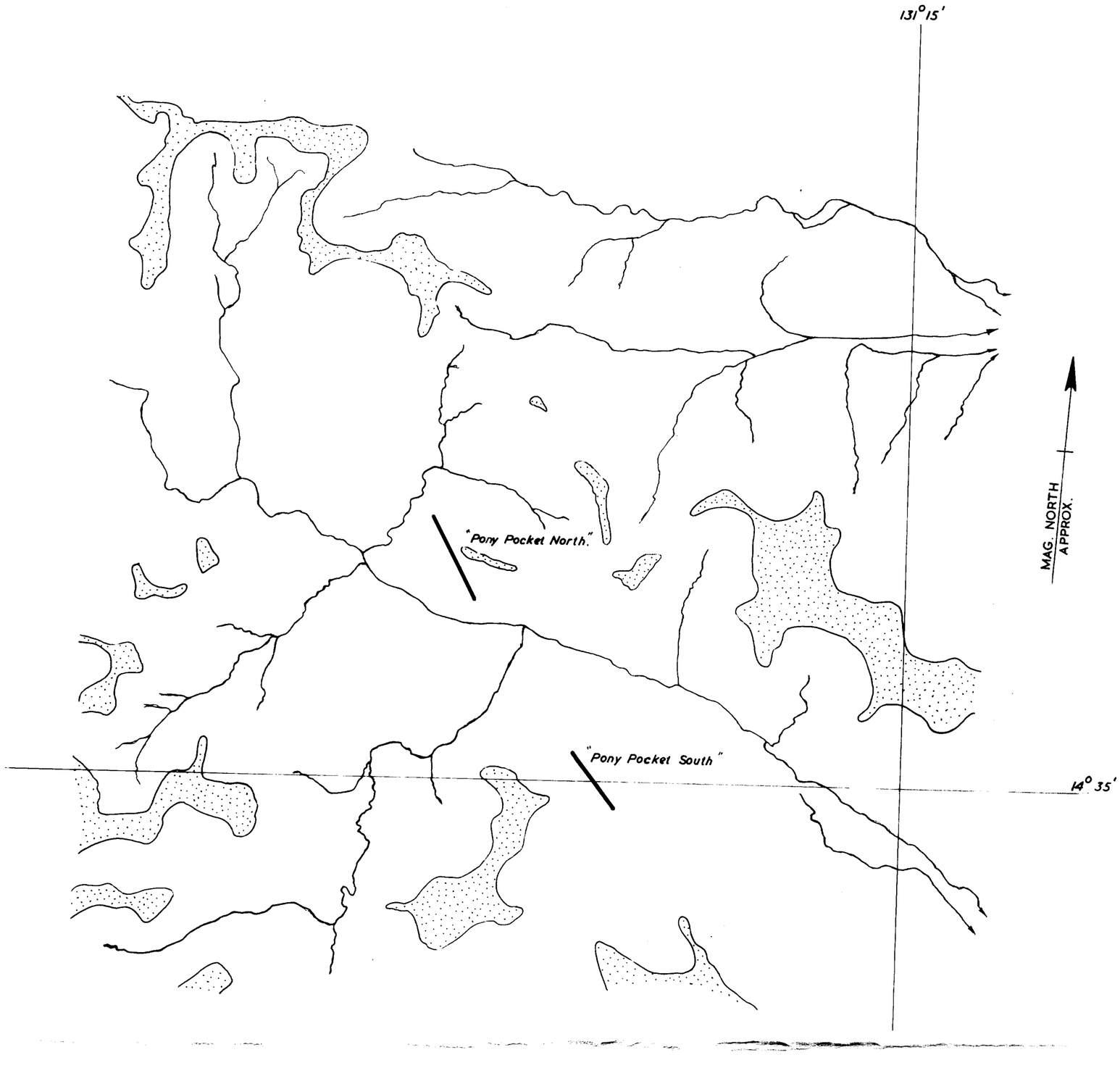
HAYS, J., 1961 - Investigation of a galena-barite occurrence at Dorisvale Cattle Station, N.T. Unpublished Report Resident Geologists File, Darwin, N.T.

RANDAL, M.A., 1962 - Explanatory Notes, Fergusson River 1:250,000 geological sheet. Bur. Miner. Resour. Aust.

PLATE 1



LOCALITY MAP



Mesas, capped by Lower Cretaceous rocks.

Barite outcrop

SCALE: 1 : 30,000 approx.

Traced from arial photograph - Survey 333 Dorisvale
Run 1 Photo No 153.

Geographical Co ordinates approximate.

0 — 2 Miles(approx)

BARITE OUTCROPS "PONY POCKET" DORISVALE

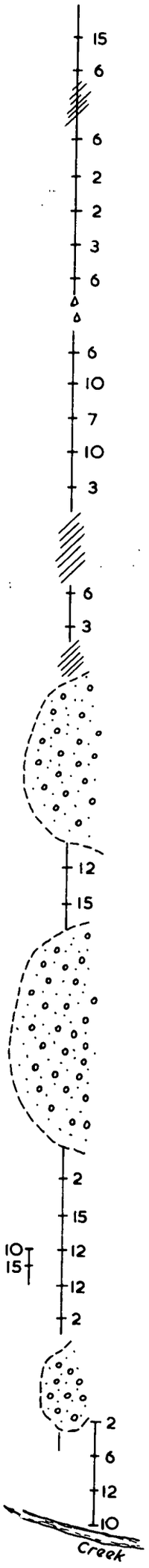
NORTHERN TERRITORY

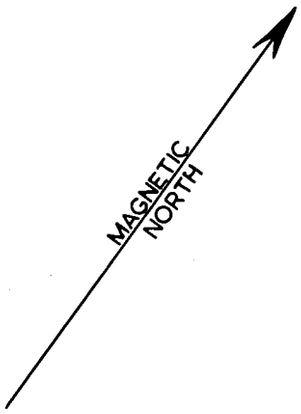
COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN MARCH 1967.

To accompany Record 1969/90

D52/A12/9

G67/22D





LEGEND

Ferruginous sandstone and conglomerite.

Scree.

3 Barite outcrop (width in feet.)

Scale : 200ft = 1 inch.

Pace & compass survey.

0 200 400 600 Feet

BARITE OUTCROPS
"PONY POCKET NORTH."
DORISVALE

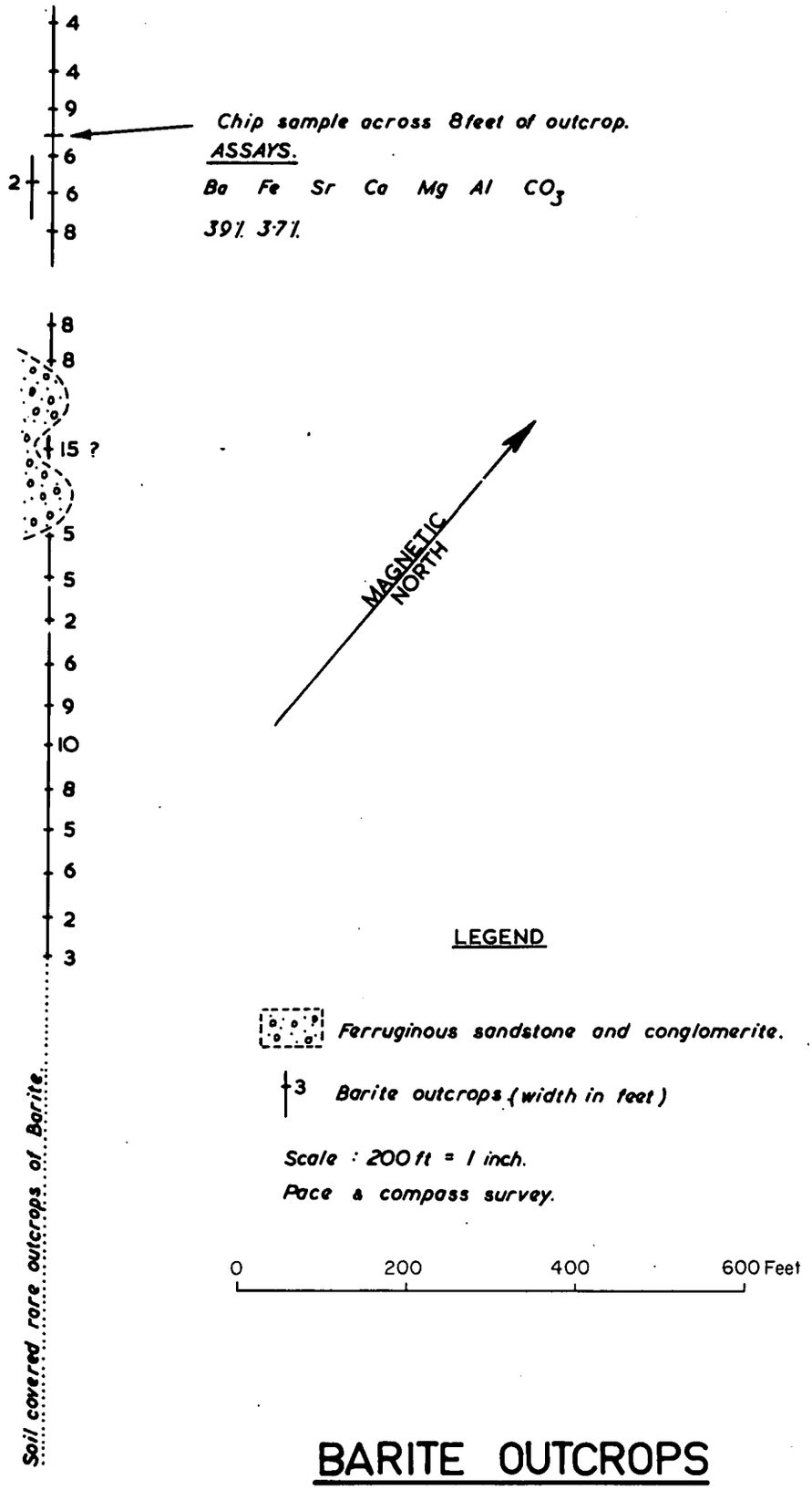
NORTHERN TERRITORY.

