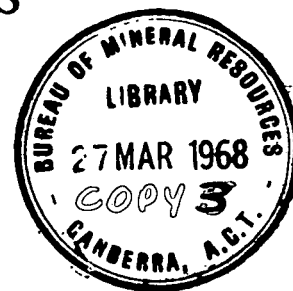


1967/128
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DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

RECORDS:

1967/128



IRON ORE RECONNAISSANCE SURVEY, BAN BAN AND WOOL WONGA
1 MILE SHEET AREAS, NORTHERN TERRITORY.

by

J.W.Shields and A. Taube

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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WONGA 1 MILE SHEET AREAS, NORTHERN TERRITORY

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SUMMARY

A helicopter reconnaissance was made of part of the Ban Ban and Wool Wonga One-mile Sheet areas to search for new iron ore deposits. The Craig Creek Member of the Golden Dyke Formation was found to be a favourable horizon for iron ore occurrences; samples from a number of ferruginous outcrops within this Member were collected for assay. Results indicated low to medium grade material with low phosphorous and sulphur; the material might be suitable for upgrading.

Samples from a gossan outcrop yielded a high lead content and anomalous copper, zinc and gold values.

INTRODUCTION

Economic deposits of iron ore occur in Lower Proterozoic rocks in the northern part of the Northern Territory. The reconnaissance was made to try to locate further sources of saleable ore in these rocks.

As the known iron ore deposits form prominent ridges and hills, the most efficient method of prospecting for additional deposits is considered to be low-level aerial reconnaissance by helicopter. The survey was made in a Bell machine from Helicopter Utilities Pty Ltd; finance for hire of this machine was provided by the Northern Territory Administration.

Using as base maps the 1:63,360 Geological Series Sheets and the corresponding aeromagnetic contour maps, the eastern halves of the areas covered by the Ban Ban and Wool Wonga Sheets were inspected by helicopter. Significant ferruginous outcrops were examined from the air and sampled where possible. An overland visit was later made to sample some outcrops which were not visited during the helicopter trip.

The Government Battery at Mount Wells was used as a landing and fuelling base. Reconnaissance flights were necessarily short because of the range limit of the helicopter. The flight paths are sketched in plates 3 and 4.

GENERAL GEOLOGY

The regional geology is shown on the Ban Ban and Wool Wonga 1:63,360 Geological Series Sheets.

Most of the area surveyed is underlain by arenaceous and argillaceous sedimentary rocks of Lower Proterozoic age. These are intruded by the Cullen Granite in the south-eastern part of the Ban Ban sheet.

A few residuals of Upper Proterozoic rocks occur; the most significant of these is Mount Douglas in the central western part of the area.

Alluvium forms plains along the Mary and McKinley rivers.

GEOPHYSICS

The magnetic contour maps used during the survey were compiled in 1963 by Adastra Hunting Geophysics Pty Ltd under contract to the Bureau of Mineral Resources (Goodeve, 1963).

On the Ban Ban 1:63,360 aeromagnetic map, magnetic highs coincide with the contact aureole of the Cullen Granite and with a line of intrusives in the approximate centre of the sheet. One strong anomaly proved to be related to a ridge of magnetic gneissic material near the granite contact, but most of the anomalies do not appear to have any relation to iron ore occurrences.

On the Wool Wonga Sheet, the relation of aeromagnetic results to geology is less apparent, and no anomalies were found to coincide with the stratigraphic horizon containing iron ore prospects.

LOWER PROTEROZOIC IRON FORMATIONS

The most significant host rocks for iron ore occurrences in the area are the sedimentary rocks of the Lower Proterozoic sequence. Three rock units of this sequence occur in the area. They are:

- (a) The Golden Dyke Formation
- (b) The Craig Creek Member
- and
- (c) The Masson Formation

The Golden Dyke Formation conformably overlies and intercalates with the Masson Formation. The Craig Creek Member is the basal member of the Golden Dyke Formation.

In the adjoining Burrundie area, the Frances Creek iron ore deposits all occur within the Masson Formation, a few hundred feet stratigraphically below its contact with the Golden Dyke Formation. This formation consists of "quartz greywacke, quartz conglomerate, sandstone, siltstone, carbonaceous siltstone, and banded siltstone" (Malone, 1962). However, no iron ore deposits of any significance, other than those already known, were found in the Ban Ban Sheet area.

