

TR16-86-88

15. Geophysical survey, Mt William area.

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The Mt William area comprises the low-lying region east of Mt William and south of Cape Naturaliste in the far north-east of Tasmania. Traces of tin ore have been found by prospectors, in various diggings behind the dunes along the coast. Following detailed geological mapping the question arose as to whether the sand-covered areas between granite outcrops reflected a lead system or a number of disconnected basins. Only the region directly east of Mt William contains a large area with few exposures. This region has been examined using resistivity methods with seismic control. The objective of the resistivity survey was the location of the regions of thickest sand cover.

RESISTIVITY SURVEY

Resistivity traverses using the Wenner configuration, with an electrode spacing of 15 m, were run across the area. The location of the traverses and the profiles derived from the resistivity data are shown in Figure 21. The figure also shows a contoured plan of the resistivity values, with 10  $\Omega$ -m and 20  $\Omega$ -m values separated. Values of more than 20  $\Omega$ -m appear to be related to either exposures or near exposures of granite. The higher the resistivity value the nearer the granite to the surface or the fresher or more massive the granite if exposed.

The smoother features on the profiles reflect deeper granite and lack of variation between many adjacent low readings reflect a cover thicker than the electrode spacing. Such 'flat' effects are only common in areas where the resistivity values are less than 15  $\Omega$ -m and values below 10  $\Omega$ -m are related to areas with thickest cover.

Two principal regions of low anomaly have been located, one in the north, and one in the far south, of the area. Other minor patches of low resistivity occur but these may possibly be related to creek or swamp features and not thickness of cover.

Resistivity depth probes, using the Wenner configuration, were used to check the thickness of cover at the southern anomaly. The probes are indicated in Figure 22. The probes did not provide evidence of any significant weathering in the profile.

SEISMIC SURVEY

Seismic work was undertaken to provide a check on depth of sand and an indication of the simplicity of the geologic situation. The covering material, sand at the surface, has a seismic velocity of 1,600-1,800 m/s, while the lower layer (granite) has seismic velocities of 4,000-6,000 m/s. The velocities are distinct in every case and there is no evidence to suggest a weathered or graded profile. All spreads were placed in zones where the resistivity traverses gave very low values which were considered to be due to thick cover. Details of the seismic spreads are shown in Figure 21.

Dune surveys

Dunes to the north of the area, adjacent to the track from the Mussel Roe Bay Road and Boulder Point on the coast east of Mt William were also examined by both methods. Dunes to the south, near Eddystone Point, have been found to contain fine grains of cassiterite and it was desired to know the

cover of such sand in this area and its relations to the granite. A number of springs confuse the overall picture in this region as they suggest rock at shallow depth. Resistivity depth probes and seismic profiles are given in Figure 22 .

### SURVEY RESULTS

#### Northern anomaly

Location	Data	Thickness of sand cover (m)
Base line footage*	3,500 seismic	16-18
Line 1 W footage	2,100 seismic	13-15
Line 2 W footage	1,650 seismic	14-15

#### Southern anomaly

Base line footage	12,500 seismic	40-42
Base line footage	12,650 resistivity	40
Line 1 W footage	11,350 seismic	21-27
Line 1 W footage	11,250 resistivity	25-30

#### Dunes

##### Spread 1

Coordinates: 69/04606225	seismic	23-24
	resistivity	16?

##### Spread 2

Coordinates: 69/04156235	seismic	6-11
	resistivity	6

##### Spread 3

Coordinates: 69/03406255	seismic	6-11
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##### Spread 4

Coordinates: 69/027677	seismic	8-11
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\*at north end of Spread

### CONCLUSIONS

Two significant areas of deep cover have been located. The shape and location of these areas does not suggest a lead system although the possibility of narrow outlets, which could have been missed in the survey cannot be discounted. The profile type is not clearly established but the sharp velocity changes and relative abruptness of the resistivity changes does suggest limited weathering of the granite.

