

RB. 59/20

DEPARTMENT OF MINES
SOUTH AUSTRALIA

IRONSTONE PROSPECTS ON MINBURRA STATION
(HELENE REEF AND KADITCHA ROCK)

Mineral Claims 4565 to 4570

G.W. Jones, R. Fisher and H.W. Rademaker

Outside Hundreda, Counties Granville and Lytton

by

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METALLIC MINERALS SECTION
GEOLOGICAL SURVEY

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Plan No.

Title

Scale

64-385

Sketch Map of Ironstone Prospects -
Helene Reef and Kaditcha Rock

1" : 2 miles
1" : 1000 ft.

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27th July, 1964.

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ABSTRACT

Kaditcha Rock and "Helene Reef" are discontinuous elongated craggy hillocks of ferruginous Wilpena Group sandstone and chert on the southern limb of a north-east trending syncline. Outcrops are too small, and grade too low to be of economic interest as a source of ironstone. Spectrographic analyses have shown that no other metals are present, except as trace elements.

INTRODUCTION

The claims described in this Report were examined in company with Mr. G.W. Jones, (representing the three claim-holders), on May 25th and May 26th, 1964. The "Helene Reef" is named after the old Helene mine, the shaft of which was sunk about 1889 in the search for silver-lead. No aeromagnetic surveys have been flown over this region.

LOCATION AND ACCESS

The prospects are 20-25 miles north-east of Minburra Head Station, and some 50 miles north-east of Orreroo, near the Orreroo - Baratta road. Over much of the stretch from Minburra, the road crosses a gravel and clay-pan flat, parts of which may be swampy in wet weather. The Helene reef is about 300 yards east of the road and $1\frac{1}{2}$ miles north of the summit of Red Hill. A 4-wheel drive vehicle is necessary to reach Kaditcha Rock, which is about 10 miles west of the old pump hut (See Plan), by way of the gravel flat and thence along the creek bed.

GENERAL GEOLOGY

The country rocks include sandstones or quartzites, siltstone and pale green shales, which presumably belong to the Wilpena Group (Marinean Series), in the upper part of the Proterozoic Adelaide System (D. Robinson, pers. comm.) Some horizons are calcareous. The formations have been folded into a broad north-east trending syncline, on the southern limb of which the claims are sited. Exposures are rare in the vicinity of the Helene mine and the few scattered ferruginous outcrops rise out of a flat or gently undulating gravel-strewn plain (See Plan 64-585).

PROSPECTS

Helene Reef
(MC 4566-4570. Each 500 x 250 yds.)

The old Helene shaft is situated about the centre of MC 4566 (See Plan 64-585). According to Brown (1908, p. 179) it was sunk to 75 ft. about 1889 in the search for silver-lead ore and drives were put in north-east and south-west. The ferruginous sandstone which outcrops some 3 yds. west was probably believed to be the gossan cap of a sulphide orebody. No galena or other sulphides are now visible on the dump and none is indicated in the spectrographic analyses. There are traces of zinc (See Appendix II). Material on the dump consists chiefly of limonite and limonitic sandstone.

From the dump, outcrops of black ferruginous chert and indurated sandstone form a broken line or reef of crags rising to about 10 ft. above the gravel flat for about 100 yds. south-west. The next outcrop is 650 yds. north-east along the strike where a similar reef up to 15 ft. wide and 85 yds. long crosses the centre of the boundary between MC 4567 and MC 4568. Part of this outcrop consists of very hard and dense jasperised breccia. Other smaller outcrops may be seen on MC 4569 and in the country beyond MC 4570.

Samples were collected for chemical and spectrographic analyses which are tabulated in Appendix II.

Kaditcha Rock
(No 4565. 500 x 250 yds. R. Fisher)

Kaditcha Rock is a small craggy hill about 50 yds. long and 20 yds. across consisting of weathered black ferruginous sandstone striking north-easterly, above the south bank of an unnamed creek. To the north-west, the sandstone is overlain by weathered calcareous sandstones and siltstones, and limestones, which are partly covered by scree and downwash. Samples of the ironstone assayed only 20.8% iron and the deposit is thus too low grade to be of economic interest.

ORIGIN AND NATURE OF THE IRON

The host rock at the Kaditcha prospect has been shattered, with joint planes striking north-east and dipping at 65° to the south-east; in a similar direction to the strike of the beds, but across the dip of bedding. Other joints strike south-east and are vertical. The joints are associated with irregular quartz veins up to about 1" thick. The ironstone deposit on Kaditcha Rock was apparently formed by local impregnation and concentration of iron in a disturbed zone which might be a strike fault. The petrological description of a specimen suggests that iron-bearing colloidal solutions permeated the matrix of the sandstone and siltstone and the iron was precipitated as fine-grained limonite ($2 \text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) which was later oxidised to goethite ($\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$) (See Appendix I). Detrital fragments of the host rock appear also to have been re-consolidated by ferruginous cementations and it is possible therefore that iron formation may have been relatively recent.

The ironstone in the "Holene Reef" probably had a similar origin though much of the outcrop consists of hard and dense fine-grained ferruginous chert, with irregular patches of indurated

red or yellowish jasperised breccia. Assays ranged from 45.6% to 52.6% iron which, however, consists mainly of fine limonite or goethite intimately bound up with siliceous material.

CONCLUSIONS

The prospects have been formed by localised permeation by iron-bearing solutions of disturbed Wilpena Group sandstone or siltstone. Silicification took place, probably before, and also during the period of iron formation. The deposits are low grade and are too small to warrant further development.

BIBLIOGRAPHY

- Brown, H.Y.L., 1908 - Record of the Mines of South Australia
(Fourth edⁿ.) Govt. Printer. Adelaide. p.179.
- Whitten, G.D., 1961 - The Devil's Chimney Ironstone Deposit.
Mining Review. Dept. of Mines of S.Aust. No. 114.
pp. 71-81.



A.H. Eliassett
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METALLIC MINERALS SECTION

AHB:ACK
27/7/64

APPENDIX I

Petrological Report

Identification P237/64: TS 14164

Location "Haditcha Rock". MS 4565 R. Fisher
Corrieton Run 1/8314

Date Received 1/6/68

D 237/64: TS 14164: ID 171/64

This is a coarse ferruginous sandstone; it is probably a surface-formed rock, as it is virtually unsorted, it is very porous (10-20% of the matrix consisting of voids), and its cementation is very irregular.

The framework fragments form about 40% of the rock, and vary from 0.1 to 2 mm across, though rare grains are larger. They are all quartz or coarse-grained quartzite, and though most have moderate sphericity they have been very little rounded, and commonly have roughly serrated edges.

The matrix consists of fine quartz grains (up to 0.03 mm across) with clay and sericite, cemented by goethite. The goethite is in the form of small pellets about 3 microns across. Their concentration varies considerably; in some parts they are isolated, but in others they are so closely packed that individual pellets are indistinguishable. The quartz, clay and sericite form about half the matrix, but their concentration varies considerably as the cementation is very irregular.

Investigation and Report by: D. SMALL

Officer in Charge, Mineralogy Section: H.W. FANDEN

L. WALLACE COPPER
Director

10/7/1968.

APPENDIX II

Analysis

Identification	A 2114/64: HB 106/64	3 yds. west of shaft
	A 2115/64: HB 107/64	Helene shaft dump
	A2116/64: HB 108/64	Reef; boundary of
		NC 4567 and NC 4568
	A 2117/64: HB 109/64	Kaditchea rock, NC 4565
Location	20 miles north-east of Minburra Station	
Date Received	8/6/64	

Chemical Analysis

	Sample Mark			
	A2114/64	A2115/64	A 2116/64	A2117/64
Acid Soluble Iron	45.6	46.7	52.6	28.8
Insolubles	17.8	14.6	10.5	35.2

Spectrographic Analysis

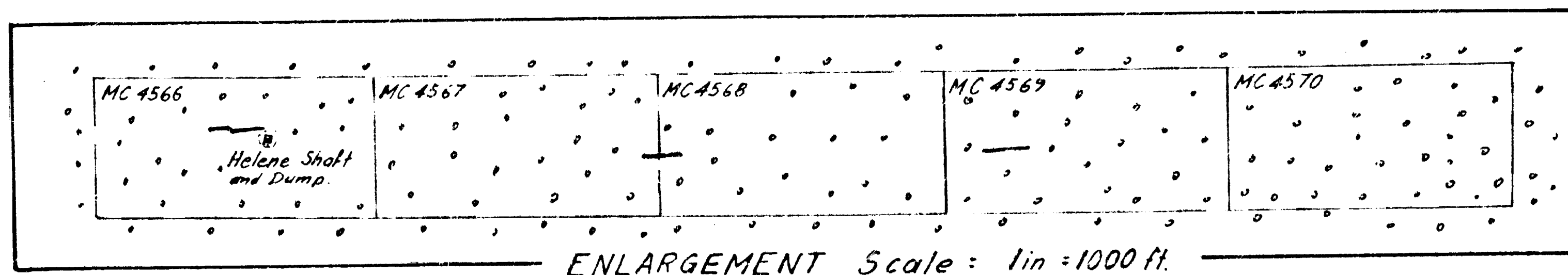
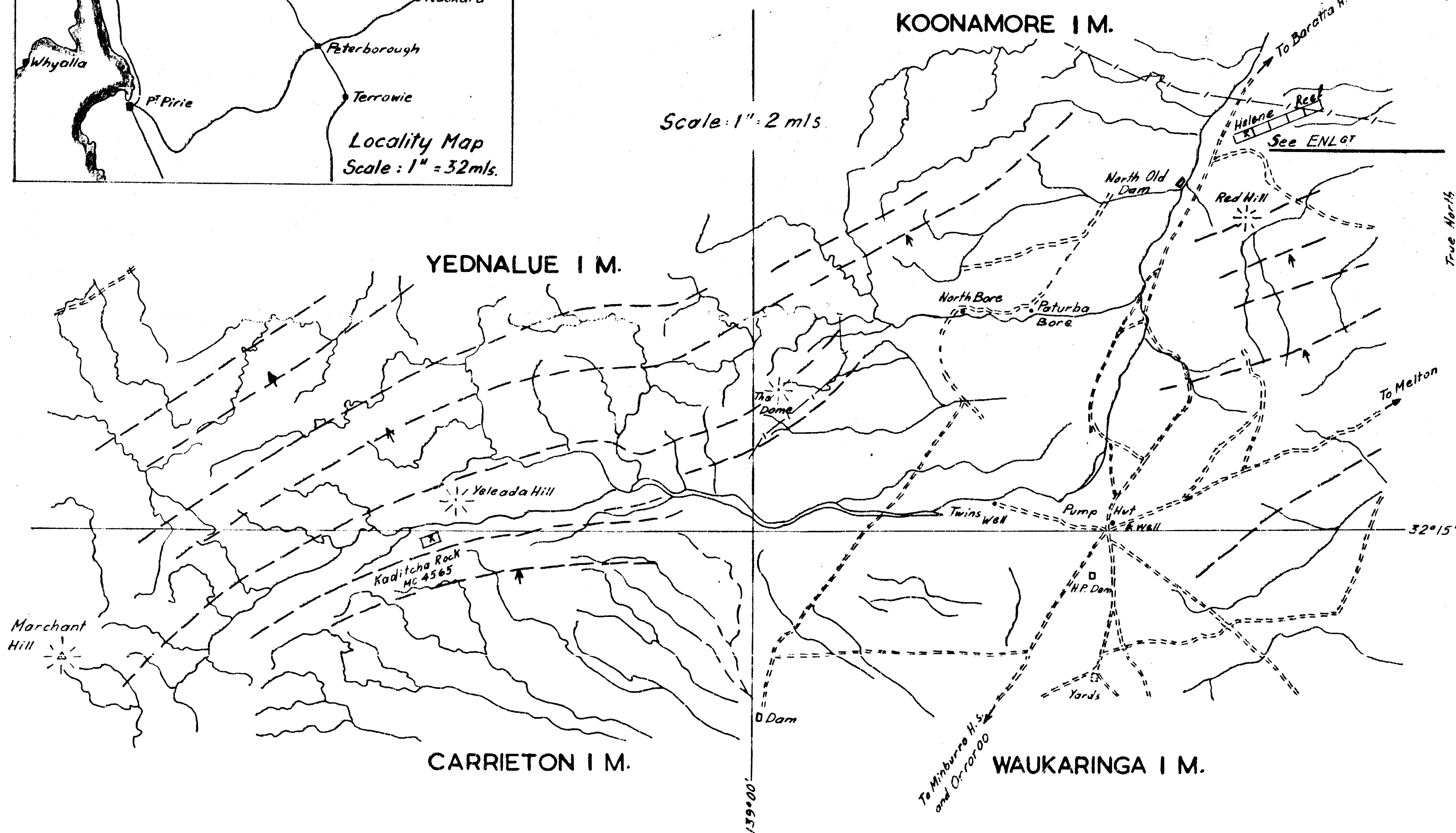
