

1979/35. Geological investigation of concrete reservoir sites,
Bridgenorth Road, Legana.

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Abstract

The site of two concrete reservoirs has been excavated by the Rivers and Water Supply Commission. Blasting was required for Tank 1 but was not necessary for much of Tank 2. Investigation has shown that the site is underlain by dolerite and its weathering products. The easier excavation for most of Tank 2 was due to the presence of many sheared zones composed mainly of extremely weathered dolerite. In its undisturbed state, this material will provide adequate foundations for the concrete reservoirs.

INTRODUCTION

At the request of the Rivers and Water Supply Commission, geologists A.T. Moon and R.C. Donaldson visited Legana on 25 July 1979 to assess foundation conditions at the site of two concrete reservoirs (fig. 1). Excavation for Tank 1 involved extensive blasting, but softer conditions were encountered at the site of Tank 2 and concern was expressed about foundation settlement and stability.

The investigation concentrated on the site of Tank 2 and involved trenching with a backhoe and geological mapping. This report describes the results of the investigation.

RESULTS OF INVESTIGATIONS

The site is located near the top of a hill about one kilometre southwest of Legana [EQ030195]. According to the published geological map (Longman *et al.*, 1964), the hill is underlain by dolerite of Jurassic age. Scattered outcrops and boulders of weathered dolerite occur close to the site.

At the time of the investigation, after recent rain, the excavated site was wet with numerous pools of water. The surface soil (remoulded) consisted of high plasticity sandy clay and clayey sand.

The results of the geological mapping and subsurface investigation are presented in Figure 1. Detailed descriptions of the materials are given in Table 1.

Table 1. DESCRIPTION OF MATERIALS

<i>Material</i>	<i>Description</i>
Extremely weathered dolerite (soil)	<i>Undisturbed</i> dry, hard, very dense, impermeable, appears like rock (medium-grained igneous texture) <i>Remoulded</i> (CH) sandy clay, high plasticity, yellow-brown sand fine to coarse (weathered mineral fragments), moist stiff, with some (SC) clayey sand, fine- to coarse-grained, yellow-brown, low plasticity, medium dilatancy.
Highly weathered dolerite (rock)	Medium-grained igneous texture, mottled yellow-brown and pale grey, very low to high strength.

Table 1. (continued)

Material	Description
Fresh or slightly weathered dolerite (rock)	Medium-grained igneous texture, dark grey, extremely high strength.

DISCUSSION

The investigation has confirmed that the site is underlain by dolerite and its weathering products. Geological mapping of the cut face around the eastern edge of the site of Tank 1 has shown the presence of a zone (Zone A) containing many sheared zones (geological faults). The dolerite in this zone is more weathered than elsewhere. The trenches show that the ease of excavation of this part of the site was due to the presence of extremely weathered dolerite. Undisturbed, this material is a dry, hard, very dense soil, but remoulded with water it becomes a high plasticity sandy clay. Most of the surface soil on the site at the time of the investigation represents extremely weathered dolerite soil reworked and remoulded during excavation and levelling.

CONCLUSION

The foundations of Tank 2 will be located on fresh dolerite or its weathering products. The extreme product of weathering is a soil (extremely weathered dolerite) but this material in its undisturbed state will provide no settlement or bearing capacity problems for the structure proposed. The geological plan on Figure 1 allows prediction of the varying foundation conditions for different parts of the tank. The foundations within Zone A will be largely on extremely weathered dolerite. Outside Zone A, the foundation will be mainly on fresh dolerite and any excavation will require blasting or pneumatic drills.