In the Wool Wonga Sheet area, the Craig Creek Member of the Golden Dyke Formation proved to be a favourable horizon for iron ore occurrences. This member is described on the One-mile map as "Pyritic carbonaceous dolomitic siltstone with chert nodules, pyritic siltstone, silicified dolomitic siltstone, purple quartz siltstone". Dow and Pritchard (1958) described it under the heading of "Gibson Creek Member". The name was altered to "Craig Creek Member" on the One-mile map of the area.

Low rounded ferruginous hills are the general surface expression of the formation, but rocks with a higher iron content locally form prominent ridges. A number of these ridges were located and examined; some not easily accessible by helicopter were later visited overland by vehicle and sampled.

The surface extent of the ferruginous rocks is large; they were traced from south to north across the Wool Wonga 1:63,360 Sheet area and are known to extend northwest past Mount Bunday. Pritchard's Lode, a sedimentary roof pendant of iron ore in the Mount Goyder Syenite, might represent part of the same stratigraphic unit.

The Craig Creek Member is not shown on the Ban Ban 1:63,360 Geological Series Sheet. However, minor ferruginous outcrops do occur along the equivalent horizon - that is, between the Masson Formation and the Golden Dyke Formation - in the sheet area.

Locations of prominent ferruginous outcrops are shown on the attached plates. Details of samples taken from the outcrops are given in the following table:

				<u>ASSAYS</u>
<u>No.</u>	<u>Fe %</u>	<u>P %</u>	<u>S %</u>	<u>Description</u>
199193	38.6	0.16	Tr	Ferruginous siltstone from capping of hill. Hematite forms a thin coating on outside of specimen and in cavities.
94	11.6	0.03	Tr	Orange/red banded siltstone, red streak, ferruginous coating. From zone of ferruginous material 50 feet wide.
95	34.7	0.03	Tr	Red limonite - hematite with angular pieces of leached slate. From ferruginous zone 50 feet wide.
96	39.5	0.10	0.15	Purple hematitic slate surrounding leached white slate; some cavities filled with clay.
97	52.0	0.05	Tr	Ferruginous siltstone, with orange to dark red hematitic coating. From ferruginous zone 30 feet wide.
98	40.4	0.13	Tr	Ferruginous siltstone as above, but less weathered. No hematitic coating.
99	50.8	0.07	Tr	Ferruginous siltstone, locally replaced by hematite; blebs of vein quartz.
200	54.0	0.04	Tr	Purple-red ferruginous siltstone.

(Assays by Mines Branch Laboratory, Northern Territory Administration)

The material sampled is low to medium grade. Assay results ranged from 54.0% Fe to as low as 11.6%, averaging 40.2% for the 8 samples taken. Sulphur and phosphorous content is low in all samples.

GOSSAN

A gossan about $2\frac{1}{2}$ miles north of the point where Minglo Creek joins the Mary River was located during the survey.

The gossan occurs in a range of hills composed of rocks of the Masson Formation, which trend north-north-west in this area. It forms a prominent ridge along a strong photo-linear feature which trends north-east for about a mile.

The gossan is lenticular, about 500 feet long and up to 20 feet wide. It lenses out to the south-west at a quartz-filled fault; quartz veins also occur north-east of the main outcrop along the photo-linear feature.

Two samples taken consist of boxworks in limonite. Assays are as follows:

<u>No.</u>	<u>Pb%</u>	<u>Cu%</u>	<u>Zn%</u>	<u>Sn%</u>	<u>Ni%</u>	<u>Au (dwt/ton)</u>	<u>As%</u>
2787	1.76	0.06	0.1	Nil	Nil	0.6	0.24
2788	0.68	0.15	0.05	Nil	Nil	0.5	0.40

(Assays by Mines Branch Laboratory, Northern Territory Administration)

Considering the leached nature of the outcrop, the lead, copper, and zinc values are high. Further work is planned in the area.

CONCLUSIONS AND RECOMMENDATIONS

Although assay results indicate that the iron prospects sampled are low to medium grade, the possibility of economic deposits in the area is not excluded. Since phosphorous and sulphur content is low, it might be possible to upgrade the material or use it for blending.

