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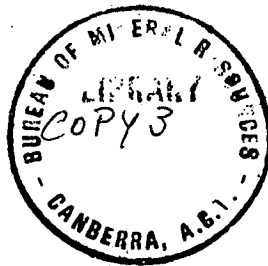
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IRONSTONE OCCURRENCES EAST OF COSMOPOLITAN  
HOWLEY MINE, BROCK'S CREEK AREA-N.T.

by

P.W. CROHN

RECORDS 1961/145



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Plate 1. Iron Ore Occurrences near Fountain Head Turn-Off  
Scale 500':1"

Plate 2. Iron Ore Deposits near Fountain Head Turn-Off  
Scale 200':1"

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## SUMMARY

Ironstone occurs at a particular horizon within the Lower Proterozoic sediments in the Brocks Creek area of the Northern Territory. East of the Cosmopolitan Howley Mine, preliminary investigation of the ironstone, to assess its value as a source of iron ore, showed a possible reserve of 1000 tons of hematitic material per vertical foot over a length of 1500 feet. However previous drilling of the ironstone for gold and base metals showed that it formed a capping over pyritic sediments and only extended to a maximum depth of 80 feet. No information is available on the grade of the ironstone. If future work is envisaged chip sampling and assaying followed by about 1300 feet of costeaning are recommended as initial steps to assess the grade and extent of the iron ore.

## INTRODUCTION

A zone of ironstone occurrences between the Cosmopolitan Howley Mine and the Fountain Head road was examined on June 13th and 15th, 1961, at the request of Messrs. K. Waters and L. Harmanis, who hold mineral leases over these occurrences. The aim of the investigation was to assess the possible value of the occurrences as a source of iron ore.

The area is part of a major belt of ironstone outcrops which extends for a distance of about 15 miles to the north-north-west and five miles to the south-east of the Cosmopolitan Howley Mine. These ironstones have been known for many years, and many of them have been tested for gold and base metal mineralization at different times, (for details see Sullivan and Iten, 1952), but they had not previously been considered as possible sources of iron ore.

## LOCATION AND ACCESS

The ironstone occurrences crop out as a series of lenses on or close to the crest of a low gentle east-west trending ridge, running roughly parallel to and a quarter of a mile north of the Stuart Highway in the vicinity of the 110 mile peg from Darwin. A good all-weather road also leads from this area to the Fountain Head railway siding, about eight miles away.

## GENERAL GEOLOGY

Throughout the Brocks Creek district, ironstones are developed at a particular stratigraphic horizon in the Lower Proterozoic sediments. Within the area examined, they occur between a series of ferruginous and graphitic shales and siltstones to the north, and a silicified sandstone, in parts grading into a quartz breccia, to the south. A very distinctive marker horizon, variously referred to by previous workers as a nodular siltstone or a conglomerate, occurs within the shale sequence. The whole succession dips to the north at angles between 70 and 90 degrees, except in the immediate vicinity of the Cosmopolitan Howley Mine, where a major north-west pitching anticline occurs. Several amphibolite sills up to about 100 feet thick are present in the area, and considerably larger ones are known from adjoining areas.

## DESCRIPTION OF INDIVIDUAL IRONSTONE OCCURRENCES

The greatest concentration of ironstone in the area occurs between about 500 and 2000 feet west of the Fountain Head road. A tape and compass survey of this area was carried out, and six blazed trees, marked A to F, were used as reference points.

From 350 feet east to 100 feet west of A, three ironstone lenses with average widths from five to ten feet are exposed. They consist mostly of massive hematite, but contain some quartzite inclusions and some portions of incompletely replaced sediments, especially to the west of A. North of A, two additional belts of ironstone rubble were noted, but the ironstone outcrops responsible for these zones are poorly exposed and are probably no more than 4 or 5 feet wide at the most.

At B, an irregular ironstone body branching to the west may have maximum dimensions of about 100 by 30 feet, but again includes some low-grade material.

Between B and C, nine separate ironstone lenses were noted, the average widths being four to six feet, and, in places, up to eight feet.

At C, heavy ironstone rubble covers an area of about 60 by 100 feet. A large pit or small open cut, measuring about 30 by 30 feet, has been excavated in the middle of this area, probably in the search for gold during the early days of mining in this district. A massive ironstone lode, averaging ten to twelve feet in width, traverses the central portion, but at present it is not known what proportion of the remainder of the area is underlain by ironstone in situ.

Between D and E, ironstone rubble covers an area about 400 feet long and from 20 to 80 feet wide, but again the largest width of outcropping ironstone is only of the order of 10 feet, and it is not known how much of the remainder of the area is underlain by ironstone. About 150 feet north of this occurrence, another area of ironstone rubble has dimensions of about 60 by 250 feet, but no ironstone outcrops more than four feet wide were seen.

Finally at F, a bold ironstone outcrop has dimensions of 70 by 12 feet, and is surrounded by heavy ironstone rubble which covers an area of 120 by 40 feet, but at least some of this material appears to be too siliceous for use as iron ore.