D52/A8/389

To accompany Record 1969/90

COMPILED BY RESIDENT GEOLOGICAL SECTION.
DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN MARCH 1967.

G67/23E



BARITE OUTCROPS
"PONY POCKET SOUTH."
DORISVALE

NORTHERN TERRITORY.

To accompany Record 1969/90

COMPILED BY RESIDENT GEOLOGICAL SECTION.
DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN. MARCH 1967.

D52/A8/390

G67/24E

BAUXITE DEPOSITS - GROOTE EYLANDT AREA

by

R.G. Dodson

CONTENTS

PLATES

SUMMARY

A helicopter survey was made of the northern part of Groote Eylandt and the neighbouring islands of Bickerton, Winchelsea and Connexion, to investigate known bauxite deposits and to seek additional sources of bauxite. However, analyses of samples from the Umbakumba Area confirm the results of previous investigations, indicating that the quality of the exposed bauxite is far too low to be considered as commercial grade.

No bauxite was found at Bickerton, Winchelsea or Connexion Islands.

INTRODUCTION

A brief but detailed survey of part of the Groote Eylandt area was made by the use of a helicopter to investigate the extent of partly exposed bauxite deposits and to plan further detailed work. The area mapped includes the north-eastern portion of Groote Eylandt and the nearby islands of Winchelsea, Bickerton and Connexion.

Groote Eylandt and the surrounding islands are part of an Aboriginal Reserve. A Welfare Department settlement is situated at Umbakumba on the north-east coast of the island, while both the Mission Settlement of Angurugu and the B.H.P. Co. Ltd mining settlement are situated on the west coast. The island is served by a regular air service from Darwin and an irregular coastal boat service from Darwin and Queensland ports.

PREVIOUS GEOLOGICAL WORK

The regional geology of Groote Eylandt and neighbouring islands was described by Plumb and Roberts (1964).

J. Shields (in prep.) made a brief survey of the Umbakumba area, concluding that the bauxite may extend over an area of about five square miles, and may range in thickness from 3 to 20 feet. He noted that the bauxite at Umbakumba is siliceous, but recommended a survey of the Winchelsea and Bickerton Islands to search for possible additional deposits.

THE HELICOPTER SURVEY

Operating from Umbakumba Welfare Department Settlement, low level traverses were made to cover the areas believed to be underlain by bauxite near Umbakumba. In addition, flights were made over Bickerton, Winchelsea and Connexion Islands to seek additional bauxite deposits (Plate 2).

Umbakumba Area. West of the Welfare Department Settlement, reddish-brown soils are believed to be thin caps of residual soils overlying bauxite. Outcrops of sandstone of the Groote Eylandt Beds in the area indicate that the bauxite was deposited on an undulating erosion surface. Where exposed in creeks and at beach cliffs, soil depth varies from a few inches to over a foot.

At the cliff face on the eastern side of Thompson Bay the exposed succession is as follows:-

Red Soil	$>\pm$ 1 foot
Pisolitic bauxite with yellow to white patches (gibbsite?)	$\pm$ 3 feet
Red Clay	$\pm$ 7 feet
Red Clay with leached lumps of siltstone	>4 feet

At Baird Cliff the section exposed is as follows:-

Red-brown soils	>2 feet
Pisolitic bauxite (irregular thickness)	$\pm$ 3 feet
Tubular bauxite (with yellowish patches of gibbsite)	>8 feet

Minor exposures of bauxite also occur along the beach west of Umbakumba Settlement and in some small creeks draining the area.

Samples of bauxite were collected from three localities shown on Plate 3, care being taken to ensure that the samples were free of loose sand. The following are the analytical results of these samples:

Sample No.	Loss on Ignition (1000°C)	Al_2O_3%	SiO_2%	Fe_2O_3%	TiO_2%
Umba 7	13.1	22.1	27.2	33.3	1.9
Umba 8	17.9	33.4	24.1	19.7	2.5
Umba 9	11	25.9	34.4	25.8	1.7
Umba 10	11.3	28.9	38.5	18.7	1.7

Bickerton Island. A series of helicopter traverses were flown over Bickerton Island. Where possible, landings were made to examine outcropping rock or soils, and to collect specimens.

Compact sandstone of the Groote Eylandt Beds is exposed in the central, northern and eastern parts of the island. In the south-western corner, a terrace approximately 10 feet high is exposed near the shore line. The exposed sediments consist of reddish to orange coloured clays with a high silica content. Similar coloured soils cover areas inland of the shore line terraces. Manganiferous laterites are patchily exposed along the beach in the south-western and western parts of Bickerton Island, and are believed to extend inland. The northern and south-eastern parts of the island are overlain by grey soils. No bauxite was found.

Winchelsea Island. Compact sandstone of the Groote Eylandt Beds is exposed on the northern part of Winchelsea Island. In the central and southern part of the island, red soils and clays overlie the bed-rock, but the red clays are not notably aluminous.

Manganiferous laterite is patchily developed in the southern part of Winchelsea Island. No bauxite was found.

Connexion Island. A brief survey was made of Connexion Island. The island is covered by a thin patchy mantle of grey to pale brown soils. No bauxite is present.

CONCLUSIONS AND RECOMMENDATIONS

Analytical results of samples from the Umbakumba area collected during the present survey and those previously submitted by Shields suggest that the bauxite is low grade with an undesirably high silica and iron content.

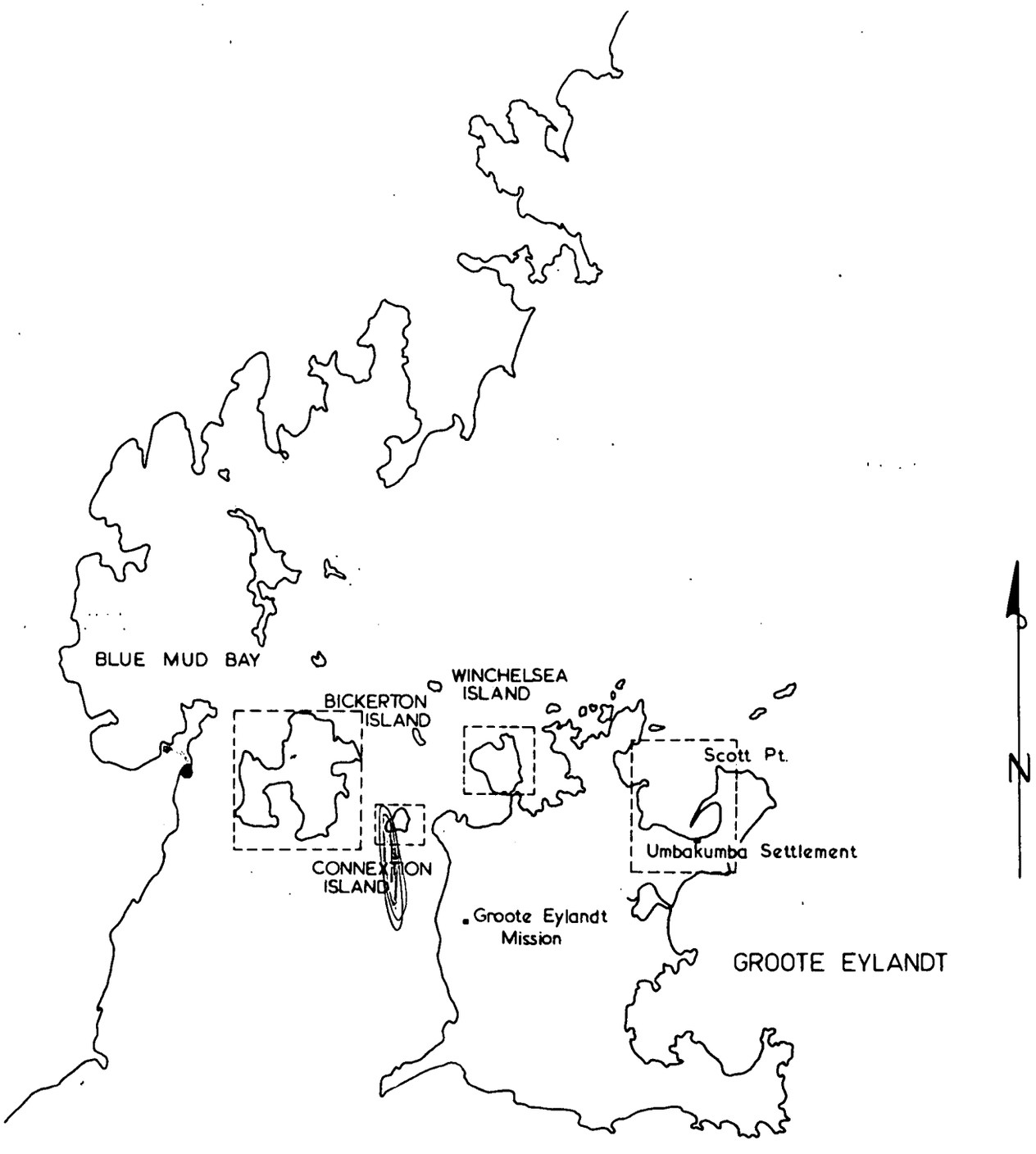
The possibility that the quality of the bauxite improves with depth inland must be considered remote. To adequately investigate the bauxite at depth, a series of pits would be required to allow sampling to the base of the laterite profile. Eight pits are recommended at the localities shown on Plate 3. If possible the pits should be excavated through the bauxite to siltstone, shale or sandstone bedrock. Any further work to be carried out in the area would be dependent on the results of analysis of samples collected from the pits.