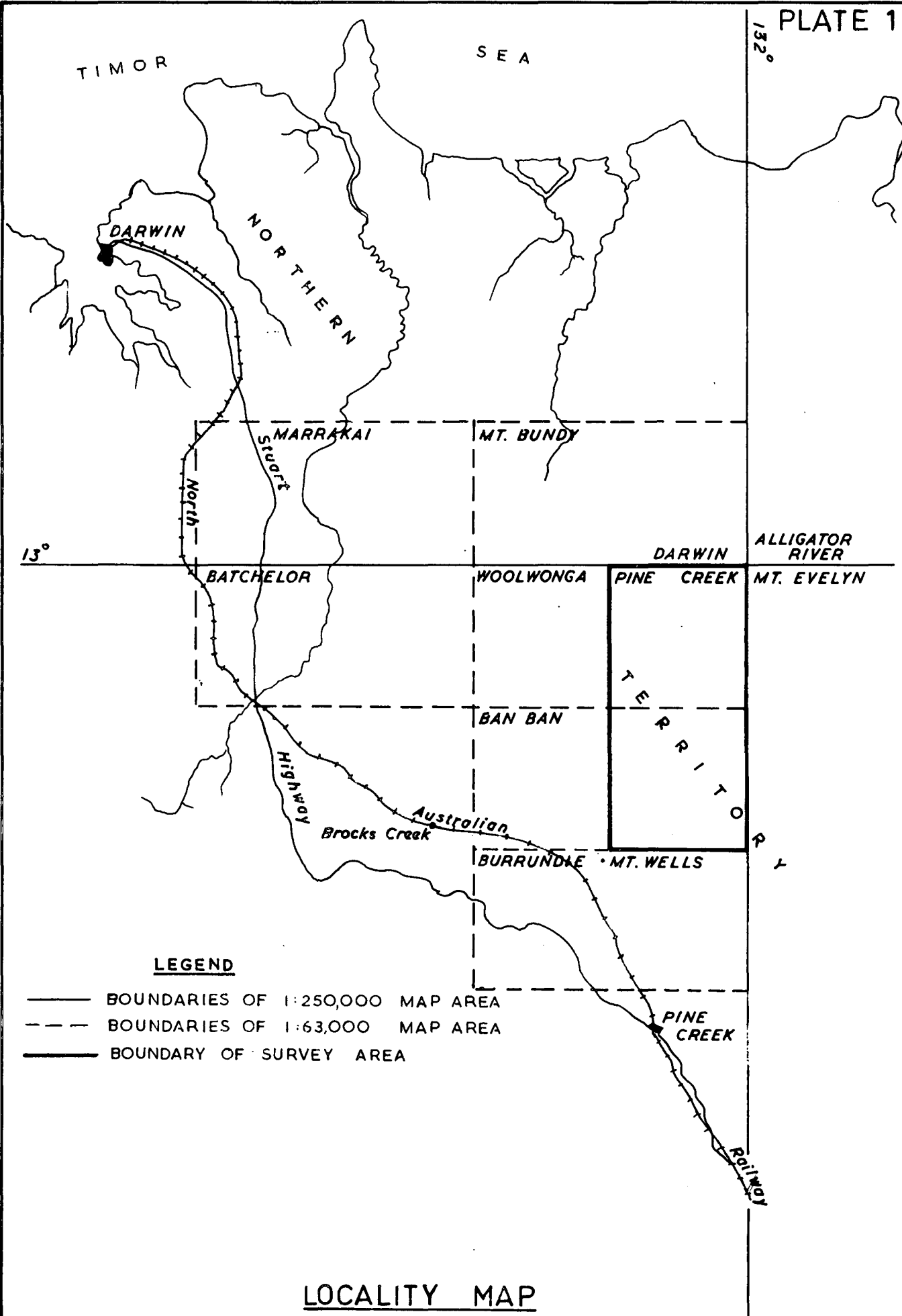
Detailed ground surveys in the area occupied by the Craig Creek Member could lead to the discovery of iron ore deposits of a large enough size and high enough grade to be economically mined.

Such work is probably warranted in the Wool Wonga Sheet area and also in the Mount Bunday Sheet area to the north, which was not covered by the aerial reconnaissance.

