DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

ENGINEERING DIVISION

THE TARTWAUP FAULT?

by

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Rept.Bk.No. 73/149
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Hyd. No. 2549
D.M. No. 297/72

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INTRODUCTION

This report summarises investigations carried out at Allen's Quarry, 10 km NW of Mount Gambier, into the nature of the only known exposure of the Knight Formation in South Australia.

The following section is intended for submission for inclusion in the Quarterly Notes, as it is felt to present useful and little known evidence about the nature of the exposure.

THE TARTWAUP FAULT?

Tertiary sediments near Mount Gambier in the Gambier Embayment of the Otway Basin thicken considerably to the south of a hingeline delineated by seismic data (Wopfner and Douglas, 1971) and known in some literature as the Tartwaup Fault (e.g. Sprigg, 1952).

The thickening of the upper Tertiary sediments has been well demonstrated by drilling operations carried out by this Department whilst investigating groundwater in the Mount Gambier area. The Gambier Limestone thickens to at least 298 m as shown in the north-south section (figure 1) from the Allen's Quarry area to Danger Point, near Port MacDonnell.

The Eocene Knight Formation underlies the Oligo-miocene Gambier Limestone throughout the Mt. Gambier area, and is known in surface exposure only at Allen's Quarry, some 10 km northwest of the city of Mount Gambier. The exposed sequence of Knight Formation, Compton Conglomerate and Gambier Limestone has been described by Ludbrook (1961), however the section is at present suffering the effects of continued quarrying of the exposed sands.

Springs, some in a nearby limestone quarry, are known in the area, and are used in literature (Sprigg, 1952) together with the position of the exposure of Knight Formation to define the location of the Tartwaup Fault. Drilling in the Allen's Quarry area has revealed marked variations in the level of the top of the Knight Formation, suggesting an undulating erosion surface onto which the Gambier Limestone was deposited. Floegel (1972) also commented on this feature.

An adjunct of groundwater investigations was to further examine the reason for the Knight Formation exposure.

The exposed unconformity at the base of the Gambier Limestone has a noticeable slope, measured accurately by survey. Figure 2 shows the locations of Knight Formation exposures, boreholes, and the reduced levels of the unconformity at the base of the Gambier Limestone.

Although there is a difference of up to 36 m between levels of the unconformity in the quarry and the adjacent boreholes, gradients between levelled points are not greater than those measured from obviously sloping sections.

The direct consequence is that this exposure of Knight Formation may be entirely due to an undulating erosion surface, offering an alternative, and simpler, explanation than faulting subsequent to deposition.

The Tartwaup Fault may be a reasonable explanation for subsurface structure, but it seems likely that it is not necessary to include it as an explanation for the surface exposure of Knight Formation at Allen's Quarry.

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18th June, 1973
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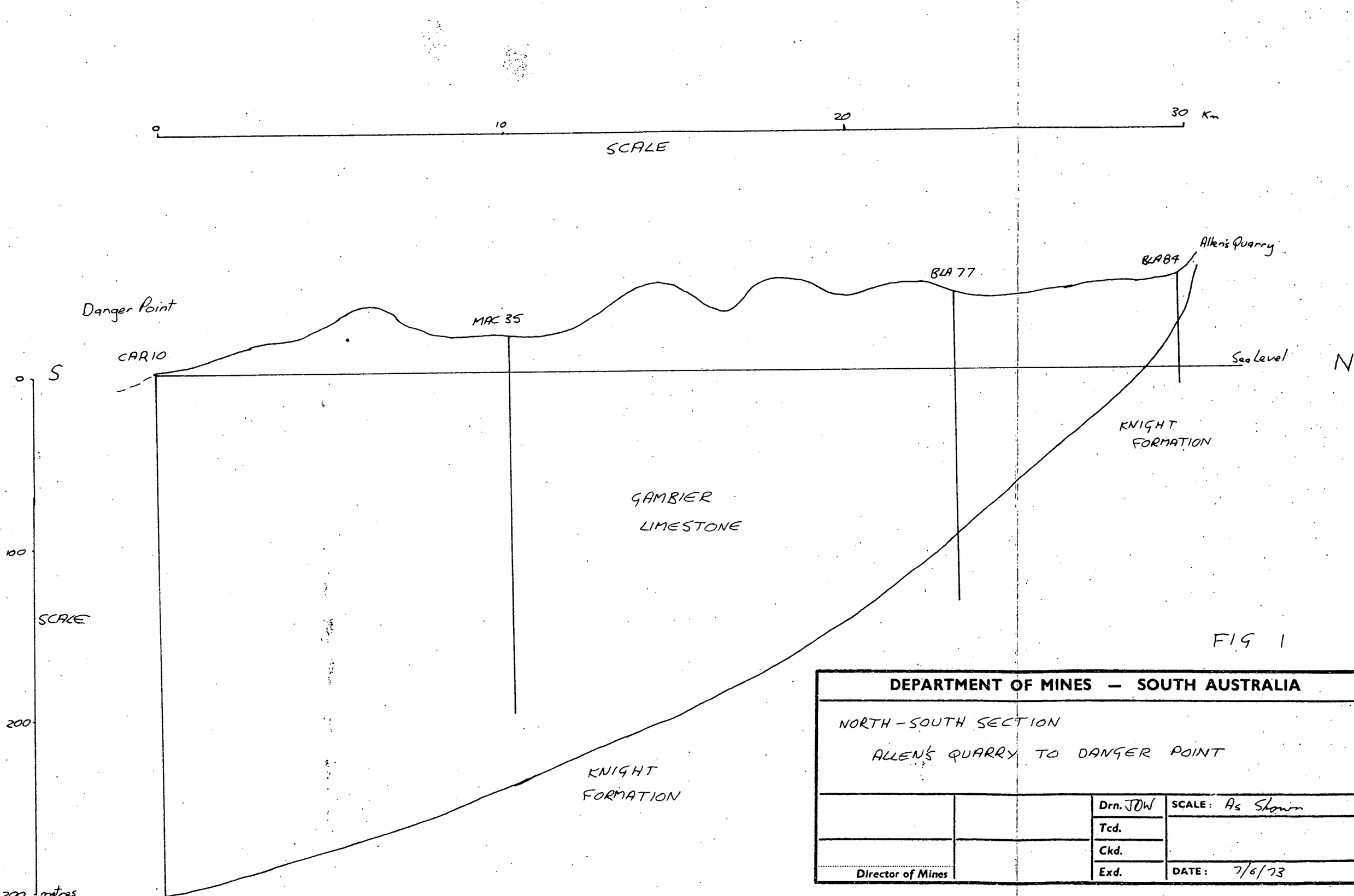