REFERENCES

PLUMB, K.A., and ROBERTS, H.G., 1964 - Explanatory Notes on the Blue Mud Bay/Port Langdon 1:250,000 Geological Series Sheet SD53-7/8. Bur. Miner. Resour. Aust. Rec. 1964/67 (unpubl.).

SHIELDS, J.W., (in prep.) - Umbakumba Bauxite Deposit, N.T. Bur. Miner. Resour. Aust. Rec.

PLATE 1



LOCALITY MAP

GROOTE EYLANDT AREA

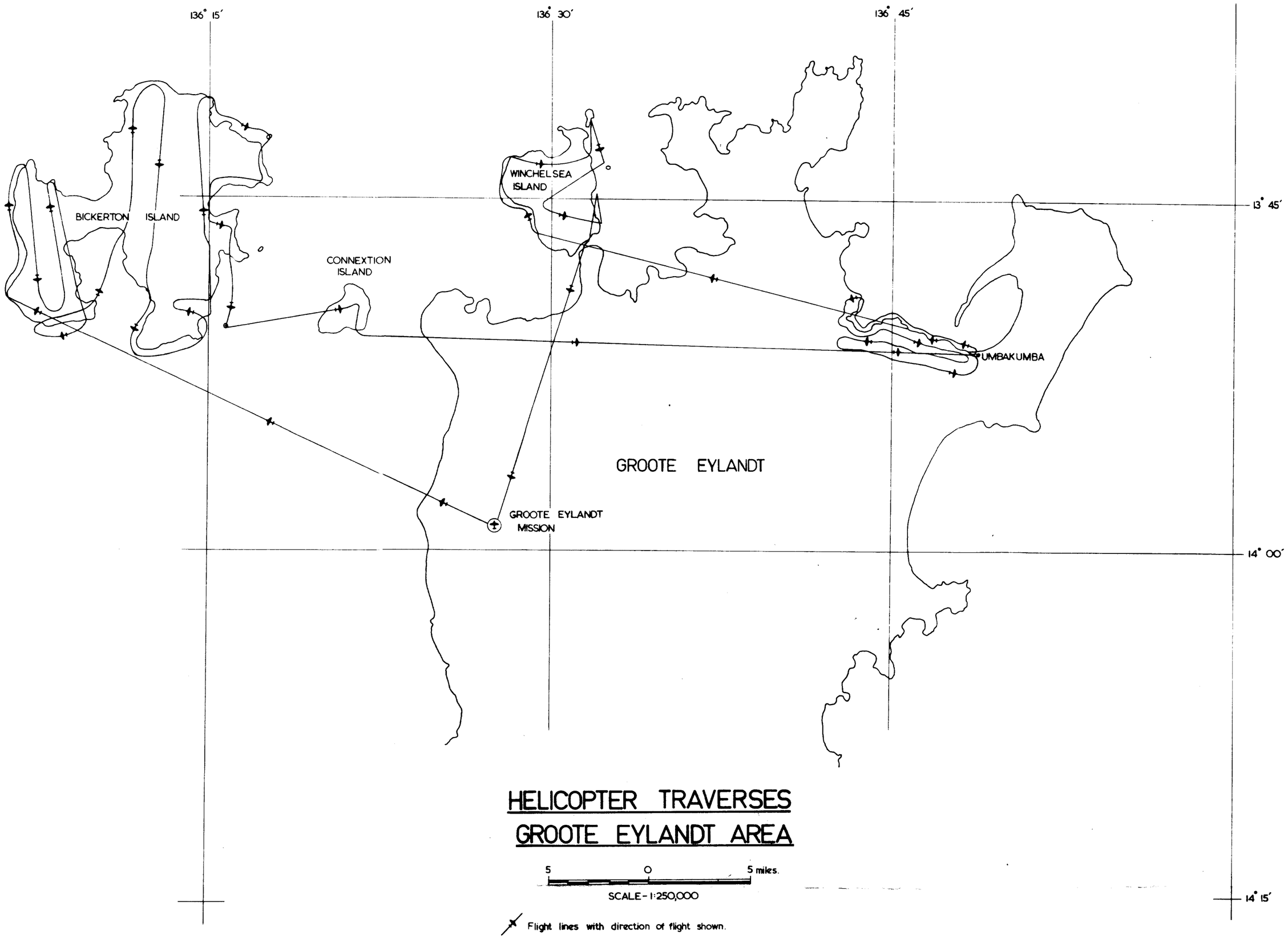
10 5 0 10 20 30 miles.

SCALE: 1 - 1,000,000

To accompany Record 1969/90.
COMPILED BY RESIDENT GEOLOGICAL SECTION.
DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, NOVEMBER, 1968.

D53/A/6
~~G68/100E~~

PLATE 2



HELICOPTER TRAVERSES
GROOTE EYLANDT AREA

5 0 5 miles.

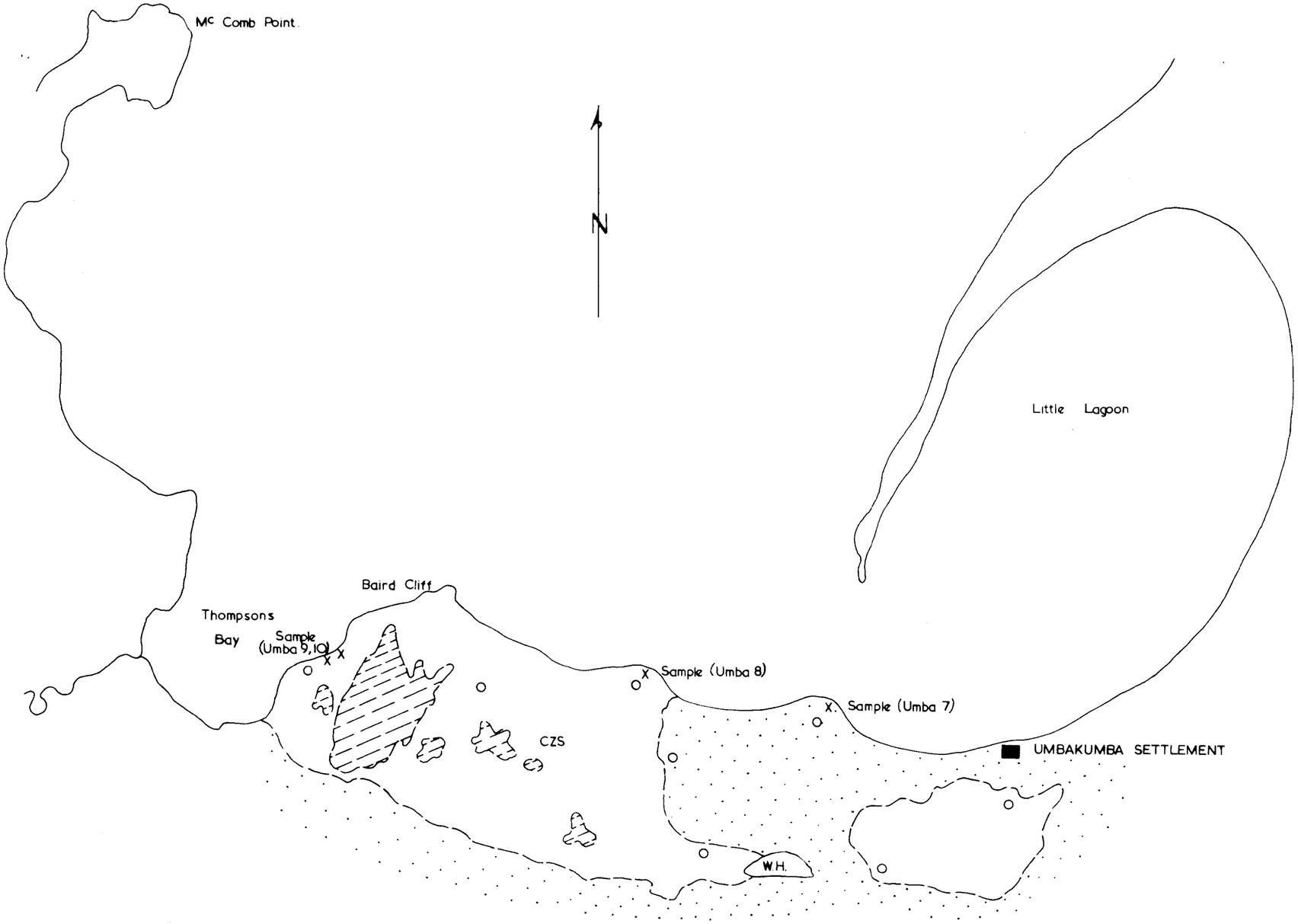
SCALE - 1:250,000

Flight lines with direction of flight shown.