A geochemical survey, followed by diamond drilling, is recommended to test the gossan.

REFERENCES

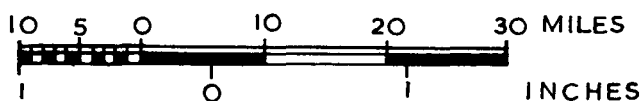
- DOW, D.B., and PRITCHARD, P.W., 1958 - The Geology of Wool Wonga, Mount Bunday, and Marrakai East areas, Northern Territory. Bur. Min. Resour. Aust. Rec. 1958/122.
- GOODEVE, P.E., 1963 - Darwin/Pine Creek contract aeromagnetic survey, Northern Territory. Bur. Min. Resour. Aust. Rec. 1966/101.
- MALONE, E.J., 1962 - Pine Creek, N.T., 1:250,000 Geological Series. Bur. Min. Resour. Aust. explan. Notes SD/52-8.



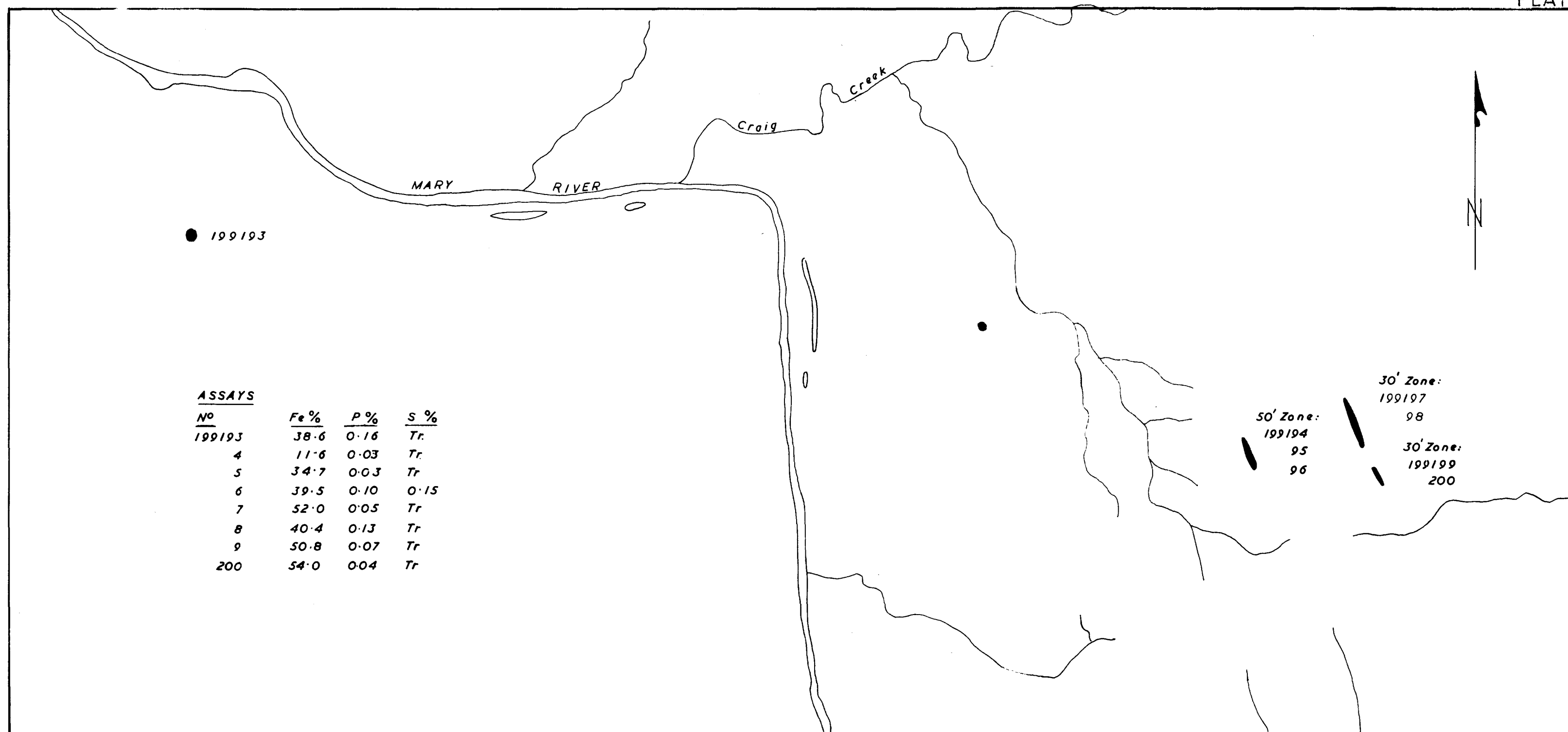
LOCALITY MAP

IRON ORE

RECONNAISSANCE SURVEY



To accompany Record 1967/128

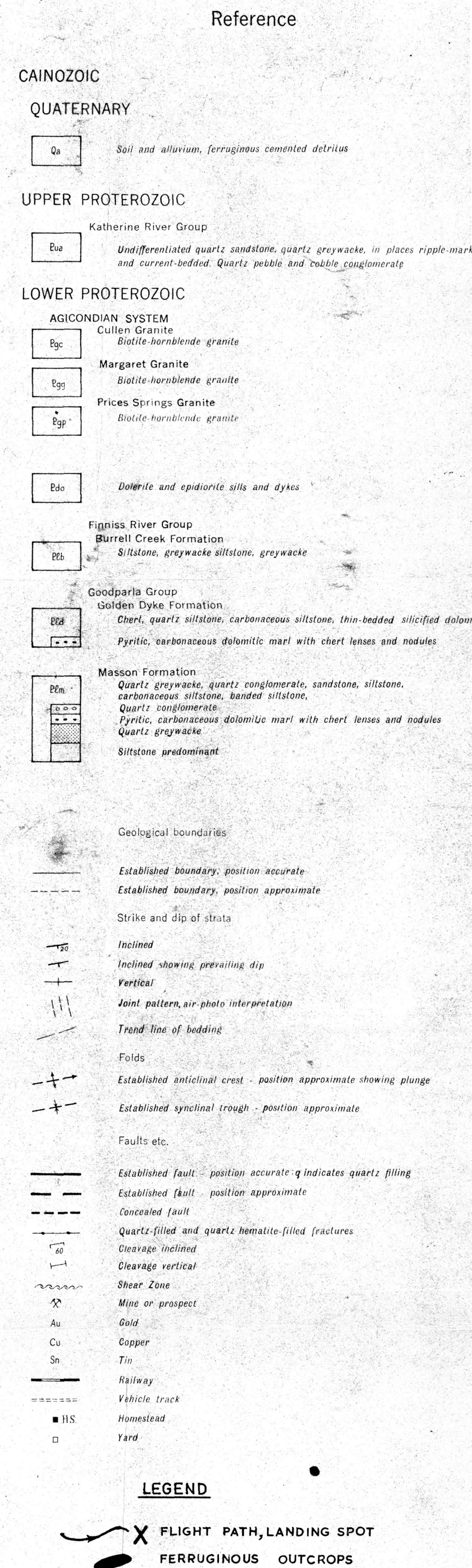


Scale: 1:14,000 approx.

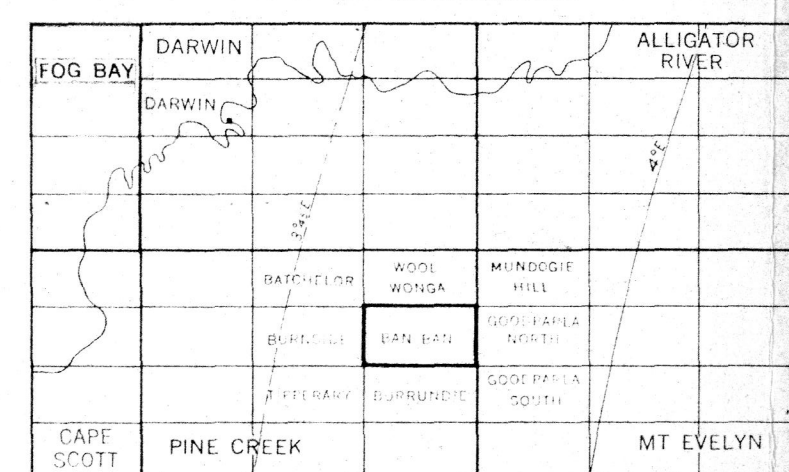
Ref. Aerial photography 1964.

CAG 174, Katherine, South Alligator River.
Run 48 Photos 5015, 5016, 5017.

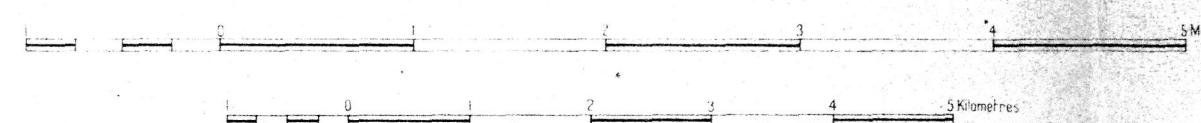
IRON ORE RECONNAISSANCE SURVEY WOOLWONGA AREA DETAILS OF SAMPLING & ASSAYS



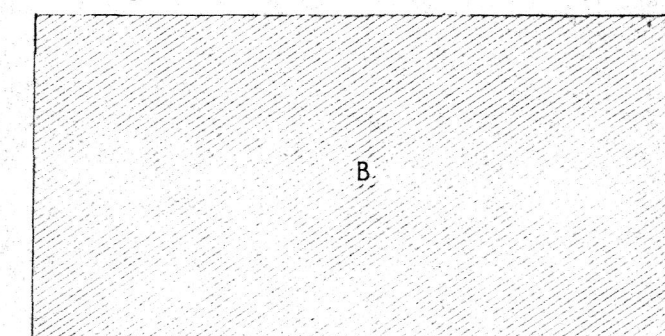
INDEX TO ADJOINING SHEETS:
Showing Magnetic Declination



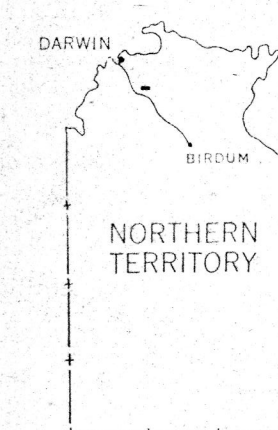
SCALE
1 Mile to 1 Inch



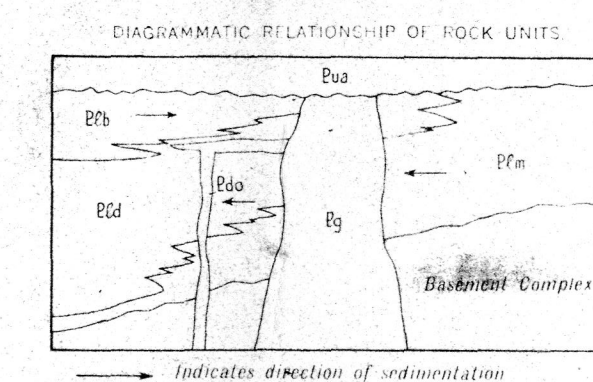
GEOLOGICAL RELIABILITY DIAGRAM



B. Detailed reconnaissance - numerous traverses with photo-interpretation



Geology, 1954, by: B. P. Walpole, D. A. White and P. R. Dunn; 1958, by: J. Hays. *W. McQueen*, compilation, 1959, by: P. R. Dunn and E. J. Malone. Drawn by: P. R. Browne.



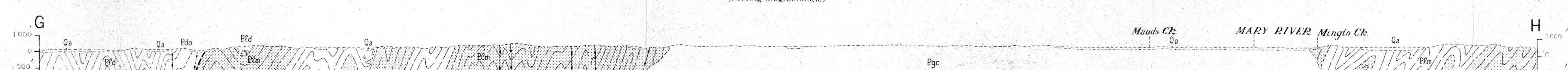
IRON ORE
RECONNAISSANCE SURVEY

HELICOPTER ROUTE AND LOCATION OF FERRUGINOUS OUTCROPS

BAN BAN
D 52 - 8 - 62

Copies of this map may be obtained from the Bureau of Mineral Resources,
Geology and Geophysics, Canberra, A.C.T., or Darwin N.T.

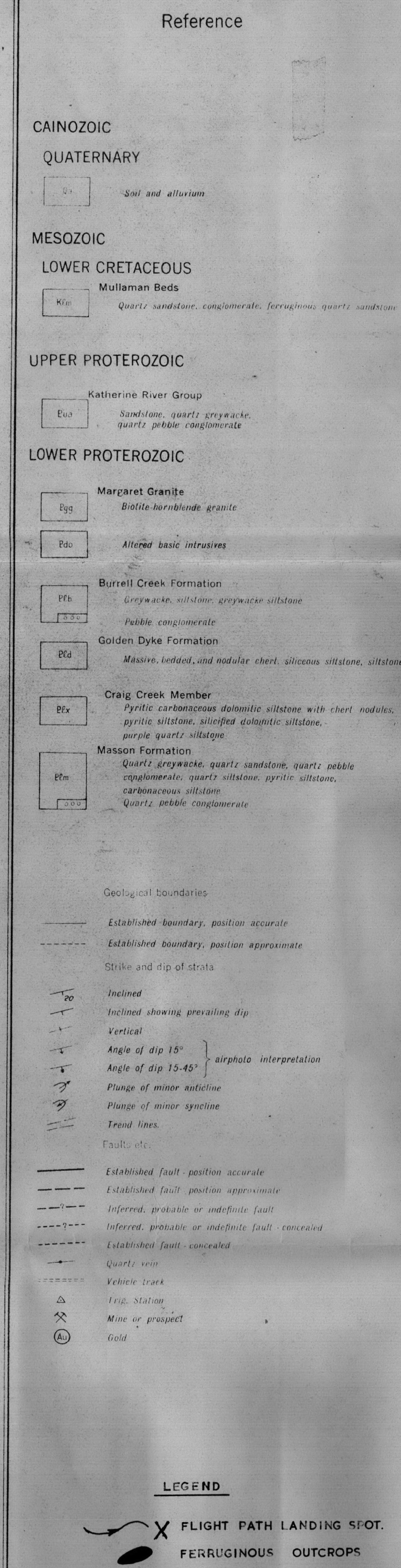
Printed by Mercury Press, Hobart

Section E-F
(folding diagrams)Section G-H
(folding diagrammatic)

To accompany Record 1967/128

ADDITIONS BY MINES BRANCH DRAUGHTING OFFICE, DARWIN, APRIL 1967.

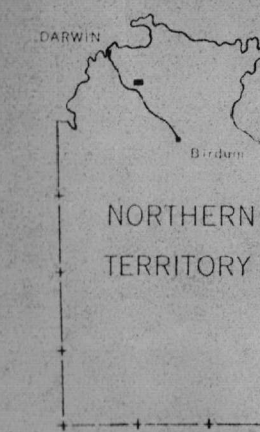
G67/41 B



SCALE
1 Mile to 1 Inch

1 0 1 2 3 4 5 Miles

1 0 1 2 3 4 5 Kilometres



Geology and compilation, 1956, by Geologists of Bureau of Mineral Resources, Geology and Geophysics, Canberra.
Drawn by W. J. Buckridge.

IRON ORE
RECONNAISSANCE SURVEY

HELICOPTER ROUTE AND LOCATION
FERRUGINOUS OUTCROPS

A geological map titled 'DIAGRAMMATIC RELATIONSHIP OF ROCK UNITS'. The map shows a central area labeled 'Balmuccia Complex' with a vertical line through it labeled 'Mg'. To the left, a series of rock units are labeled: 'R1i', 'R2o', 'R1o', 'R1a', 'R1b', 'R1c', 'R1d', 'R1e', 'R1f', 'R1g', 'R1h', 'R1i', 'R1j', 'R1k', 'R1l', 'R1m', 'R1n', 'R1o', 'R1p', 'R1q', 'R1r', 'R1s', 'R1t', 'R1u', 'R1v', 'R1w', 'R1x', 'R1y', 'R1z'. To the right, units are labeled 'R2a', 'R2b', 'R2c', 'R2d', 'R2e', 'R2f', 'R2g', 'R2h', 'R2i', 'R2j', 'R2k', 'R2l', 'R2m', 'R2n', 'R2o', 'R2p', 'R2q', 'R2r', 'R2s', 'R2t', 'R2u', 'R2v', 'R2w', 'R2x', 'R2y', 'R2z'. A legend at the bottom indicates 'Indicates direction of sedimentation' with an arrow pointing right.