To the west of this point, only very minor ironstone is encountered until the Cosmopolitan Howley Mine is reached, about 4000 feet from point F.

In the south-east portion of the mine area, Sullivan and Iten have recorded a large occurrence of ironstone, localised on the nose of a large west-pitching fold but the area shown as ironstone on their plans includes some quartz breccia and shale incompletely replaced by iron oxides, as well as large areas of scree and soil which may be underlain, at least in part, by unreplaced sediments. The amount of ironstone in situ in this area can therefore not be estimated from existing exposures.

### ORIGIN OF IRONSTONE OCCURRENCES

Sullivan and Iten divided the ironstones of the Brocks Creek district, which they referred to as ferruginous deposits, into groups composed dominantly of cellular, spongy, honeycomb, botryoidal and structureless limonite on the one hand, and of hematite on the other hand. The occurrences described in this report correspond largely to their hematite type. However, all the available information indicates that both the limonitic and hematitic deposits represent cappings on sulphide lodes.

In 1950, four diamond drill holes were put down by the Bureau of Mineral Resources to test these ferruginous deposits in depth. One of these (D.D.H. No.1), drilled underneath one of the hematitic deposits, passed through 159 feet of slate and amphibolite followed by 10 feet of limestone with disseminated hematite, and then by limestone and slate with disseminated pyrite. The other three, (D.D.H's No.2-4), were drilled beneath some of the limonitic deposits and these all encountered slate with disseminated hematite, passing into pyrite at depths between 60 and 80 feet.

Workings and diamond drill holes at the Cosmopolitan Howley Mine itself also encountered abundant pyrite within the siltstones in the primary zone, the average depth of oxidation at the mine being between 70 and 100 feet.

### PROBABLE RESERVES

Outcropping lenses of ironstone between 500 and 2000 feet west of the Fountain Head road cover a total area of approximately 10,000 square feet, equivalent to about 1000 tons per vertical foot. The discovery of extensions and repetitions of these lenses in rubble covered areas may increase this figure, but on the other hand some of the material in these lenses will be too low-grade for use as iron ore.

Information on the ironstone occurrences in the south-east portion of the Cosmopolitan Howley Mine area is insufficient to enable any estimates of tonnage to be made.

The change to sulphides is expected to occur at an average depth of between 60 and 80 feet in all the occurrences observed to date.

### RECOMMENDATIONS FOR FURTHER TESTING

If the lease-holders wish to carry out any further testing, the following programme is suggested:-

1. A number of representative chip samples of surface material from different parts of the area should be assayed for iron. These assays will not necessarily reflect accurately the grade of material likely to be encountered at depth, but they should give a general indication as to whether the bulk of the material is likely to be acceptable as ore.

2. If the results of these assays are satisfactory, six costeans totalling about 1300 feet in length, should be dug

4.

by bulldozer in the positions indicated on the accompanying plan, to expose fresh material in the outcropping lodes and to locate non-outcropping extensions or repetitions. All ironstone occurrences exposed in these costeans should then be carefully sampled and the samples assayed for iron and for possible deleterious impurities.