REFERENCE

LONGMAN, M.J.; MATTHEWS, W.L.; ROWE, S.M. 1964. One mile geological map series. K/55-7-39. Launceston. *Department of Mines, Tasmania.*

[8 August 1979]

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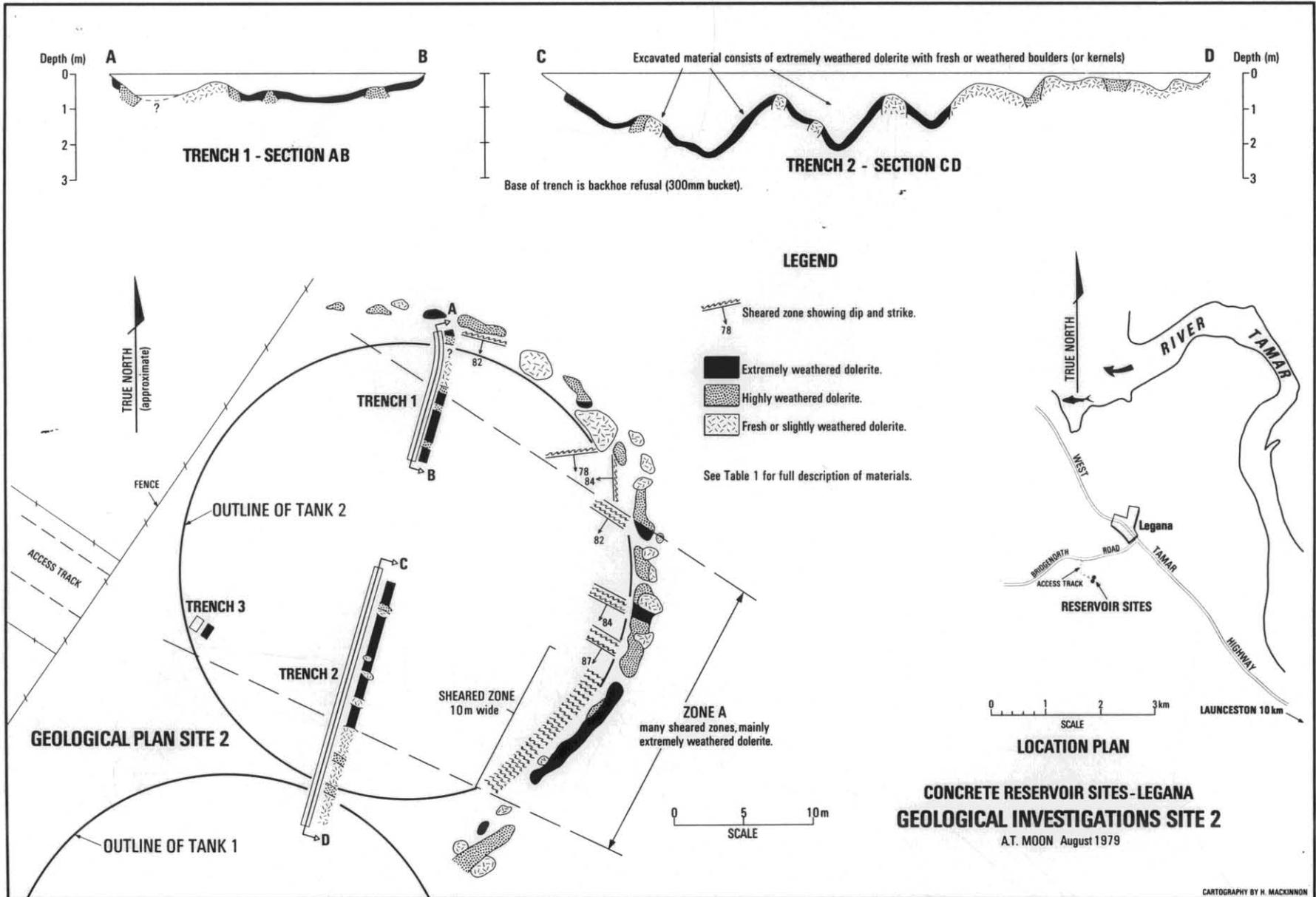
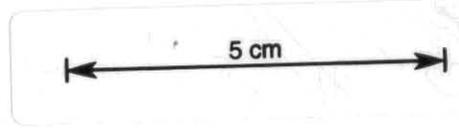


Figure 1.



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