

TR13-98-100

14. REPORT ON THE GEOLOGICAL EXAMINATION OF THE No. 1 DAM SITE (GOAT HILL) ON THE CLYDE RIVER

by W. R. Moore

INTRODUCTION

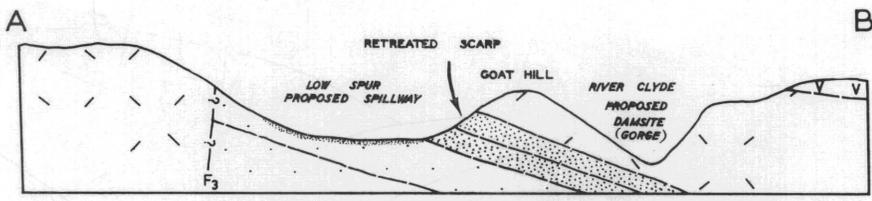
The Clyde Water Trust requested, through the Rivers and Water Supply Commission that the dam site be examined to outline the general geology and to recommend work which would determine its suitability.

TOPOGRAPHY

A narrow gorge, cut in dolerite by the Clyde River, separates Goat Hill from the high ENE scarp which forms the SE side of the Clyde River Valley (fig. 28). A rock fill dam could easily be built across the entrance to this gorge from material on the site. There is a low spur which forms a natural spillway between the N side of Goat Hill and the NW side (F.) of Clyde Valley. Immediately upstream from the gorge there is an alluvial basin, named Officer Bottoms Flats which would provide a good reservoir area. Hence, topographically, the site is suitable.

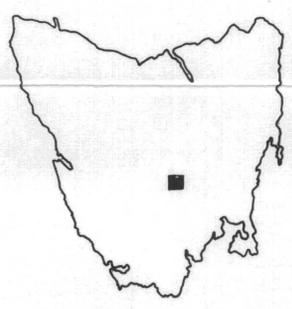
GEOLOGY

Geologically the site is less attractive, mainly because of the contact between the dolerite and the underlying Triassic sediments. Cooling of the dolerite and baking of the Triassic sediments at this contact has formed a zone of close jointing. At the surface many of the joints are open and if this persists beneath the surface there is an excellent short leakage path beneath the dam and Goat Hill (fig. 28).

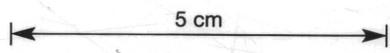


DIAGRAMMATIC CROSS-SECTION

- QUATERNARY *River sands and gravels*
Alluvial deposits
- TRIASSIC *Sediments*
Exposures
- JURASSIC *Dolerite*
Exposures
- TERTIARY *Basalt*
- Talus - mainly dolerite boulders*
- Recent slump*
- Clay formed from metasomatism*
- Geological boundaries*
- Approximate geological boundaries*
- Bedding dip and strike*
- Joints*
- Current direction*
- Faults*
- Auger holes*
- Proposed damsite centre line*
- Cliff face*



LOCALITY MAP



DEPARTMENT OF MINES - TASMANIA	
PROPOSED DAMSITE GOAT HILL CLYDE RIVER	
DATE SEPTEMBER 1968	APPROX. SCALE OF CHAINS 0 5 10
GEOLOGIST W. MOORE	
DRAUGHTSMAN TR. BELLIS	MAP SHEET & N° OUSE 67
REVISIONS	FILE N° 3180

The SE side of the Clyde Valley including Goat Hill is a dissected scarp of a fault bounded block which has been tilted to the SE. This scarp is composed of Triassic sandstone and mudstone of unknown thickness overlain by a dolerite sill with a maximum thickness of 500 feet capped by basalt up to 200 feet thick. The contact between the dolerite and the Triassic sediments is exposed 20 yards upstream from the dam site which dips 8 degrees to the SE and is concordant with the bedding in the Triassic sediments at this locality. Because of the large amount of dolerite and basalt talus the contact is not exposed E of Goat Hill along the scarp but its trace can be followed readily from the continuous line of outcrops of dolerite 30-50 feet high. This contact between the dolerite and Triassic Sediments can be traced around Goat Hill to where it recrosses the Clyde River 200 yards downstream from the dam site.

On the NW side of the Clyde Valley exposures are few and widely separated and the relation of the dolerite to the Triassic sediments is not clear but a fault (F_3) is inferred.

South of the intersection of F_1 and F_2 the Triassic sandstone beneath the dolerite appears to have a low dip to the SE.

From the W flanks of the low spur along F_2 the height of the dolerite-Triassic contact appears irregular. This is probably due to movement along three NW-SE faults (F_1 , F_2 , F_4). From the few outcrops present in this region the contact along F_1 appears to be steep or vertical. A vertical contact is exposed between the dolerite and the Triassic mudstone at the N end of Officer Bottom's flats on the W bank of the Clyde River. This contact is not related to F_1 but is the W end of a large E-W fault, F_2 , that runs along the foot of a high S dipping scarp which forms the S side of Katrine Vale.

In the auger holes drilled between F_2 and Goat Hill Triassic mudstone was encountered in Hole No. 1 at a depth of 6 feet and possibly in Hole No. 2 at a similar depth. In this hole the clays derived from dolerite and Triassic sandstone were difficult to identify and only at the maximum depth of the auger were two small fragments of Triassic mudstone collected. Auger Hole No. 3 only penetrated to 5 feet in dolerite derived clays and dolerite boulders but it is possible that these clays are derived from soil creep from the valley-side rather than from dolerite in situ. From this shallow drilling it appears that soft Triassic mudstones compose most of the low spur which was easily eroded by the wind. Mudstone underlies the 30 feet thick band of quartz and feldspathic sandstone that forms discontinuous outcrops around the N flank of Boat Hill. This mudstone would be likely to be easily eroded if used as a dam spillway without some form of protection. Also as a NE-SW faulted contact (F_2) between the Triassic mudstone and the dolerite along the NW side of the valley has not been disproved by this investigation is must be considered a potential leakage path requiring further investigation.

CONSTRUCTION MATERIALS

Abundant supplies of dolerite for a rock fill dam are available at the site. Dolerite clay of an unknown thickness is present along the NW side of the Clyde Valley. Also, a fine white clay 20 to 30 feet thick is present at two localities along the basalt-

dolerite contact (fig. 28). This clay is formed from the metasomatism of the dolerite and basalt where two lakes or lagoons were present when the basalt flowed across the old dolerite surface.

RECOMMENDATIONS

Drilling accompanied by water pump testing will be necessary along the Triassic sediment—dolerite contact at the dam site to establish if this zone of close jointing persists at depth. It is possible that the open joints seen in outcrop are only surface weathering features. Where exposed the contact consists of 100 feet of closely jointed dolerite 6 feet bedded and baked Triassic sandstone, 30 feet of closely jointed dolerite, 8 feet of bedded quartz feldspathic sandstone and 8 feet of mudstone with thin carbonaceous bands. The leakage path is thought to be confined between the 3 to 4 feet layer at the bottom of the dolerite sill and the top of the mudstone. Further investigation and drilling will be necessary on the contact on NW side of the valley (F₃).