D53/A/7

~~G68/101D~~

COMPILED BY RESIDENT GEOLOGICAL SECTION. DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, NOVEMBER, 1968. To accompany Record 1969/90



GEOLOGY

OF THE

UMBAKUMBA AREA
GROOTE EYLANDT

1 0 1 miles.

SCALE Approx. 1:50,000.

LEGEND

- White dune sand.
- CZS — Sand, lateritic soil.
- Groote Eylandt Beds (Quartzite Pta)
- X — Sample point and number.
- O — Pits recommended.
- WH — Waterhole.

COMPILED BY RESIDENT GEOLOGICAL SECTION. DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, NOVEMBER, 1968. To accompany Record 1969/90

D53/A/8

~~G68/102D~~

COPPER-GOLD OCCURRENCE NEAR HOWLEY SIDING, NORTHERN TERRITORY

by

J.W. Shields

CONTENTS

LIST OF PLATES

SUMMARY

A gold and copper bearing lode 3 feet wide and at least 100 feet long has been exposed by trenching near Howley Siding. Further trenching and sampling is required to assess the total length and grade of the lode.

INTRODUCTION

A short visit was made to the prospect in October 1966 in company of the leaseholder, Mr S. Mazlin. The prospect had been costeaned earlier in the year without locating the lode and Mr Mazlin requested assistance in this respect.

During the visit the lode was uncovered in four places by drilling, blasting and digging.

LOCATION AND ACCESS

The prospect is situated 0.3 miles to the south of Howley Siding, on the North Australian Railway (see accompanying sketch).

Access from Darwin is via the Stuart Highway for 101 miles, then along bitumen and unsurfaced roads to Brocks Creek. Howley Siding is 3 miles west-north-west of Brocks Creek, along the North Australian Railway. A bush track runs along the railway and to the prospect.

HISTORY

Gray (1916) reported on a prospect near Howley Siding, under the heading "McKay and Francis lease". Samples from a shaft 30 feet deep assayed:

	Copper %	Gold dwts/ton
1.	16.6	13
2.	35.5	6
3.	23.8	Trace
4.	29.7	6

GENERAL GEOLOGY

The copper-gold lode is enclosed by rocks of the Lower Proterozoic Golden Dyke Formation. Other rocks in the area include the Brocks Creek Granite which crops out 1½ miles north and north-east of the lode and ortho-amphibolite which intrudes the sedimentary rocks surrounding the granite.

DESCRIPTION OF LODE

General

The lode is in a shear zone which cuts across the strike of the country rock. The lode strikes 050° magnetic and dips 85° to the north. It is more than 100 feet long and up to 2 feet 9 inches wide.

Mineralogy

Minerals identified in the lode are chalcopyrite, chalcocite, malachite, gold, barytes, calcite, hematite and chalcedony. Chalcopyrite is almost completely replaced by chalcocite. The malachite is a weathering product of chalcocite.

Detailed

The lode was exposed in four places: copper minerals were identified in only one place. In one other place, copper was proven by assay. For the most part the lode consists of brecciated country rock veined with auriferous quartz. Copper minerals appear to be present in lenses up to 6 inches wide.

At locality A (see sketch map, Plate 2) a 6-inch vein with chalcopyrite, chalcocite, barytes and malachite was sampled and assayed:

	Mark	Gold	Copper	Cobalt
*	199294	5.5 dwts/ton	3.3%	Not detected

The vein is on the northern or hanging wall of the shear zone, with 2 feet of brecciated slate, greywacke, and leached white greywacke occupying the remainder of the zone.

A hole 9 inches in diameter was made at locality B in line with localities D, C and A (Plate 2). Soft red hematite from the hole assayed:

	Mark	Gold	Copper	Cobalt
*	199295	3.6 dwts/ton	0.6%	Not detected

Vein quartz 6 inches to 1 foot wide with manganese coating was found in the eastern at locality D.

At locality C, 20 feet from D, the shear zone was also uncovered. The lode material filling the shear zone of this point consists of brecciated, chloritised country rock, veined with quartz and coated with manganese.

* Assay by N.T.A. Mines Branch Laboratory, Darwin

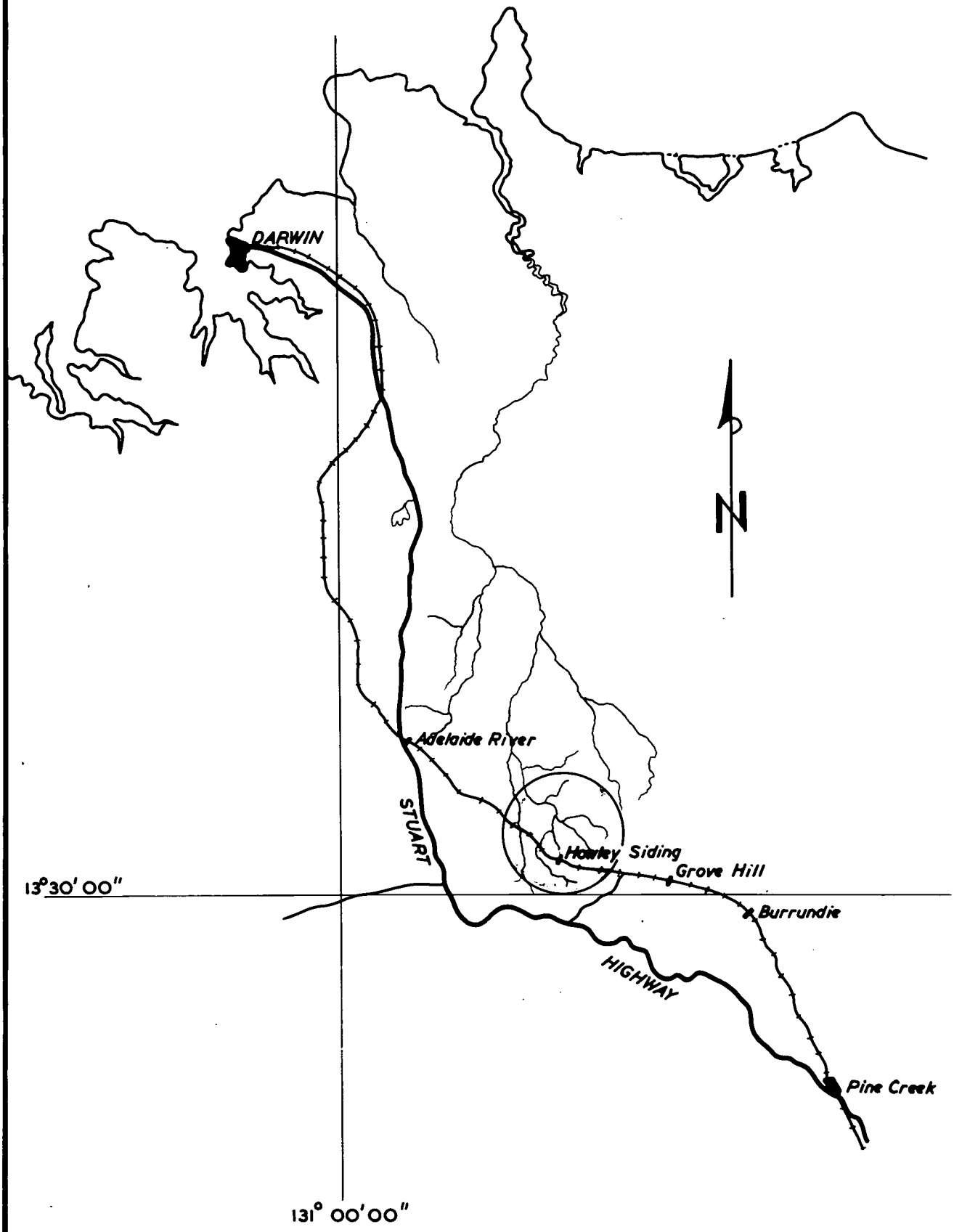
CONCLUSION

Further trenching along the lode is necessary to determine its width, length and the distribution of values.

