

1977/29. Investigation of land proposed for subdivision, Leith-Forth landslip area.

R.C. Donaldson

Messrs R.C. and P.W. Scott, Ulverstone, requested that the Department of Mines inspect and report on the stability of approximately 1.2 ha (3 acres) of land [DQ373426] below Braddons Lookout Road, Leith (fig. 1). It is proposed to subdivide the land into 0.4 ha (1 acre) lots.

The request followed advice from the Devonport Council that the land is currently classified as an 'A' landslip zone and any proposed residential development requires the approval of the Department of Mines.

PHYSIOGRAPHY

Much of the hillslopes that lie east of the Forth River between the townships of Leith and Forth has been subject to extensive mass movement in the past. The age, type, and scale of movement varies from old, large scale rotational slumps to more recent, active shallow translatory earth flows, generally of a smaller nature. The land under investigation is situated immediately below a prominent head scarp of an old rotational slip, and exhibits typical landslip characteristics - disturbed hummocky ground, localised depressions, and back sloping benches that are frequently associated with multiple slumping.

GEOLOGY

Six test pits were excavated by back-hoe to approximately 2 m in depth. These revealed a deep, red/brown soil profile overlying very weathered scoriaceous basalt (Appendix 1).

The thickness of soil was found to be greatest in the heel region of the slip (test pits 1, 2, 3). This is to be expected and is the result of continual soil accumulation from the erosion of the steep head scarp immediately upslope.

The soils are typically dark red-brown clay loams grading downward to a granular clay. These clay soils are very friable over a wide moisture range and drain freely into the underlying decomposing scoriaceous basalt. The remarkably dry and friable nature of the clays, and the absence of water lying in the bottom of the pits despite recent heavy rains indicates the permeable nature of the near-surface materials.

DISCUSSION OF LAND STABILITY

In 1974, the area between Leith and Forth was provisionally zoned with respect to land stability. The land was divided into areas of active or dormant movement (charted A landslip zone), areas of potential movement (charted B landslip zone), and stable areas. The land under discussion was provisionally charted as an 'A' landslip zone.

Over the ensuing years additional investigational work has been carried out in this region and in similar areas along the north-west coast where slumping is prevalent. As a result of this work, minor changes to the Leith-Forth land stability zone map (1974) have become possible.

Although the land lies within an area showing a past history of instability, the blocks are considered to be satisfactory for development provided adequate precautions are taken. This decision is based on the

favourable overall slope (max. 9°) and the soil/rock profile giving rise to the free movement of water through the subsurface.

Proposed dwellings should be sited with the approval of both Council and the Department of Mines. Undue disturbance to the ground by excessive cut or fill should be avoided. Building would not be permitted on the steeper slopes at the front of the benches. Adequate provision for the effective removal of all stormwater, sewage and sullage is necessary to minimise changes in the existing groundwater regime. During periods of heavy rainfall, soil wash erosion from the steep head scarp is likely to deposit surficial material on Block 15 and will be more of a nuisance to a dwelling rather than a geological hazard. The planting of trees or shrubs on this steep scarp will help prevent this soil erosion process.

CONCLUSION

The land under investigation is situated in an area where land instability has been a feature in the past. The three factors of slope, the free movement of water through the soils, and the nature of the soil and underlying rock appear to be favourable for the provisional reclassification of this land from 'A' to 'B'. It is stressed that any proposed development should be in accordance with the building regulations specified for land-slip 'B' zoned land.

APPENDIX 1

Logs of test pits

Test Pit 1

Depth (m)	Description
0-0.3	Dark brown-red friable clay loam.
0.3-2.0	Red-brown clay, friable and with a strong granular structure.

Test Pit 2

0-0.3	Dark brown-red friable clay loam.
0.3-2.1	Red-brown clay, dry and friable.

Test Pit 3

0-0.3	Dark brown-red friable clay loam.
0.3-2.0	Red-brown friable clay.

Test Pit 4

0-0.3	Dark brown-red friable clay loam.
0.3-1.5	Red-brown friable granular clay.
1.5-1.8	Fragments of blue-grey very weathered vesicular basalt dispersed in red-brown clay. Fe-oxide staining evident in the vesicles. Fragments can be broken by hand.

