RB 58/138

DEPARTMENT OF MINES
SOUTH AUSTRALIA

REPORT

ON

FLUORITE DEPOSITS - OLARY AND BROKEN HILL DISTRICTS

by

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28th May, 1964.

DEPARTMENT OF MINES
SOUTH AUSTRALIA

REPORT ON

FLUORITE DEPOSITS - OLARY AND BROKEN HILL DISTRICTS

ABSTRACT

Known occurrences of fluorite have been examined for a source of low grade fluorite - quartz ore for chemical manufacture at Port Adelaide. No suitable deposits were found. Further enquiries of a possible source from the Broken Hill Lodes is suggested.

INTRODUCTION

A source of fluorite is required by the Company for the manufacture of chemicals at their Port Adelaide works. The proposed consumption amounts to 2,000 tons per year of 98% fluorite initially, rising later to 4,500-5,000 tons per annum.

The process requires the addition of silica and it was suggested that a low grade fluorite ore containing free quartz might be usable and more easily obtained.

Known occurrences of the Mineral in the Olary Province and Broken Hill District were inspected from 9th to 12th March, 1964. The Olary Province contains the only commercial deposits of fluorite in the State, while over 1000 tons of high grade ore have been won from deposits north of Broken Hill in past years.

Details of the deposits in N.S.W. were supplied on request by the N.S.W. Department of Mines, who also consented to the inspection being made. Mr. Harry Thomas, the present leaseholder at Mt. Robe, guided the writer to the Mt. Ditie and Mt. Robe workings and his assistance is acknowledged.

For convenience the two areas inspected will be discussed separately.

DEPOSITS IN THE OLARY PROVINCE

Geological Setting

The Pre-Cambrian rocks of the Olary Province, particularly those of Archaean Age, have been mapped and prospected in considerable detail and the results published by Campana and King. (1958.)

Two distinct groups of rocks are recognised. The older group, termed the crystalline basement, consists of metasediments of Archaean Age which have been partially converted to granitic rocks and granite by an orogenic cycle which occurred in late Middle Proterozoic time.

Sediments of the Upper Proterozoic Adelaide System unconformably overlie the basement and post date the orogeny.

Fluorite Deposits

Small deposits occur both in the granitic rocks and the metasediments of the crystalline basement and at two localities small quantities of high grade fluorite ore have been mined. These are described in detail by King (Campana and King 1958) and are summarised below.

Plumbago Fluorite Workings Narrow veins (up to three feet wide) containing fluorite, quartz and apatite occur in metasediments intruded by granite, ¾ mile S.E. of Plumbago Station.

Shallow open cuts show two sets of intersecting veins and an underlay shaft is reported to be 28 feet deep.

The deposit is small, the lateral limits of the veins having been reached, and according to King "fluorite remaining underfoot cannot be profitably mined at present prices".

New Deposits, Plumbago Station Fluorite occurs in the eastern portion of a well defined shear zone which runs for 200' south easterly from the margin of an Archaean outcrop located 150 yards south of the station shearing shed.

Workings consist of some shallow trenches and an inclined shaft of unknown depth. They are now abandoned.

This deposit is also small and unlikely to be mined economically.

Scheelite Occurrence, Old Boolcoomata Station Scheelite and small amounts of fluorite occur along former bedding planes in a calc silicate bed, one and three quarters miles east of Old Boolcoomata Homestead.

The horizon is clearly defined as a zone of poor outcrop, 30 feet wide, interbedded with boldly outcropping mica schist. On the western side of this zone is a bed of carphosiderite (basic sulphide of iron) and on the eastern side the calc silicate bed is exposed intermittently over a strike length of 2,300 feet. (Peterson 1955) and is intruded by pegmatite.

A shallow pit near the southern end of the deposit has exposed the ore over a width of three feet and this is the only locality in which fluorite was observed.

Reserves and grade of fluorite are considered to be too low for the project under investigation.