REFERENCE

GRAY, 1916 - The Brocks Creek District, in Bulletin of the Northern Territory No. 16 "The Geology of the Woggaman Province, N.T."

PLATE 1



LOCALITY MAP

BALBIRINI COPPER PROSPECT

by

M.R. Daly

CONTENTS

LIST OF PLATES

SUMMARY

Secondary copper mineralisation consisting of malachite, azurite, chrysocolla and chalcocite, was examined near Sandy Creek in the southern portion of Balbirini Station.

The mineralised zone is poorly exposed so that its areal extent is impossible to determine.

INTRODUCTION

At the request of the lessee, a copper occurrence in the southern portion of Balbirini Station was examined on the 4th October, 1967.

The prospect is located near Sandy Creek, a tributary of the McArthur River. The prospect is reached by travelling 47 miles south along the Wallhallow road off the Daly Waters - Borroloola Beef Road, and then 24 miles eastward along a rough track across black soil flats and low limestone ridges.

GENERAL GEOLOGY

The geology of the area is shown on the 1:250,000 Bauhinia Downs and Wallhallow Geological maps.

Exposed rocks in the area are predominantly limestone of the Top Springs Formation, flanked to the north-east, north, and north-west by rocks of Proterozoic age and to the south-east, south and south-west by sediments of Cretaceous and Cainozoic age.

The Limmen Sandstone belonging to the Roper Group of (?) Upper Proterozoic age, is exposed around the northern edge of the Top Springs Limestone. This formation consists of blocky medium-grained sandstone with a basal conglomerate, and grades upwards into the poorly outcropping Mainoru Formation of purple-brown micaceous siltstone and fine sandstone, and the Crawford Formation characterised by glauconitic sandstone.

Structurally, the Proterozoic sediments strike roughly north-south, and are heavily faulted in a north-south to north-west - south-east direction.

The Top Springs Limestone of Lower Cambrian age is typically a massive, brown, fine-grained rock; it is thin and unconformably overlies rocks of Proterozoic age. Numerous small outcrops of sandstone not recorded on the Wallhallow 1:250,000 Geological Sheet, are probably inliers of the Limmen Sandstone.

Horizontal beds of Lower Cretaceous sandstone unconformably overlie the Top Springs Limestone. These sediments have been intensely lateratised.

COPPER MINERALISATION

The copper mineralisation occurs as veins in a pinkish white, medium grained, silicified, highly fractured sandstone. The silicified sandstone is probably Limmen Sandstone. Copper is localised in a fracture zone, coinciding with a minor tectonic trend.

The mineralised zone is poorly exposed in shallow excavations reaching6 inches to one foot below the superficial deposits. Secondary copper mineralisation can be traced over an area of about 30 by 12 feet. As far as could be seen, the mineralised fracture zone strikes about 50°, and has a near vertical or steep westerly dip.

Sandstone outcrops a few feet east and south of the mineralised zone. Apart from a few small isolated malachite veins, there is no mineralisation in these outcrops. The zone does not appear to extend much to the east or south, indicating that it has a probable width of about 12 to 15 feet. Due to incomplete excavation and lack of outcrop, the extension in the north-easterly direction cannot be determined.

Minerals present include malachite, azurite, chrysocolla, and some chalcocite and hematite occurring in fracture fillings and in the interstices of a fault breccia. Bluish green chrysocolla forms only thin coatings on minor fractures, whereas malachite and azurite more commonly occur in thicker veins up to ¼ inch across. Hematite is almost entirely confined to the highly brecciated zones. Chalcocite is a minor constituent in the malachite and azurite veins.

No primary copper mineralisation was seen. Three samples assayed contained 7.1%, 8% and 10.9% copper.

CONCLUSIONS AND RECOMMENDATIONS

The grade of the exposed mineralisation may be high enough for economic exploitation, but the excavations do not indicate a sufficient extent to justify diamond drilling of the deposit.

The overburden should be stripped off or pits dug to reveal the size of the mineralised zone, particularly its extension in the north-east direction. Further development work is dependent on the extent and quality of mineralisation which may be exposed.

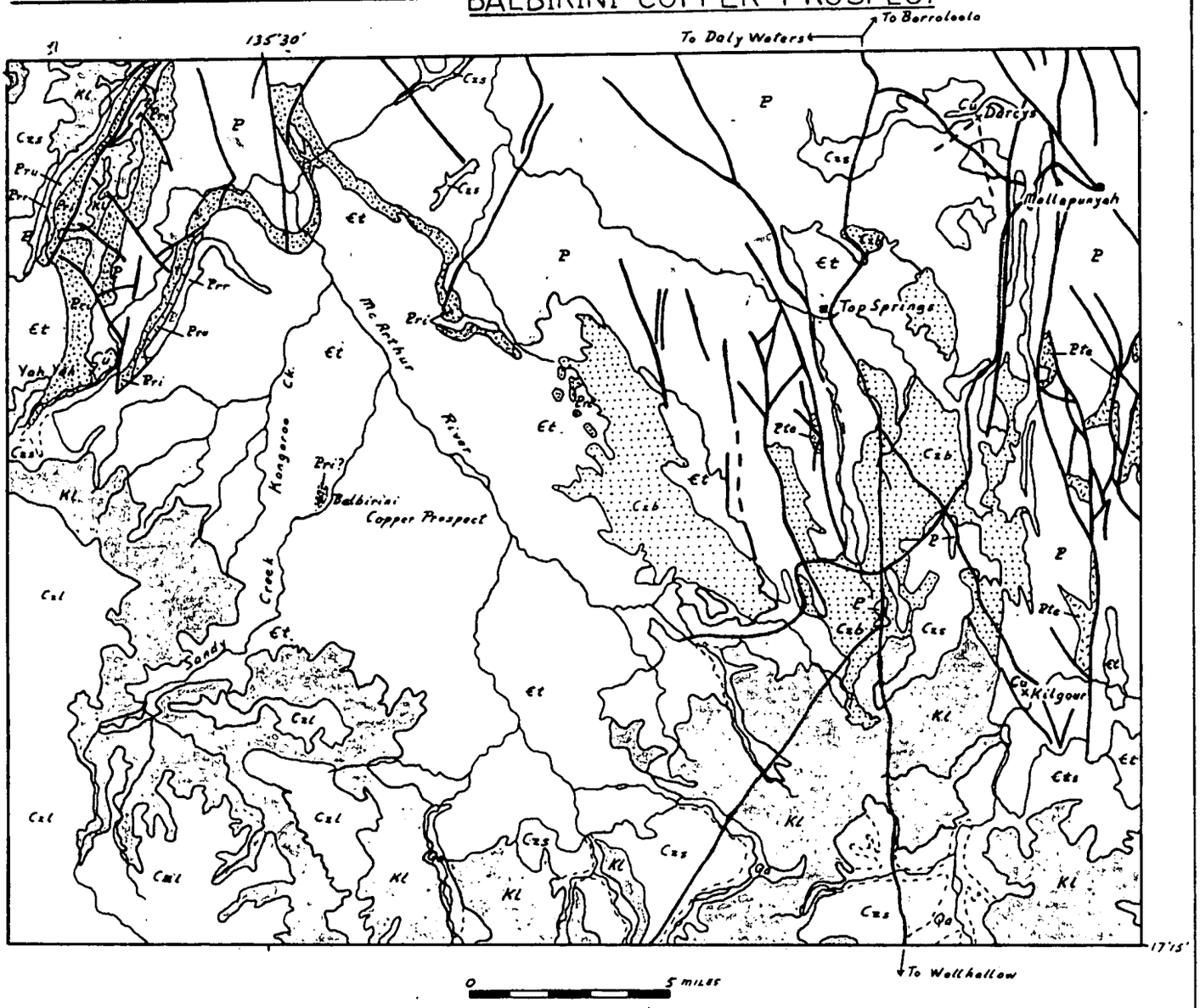
A number of other near-by copper prospects in the Balbirindi - Mallapunyah area should also be investigated to determine whether they are part of a more extensive mineralised zone. Because of the roughness of the terrain, a helicopter would be useful for such an evaluation.

The rock, with green, blue and red veining, is most attractive and might be suitable for ornamental purposes. Distance from markets might limit such a use.

REFERENCES

PLUMB, K.A., and RHODES, J.M., 1964 - Wallhallow, N.T. - 1:250,000 Geological Series. Bur. Miner. Resour. Aust. Explan. Notes SF/53/7.