Test Pit 5

0-0.3	Dark brown-red friable clay loam.
0.3-1.4	Red-brown friable granular clay.
1.4-1.7	Fragments of very weathered vesicular basalt in red-brown clay.

Test Pit 6

0-0.3	Dark brown-red friable clay loam.
0.3-1.2	Red-brown friable clay.
1.2-1.8	Very weathered blue-grey vesicular basalt. Fe-oxide staining prominent.

[6 July 1977]

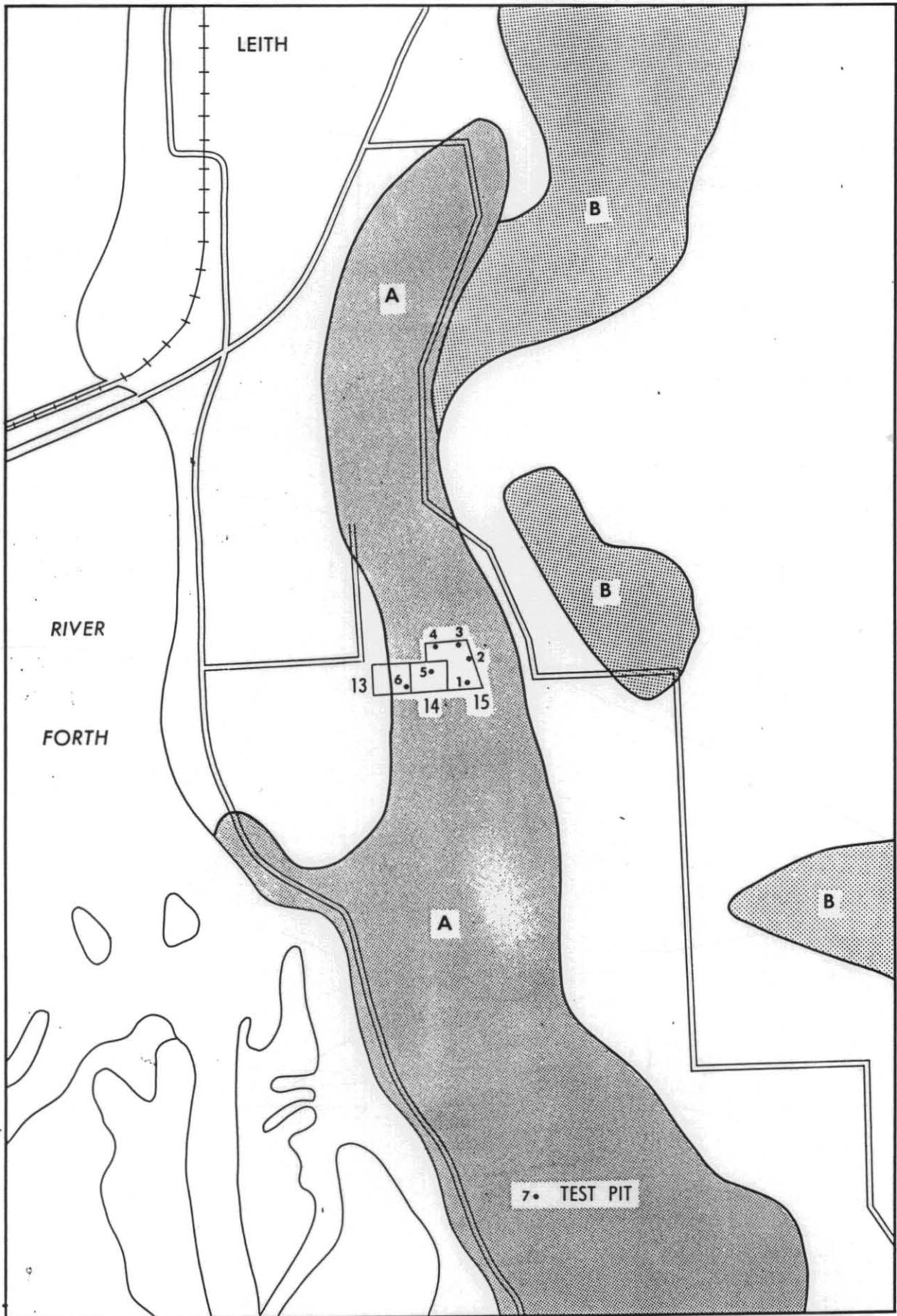


Figure 1. Location of proposed subdivision, Leith.