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**RECORDS:**

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FELSAR DEPOSIT - LONDONDERRY. COOIGARDIE DISTRICT - W.A.

by

H.G. Raggatt

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FELSPAR DEPOSIT - LONDONDERRY.

COOLGARDIE DISTRICT - WESTERN AUSTRALIA.

Report No. 1943/44. Plan No. 947.

The felspar deposit near Londonderry was examined on Saturday, September 11th, in company with Mr. Winzar, Senior Inspector of Mines, Kalgoorlie, and Mr. Ranc of the Kalgoorlie School of Mines.

The deposit is situated  $13\frac{1}{2}$  miles southerly by road from Coolgardie and  $4\frac{1}{2}$  miles southwesterly from Londonderry railway siding. The product is railed to Fremantle and shipped thence to consuming centres in the Eastern States.

The deposit has been worked by open cut, the size and shape of which are given in the plan accompanying this report. The average depth of the cut is about thirty feet. This plan has been prepared from a drawing made at the office of the Senior Inspector of Mines, Kalgoorlie, from measurements supplied by the Manager.

The mineral assemblage is very interesting. The bulk of the deposit consists of white quartz and approximately in order of abundance, microcline, felspar, petalite, beryl, amblygonite (?), lepidolite and mangano-columbite.

Microcline Felspar - The mine is operated primarily to produce this mineral which occurs in the form of lenses of average size of about 60 feet long, 30 feet wide and 15 feet high. These lenses are irregularly bounded, but a very clean high-grade product is easily selected by hand picking.

Petalite -  $\text{Li}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 8\text{SiO}_2$  is a white to colourless mineral closely resembling  $2\frac{3}{4}$  soda  $2$  felspar. It contains 4.9%  $\text{Li}_2\text{O}$ . It is generally considered a rare mineral but there are 6 tons of it at grass at this mine and several more tons could be mined without difficulty. It may have some value as an ore of lithium.

Beryl -  $3\text{BeO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2$ , is in demand as an ore of beryllium. When pure, beryl contains  $2\frac{1}{4}\%$  BeO and ore containing as low as 9.5% is marketable. The present price is  $47/8$  per long ton unit BeO, f.o.b. Fremantle, Brisbane and/or Melbourne. During the period of operations covered by the table below, 3 tons of beryl have been produced from the deposit and there is about  $\frac{1}{2}$  ton at grass.

Amblygonite -  $\text{AlPO}_4 \cdot \text{LiF}$  is an ore of lithium and contains, when pure, 10% lithium oxide  $\text{Li}_2\text{O}$ . It is also a possible source of phosphoric acid and fluorine. The determination of this mineral as amblygonite is purely tentative and requires verification.

Lepidolite - Lithium-bearing mica - is also a possible source of lithium, as some varieties contain up to  $4\frac{1}{2}\%$   $\text{Li}_2\text{O}$ .

Mangano-columbite - Small quantities of this mineral have been found from time to time, especially during the past eighteen months. It is very irregularly distributed.

All minerals, with the exception of lepidolite, occurring in the Londonderry deposit could be produced as clean concentrates by hand-picking, but concentrating plant would be necessary if production of lepidolite were to be considered.

Approximately 100 yards easterly from the northeast corner of the main quarry is another small opening on a body of soda felspar. A few tons have been mined here, the output being included with the microcline given in the general table below.

The following table gives the production from the deposit for the period September, 1936 to August, 1943, during which time it was operated by Australian Glass Mfrs. Limited. This table does not represent total production from the deposit as the output from 1933 to September, 1936, amounted to 5,507 tons.

	1.	2.	3.	4.	5.	6.
	Tons	Tons			Tons	Tons
From Sept. 1936	2,187	6,000	2.8	8	---	---
1937	2,630	10,000	3.8	8	1,579	329
1938	3,028	12,000	3.9	10	1,501	303
1939	3,271	14,000	4.3	15	1,151	218
1940	3,478	17,000	4.9	13	1,575	267
1941	4,114	12,750	3.1	14	1,204	294
1942	3,399	4,014	1.2	6	1,236	566
To end Aug. 1943	1,293	3,828	3.0	5	1,536 x	388
TOTAL:	23,400	79,592				
Average:	---	---	3.4	-	1,280	300 1/2

x Estimated.

1/2 1942 figure omitted.

1. Felspar.
2. Mullock mostly quartz.
3. Tons mullock mined per ton felspar.
4. Men employed.
5. Rock quarried per man per annum.
6. Felspar quarried per man per annum.

It will be seen from this table that approximately 103,000 tons of rock has been quarried of which 23,000 tons was felspar. The table also shows the quantity of mullock mined per ton of felspar obtained for each year and the production per man per annum of rock quarried and of felspar recovered. From this table it will be seen that the average production per man per annum of rock is 1,280 tons and of felspar 300 tons (omitting 1942 figures). As it is intended to increase production to the rate of 5,000 tons per annum, if possible, it may be deduced that 16 men will be required unless mechanical appliances are used. Buildings on the property consist of a blacksmith's shop, store, power plant and six hutments.

The power plant consists of two 22 H.P. Clayton Shuttleworth diesel engines and two Reavell air compressors.

Even though the deposit has been opened to such a large extent the form of the orebody is not apparent. It consists of a large pegmatite mass, but neither the boundaries nor the trend of the formation could be deduced during the brief examination made. Only in one place, namely the north wall of the quarry, may the wall rock be seen. The wall rock here consists of garnet-amphibolite (?) - schist.

This report should be regarded as only embodying rough notes made for a particular purpose. It is understood that a survey of minerals in the deposit has been made by the Government Mineralogist, Mines Department, Western Australia. The results of this survey should be incorporated in any final report on the deposit. A geological survey of the locality should be made as it would probably enable the size and form of the body in which the felspar occurs to be delineated. Such survey might also reveal structural features which would be of value in future prospecting and working of the deposit.

Canberra.

20th September, 1943.

(H.G. Raggatt)  
Director.