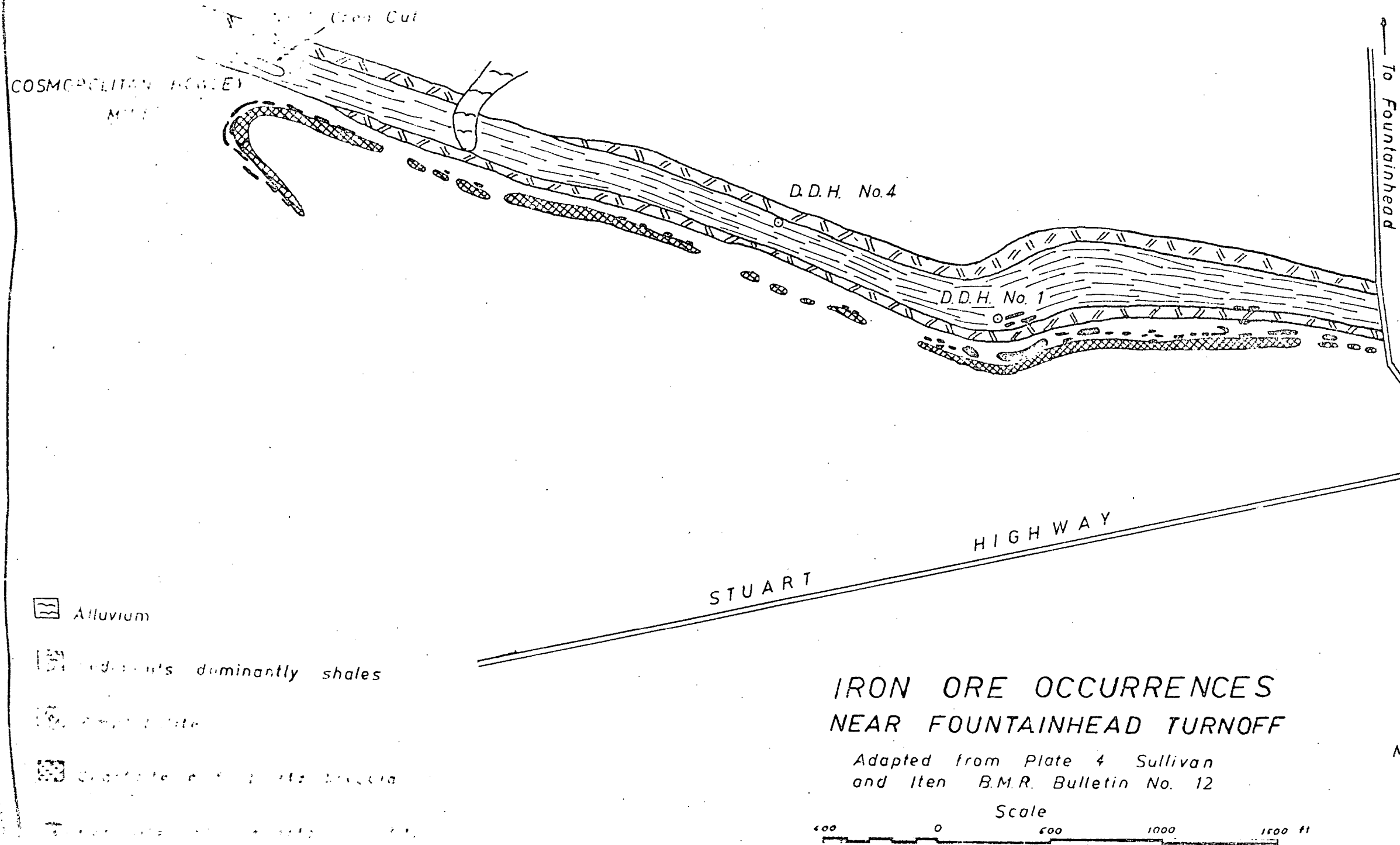
Three costeans, totalling between 600 and 800 feet, should also be dug across the zone of ironstone occurrences in the south-east portion of the Cosmopolitan Howley Mine area.

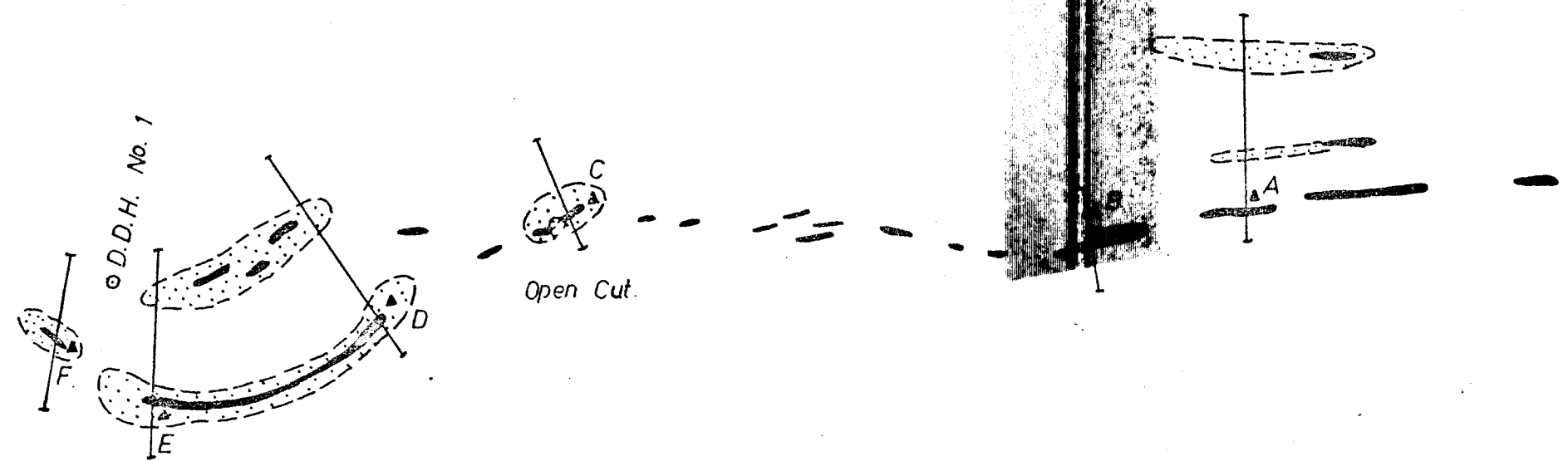
3. No underground exploration should be attempted until the results of this costeaning programme are known.

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REFERENCES:

SULLIVAN, C.J. and ITEN, K.W.B. - 1952 : The Geology and Mineral Resources of the Brocks Creek District, N.T. Bur.Min.Resour. Aust.Bull.12.





- Blazed tree
- Hematite in situ
- △ Hematite detritus
- - - Proposed costeans

IRON ORE DEPOSITS  
NEAR FOUNTAINHEAD TURNOFF