Fluorite near Ameroo Hill Grains of fluorite, with magnetite and orthite have been recorded in gneiss, 1 mile S.W. of the Perry Humuck Mine near Ameroo Hill.

The occurrence is too small to be considered as a source of fluorite.

DEPOSITS IN THE BROKEN HILL DISTRICT

Fluorite occurs as a gangue mineral in the Broken Hill Lodes and it is believed that experimental separation of the mineral has been successful. No further details of this source have been obtained by the writer.

Several deposits have been worked outside of the mine area, mainly in the period 1929-1937. Here fluorite is associated with quartz, felspar and galena and occurs in narrow fissure lodes in Archaean metasediments.

Mt. Eltis (Parish Robe, County Yancowinna) The largest recorded production was won from this mine and totals about 900

tons of high grade ore. The B.H.P. Company holds M.L. 176 in this locality at the present time. The lease is 35 miles by road from Broken Hill, the last four miles being via a narrow track over extremely rough terrain.

Workings extend over a length of about half a mile but the lode, which varies from a few inches to three feet in width, occurs intermittently, separated by barren sections.

According to Thomas, who worked in the area at the time, the lode is worked out and prospecting failed to find extensions. Even if reserves remain, costs would be high because of the nature of the deposit, requiring underground mining, and the difficult access for road transport to the rail yead.

Mt. Robe (Parish Robe, County Yancowinna) One mile east of Mt. Eltie an orebody of similar attitude and dimensions has been worked by Thomas for lead.

Fluorite occurs in smaller quantities than at Mt. Eltie and the deposit is of no interest to this project.

Mayflower Area (Parish Purnamoota, County Yancowinna) A total of 240 tons of fluorite was raised in 1933-1935 from "a local enlargement of restricted dimensions, occurring in a shear in sillimanite schist" (N.S.W. Dept. of Mines 1964).

Warne (1964) examined the deposit in 1961 and considered that it was unsuitable for large scale mining. The deposit was not inspected during the course of the present survey.

Thackeringa "It was reported in 1934 that rich fluorite ore was worked on two claims in this locality but no further information is available" (N.S.W. Dept. of Mines 1964)..

SUMMARY AND CONCLUSION

Fluorite occurs in narrow fissure lode structures in metasediments of Archaean Age in both areas inspected.

High grade ore has been produced by underground mining methods and concentration. The largest recorded production was

raised from Mt. Eltie ever a period of eight years and totalled about 900 tons.

The deposits inspected are now abandoned and appear either to be worked out or to be too small to provide the tonnage required.

It is concluded that there are no deposits of interest in the areas examined and no further work is recommended.

A successful method of recovering fluorite from the gangue in the Broken Hill Lode is reported to have been developed. Enquiry into the availability of this bi-product material is suggested.

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MNH:AVK
28.5.64

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REFERENCES

Campana B. and King, D. 1958 "Regional Geology and Mineral Resources of the Olary Province" Geol. Survey S.A. Bulletin 34.

