UR1976_06

1976/6. Inspection of a landslip on D.J. Squibbs' property, Spreyton.

W.L. Matthews

The Australian Housing Corporation and the property owner requested an examination of a house near Spreyton [DQ439369]. The house has been built about 3 years and it was thought that it was affected by a landslip.

RELIEF AND GEOLOGY

The house is situated on the eastern bank of the Kelcey Tier towards the base of the main slope (fig. 1). The land surface rises slightly from orchard land to the house site situated on a narrow flat and then rises steeply behind the house. There are a series of benches around the slope before the summit is reached, about 170 m above the house.

The area has previously been mapped by Burns (1957, 1963). Most of the area is underlain by Permian pebbly mudstone and sandstone while a thin dolerite sill crops out on the top of the Tier. The slopes are largely covered with dolerite boulders, dolerite derived soil and weathered mudstone. Few outcrops of Permian rocks occur and bedding is poorly developed. Burns (1963) indicates that the Permian in the area dips about 10° to the north-east or east.

STABILITY OF THE AREA

Burns (1957, 1963) mapped landslip zones along the eastern flank of Kelcey Tier, the house being situated just within one of these zones. The slip zones are characterised by a series of bulges and narrow flats on the slope. The broader benches could have formed either as a result of large rotational slips as suggested by Burns (1957) or as a result of the different weathering rates of dolerite and the various beds within the Permian sequence.

Most of the slips are old and show no signs of recent movement, but two slips have taken place since the house was built and are affecting the property (fig. 2). One slip has occurred on the steep slope directly behind the house and the other is on the shallower slope in front of the house. It is probable that the flat on which the house is built is an old rotational slip, but there does not appear to be any renewed movement on this slip. The slip to the rear of the house has not affected the building but has bowed the fence just behind it. The heel of the slip in front of the house passes under the building and has caused quite serious cracking to the brickwork in the north-eastern corner. Each of these slips has the appearance of being relatively shallow, the one in front of the house probably being the deeper.

CAUSES OF MOVEMENT

It is probable that the disturbance to the land surface during excavation and building of the house combined with the high rainfalls experienced over the past two years have been major factors in causing the movements. The slip at the rear of the house is on a steep slope and would possibly have occurred naturally, as many new slips have formed in similar locations on the north-west coast as a result of wet winters over the past two years. Some material may have been removed from the toe of this slope thus removing the support for the soil uphill. The house site required some excavation to flatten the area and fill was placed on the shoulder of the slope in front of the house. This has tended to load the top of this slope and has probably altered the drainage situation, the fill probably being more permeable than the natural soil and thus allowing the infiltration of more water underground.

