



Division of Mines and Mineral Resources — Report 1990/35

# Land stability assessment of a proposed fibre optic cable between Burnie and Smithton

by R. C. Donaldson

## Introduction

The investigation of the proposed 80 km fibre optic cable route between Burnie and Smithton was carried out over a three-day period. Stage 1 involved the identification of unstable or potentially unstable areas using aerial photo interpretation techniques. Those areas targeted were subsequently traversed by foot to more closely define the extent and severity of the potential problem.

## Geology

The proposed route is underlain by a variety of rock types of different ages and origins. A guide to their occurrence and distribution along route is shown on the route map (fig. 1, 2).

It is not the intention of this report to describe the major rock types in detail, but rather to give a brief summary. More detailed information is given in the published 1:50 000 and 1:63 360 scale geological map sheets and explanatory notes for the Burnie, Table Cape and Smithton quadrangles.

The oldest rocks along route are of Precambrian and Cambrian age. There are several distinct mappable units within this group but the rocks essentially comprise interbedded quartzite/slate and siltstone/mudstone sequences.

The Permian tillite, which underlies the majority of the proposed route between Doctors Rocks and Wynyard, is basically a pebbly mudstone sequence.

There are two distinct rock types of Tertiary age. Tertiary-age sediments, which are not prominent along the route, consist of sand, gravel and lacustrine deposits. Of far more prominence are the Tertiary basalts from which the red and red-brown soils, characteristic of much of the northwest coastal region, are derived.

The youngest sequences encountered are the Quaternary alluvial deposits associated with rivers

and streams and the windblown sand deposits in the Smithton area.

## Land instability

Land instability, or mass movement due to landslides, is very prominent along parts of the northwest coastal region of Tasmania.

The basalt-derived red soils have by far the highest incidence of landslide activity, whether it be the ancient or fossil slides or the present day active features. Unstable areas associated with the Permian age sedimentary rocks do occur along the coast but are less common than in Tertiary basalt.

The proposed route traverses some 43 km of Tertiary basalt country and approximately seven kilometres of Permian sedimentary rocks. The aerial photo interpretation identified that unstable areas appeared to be restricted to areas underlain by basalt only and were essentially confined to the section of the route between Burnie and Sisters Creek.

Despite the relatively large areas of basalt country that have been subjected to landslide activity in the vicinity of the proposed route, only about seven kilometres of the fibre optic cable will actually traverse landslide affected terrain. These areas are shown in more detail on the accompanying detailed map segments (fig. 3-6).

All the unstable areas identified along route are considered to be ancient or fossil landslide features and no actively moving landslide masses were identified. The fossil landslides are thought to have developed many thousands of years ago under climatic conditions different from those experienced today. These features are currently considered to be dormant, although parasitic slumping (small scale, localised, generally shallow movement) can develop, often without warning, on these large-scale fossil landslide complexes under certain conditions.

The major causes for renewed movement generally relate to saturated soil conditions, often associated

with periods of heavy rainfall, and disturbance to the ground in the form of cuts and trenches in critical areas of the landslide mass. Such areas are those locally oversteepened slope segments, especially in the toe region of the landslide, where disturbance and removal of material effectively reduces the resisting forces acting on the slip. The potential for renewed movement is increased if due caution is not exercised in the more sensitive zones of these essentially stable fossil landslide complexes.

Whilst it is our opinion that the potential for landslide activity along the route overall is low and of minimal risk, there is some concern about the stability of the slopes in the vicinity of Busbys Hill to the south of Doctors Rocks (fig. 5). The general route alignment indicated by Telecom shows that the cable will be laid along some relatively steeply sloping land. The area immediately south of the Busbys Hill fossil landslide complex and to the west of *Lewana*, whilst not considered to be an existing landslide area, has the potential for shallow landslide movement to develop. The slopes are moderate, and at the time of the field inspection, were waterlogged. There is also evidence of gully erosion on the slope. These are indicators that the slope is in stress and therefore has the potential to become unstable.

## **Conclusions**

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- Approximately seven kilometres of the fibre optic cable route will traverse landslide affected terrain.

