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33. Dam site, Mountain River

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A region in the middle reaches of the Mountain River, near Grove, has been examined as part of a preliminary study for a dam site. At this stage no definite sites have been selected by the Rivers and Water Supply Commission, at whose request this study was undertaken, although investigations have been restricted to a quarter of a mile stretch of the river. Two sites have been indicated which provide the best valley crossings with good abutments on the eastern bank (fig. 29). A dam of about 30 m in height has been assumed in the following discussion.

GEOLOGY

Three rock types are present in the immediate area under consideration. The bedrock is a variably bedded quartz sandstone, of the Cygnet Coal Measures, which contains much graphite and mica on the bedding surfaces. Small coal seams and carbonaceous fragments are present and the whole material is partially weathered, with the result that the rock is friable and soft. The sandstone dips SSW at 1-4°. There is a possibility of a small fault in the niche between the two sites suggested and a further fault appears probable immediately south of the lower site, as indicated by dip changes. Jointing is relatively sparse and irregular.

A coarse boulder bed overlies the sandstone in the valley flat. The river has gouged a 2 m cut in this material and runs for much of its length on or near bedrock. The total thickness of gravels, boulders and river sands and alluvium is about 3 m near the upper site and less downstream. Most boulders are of dolerite although fragments of Permian mudstone and Triassic sandstone do occur. Many boulders are 30-60 cm across.

With a 30 m dam it is likely that the eastern abutment will in each case terminate near or on a dolerite boundary. The exact form of this boundary is unknown, but is probably discordant and is a true contact as metamorphism and chilling has occurred.

Permian Ferntree Mudstone underlies the storage area. There are at least two sizeable faults in this region, both containing dolerite dykes. The mudstone dips south-west at 4-12°. There is a possibility of further faulting here although no positive evidence has been found.

ENGINEERING CONSIDERATIONS

Quarry Sites

Either dolerite or Ferntree Mudstone could be employed if a rock-fill dam is envisaged. However, it is doubtful if the dolerite adjacent to the eastern end of the dams would be suitable since this body of material is much jointed: blocks 30 cm across were the largest seen. Mudstone may be found in much larger blocks.

Suitable quarry sites for the mudstone may be found in the flooded area, whereas the nearest possible quarry of quality in the dolerite would be in the hills 1.5 km to the east at a distance of 3 km by road.

Spillway

A spillway would only be possible on the eastern bank of the river. However, examination of the topography in this region above a dam of the

assumed height shows that a long spillway would be necessary. The entire route is in finely jointed dolerite.

RECOMMENDATIONS

Boreholes

Due to the uniformity of the foundation materials in the region of the dam sites no great spread of holes is required. In either of the suggested sites a line of 6 or 7 holes along the centre-line with one 15 m on either side of the centre-line in the centre of the valley, should provide all the information necessary for design purposes. All holes should be to a depth of 25 m.

Geophysical Work

No geophysical work is recommended as the site is reasonably well exposed, structurally uniform with lithologies which do not lend themselves to geophysical examination.

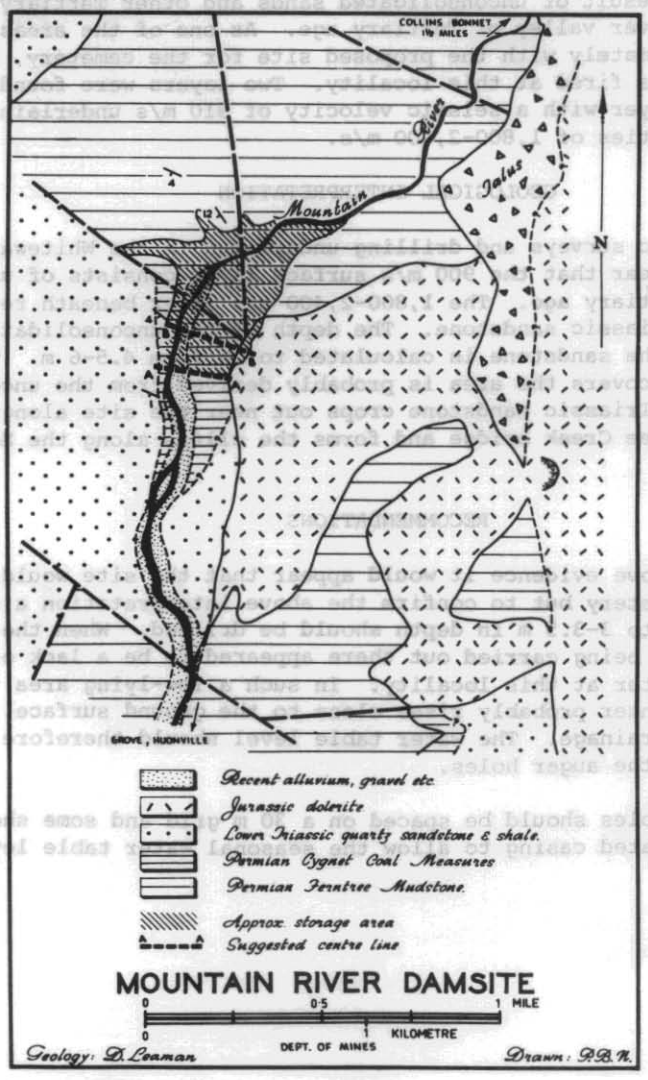

Figure 29.

5 cm