

COMMONWEALTH OF AUSTRALIA.



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

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1961/108

PRELIMINARY REPORT ON IRON ORE DEPOSITS NEAR
MAUDE CREEK AND FRANCIS CREEK, BURRUNDIE AREA
NORTHERN TERRITORY

by

P.W. Crohn

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 It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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Plate 1 : Sketch map of Maude Creek Iron Deposits.
Scale : 1 inch to 1 mile.

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SUMMARY

Reconnaissance surveys have shown that an area of approximately eight miles by four miles in the vicinity of Maude and Francis Creeks, near Burrundie, Northern Territory, contains six groups of major ironstone deposits. The deposits crop out discontinuously over a length of about 15 miles in a favourable bed of the Lower Proterozoic Masson Formation. The total length of ironstone outcrop is about 15,000 feet, the width ranges from 30 to 80 feet, and the minimum depth is estimated to range from 100 feet to 200 feet. Until assay results are available, the highest grade of ironstone is visually estimated at about 60 percent. One of the largest deposits has an ironstone potential of 10,000 tons per vertical foot.

INTRODUCTION

The Maude and Francis Creeks area is covered by Authority to Prospect No. 898, held jointly by Messrs. K. Waters and L. Harmanis of Darwin and Mr. C. Astley of Duval and Company, Tokyo. Plate 1 shows the boundaries of this Authority to Prospect and the approximate positions of the main deposits.

Mr. Harmanis was originally attracted to this area by reports from local prospectors. Deposit A was located in mid-July by Mr. Harmanis and Mr. J. Hays (Resident Geological Section), assisted by Mr. R. Findlay, a local resident. On July 31st, a further reconnaissance by Messrs. K. Waters, L. Harmanis, C. Astley and party, accompanied by P. Crohn and J. Hays, resulted in the discovery of deposits B and C. As a result of an examination of the Burrundie One-mile geological map, produced by the Bureau of Mineral Resources, an extension or repetition of these deposits to the south of Francis Creek was suggested, and deposits E and F were located by Messrs. Harmanis and Hays on August 6th. Simultaneously, as a result of arrangements made by Mr. Astley, mapping of the area was begun by Messrs. M. Suzuki and T. Emra of Sumitomo Metal Industries, Tokyo. The area was inspected by the Director of Mines on August 9th, and a further visit was made by P. Crohn and J. Hays on August 11th-12th, when deposits C and E were examined in some detail.

Location and Access :

The area extends from about eight miles east to about twelve miles east-south-east of the Mount Wells Government Battery. At present, access is by eleven miles of bush-track from the Battery, which itself is three miles by good earth road from Burrundie railway siding. Alternative access is from the south-west, via Esmeralda Homestead, which is about twelve miles from the southern part of the area. From Esmeralda Homestead, there is a fair dirt road to Union Reefs siding (about three miles), or a good road to Pine Creek (about eight miles). This road avoids major creek crossings and lies mostly over gently undulating granite country. However, if required, a direct route could probably be found from the head of Francis Creek to the nearest point on the railway, which would be about two miles south of the Spring Hill siding. The straight-line distance from ^{deposit} E to this point would be about eight miles.

GENERAL GEOLOGY

The area consists dominantly of tightly folded Lower Proterozoic greywackes and shales, shown as part of the Masson Formation on the Burrundie One-mile map.

The known ironstone deposits conform broadly to the bedding of these sediments, and mapping by Messrs. Suzuki and Emra suggests that all these deposits lie at or close to a single stratigraphic horizon. However, there are still several gaps in the known exposures of this horizon, especially south of deposit C.

Hematite is the dominant iron mineral in all the known deposits. The main impurities are silica and some inclusions of incompletely replaced sedimentary rocks.

DESCRIPTION OF DEPOSITS

A :

The main deposits at this locality consist of two sub-parallel outcrops of ironstone, each averaging 30 to 40 feet wide for a length of about 1,000 feet, and including some bulges up to 100 feet wide. These outcrops form ridges from 50 to about 80 feet above the general level of the surrounding flats. To the south, the grade of both outcrops becomes lower, and the deposits finally lens out; the total length of the eastern line is about 2,500 feet and that of the western line is about 3,500 feet. In their northern portion, these outcrops are only about 100 feet apart, but in their southern portion this distance increases to about 300 feet. The dips are generally steep, except in the southern portion of the eastern outcrop, which has a gentle westerly dip. Minor cross-faults have offset both lines by up to 50 feet.

The composition of both outcrops is variable. Some portions are siliceous, others contain inclusions of quartzite and incompletely replaced shale, and there are some bands of quartz breccia with a ferruginous matrix, so that the average grade could only be determined by careful sampling. For a preliminary assessment, two samples across representative sections of the outcrops were collected for assay, but the results are not yet available.

B :

To the south of A, only isolated deposits of low-grade material are exposed for about one and a half miles. Along the trend of these, at locality B, is a very prominent outcrop, which, in places, is about 150 feet high above the surrounding plains. The total length of this outcrop is about 2,000 feet, of which the central 600 feet have an average width of between 60 and 80 feet. The grade of most of this material, however, is lower than that of the ~~deposit~~ at A, and very much lower than that of C and E, so that it is doubtful whether much of this material could be mined economically.

Two smaller low-grade deposits also are exposed a few hundred feet west of the main outcrop, but these are not likely to be of economic value.

