TR16-214-215

41. Inspection of a well on G.J. & W.L. Larcombe's property at Deloraine.

W.L. Matthews

During the reconstruction of the Bass Highway, the Public Works Department dug a cutting about 3 m deep at a distance of 4.5 m from a well on a property owned by G.J. and W.L. Larcombe. The owners of the well have claimed that the water supply has been affected by the cutting. The Public Works Department requested an investigation into what effect the cutting construction would have on the well and also if remedial measures could be taken to maintain the well in its original state.

The well, when first dug, is said to have supplied a hotel with water but had not been used for many years until about 2 years ago when a new house was built nearby. Before installing a pump, the owners state that the water level was never less than about 2 m from the bottom of the well and had not been pumped dry until the summer of 1971 following the construction of the cutting. On the day the well was examined there was about 0.4 m of water in the well; the total depth of the well was 7 m. The content of total dissolved solids in the water measured with a salinity meter was 190 ppm indicating that the water was of good quality. The reconstruction of the road in the vicinity of the well commenced in late 1970 and was completed during February 1971. A drain was installed 4 m below the surface not far from the well, in a damp area found during excavations for the road.

The rocks in the area are Tertiary basalt and Jurassic dolerite and the cuttings and well have been dug in weathered basalt. A basalt/dolerite contact with E-W trend occurs about 140 m north of the well while south of the Bass Highway basalt appears to extend at least as far as a creek, which also has an E-W trend. It is expected that dolerite underlies the basalt but the surface of the dolerite is probably uneven. The basalt, as in many areas, is deeply weathered whereas the dolerite tends only to weather to shallow depths.

Surface drainage, is in general directed away from the dolerite areas towards the creek south of the Bass Highway but in the vicinity of the well there is a slight downward slope wards the west. The land surface and the water table in unconfined aquifers usually have a similar shape, so that surface drainage directions are similar to the direction of movement of groundwater. If this is the case here, the groundwater would tend to move away from the dolerite towards the creek south of the highway. As there is a slight slope in an E-W direction in the vicinity of the well, there could also be some east to west movement of the groundwater in this area.

POSSIBLE EFFECTS OF THE CUTTING ON THE WELL

Because of the possible E-W movement of the groundwater near the well, the improved drainage along the road could remove some water that would otherwise arrive in the vicinity of the well.

The owner of the property states that during winter, the water level in the well comes to within about 1 m of the surface. A cutting 3 m deep and a drain 4 m below the surface near the well, could be expected to have a depressing effect on the water table and could mean that at the beginning of dry periods the water table could be some 3 m lower than if the cutting were not present.

The total effect and significance of the above factors on the water supply is unknown and could only be determined by observation of water levels, amount of water used and rainfall over a period of several years before and

after the cutting is dug. It is not expected that these effects would be large but they could be significant.

Little could be done to remove the above effects on the well. The only remedy would be a new well in basalt in an area away from the cutting.