

THE UNIVERSITY OF ADELAIDE
DEPARTMENT OF ECONOMIC GEOLOGY

THE GEOLOGY OF AN AREA IMMEDIATELY
SOUTH OF BURRA, WITH PARTICULAR
REFERENCE TO MINERALISATION

HONOURS THESIS 1956

by P. R. BRETT

Copy (2)

C O N T E N T S

SUMMARY

INTRODUCTION

History

PHYSIOGRAPHY

STRATIGRAPHY

Torrensian

Alluvium

Shale-sandstone Group

Fluvioglacial Group

Calc Shale Group

Limestone - dolomite group

STRUCTURE

MINERALISATION

(1) Karinga Fault

(ii) West Burra Mine

(iii) Princess Royal Mine & Area

(iv) Burra Mine.

Localisation

CONCLUSIONS

PHOTOGRAPHS

REFERENCES

—

SUMMARY

An area of some 25 sq. miles was investigated including Burra and the district due south of it.

The copper deposits of Burra, of such fundamental importance to the early colony, were discovered in 1843 and subsequently worked by the S.A. Mining Association, who obtained some 234,600 tons of ore of approximately 22% grade. The mine finally closed in 1877 due to cessation of mining, drop in the price of copper etc.

The area is essentially a part of the Mt. Lofty - Flinders Ranges and is of mature topography. The rock sequence consists of a series of marbles, limestone, dolomites, fluvio-glacials, quartzites and shales of Sturtian and Torrensian age folded into a series of gently north-pitching folds, the fold axes lying approximately 1 mile apart. Folding is most intense in the vicinity of the Burra Mine and the Princess Royal Mine, where a closed dome structure occurs. Strike faulting along the axes of anticlines is quite prominent, the Karinga Fault extending right through the area and having a stratigraphic displacement of up to 10,000 feet. The only igneous rock found was a felspar porphyry outcrop, lying about $\frac{1}{2}$ mile west of the Burra Mine.

Copper mineralisation consisting of mesothermal veins chalcopyrite, bornite and pyrite in a gangue of calcite, quartz with occasional barite is common throughout the area. These veins commonly occur in reverse strike faults. Supergene carbonate derived from the primary mineralisation is common, and is believed to have been formed by the precipitation of downward percolating acid copper solutions with carbonate wall - rock.

The two main mineralised zones of the area are the Princess Royal Mine where low grade veins occur in a brecciated and shattered zone at the axis of the dome structure, and the Burra Mine where low grade veins occurred in the brecciated zone between two strike faults. Precipitation of carbonate has been considerable at the Burra Mine, where the supergene ore occurred as a cigar-shaped "blanket". The primary ore was localised by the

intersection of the two strike faults with a series of dolomites and limestones.

From an examination of the area, the likelihood of finding a new orebody is remote, and the discovered orebodies appear either to be worked out or else uneconomic.