GEOLOGICAL SKETCH MAP: BALBIRINI COPPER PROSPECT



CAINOZOIC

QUATERNARY: Qo — Alluvium

UNDIFFERENTIATED: Czs — Residual soil, sand

Czb — Black soil

Czl — Laterite, laterite soil

MESOZOIC

LOWER CRETACEOUS: Kl — Massive grey calcareous siltstone, white leached siltstone, massive white quartz sandstone and conglomerate

PALAEOZOIC

MIDDLE OR LOWER CAMBRIAN: Et — Top Springs Limestone: massive yellow-brown fossiliferous limestone

PRECAMBRIAN

UPPER (?) PROTEROZOIC: Prr — Crawford Formation: blocky glauconitic sandstone, flaggy purple micaceous sandstone

Pru — Mainoru Formation: flaggy purple micaceous siltstone and fine sandstone

Pri — Limmen Sandstone: blocky medium quartz sandstone and conglomerate

LOWER PROTEROZOIC: Pte — Settlement Creek Volcanics: basalt, tuff, tuffaceous siltstone

UNDIFFERENTIATED LOWER (?) PROTEROZOIC: P — Mainly dolomites, dolomitic sediments, sandstones and siltstones

Geological boundaries

Faults

x Cu Copper occurrence

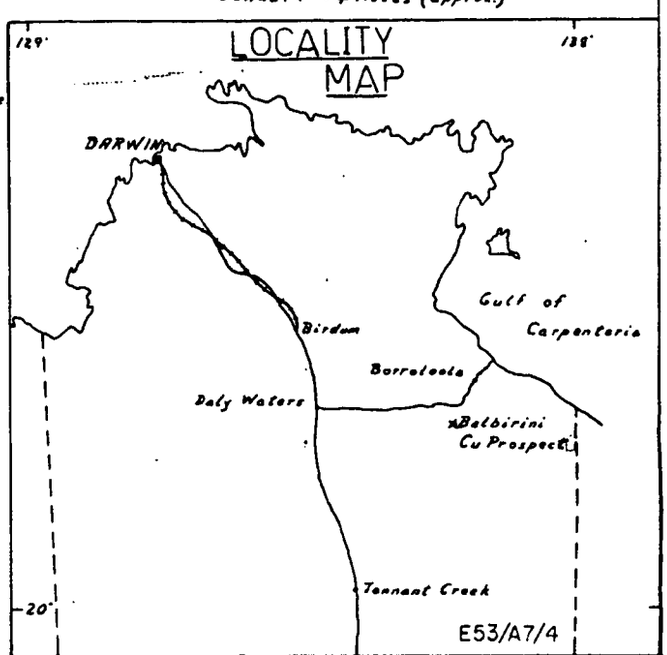
Streams

Waterhole

Road

SCALE: 1" = 4 Miles (approx.)

Reference: 1:250,000 Bauhinia Downs and Wollhallow Geological Series Sheets



To accompany Record 1969/90

Resident Geological Section, Darwin, N.T. October '67

E53/A7/4

THE GRANITE MINE COPPER PROSPECT

by

J. Watts

CONTENTS

LIST OF PLATES

SUMMARY

At the request of Mr T.V. Collins, holder of the Authority to Prospect over the area, the Granite Mine was visited on 18th October 1968. The prospect is situated in the headwaters of the Douglas River, approximately 10 miles northeast of Pine Creek. Disseminated copper ore is contained in waste rock left from previous workings. Mineralisation is also exposed in a series of shallow pits and costeans along the lode. Deeper costeaning and drilling is recommended to prove the size and quality of the lode.

INTRODUCTION

The Granite Mine lode outcrops in bush country approximately 3½ miles west of the 138-mile marker on the Stuart Highway. The aerial photograph position is Daly River Run 18, CAG4041, Photo 5766, Quadrant B, x = 3.0", y = 2.0", diagonal = 3.6".

The area is served by the Stuart Highway and the North Australian Railway. The McDonnell emergency airstrip is situated nearby. To reach the lode, it is necessary to traverse thick bush country, and cross a steep-sided, intermittently flowing creek, a tributary of the Douglas River.

The lode was surveyed at the request of Mr T.V. Collins who holds the Authority to Prospect for the area.

GENERAL GEOLOGY

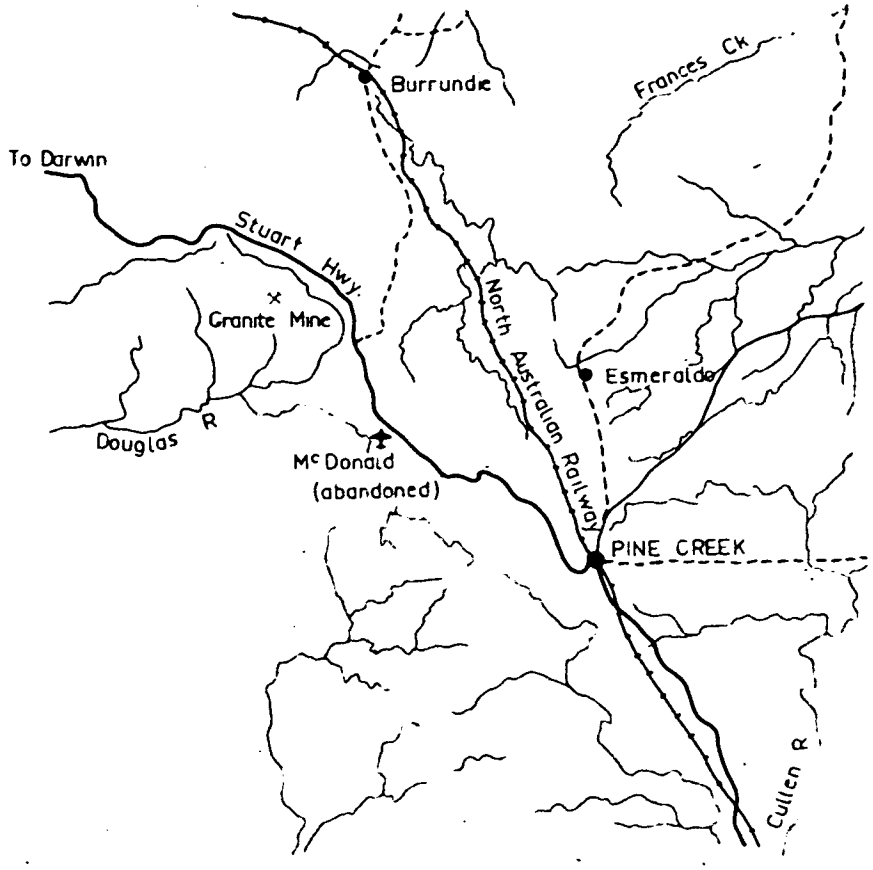
The orebody occurs within the Cullen Granite, a biotite-hornblende granite of Lower Proterozoic age. Boulders of Cullen Granite are exposed to the northwest and southwest of the lode.

The strike of the lode is northeast at 40° true bearing. It is from 4 to 5 feet wide and appears to be vertical. The lode has been intermittently exposed by shallow costeans over a length of 950 feet (see Fig. 2).

At the surface, the mineralisation consists of malachite and chrysocolla, which occur as veinlets up to 2 mm in width and are disseminated in the quartz gangue. In the area in which the lode is cut by a small creek, the gangue is hematitic. Towards the south-western end of the lode, the gangue contains weathered felspar, and irregular shaped grains of magnetite.

RECOMMENDATIONS

To establish the full extent and grade of the lode, deeper costeaning at right angles to the strike of the exposed lode is necessary. Systematic sampling of the lode should also be carried out in order to determine whether further testing by shaft-sinking or diamond drilling is warranted.



GRANITE MINE

LOCALITY MAP

SCALE 1 : 500,000

4 0 4 8 12 16 20 Mls.

To accompany Record 1969/90

COMPILED BY RESIDENT GEOLOGICAL SECTION.

DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN JAN. 1969

D52/A4/127

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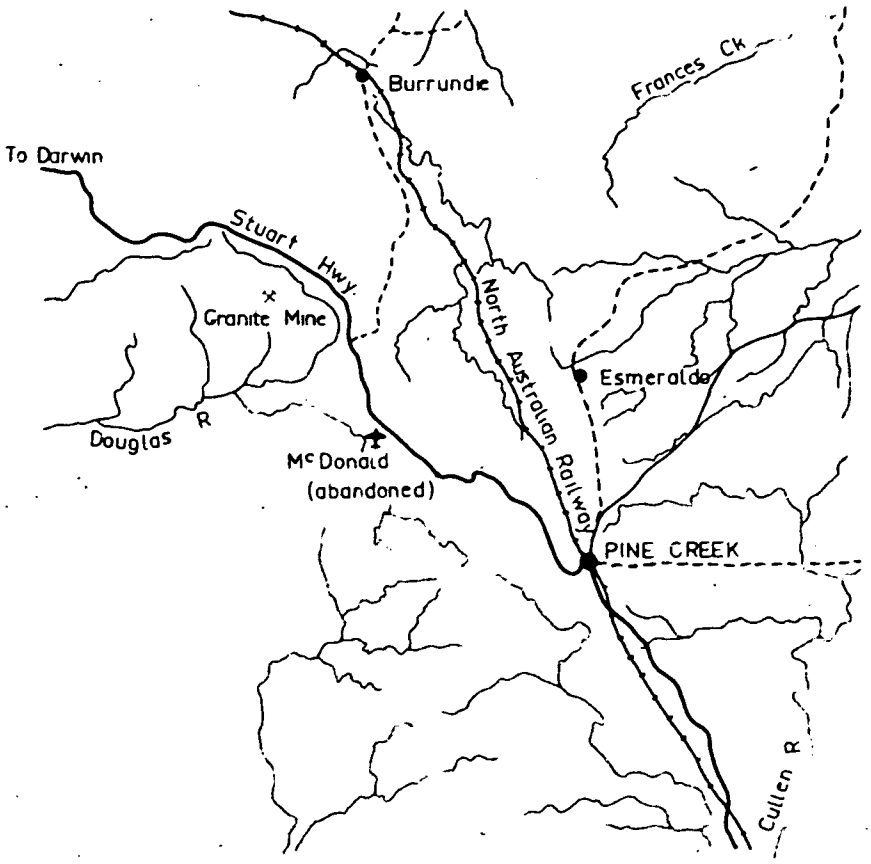

GRANITE MINE

LOCALITY MAP

SCALE 1 : 500,000

4 0 4 8 12 16 20 Mls.