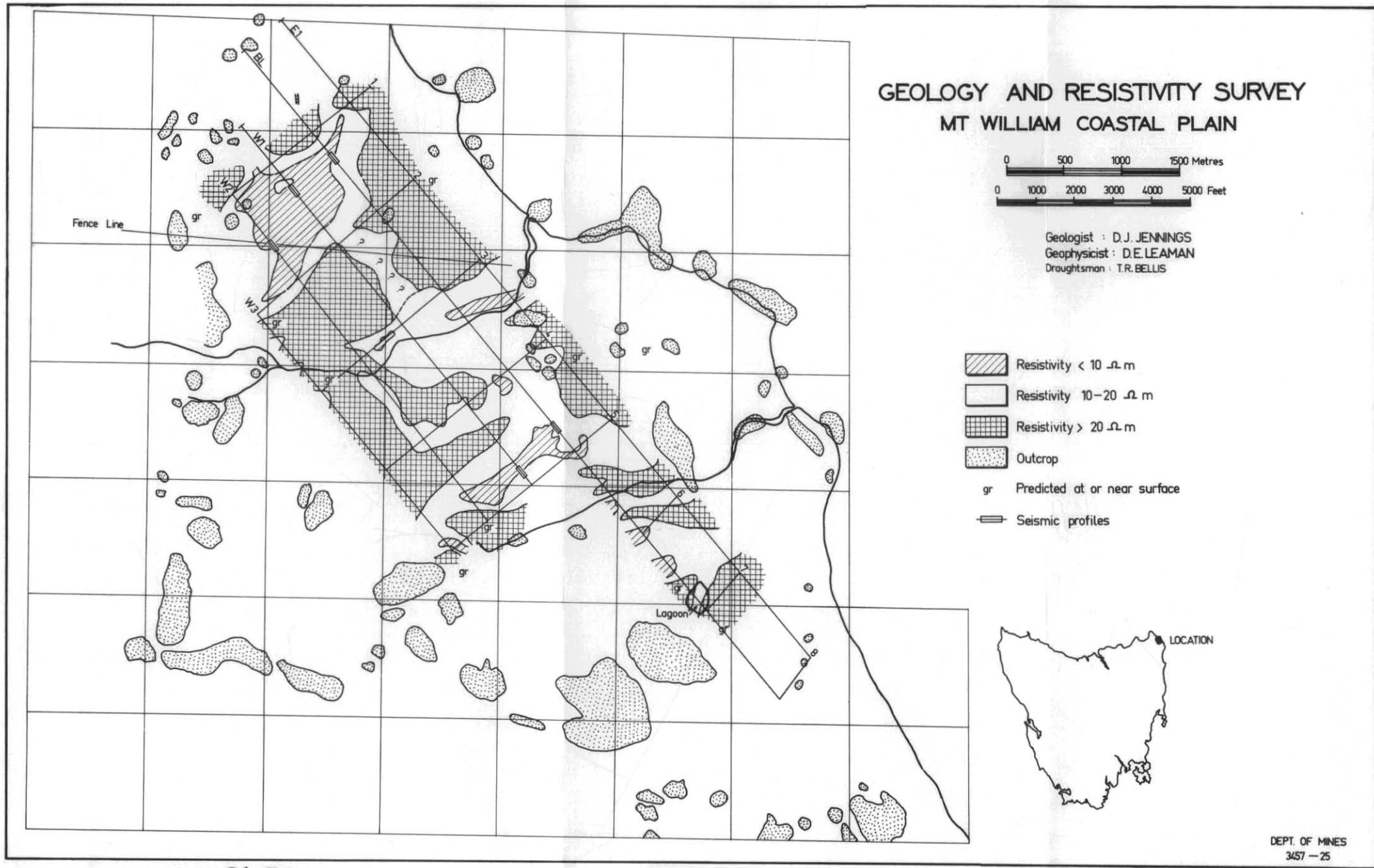


Figure 21. TR16-86-88

5 cm

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