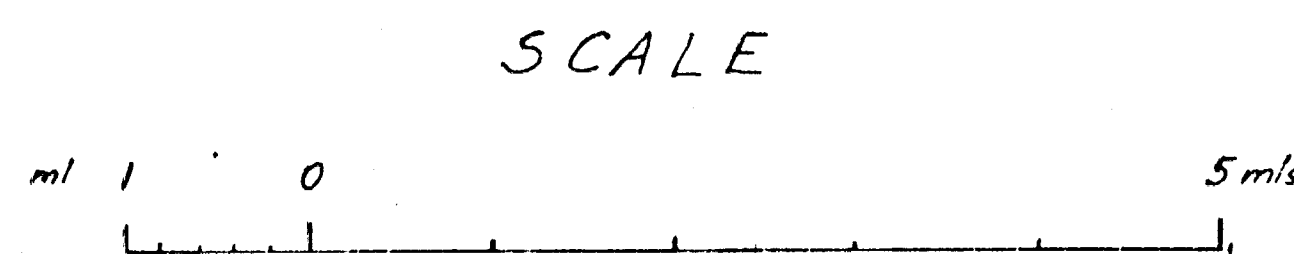
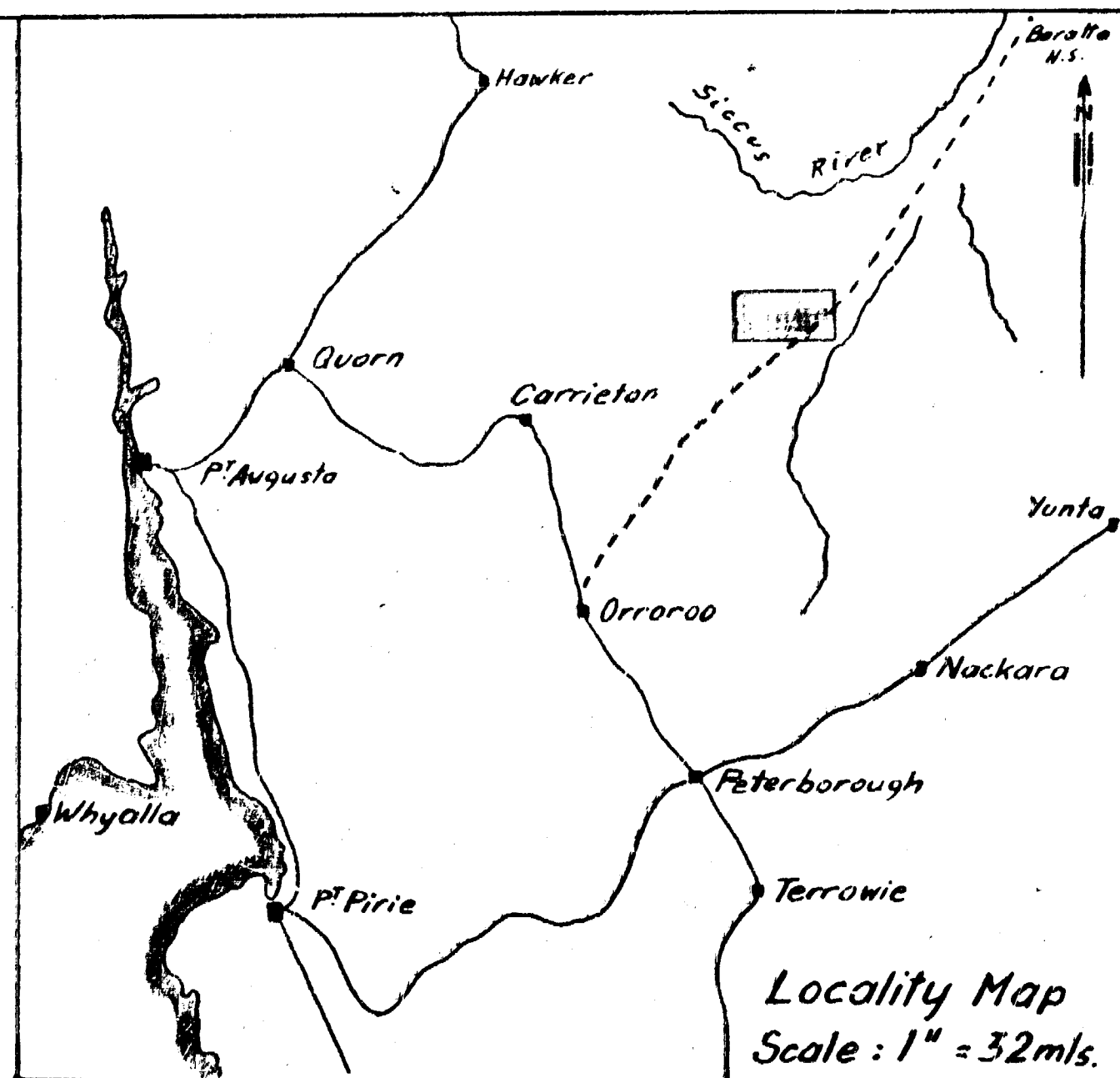
Parts per million