To accompany Record 1969/90

COMPILED BY RESIDENT GEOLOGICAL SECTION.

DRAWN BY MINES BRANCH DRAUGHTING OFFICE, DARWIN JAN. 1969

D52/A4/127

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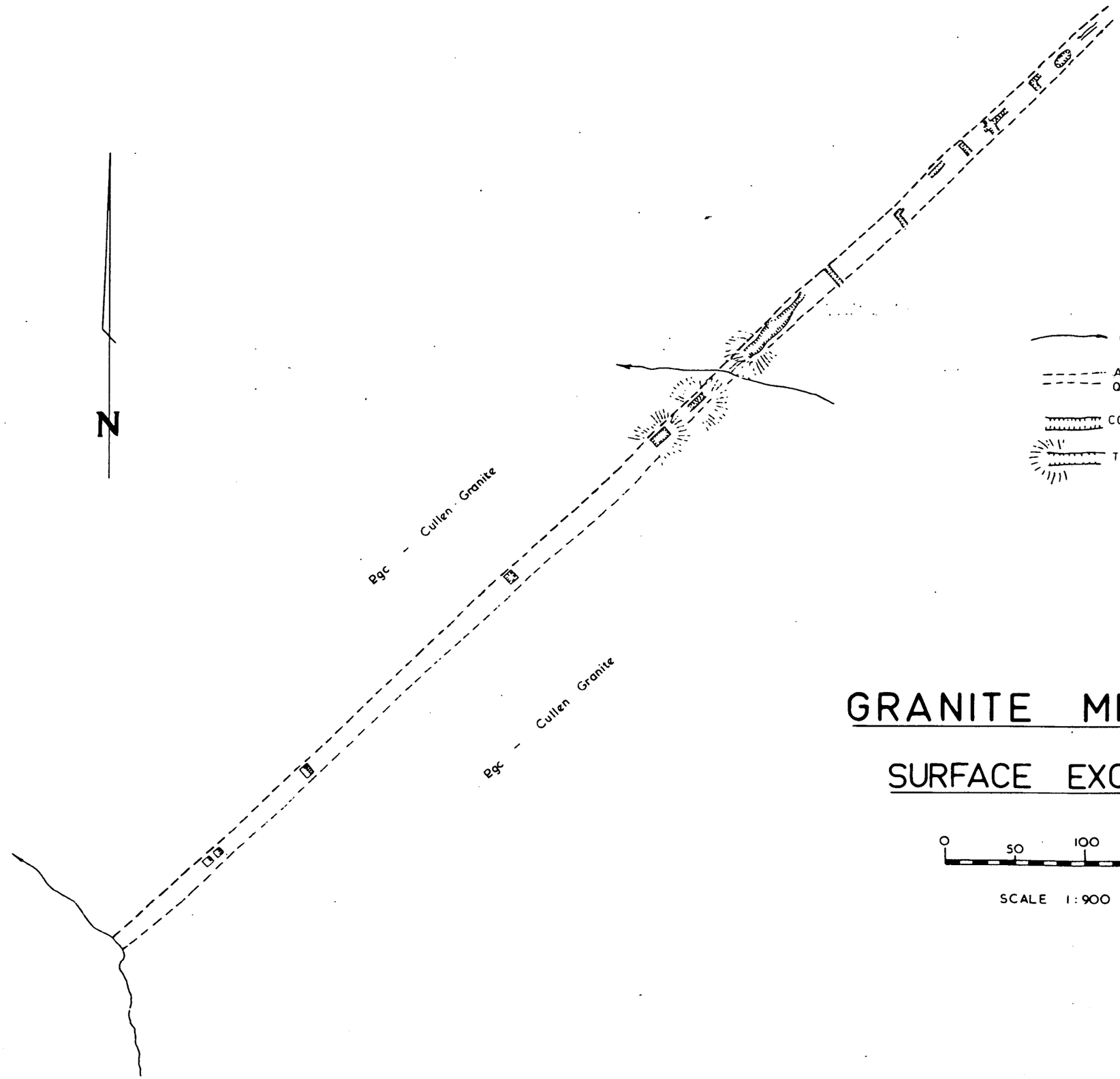


LEGEND

CREEK WITH DIRECTION OF FLOW

APPROX BOUNDARY OF MINERALISED QUARTZ VEIN.

COSTEANS & EXCAVATION PITS

TAILINGS FROM EXCAVATION PITS

GRANITE MINE LODE

SURFACE EXCAVATIONS

0 50 100 150 200 Ft.

SCALE 1:900 (Approx.)

D52/A4/128

~~G69/3D~~

COMPILED BY RESIDENT GEOLOGICAL SECTION DRAWN BY MINES BRANCH DRAUGHTING OFFICE DARWIN JAN. 1969 To accompany Record 1969/90

REPORT ON A VISIT TO AN ALLEGED TANTALITE OCCURRENCE NEAR ROPER VALLEY

by

M.R. Daly

CONTENTS

LIST OF PLATES

SUMMARY

A reported occurrence near Roper Valley of black sand containing exceptionally high amounts of tantalite - columbite (52%), was proved to be incorrect; black minerals contained in the sand are ilmenite, hematite and magnetite.

INTRODUCTION

The area immediately south of Roper Valley was visited on September 15th to investigate a claim that tantalite - columbite had been discovered. An Authority to Prospect including this area (No. 1842), and another over a similar area west of Roper Valley, has been taken out by a Katherine syndicate.

The first area is crossed by the new road between Roper Valley and Hodgson Downs, and the second is located on the Mataranka - Roper Valley road 55 miles from Mataranka.

Previously, a heavy black sand submitted to the Resident Geological Section (Darwin) had been identified as predominantly ilmenite. However, the prospector submitted a sample to United Uranium at Moline for examination, and a letter purporting to come from the chemist at Moline contained the following assay:-

Ti	:	none detected
Fe	:	38%
SiO_2	:	4%
Mn	:	0.3%

Tantalum and Niobium oxides $(Ta\ Nb)_2O_5$: 52%.

(NOTE: As a result of enquiries made by the Senior Resident Geologist to the Chief Geologist, United Uranium Ltd, a search was made at the company's laboratory for a record of the assay. No record was found).

GEOLOGY

A. Regional

Outcropping rocks are predominantly (?) Upper Proterozoic siltstones and sandstones of the Roper Group, including some ferruginous sandstones. There is also some oolitic and pisolitic ironstone. The sediments have been intruded by dolerite sills.

Apart from the Shirwin Ironstone Member, the Proterozoic sediments of the Roper Group have not been differentiated into formations on the accompanying map, which is based on information from the 1:250,000 Urapunga and Hodgson Downs Geological Sheets.

B. Mineral Occurrences

Fine to medium-sized black mineral grains occur mainly within a thin, but extensive, red laterite profile; minor high-grade concentrations of sands with a bluish-black colour also occur on the laterite surface, particularly in water channels. Brown alluvium, underlying the laterite, also contains concentrations of these black minerals.

Concentrates from the heavy sand accumulations on the surface contain the following minerals:

Ilmenite	:	50-55%
Hematite	:	25-35%
Magnetite	:	15-20%

Ilmenite was identified by its magnetism after heating, and by chemical tests for titanium. Simple chemical tests for tantalum and niobium were inconclusive, since titanium masks them; these elements would be present only in minute quantities as substitution ions for titanium. Tests since made at a Mining Company assay laboratory proved only traces of Ta and Nb (approx. 0.002%).

A ridge of ironstone outcrops on the road to Hodgson Downs (see map) 12.1 miles from Roper Valley. The outcrop varies from ferruginous sandstone, strongly cemented by iron oxides, through sandy ironstone to almost pure iron oxides. The main iron mineral is hematite, but the specimens are quite magnetic, indicating abundant magnetite and/or ilmenite. This and similar outcrops probably form the source of the black sand.