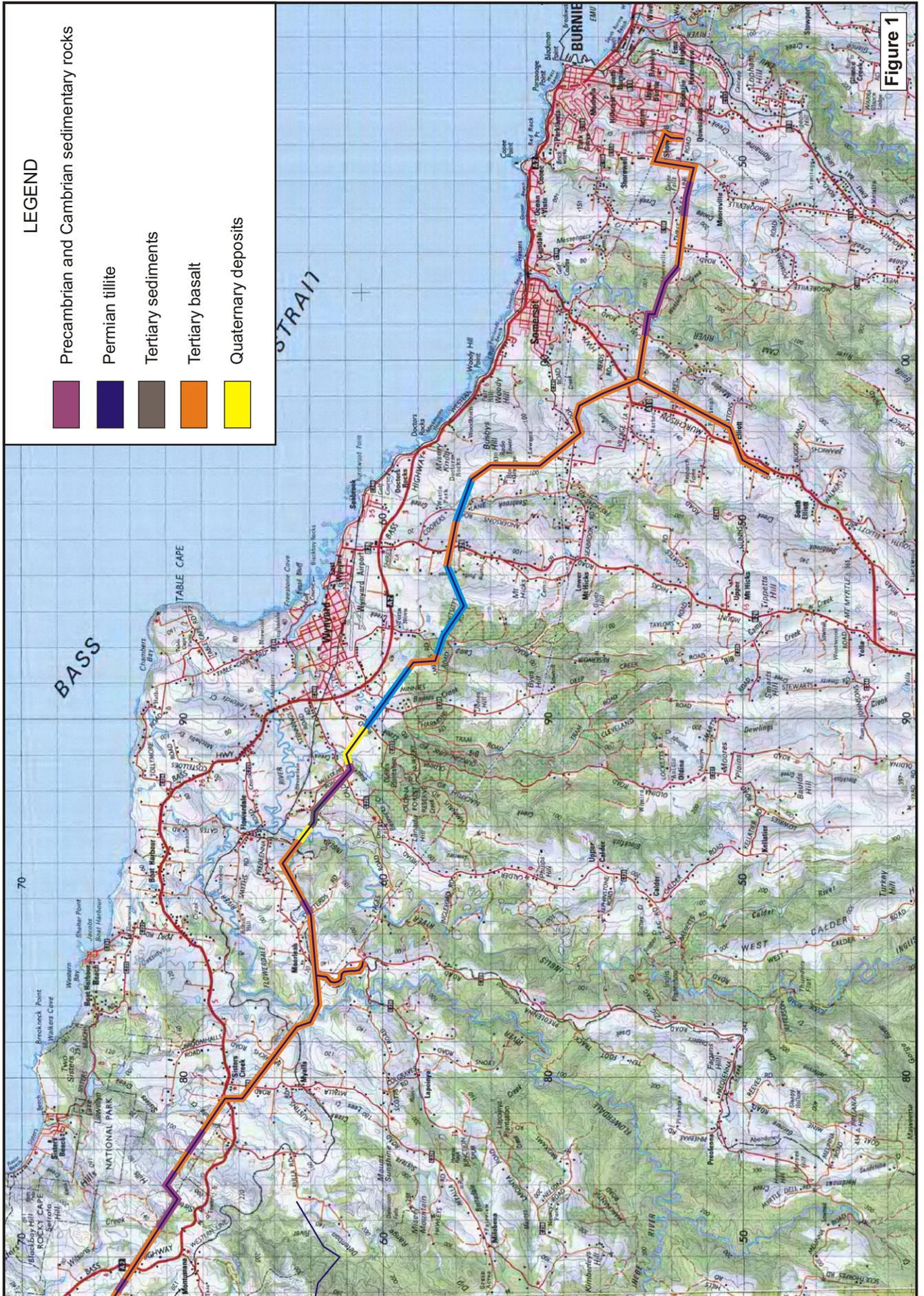
- The section of the route affected is between Burnie and Sisters Creek.
- The unstable areas are ancient or fossil landslide complexes and have developed entirely within the basalt red soil terrain.
- No active landslide masses were noted along the route.
- There is potential for landslide activity in the oversteepened toe regions of the fossil landslide complexes as a result of ground disturbance (such as trenching).
- The slope to the south of Busbys Hill is considered to be under stress and has the potential to become unstable.
- Overall, the potential for unstable land adversely affecting the fibre optic cable is considered to be low.