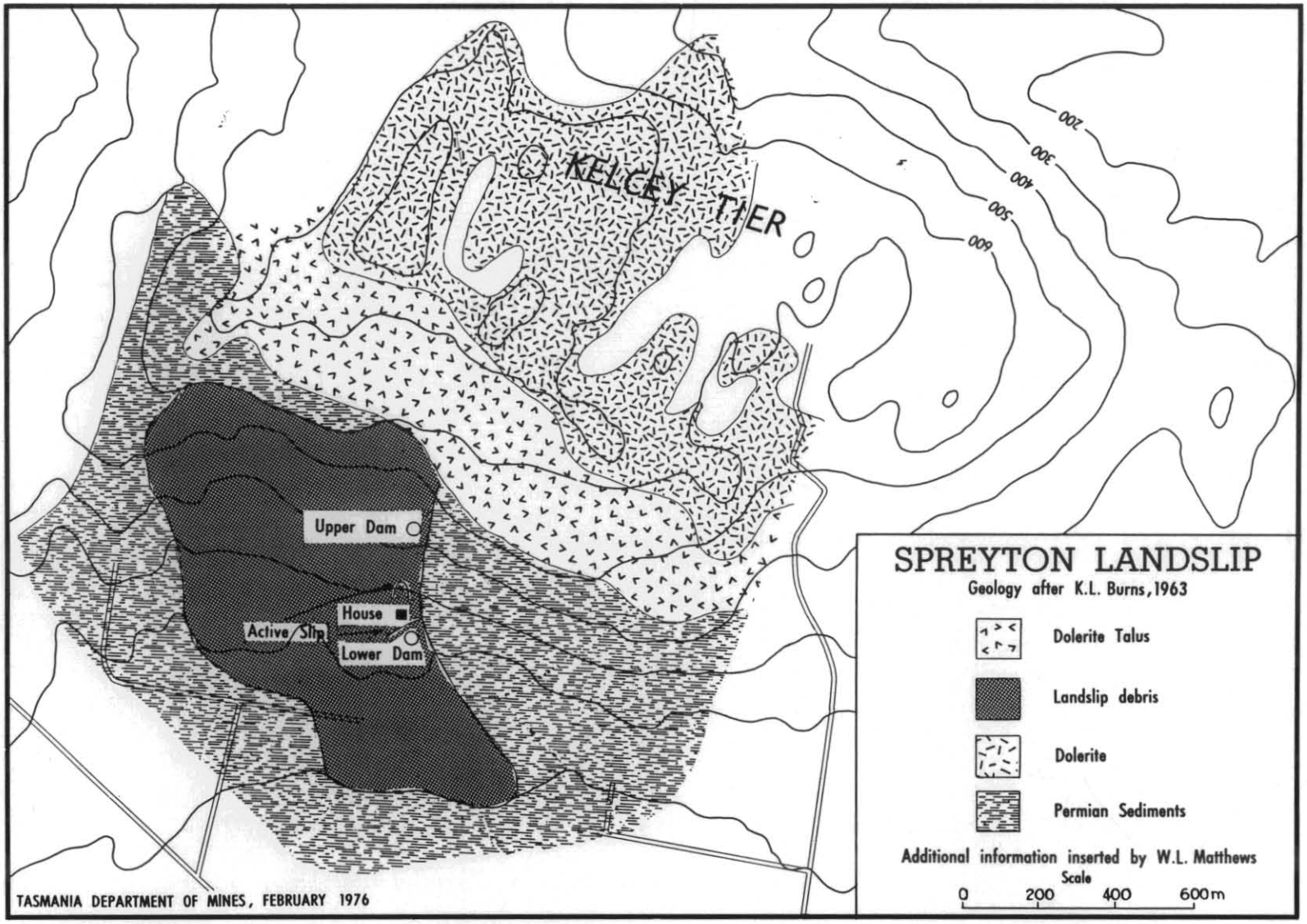
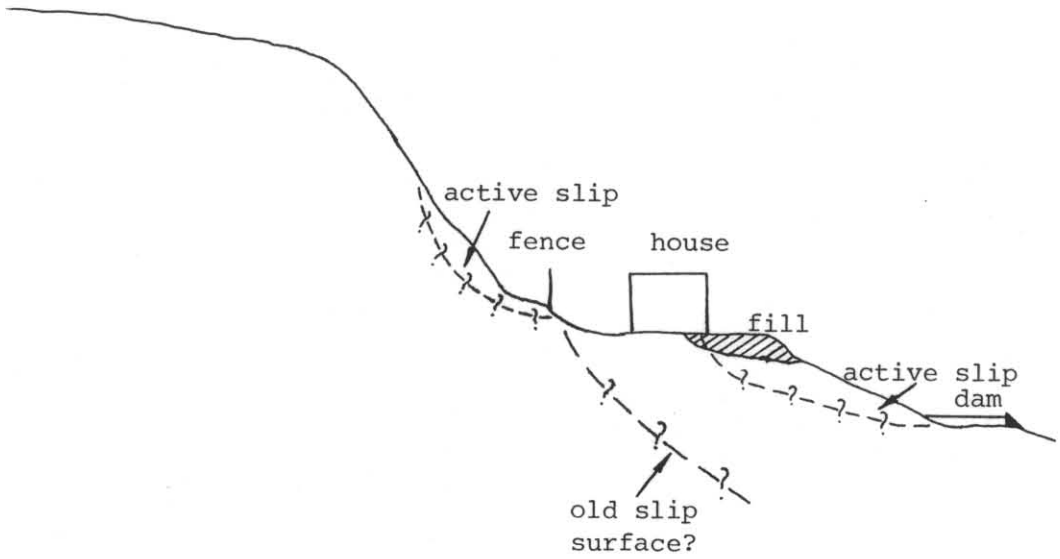

KELCEY TIER
200
300
400
500
600
Upper Dam
House
Active Slip
Lower Dam
SPREYTON LANDSLIP
Geology after K.L. Burns, 1963
Dolerite Talus
Landslip debris
Dolerite
Permian Sediments
Additional information inserted by W.L. Matthews
Scale
0 200 400 600m
TASMANIA DEPARTMENT OF MINES, FEBRUARY 1976
5 cm

Figure 1.



Not to scale

Figure 2. *Sketch section of slip area.*

Two dams are located in the vicinity of the house. One is situated at the toe of the slip in front of the house and has been located there for some 20 years and is not the cause of this slip, although probably aggravating the situation. The other dam is located on the flat above the slip at the rear of the house and has only been built one year. Seepage from this dam is less likely to affect the slipping areas as the valley in which it is built extends north of the house. Some seepage could however, come towards the slip areas.

POSSIBLE AIDS TO STABILISATION

If slipping in the area becomes widespread attempts to stabilise the slope would probably not be justified on economic grounds. Measures which would help to stabilise the area would include the drainage of seepages, flat areas and areas of internal drainage in and around the active slips. This water should be conducted away from the slips to the flat area below, preferably in sealed drains. Surface water from above the slips should be diverted away from the active slip areas. The planting of trees on the slopes behind and in front of the house would have a stabilising influence once they were well established. The lower dam should be drained as it is keeping the toe of the slip wet and the clay in a softened state. It is unknown whether the upper dam has any influence on either of the slips but some seepage from it could reach the slip area.

More extensive (and expensive) treatment could be undertaken for the lower slip. Any further backward movement of this slip would seriously affect the house. The slip is probably not too large to consider piling, the cutting of deep french drains through the slip or the placement of a permeable toe loading material against the lower part of the slip. Subsurface investigations with either an auger drill or back-hoe would aid in determining whether any of these possibilities were feasible. Any measures planned for the slip should be undertaken before the winter.

REFERENCES

BURNS, K.L. 1957. Reservoir sites near Kelcey Tier. *Tech.Rep.Dep.Mines Tasm.* 1:41-49.

BURNS, K.L. 1963. Geological atlas 1 mile series. Zone 7 sheet 29 (8115N). Devonport. *Department of Mines, Tasmania.*

[17 February 1976]