

Section 2 — Engineering Geology

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12. PROPOSED DAM SITE AT COLES BAY

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INTRODUCTION

Coles Bay residents depend on tank water and a few soaks for their water supply and with the influx of tourists during summer months these supplies become seriously depleted. The local progress association, through the Glamorgan Council, are investigating the possibility of a reticulated supply. Creeks and streams are very limited and the only stream of any consequence is the Apsley River about 16 miles away. A dam, 15-20 feet high, in a small creek about $\frac{3}{4}$ mile north of the town (see Figure 28) is being investigated by council engineers.

GEOLOGY

Coarse-grained granite with large phenocrysts of feldspar is the only rock type occurring at the dam site and underlies the whole catchment area. At the dam site, granite outcrops on both sides of the creek constrict the valley making an ideal site for a low dam. Strong jointing is developed in the granite and 145 measurements of the orientation of joint planes were measured along a traverse across the creek. These have been plotted on rose diagrams to determine dominant directions. Two plots were made—one which included all joints and the other consisting of the 92 joints which could be traced for more than 4 feet. Two peaks appear in each diagram at strikes of about 310° (mag.) and 60° (mag.). The approximate direction of the dam wall is at about 317° . Most of the strong 310° direction joints occur on the W side of the creek, but the strong 60° direction joints occur generally throughout but are not quite so prominent on the W of the creek. Most of the joints dip at an angle between 70° and 90° with occasional dips as low as 30° .

The granite outcrops rise to a height of about 20 feet above creek level. Outside these outcrops the topography drops slightly to narrow saddles underlain by a grey soil. Upstream from the dam site, the creek runs along the E margin of the storage area with the main potential storage area separated from the creek by a small ridge of granite. A small flat of about 5 acres in area has developed here, where granite debris has accumulated while the creek has been cutting through the largely unweathered granite at the dam site.

5 cm

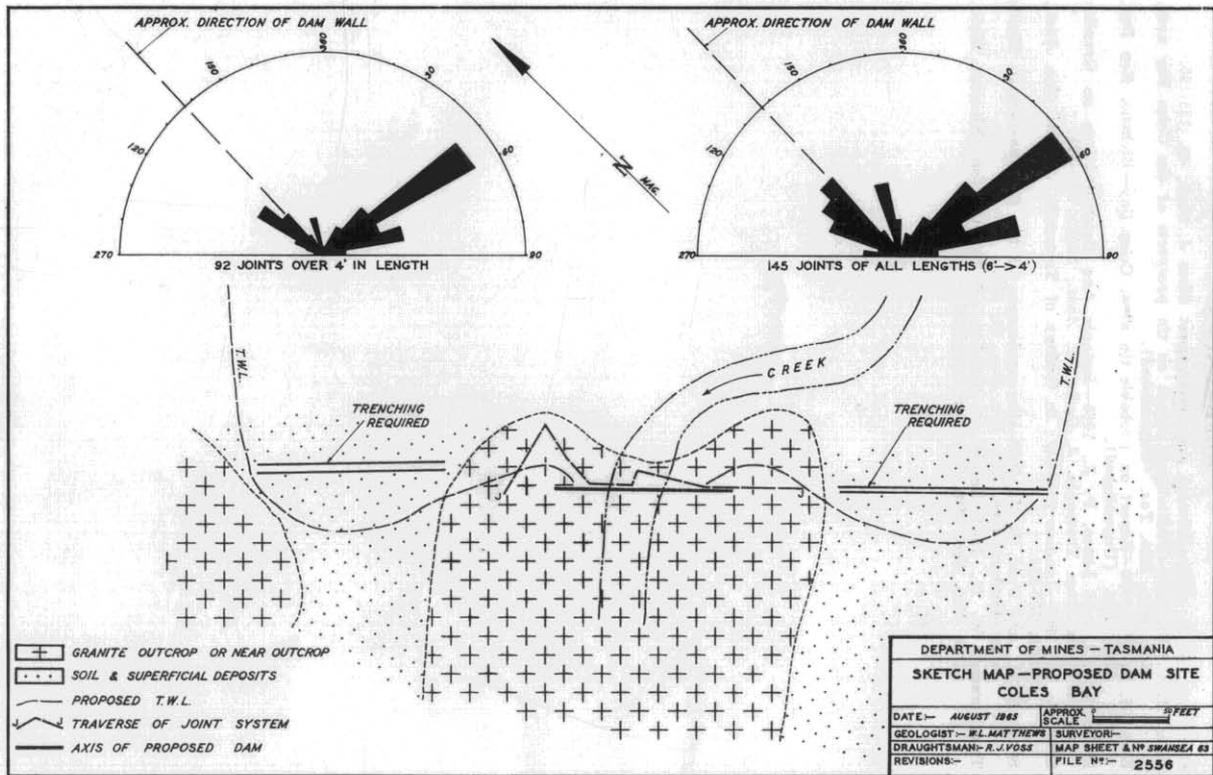


Figure 18.

HYDROLOGY

The jointing developed in the granite is closely spaced with the strongest direction approximately perpendicular to the dam wall. In the joints examined, little weathering has taken place and in general they should not present large seepage problems. However, the two saddles where no outcrop occurs could possibly be a reflection of strong jointing and deeper weathering or small faults which would allow greater seepage. It is recommended that trenching be carried out to expose bedrock in these areas.

Rainfall figures for Coles Bay are limited to the last few years when they were recorded by the park ranger.

	1961	1962	1963	1964	1965
Jan.	3	219	349	20	104
Feb.	106	120	270	870	74
Mar.	161	74	148	121	138
April	271	96	35	219	308
May	237	213	270	142	205
June	143	44	120	432	62
July	384	421	433	203	113
Aug.	135	585	131	84	356
Sept.	78	163	106	179	219
Oct.	53	241	241	212	54
Nov.	164	74	248	120	261
Dec.	195	267	86	607	332
TOTAL	1930	2517	2437	3209	2227

Although rainfall figures over such a limited period have a restricted value, it can be seen that the rainfall is distributed rather erratically throughout the year and that the probable average is around the mid twenties.

The catchment area, measured from the air photos, is about 475 acres. Assuming an annual average of about 25 inches, rainfall on this area would amount to about 2.7×10^8 gallons. In most publications on dispersal of rainfall about 20% is allowed to direct run off, which reduces this figure to 5.4×10^7 gallons. This is the quantity of water which would theoretically arrive at the dam site. This figure is for an average year but if a drought were to occur the rainfall could drop to half this figure or even less. Thus, for a dry year, run off may be of the order of 2.7×10^7 gallons (12½ inch rainfall). All of this water would not be available for reticulation because seepage from the dam and evaporation have not been taken into account.

RECOMMENDATION

It is recommended that trenching be carried out adjacent to the granite outcrops along the creek at the damsite, to expose bedrock.