C :

Exposures in this vicinity are not as spectacular as those at E, mainly because most of the hematite in this group of deposits is micaceous and powdery, and hence forms less resistant outcrops. However, three parallel outcrops of ironstone occur at this locality, spaced on the average from 200 to 300 feet apart, the western outcrop being the strongest and most persistent. As a result, outcrops of ironstone are

distributed sporadically over the crest and upper slopes of a wide, gentle ridge, approximately 4,000 feet by 1,000 feet in area, which is about 250 feet high above the level of the creeks in the adjoining valleys.

Within this area, about eight separate lenses of ironstone, with a total area of about 100,000 square feet are now exposed, and these could probably be augmented considerably by costeaning or pitting in the scree-covered areas adjoining the known occurrences. The largest of these lenses is about 700 feet long and between 40 and 60 feet wide, and the grade, although slightly more variable than that of deposit E, appears to be high.

D and F :

These deposits have not yet been fully examined. According to Messrs. Suzuki and Emra, they are smaller and lower grade than the main deposit at E, but some lenses capable of economic production may be present in both deposits.

E :

The main deposit at this locality contains the highest grade iron ore so far seen in the area, and this is also the deposit for which an estimate of size can most readily be made. This deposit consists of a lens of high-grade crystalline hematite, which is continuously exposed over a strike length of 1,500 feet and ranges in outcrop width from 40 to 70 feet. At several points, this hematite lens rises above the surrounding rocks in almost vertical cliffs, more than 50 feet in height, without any indication of a change of width or grade. The height of these outcrops averages about 200 feet above the level of the creeks in the adjoining valleys.

To the north, the deposit narrows and its extension is obscured for a distance of about 1,000 feet by scree from a flat-topped hill of Cretaceous sandstone and conglomerate. North of this scree, there is another ironstone lens, approximately 500 feet long and 25 to 60 feet wide, but of lower grade. In places, this consists of two parallel bands of hematite, up to 15 and 30 feet wide respectively, separated by up to 30 feet of low-grade material.

To the south, the width and grade of the deposit decreases, but it continues for another half mile, until it is again obscured by flat-lying Cretaceous sediments.

DEPTH OF DEPOSITS

Hematite crops out at or near plain level at all the deposits, so that the probable minimum vertical extent will be about 100 feet for the deposits at A and B, and not less than 200 feet for C and E.

By analogy with similar ironstone deposits in the Brocks Creek area, it is probable that these hematite rocks will pass downwards into sediments carrying disseminated sulphides, mainly pyrite, but the depth at which this will occur cannot be predicted without some exploration by drilling or shaft-sinking.

GRADE

Chip samples across representative sections of the deposits A, C, and E have been taken for assay, but the results are not yet available. Only visual estimates of the grade of the various deposits can therefore be given at present. These suggest that the E deposit and at least part of the C deposit will be of high grade (better than 60 percent iron), and that the remainder of C and possibly some parts of A will be of medium grade (between 45 and 60 percent iron). No estimates can be made as yet for any of the other deposits.

POSSIBLE RESERVES

In the absence of any information on the full vertical extent of the deposits, it is not possible to estimate the total reserves of iron ore of various grades which may be present in the area. However, the main lens of E, with an exposed surface area of approximately 80,000 square feet, has a potential of about 10,000 tons per vertical foot, and the aggregate exposed area of the four largest lenses of C is of the same order of magnitude. In addition, it seems likely that systematic costeaning or pitting scree - and soil - covered parts of the favourable localities will reveal extensions or repetitions of the known deposits.

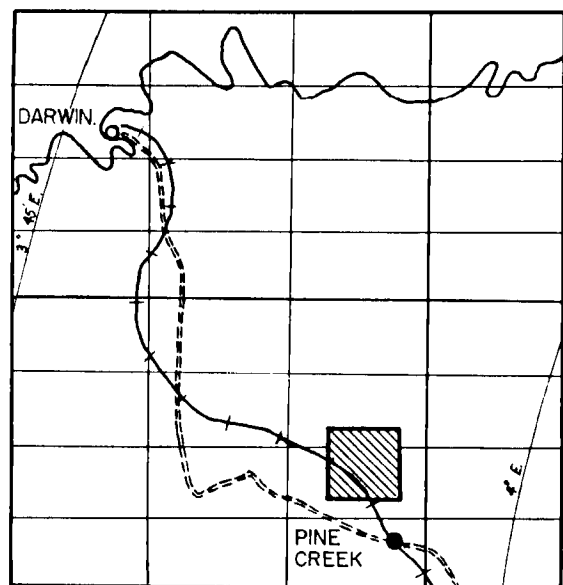
FUTURE WORK

The immediate need is for detailed mapping and sampling of the known deposits, which can be carried out concurrently with further prospecting for repetitions or extensions of these bodies within the established favourable zones. To save time in preparing base maps for this work, it might be possible to use enlargements of the existing air photos.

Costeaning will be required to delimit the deposits more accurately, especially those at C, and drilling will be required to establish their vertical extent.

Provided that no unforeseen difficulties or delays arise, such a programme should enable a fairly close assessment of the potential of this area to be made by the end of the year. The Resident Geological Section will continue to give every possible assistance to the holders of the Authority to Prospect in order to complete the evaluation of these deposits as quickly as possible.

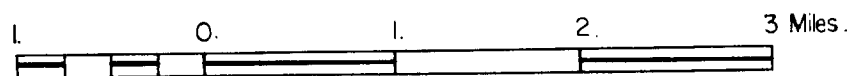
LOCALITY MAP.



MAUDE CREEK IRON DEPOSITS. BURRUNDIE AREA NORTHERN TERRITORY.

SCALE.

1 Mile to 1 Inch.



REFERENCE.

- Known ironstone deposits.
- Probable trend of favourable zone in intervening areas.
- Major track.
- Minor track.
- Railway line.