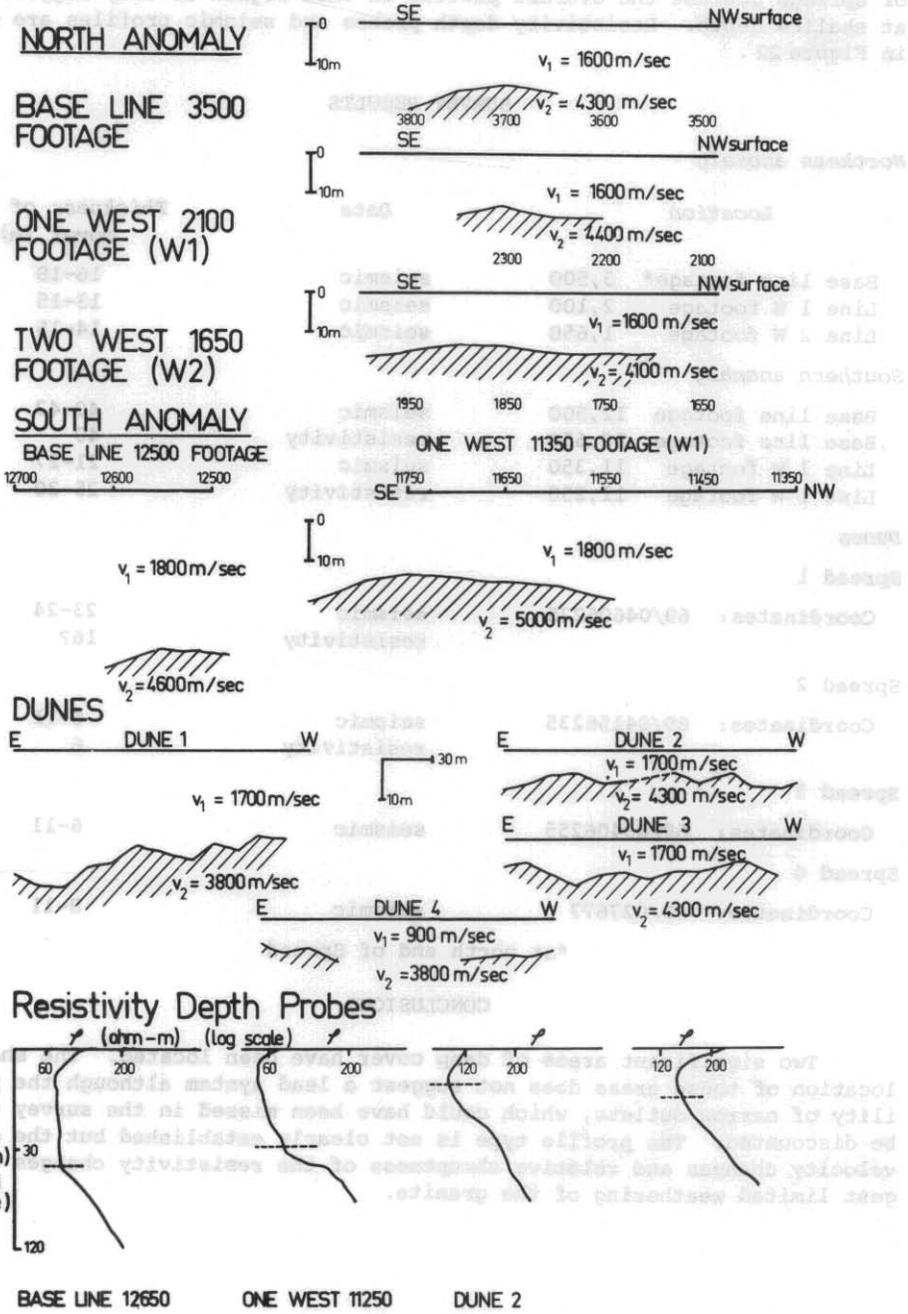


Figure 22. Seismic profiles and resistivity depth probes, Mt William coastal plain.