FIG 1

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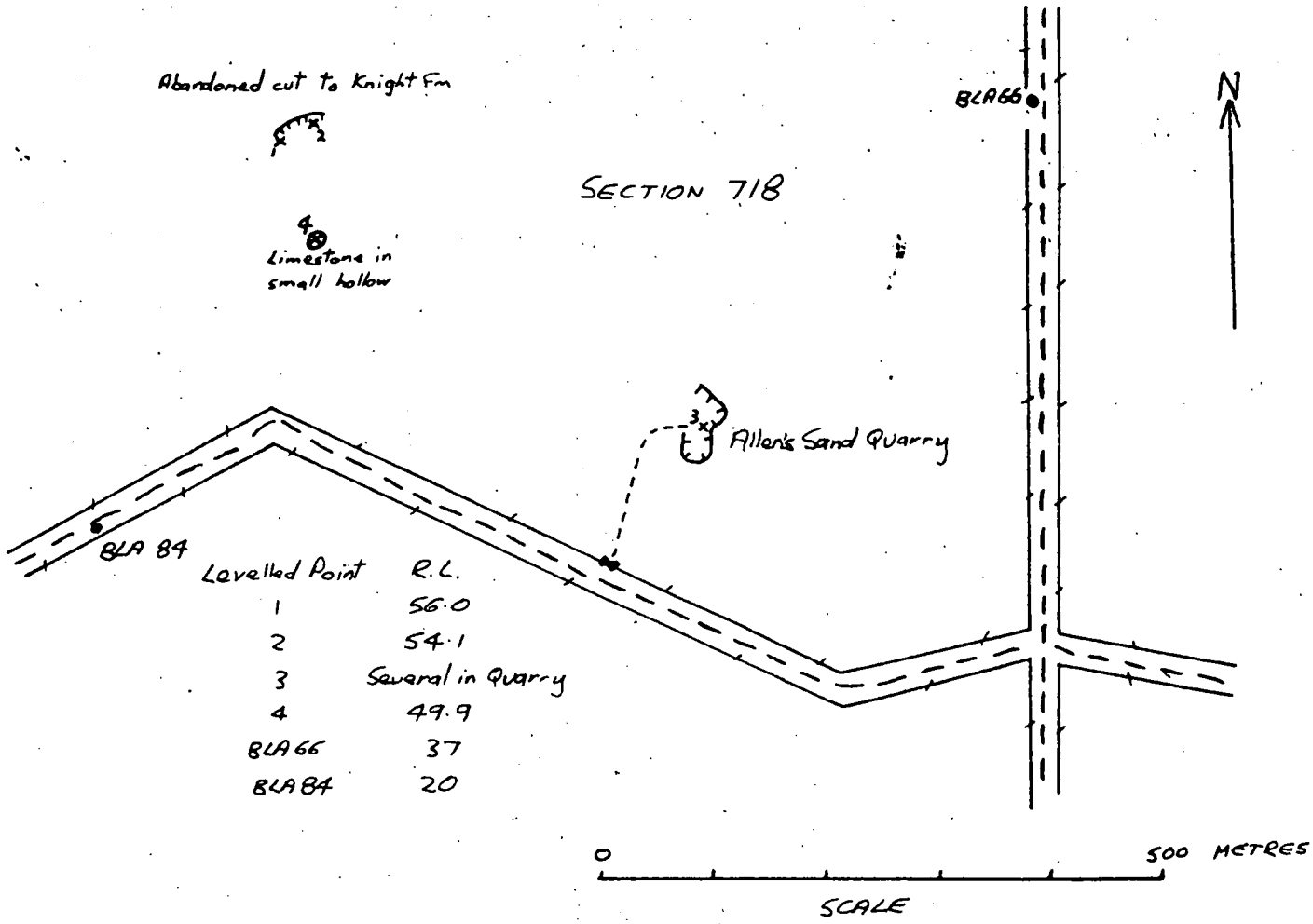
NORTH – SOUTH SECTION

ALLEN'S QUARRY TO DANGER POINT

		Drn. JOW	SCALE: As Shown
		Tcd.	
		Ckd.	
Director of Mines		Exd.	DATE: 7/6/73



LEGEND

Track

Gravel Rd.

Fence

Quarry Face

Levelled Points

'x u/c Base of Gambier Limestone

3 ⊗ Gambier Limestone exposure

BLA66 ● DTM Observation bore with bore number

FIG 2

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ALLEN'S QUARRY AREA - Section 715, Hd BLANCHE			
		Drn. JOW	SCALE: As Shown
		Tcd.	
		Ckd.	
Director of Mines		Exd.	DATE: