

TR6. 59-61

PROPOSED DAM SITE, WHITEWATER CREEK, KINGSTON

by W. N. MacLeod.

A geological examination of the proposed dam site at Whitewater Creek in the Municipality of Kingborough was made on June 20th, 1961 at the request of the City Engineer, Hobart. The reservoir site is in the valley of Whitewater Creek, about a mile to the west of Kingston township and about one quarter of a mile north of the Channel Highway. It is intended to supplement the natural catchment by gravity intake from Dunns Creek and Browns River.

GEOLOGY OF THE DAM SITE

The proposed reservoir area is underlain by flat-lying sedimentary rocks of Triassic and Permian age. Tertiary basalt occupies the higher ground both north and south of the reservoir. Exposure throughout the area is poor, except in the vicinity of the embankment site where the creek has cut a shallow gorge in massive sandstones.

The sedimentary rocks are traversed by two northerly trending faults which downthrow on the eastern side. The cumulative downthrow of these faults is probably of the order of 800 feet. The Ross sandstone, of lower Triassic age, is consequently dropped to a lower level than the Permian mudstone of the Woodbridge Group which outcrops along Whitewater Creek in the western extremity of the reservoir area. (See figure 15.) The presence and position of the two faults have been deduced from stratigraphical relationships; nowhere are the fault planes actually exposed. The westernmost fault has a downthrow of the order of 600 feet as can be inferred by the occurrence of basal Triassic conglomerate less than 100 feet above Woodbridge mudstone in the creek bed on the western side of the area. Downfaulting has eliminated the greater part of the Ferntree mudstone, which is known to be about 650 feet thick, from the section.

The amount of throw of the easternmost fault cannot be estimated. Massive sandstone of the Ross Formation is brought into contact with mudstone of the Ferntree Group and the entire central and eastern sections of the reservoir site are underlain by Ross Sandstone of unknown thickness. Ferntree mudstone can be presumed to continue eastwards beneath the Ross Sandstone at least as far as the Channel Highway.

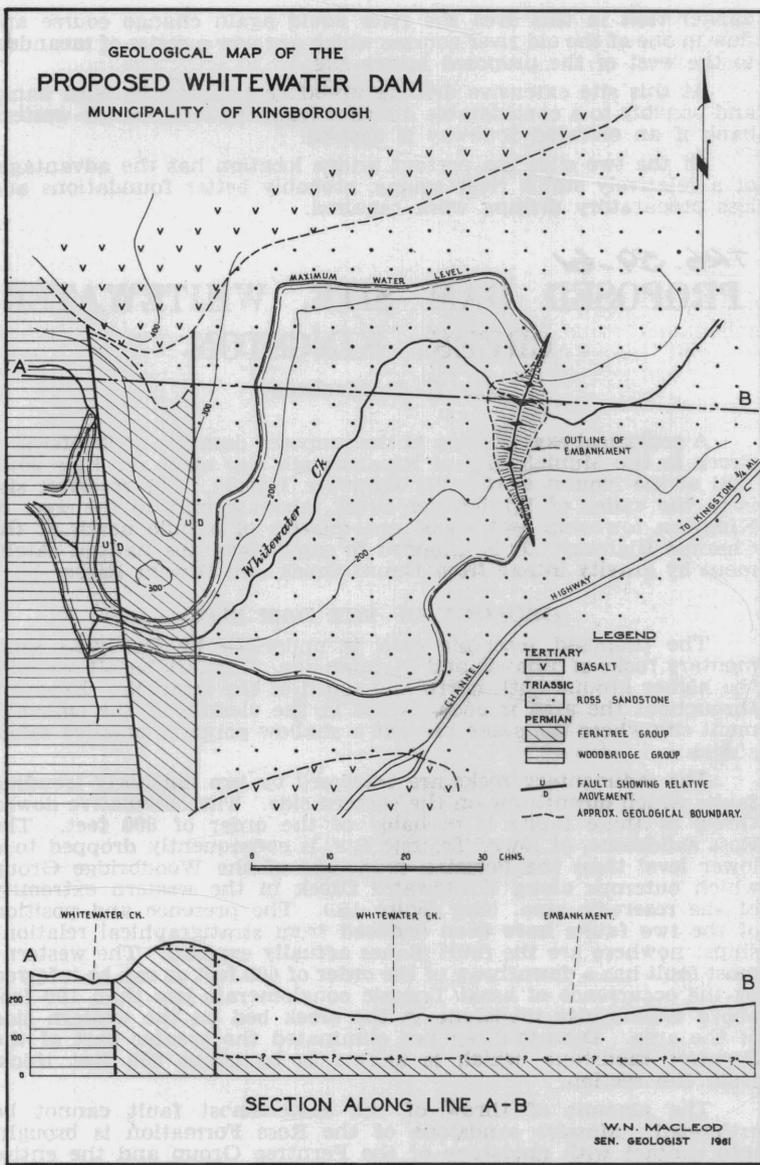
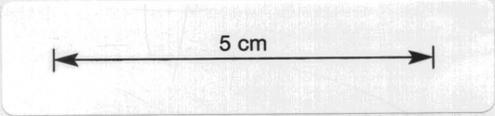


FIGURE 15.



HYDROLOGY

The western fault occurs between mudstone and siltstone of the Ferntree and Woodbridge Groups, and there is every likelihood that this fault zone is sealed with relatively impermeable clay pug. The eastern fault zone lies between Ferntree mudstone and the highly permeable Ross Sandstone, and would almost certainly provide a plane of leakage. It is perhaps significant that there was no surface flow in the creek bed east of this fault at the time of examination despite the fact that deep pools occurred further upstream in the Permian rocks, and that heavy rain had fallen on the preceding three days.

The Ross Sandstone, which underlies the greater part of the reservoir area, is a good aquifer and its presence would favour abundant downward and lateral seepage from the reservoir. In the embankment zone, the massive, porous sandstone dips gently to the east and this attitude would tend to accelerate seepage below and around the embankment.

The higher ground to the north is covered with clayey soil of basaltic derivation which should present no serious siltation problems.

CONCLUSION

The geological examination suggests that the construction of a reservoir in this area will be attended by a certain degree of risk. Leakage will certainly occur along the easternmost fault plane at the upper end of the reservoir, and the highly porous sandstone underlying the floor of the reservoir and in the embankment area is prone to downward and lateral seepage. It is felt that consideration should be given to alternative sites before a final decision as to the construction of a reservoir in this area be reached.