	A2114/64	A2115/64	A2116/64	A2117/64
Copper (Cu)	15	50	20	15
Lead (Pb)	12	15	12	10
Zinc (Zn)	800	700	600	700
Silver (Ag)	0.4	0.3	0.1	0.1
Molybdenum (Mo)	3	12	2	10
Cobalt (Co)	20	25	20	60
Nickel (Ni)	50	40	30	30
Gold (Au)	* 3	* 3	* 3	* 3
Beryllium (Be)	7	10	12	2
Tin (Sn)	8	3	5	6
Vanadium (V)	10	10	5	15
Zirconium (Zr)	100	100	150	80

- Indicator "less than".

Analyses by: A.H. JORGENSEN
Spectrographic Analyses by: A.B. TIMMS
Officer in Charge, Analytical Section: T.R. FROST
24/6/64; 26/6/64

L. WALLACE COFFER
Director



MC4566 G.W. Jones
MC4567 H.W. Rademaker
MC4568 R. Fisher
MC4569 G.W. Jones
MC4570 H.W. Rademaker.

LEGEND

Ferruginous sandstone or chert
Recent gravels
Fence
Roads & Tracks

Strike and dip of bedding
in Marinoan
Trig Point

To accompany report by A.H. Blissett.

S.A. DEPARTMENT OF MINES

IRONSTONE PROSPECTS
HELENE REEF & KADITCHA ROCK
MINIBURRA STATION - C^o GRANVILLE & LYTTON

Approved

Passed

Drn.
Fcd. G.S.
Ckd.
Exd.

Scale: As shown.

64-585

Fig
Date 21-7-1964

Amendment

Exd.

Date

Director