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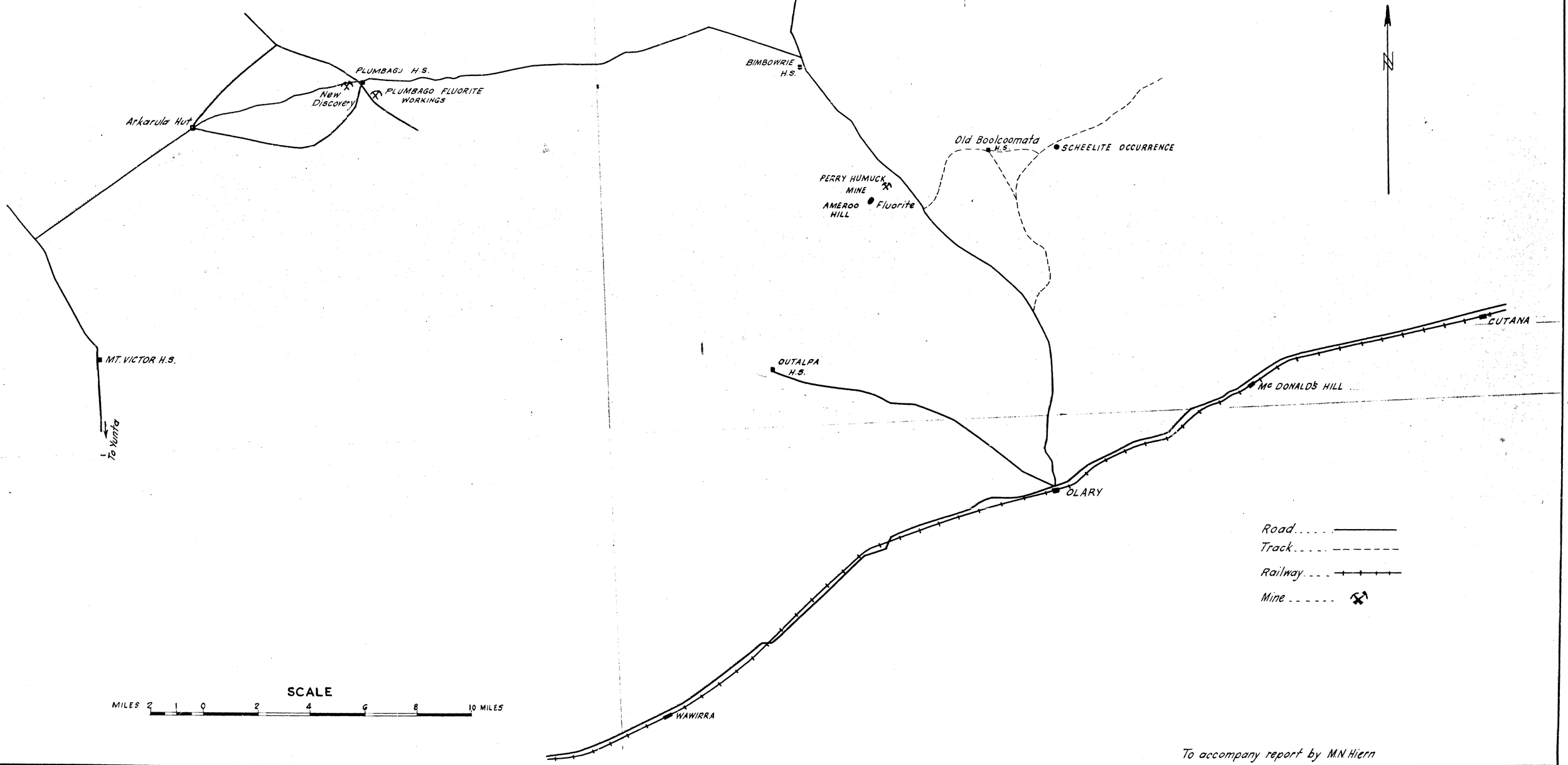