## **Recommendations**

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The proposed route in the vicinity of Busbys Hill should be pegged in the field. The Department can then re-examine this approximate two kilometre section of the route to ascertain the potential for instability.

[1 August 1990]



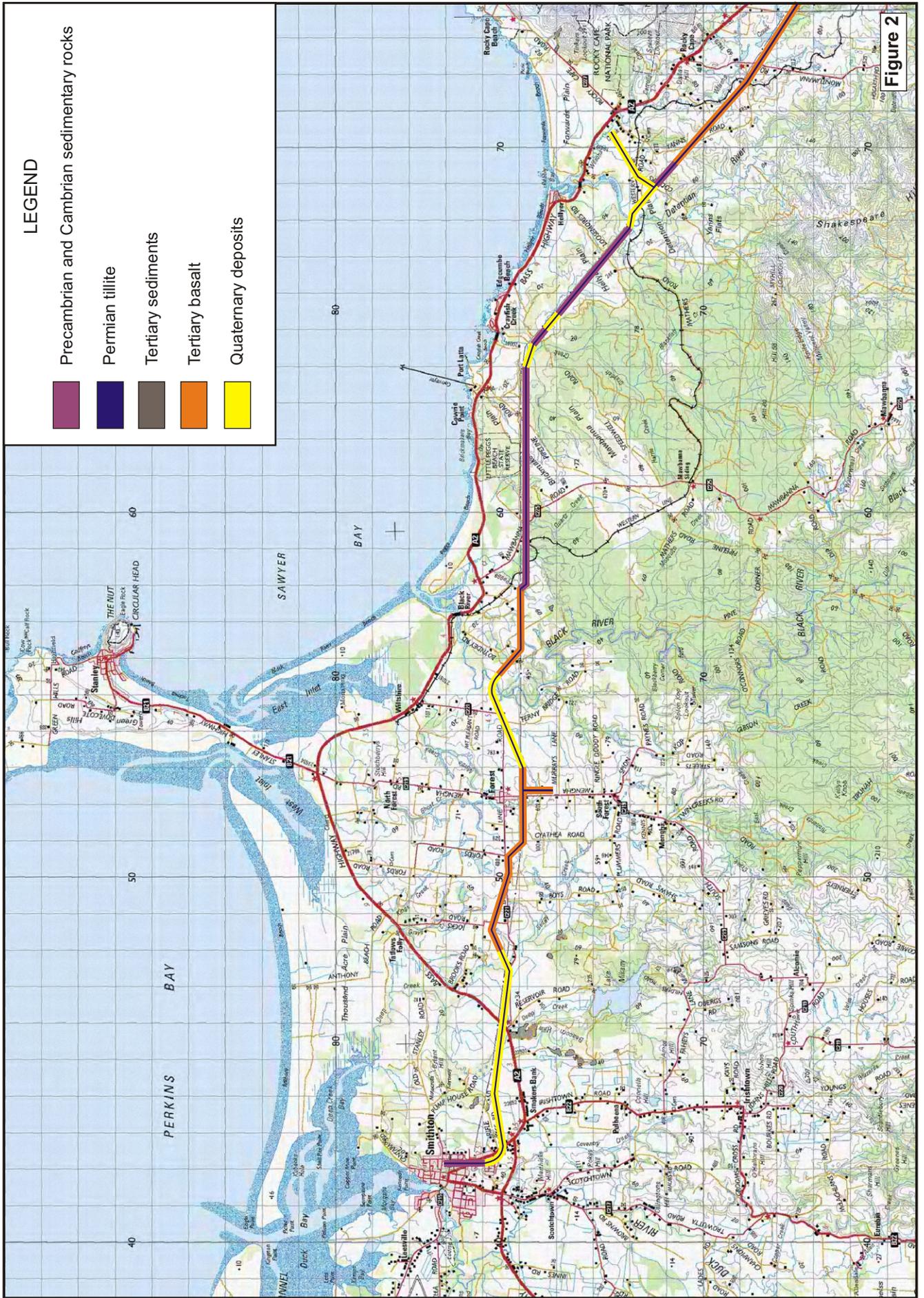
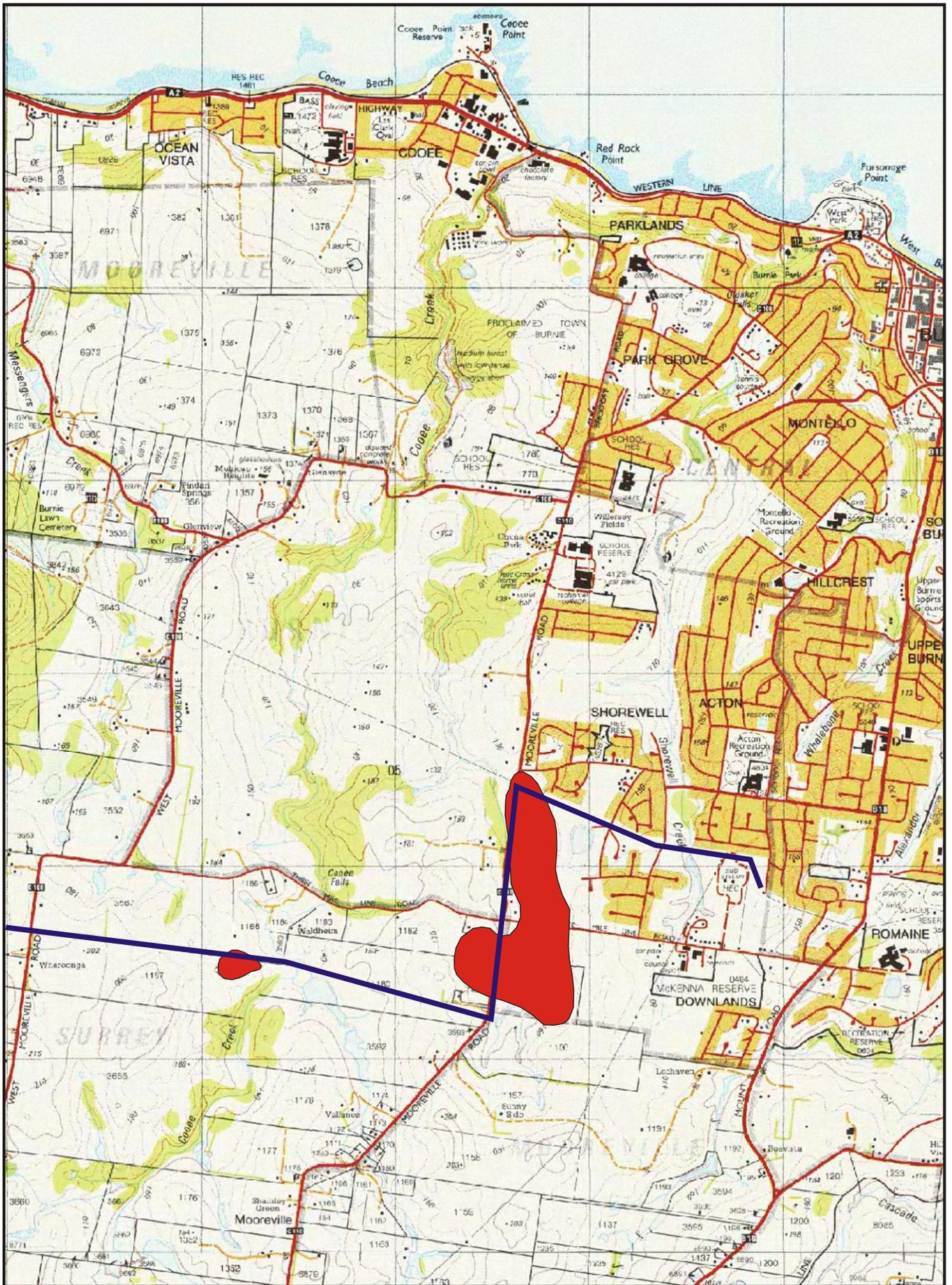
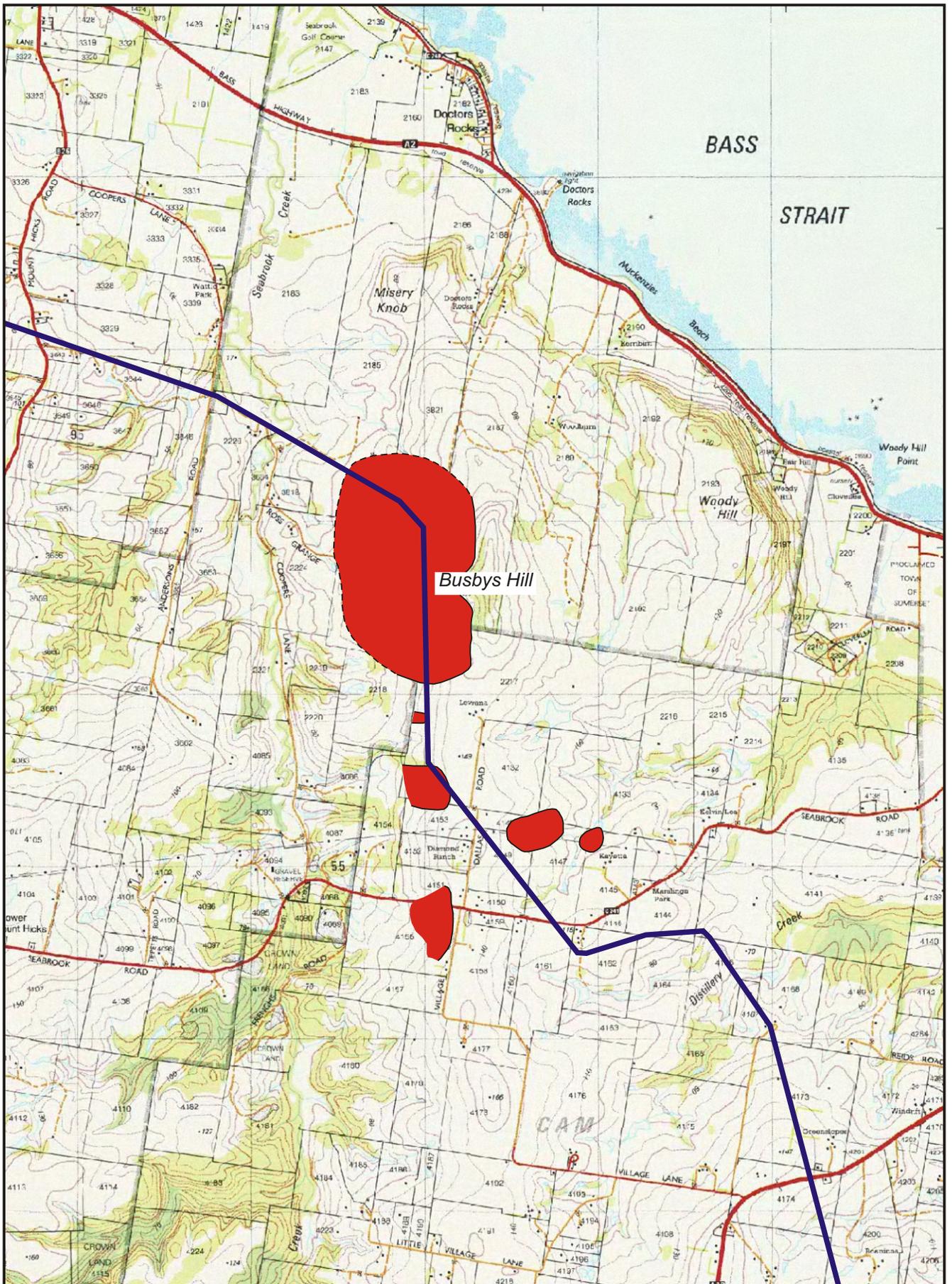


Figure 2



**Figure 3**  
Landslide affected terrain, Mooreville area





**Figure 5**  
*Landslide affected terrain, Busbys Hill area*



Figure 6  
Landslide affected terrain, Sisters Creek-Moorleah area