CONCLUSIONS

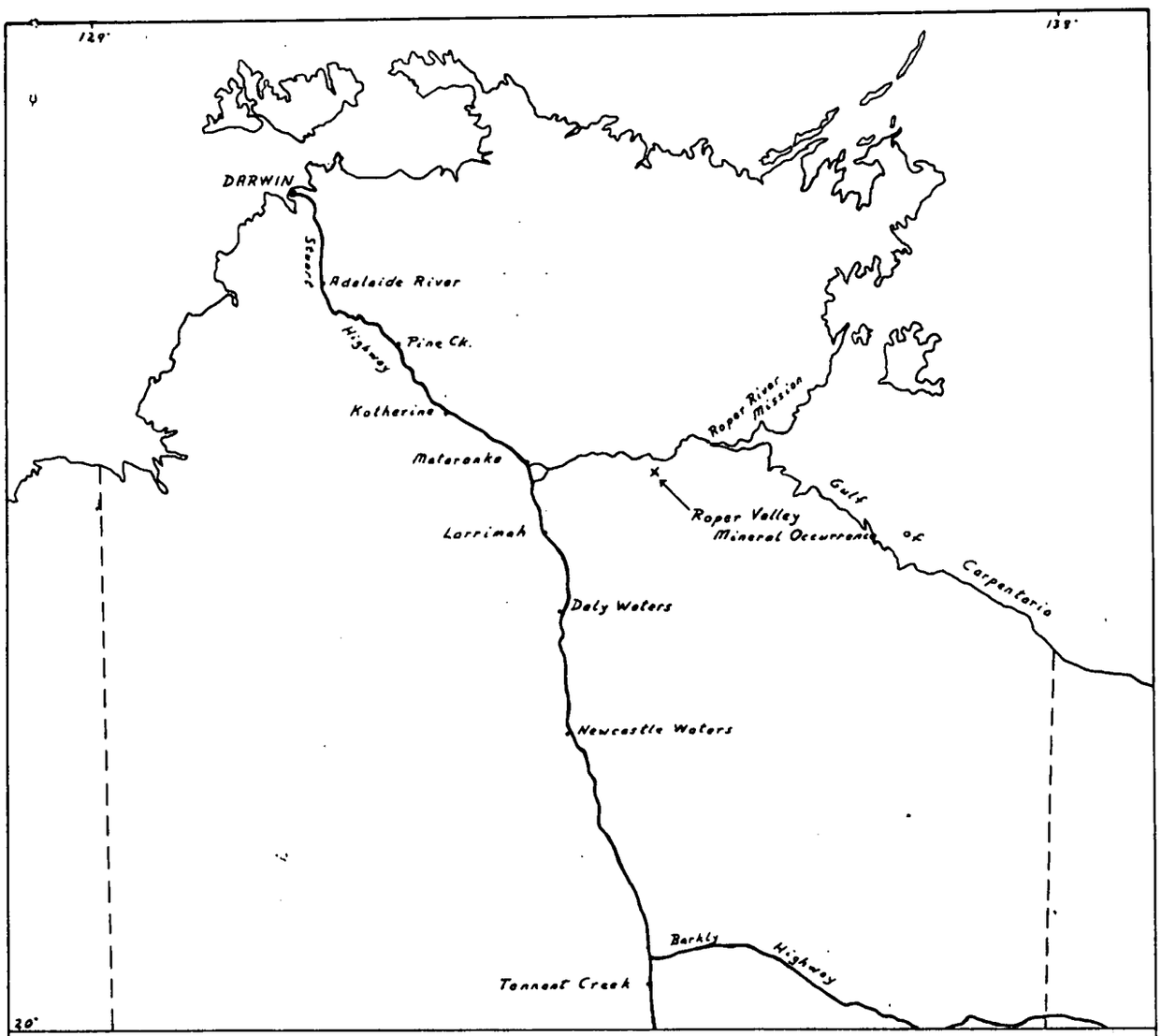
The black sand consists of iron oxides, including ilmenite.

There is no columbite - tantalite in the sand, and as the nearest granite outcrop is some 60 miles away, there is little chance of these minerals occurring in the geological environment described.

Ferruginous sandstones and ironstones, as well as dolerites are possible sources of the iron and titanium oxides.

The concentrations of heavy sands are patchy and form only thin coatings in water channels; the quantity is insufficient for the economic extraction of ilmenite, even if the area was more readily accessible.

The ironstone is generally low-grade, but contains scattered small patches of high-grade material. The area may contain other low-grade iron ore deposits, but its remoteness would prevent exploitation of iron ore at present.



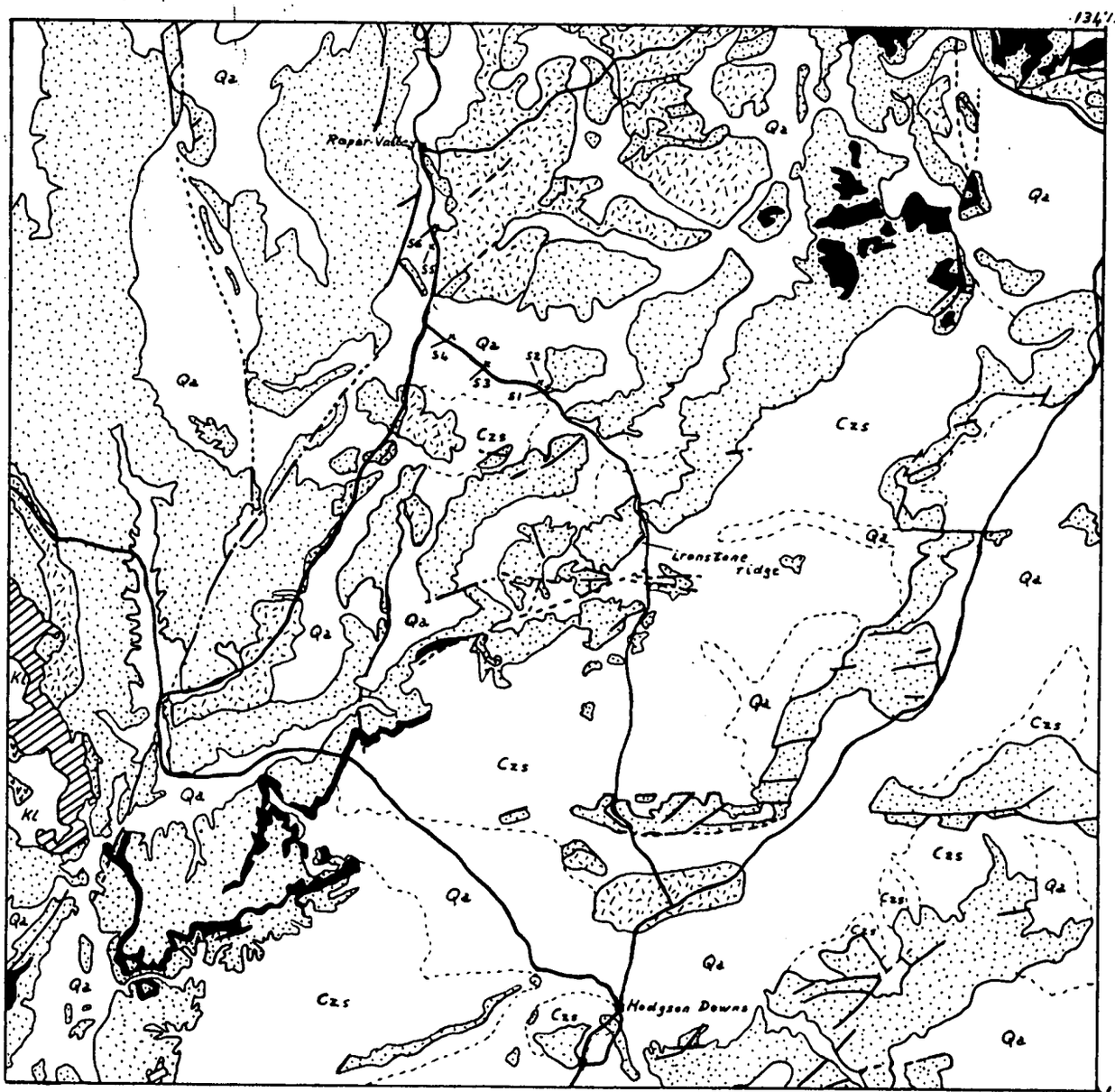
LOCALITY MAP:

ROPER VALLEY
MINERAL OCCURRENCE.

Resident Geological Section, Darwin N.T. To accompany Record 1969/90 D53/A/9 Oct. '67

GEOLOGICAL SKETCH MAP:

ROPER VALLEY MINERAL OCCURRENCE



CAINOZOIC.

QUATERNARY: Qa Alluvium.

UNDIFFERENTIATED: Czs. Sand, soil, laterite.

MESOZOIC.

LOWER CRETACEOUS: Kl. Porcellanite, ferruginous sandstone, white friable sandstone.

PALAEOZOIC.

LOWER CAMBRIAN: Nutwood Downs Volcanics. basalt, feldspathic sandstone.

Bukalara Sandstone.

PRECAMBRIAN

UPPER(?) PROTEROZOIC: Dolerite Sills.

Undifferentiated Roper Group. micaceous siltstone, sandstone, ferruginous sandstone, minor shale.

Shirwin Ironstone Member of Roper Group. ferruginous sandstone, oolitic & pisolitic ironstone.

x S1. Location of black sand samples.

0 4 8 Miles

SCALE: 1" = 4 miles.

Geological boundaries.

Faults.

Roads.

Reference: 1:250,000 Urapunga & Hodgson Downs Sheets.

Resident Geological Section, Darwin, N.T. To accompany Record 1969/90 D53/A/10