

Seismic survey, 'gravel' deposit, Christian Marsh.

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A deposit of quartzite has been worked for road base material immediately west of the Shannon River near the Christian Marsh homestead, about 30 km north of Bothwell on the Lake Highway. The quartzite, which shows some relict sedimentary features, has been derived from quartz sandstone of Lower Triassic age by extensive and abnormal thermal metamorphism accompanying several dolerite intrusions. The quartzite is covered by a deposit of Pleistocene-Recent 'talus' mainly composed of dolerite boulders and clay. In the western side of the main pit some 'breccia'/conglomerate has been found which is composed of rounded and angular pieces of quartzite of varying size in a silt/sand matrix. The seismic survey was undertaken west of these exposures in an attempt to estimate the volume of more easily worked 'breccia'.

SURVEY

A spread with geophone spacing of only three metres was fired in the region of the present exposures in order to determine whether a velocity contrast existed between the dolerite 'talus' type material, the quartzite 'breccia' and the moderately shattered quartzite. This test spread indicated that the dolerite 'talus' had a seismic velocity of 375-400 m/s and a thickness of 1.0-2.0 m while the quartzite 'breccia' yielded a velocity of 900-1200 m/s and a thickness of 4-5.5 m. These values were compatible with observations made in the quarry nearby. The shattered quartzite had a seismic velocity of 1500-2500 m/s. Other spreads fired in the region of the sample pits, up to 80 m west of the main working, indicated substantial thicknesses of low velocity material (400-450 m/s) but no significant amount of intermediate velocity material. The thickness of 'talus' is very variable in this region (2.0-5.5 m) and the talus appears to directly overlie quartzite (velocity 1600-3000 m/s). The shape of the time-distance curve suggests that the quartzite nearly crops out along the track about 40 m west of the main pit.

The thickness of quartzite present was also found to be variable but was at least 10 m over the area examined. A high velocity material (5500-6000 m/s) was indicated below it: this is probably dolerite. The velocities determined for the quartzite indicate that with occasional exceptions the whole area can be worked by ripping techniques (material with a seismic velocity of more than ~2500-2800 m/s cannot be worked by ripping).

CONCLUSION

There is a variable but often thick cover of dolerite 'talus' overlying one pocket of quartzite 'breccia'. It appears to be no thicker than as seen exposed. The deposit of quartzite is large in volume and nearly all that examined could be worked by ripping.

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