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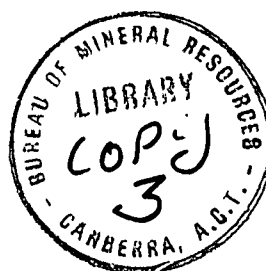
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD 1951/37

The Coobina Chromite Deposits,
Peak Hill Goldfield, W.A.

by

R.S. Matheson



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THE CHROMITE DEPOSITS

PEAK HILL GILFILLAN, W.A.

Report no. 37/51

Records 1931/37

INTRODUCTION

Chief Geologist

These deposits were visited by the writer and E.F. Mead, Assistant Mining Engineer, Bureau of Mineral Resources, between the 3rd and 5th July, 1951. The investigations were carried out in order to obtain a first hand knowledge of the extent and mode of occurrence of the deposits, and to select a number of diamond drill hole sites to test the continuity of the deposits at depth.

The deposits are situated about 4 miles southwest of No 43 Stock Route Well, and about 5 miles southeast of Jimblebar, near the eastern end of the Ophthalma Range. The distance by road to Roebourne, the nearest port, is about 350 miles, and the distance by road to Meekatharra, the most convenient railhead, is about 266 miles. Meekatharra is 320 miles by rail from the port of Geraldton.

GEOLOGY.

The regional geology of the area has been reported on previously by Talbot (1920) and the deposits are described previously in reports by Blatchford (1925) and Pinuccane (1938).

The Deposits occur in an area of metamorphosed ultrabasic rocks consisting chiefly of serpentine, but talc schists, chloritic schists, anthophyllite schists, and what appear to be hydro-biotite schists occur in parts of the area. These rocks are regionally folded, probably also faulted, and they are intruded by quartz veins, and granitic dykes, which suggests they are part of the Older Greenstones of Archaean age. Decomposition products in the form of jaspery ironstone, spalling quartz and magnesite are scattered over the surface of the ultrabasic rocks. A petrological description of the serpentine is contained in Bulletin 83 (Talbot 1920). Ferruginous cherty quartzites of the jaspilite type, also occur in the Older Greenstones, and they form a folded junction with the ultrabasics along the western edge of the area examined (Refer to accompanying plan from A.G.G.S.N.A., W.A. Rept. No. 34).

The rocks are highly sheared and jointed, in at least three different directions, and this fracturing taken in conjunction with the folding makes it difficult to recognise the dip of the ultrabasic rocks.

THE DEPOSITS.

The chromite deposits occur over an area of about 1 square mile, in a rugged northeasterly trending range of hills, which rise to about 200 feet above the general level of the surrounding country.

More than a hundred chromite veins were shown on the area previously mapped (Pinuccane 1938), and the present investigations have shown that at least another fifty occur outside this area.

The chromite lenses vary considerably in width, length and attitude. The smaller lenses are 20 to 30 feet long and 3 to 6 feet wide, whereas the larger lenses attain lengths of 300 to over 400 feet and widths of from 10 to 30 feet.

The chromite lenses appear to occupy a few definite zones in the ultrabasic belt, which follow a folded pattern approximately parallel to the folding of the junction of the ultrabasics and ferruginous quartzites. It seems likely that faulting of these chromite-bearing zones may have also occurred in the central part of the area mapped.

The chromite lenses being more resistant to erosion than the enclosing ultrabasic rocks, stand out as low bouldery ridges in the ultra-basic belt. The lenses can be seen persisting down the dip in some of the gorges to a depth of about 150 feet from the outcrop. Most of the chromite lenses consist of dense black or brownish-black material, but some lenses contain sections in which a fair proportion of serpentine occurs as scattered blebs.

The deposits are considered to have formed as a result of segregation of the chromite from the serpentine.

THE HOLDINGS.

Most of the deposits, including the principal ones, are enclosed in three Mineral claims (namely H.C. 39P, H.C. 40P, and H.C. 41P occupying an area of 540 acres), which have been taken up by Mr. L. Ives.

The remainder of the deposits in the intervening and adjoining ground to these three mineral claims, are enclosed in four mineral claims (H.C.'s 44P, 45P, 46P, and 47P) recently pegged and applied for by the Broken Hill Pty., Company Ltd.,

ANALYSES.

Analyses of samples of chromite from Coochinda carried out at various times by the W. A. Government Chemical Laboratories are given below.

Four samples collected by Blatchford (1925) gave the following results.

<u>Sample No.</u>	<u>Cr₂O₃ per cent</u>	<u>Chromite (calculated) per cent.</u>
1	44.74	82.7
2	46.53	86.0
3	43.85	81.0
4	42.53	73.7

A fairly representative sample collected by Pincoane (1938) contained 48.01 per cent Cr₂O₃.

A group of samples assayed for L. Ives in August, 1950, gave the following results.

<u>Description</u>	<u>Cr₂O₃ (per cent)</u>
Composite of four samples	48.6
Sample from H.C. 39P	50.1.
Sample from H.C. 41P	50.1

Other samples received by the W.A. Government Chemical Laboratories have shown a range of from 46.4 to 50.8 per cent Cr₂O₃. The sample with a Cr₂O₃ content of 46.4 per cent is said to have contained appreciable magnetite.

During the recent investigations eleven samples were collected from the five main chromite lenses in the area, which are the ones to be drilled, and these have been submitted to the W.A. Government Chemical Laboratories for analyses. Determinations are to be made of the Cr₂O₃ and FeO content of all samples, and of the Cr₂O₃, FeO, MgO, and Al₂O₃ content of the three main grades of samples. These results are forthcoming.

RESERVE.

An approximate idea of the reserves available can be made from information kindly made available by the Broken Hill Pty., Company Ltd.

The areas of the chromite lenses in the mapped area, as worked out by a planimeter, indicate that there are 45 lenses with areas of over 1,000 square feet aggregating 143,100 square feet, and 63 lenses with areas of less than a 1,000 square feet, aggregating 27,950 square feet. The total area of outcrop in the mapped area is therefore 171,050 square feet, and if we adopt a conversion factor of 8 cubic feet per long ton, this represents reserves of chromite of the order of 21,380 long tons per vertical foot. There is in addition at least an additional 10,000 long tons per vertical foot in outcrop outside the area mapped. It is known from exposures in gorges that some lenses persist over a vertical depth of about 150 feet, and further information in this regard will be obtained from the drilling results.

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DRILL SITES.

In selecting the drill sites it was decided that the main lenses or groups of lenses, in different zones should be tested over the full length of the chromite-bearing area. With these points in view one main western, one main eastern, and three main central lenses were selected for drilling from eight different sites, details of which are given below. With the exception of sites 6 and 7 all drill sites are shown on the accompanying plan. The drilling is to be carried out with a view to intersecting the lenses at a vertical depth of about 150 feet in the first instance, following which deeper holes may be planned.

A. "Main West Lens."

Site No. 1. (30ft. below outcrop)

Site 200 ft. on Bearing 190 degrees from blazed tree on ridge.

Depress 40 degrees and probably also 70 degrees with two bores on bearing 340 degrees.

Bearing to Cairn N. 20° E.

Site No. 2.

Site 200 ft. on bearing 150 degrees from outcrop.

Depress 45 degrees on bearing 330 degrees to intersect at about 150 feet vertical.

Site No. 3.

Site 150 feet on bearing 570 degrees W. of North - South run of "Main West Lens."

Depress 45 degrees and bore on bearing N. 70° E.

B. "Main Central No. 1. North Lens."

Site No. 4.

Site 150 feet on bearing N. 15° W. of outcrop drill 45 degrees on bearing S. 15° E.

C. "Main Central No. 2. North Lens."

Site No. 5.

Site 150 feet on bearing N. 15° W. of outcrop.

Drill on Bearing S. 15° E. with 45 degrees depression.

D. "Main East Lens."

Off the A.G.C.S.N.A. plan. Near east peg of M.C. 39^D and along its southeast boundary. Lens dips 70 degrees N.W.

Site No. 6.

Site about 400 feet West Southwest of Cairn on N.E. Boundary of M.C. 39^D, and 150 feet northwest of line of outcrop.

Drill on bearing southeast with 45 degrees depression.

Site No. 7.

Site 140 feet northwest of outcrop line and about 600 feet West southwest of site No. 6.

Drill on bearing Southwest with 45 degrees depression.

E. "Main Central South Lens."

Site No. 8.

Site about 500 feet S. 10° W. of North peg of M.C. 41^D, and 200 feet west of line of outcrop.

Drill east with 45 degrees depression.

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CONCLUSIONS.

From available evidence it appears that large reserves of chromite occur at Coobina making it an important Australian resource, but high transport charges involved in marketing the ore would make it difficult to compete with foreign chromite on the open market. Work carried out to date also suggests that it is unsuitable for refractory purposes. Results from the present drilling and sampling programme must be awaited however, before a correct appraisal of the deposits can be made.

REFERENCES.

- Pinnacane, J. J. 1938: The Chromite Deposits of Coobina. A. G. C. R. N.A., W.A. Rept. No. 34.
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