To accompany report by M.N. Hiern

S.A. DEPT. OF MINES

300—6.63 1425

Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

LOCALITY PLAN FLUORITE OCCURRENCES OLARY PROVINCE

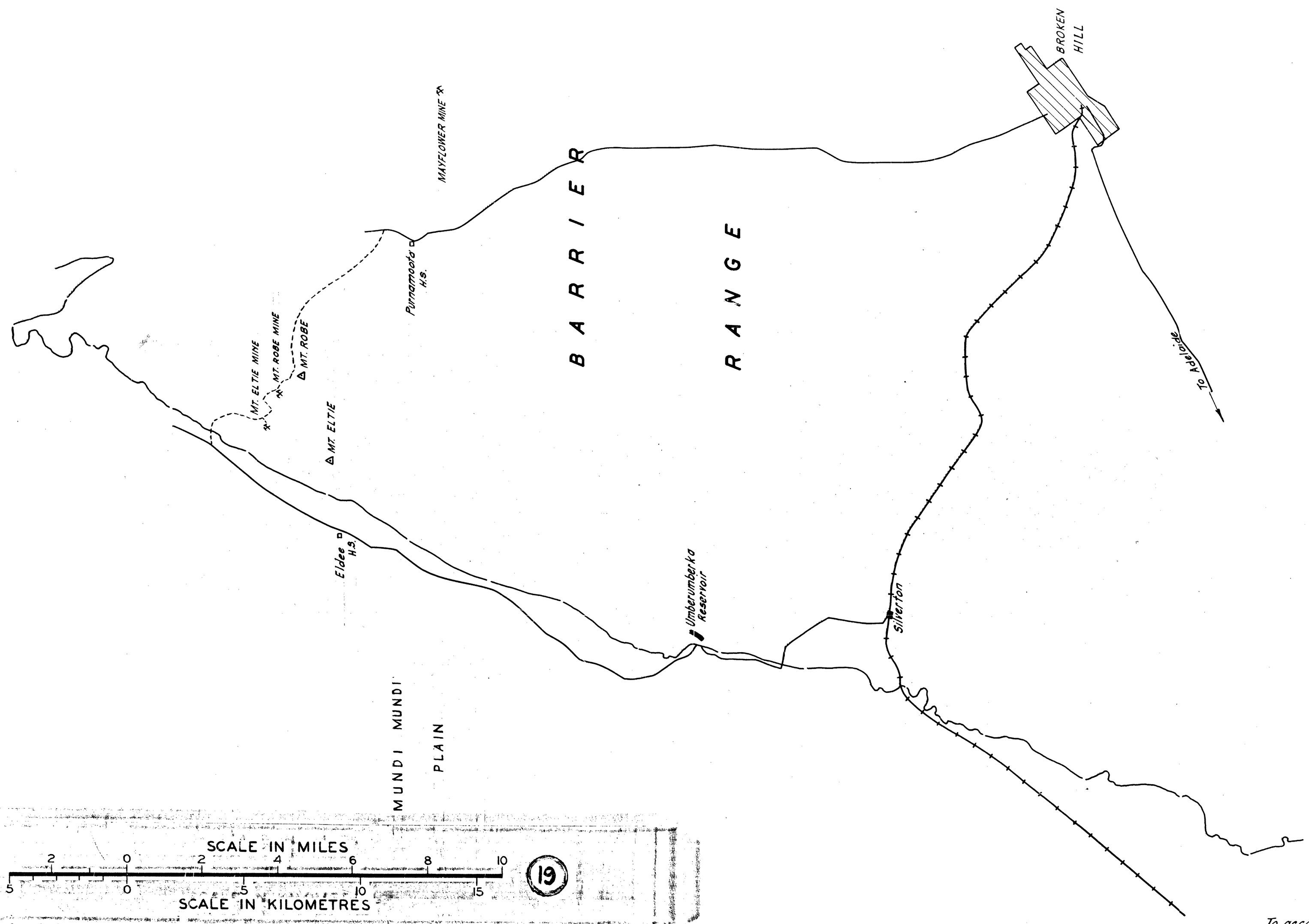
Approved	Passed
Director of Mines	

Drn.
Tcd. A.O.W.
Ckd.
Exd.

Scale: As shown

64-252
Fd + g + l

Date 31-5-64



To accompany report by M.N. Hiern.

300—6 63 1423

S.A. DEPT. OF MINES

Req. No.
D.M.
Compiled from

LOCALITY PLAN
FLUORITE OCCURRENCES
BROKEN HILL AREA

Approved	Passed	
		Drn.
		Tcd. A.O.W.
		Ckd.

Scale : 1" to 2 miles

64-251
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