

977001

*To be used in conjunction  
with corresp. file*

---

EXPLORATION LICENCE 17/85

ANDERSON CREEK, TASMANIA.

FINAL REPORT SUMMARY

**OPEN FILE**

86-2604

977B

## AUSTRALIAN CONSOLIDATED MINERALS LIMITED

EXPLORATION LICENCE 17/85  
ANDERSONS CREEK, TASMANIA

## FINAL REPORT SUMMARY

J E Thompson

October 1986

D. DIR.	- 4 NOV 1986			
	DEPT. OF MINES			E & IL
	REF. No. 11,135/86			

**MICROFILM**

Distribution: Department of Mines, Tasmania  
J E Thompson  
File

## 1. INTRODUCTION

Exploration Licence 17/85 was granted to AUSTAMAX Operations Pty Limited on 20 August 1985 with a commitment to spend not less than \$41,000 on investigations in the first two years. The Licence was renewable annually, subject to satisfactory work performance. Pro rata work and expenditure for the first year of tenure has been exceeded but after discouraging results the Company has applied for relinquishment of the Licence as from 20 August 1986.

The reasons for this relinquishment request are briefly outlined below and expanded upon in the body of the report.

The objectives of the first year's investigations were:

- (i) To review and evaluate all available data on previous exploration and mining of secondary (reworked) chromite deposits in the area.
- (ii) To determine through new field observations, the true nature of deposition of the secondary chromite deposits in order to critically evaluate existing data and to plan an appropriate testing programme, should such further testing be warranted.
- (iii) To examine the chromite marketing scene to determine whether a ready market existed for the entire chromite product. The previous operator had aimed to produce only foundry sand with strict size specifications (-40 +140 BS mesh). This precluded more than 50% of total available chromite which was either discarded with tailings or stockpiled and later dispersed.

Briefly, investigations over the twelve month period have led to the following conclusions.

002

## 2. RESERVES

Previous testing tended to over estimate the mineable reserves of secondary chromite at Barnes Hill and in the Rifle Range area, primarily because all Cr reported in analyses was attributed to chromite when, in fact, much of the Cr, particularly in lateritic clay matrix deposits, is associated with limonite and clay materials. Such non-chromite Cr has been derived from primary and secondary chromite by acid leaching during prolonged weathering and is now fixed in limonite and clay minerals.

In the Rifle Range area, the reliance on percussion drilling for both quantitative and qualitative data, combined with the non-chromite Cr problem, seriously undermines confidence in the estimated secondary chromite reserves there.

### 3. NATURE OF DEPOSITION OF SECONDARY CHROMITE

It has been concluded from observations in the mined areas at Barnes Hill, that the secondary chromite concentrations are not planar sedimentary deposits in the normally accepted sense, and that lateral extrapolation using shoreline or other conventional stratigraphic models is not justifiable. This applies particularly to the Rifle Range area.

The deposits are now interpreted as residual chromite concentrations formed by the chemical and hydraulic flushing of limonite from the upper part of a pre-Tertiary ultramafic laterite profile. The active agent in this process is acid ground water percolating through Tertiary quartz gravels with peaty interbeds. The leaching and flushing action of acid groundwater on ultramafic laterite proceeds rapidly only after the groundwater table falls below the quartz gravel/ultramafic laterite contact. Barnes Hill where a small quartz gravel cap overlies ultramafic laterite in a simple mesa-like prominence, provides an ideal situation for the envisaged leaching and flushing process.

It has been concluded that the high grade residual concentrations of chromite and silica platelets at Barnes Hill, accumulated in a system of solution channels in the laterite immediately below the gravel and in narrow steep-sided, spring-fed gutters in laterite on the flanks of the hill below the surface trace of the gravel/laterite contact. The complexity and irregularity of such deposits precludes rational lateral extrapolation of data from drilling or pitting for ore reserve estimation, and would inhibit selective mining of the high grade chromite concentrations. The chaotic distribution of the high grade chromite concentrations was a significant factor in the demise of the operations of Northern Chromite Limited.

## 4. MARKETING

Chromite from the Andersons Creek deposits could not compete in the international metallurgical chromite market because reserves are too small to warrant local reduction to ferrochrome which is a necessary requirement to reduce overseas freight costs.

The Andersons Creek chromite is both physically and chemically unsuitable as refractory chromite other than foundry sand for which Australian demand is small and shrinking. The strict size specifications for foundry sand are such that at least half the chromite from the Andersons Creek deposits would not qualify.

Interest has been shown in high quality chromite ( $\text{Cr}_2\text{O}_3$  60%,  $\text{SiO}_2$  <1%) by chrome chemical manufacturers in Japan and the United States. This presumably would be used for blending and upgrading of lower quality chrome ore from other sources. However, despite the high  $\text{Cr}_2\text{O}_3$  and low  $\text{SiO}_2$  content of samples and small parcels of foundry sand chromite produced by the previous operator, it is most unlikely that this quality of product could be maintained in any large scale operation. The previous operator selectively mined small pockets of high grade chromite sand which had been residually enriched in  $\text{Cr}_2\text{O}_3$  by the partial leaching of alumina and iron from some of the chromite by acid ground water. Any larger scale operation would necessarily have to include lower grade clay matrix chromite bearing material in which the chromite has not been enriched by ground water leaching. All chrome chemicals used in Australia are currently imported, mostly from the United States.

If a chrome chemical plant were to be built in Australia, then the higher quality chromite from the Andersons Creek deposits could probably be used at the rate of a few thousand tonnes a year to blend with other readily accessible but lower quality Australian chromite. However, at this time, there are no known plans to establish a chrome chemical plant in Australia. This aspect may be worthy of further investigation for later exploitation of the small quantity of near surface high quality chromite left at Barnes Hill.

#### 5. CONCLUSION

Having regard to the low size potential, erratic distribution, and the lack of a local market for chemical grade chromite, the prospect does not appear to warrant further investigation, and accordingly, surrender of the Exploration Licence was recommended.