UNDERGROUND WATER

TR16_210-213

40. Underground water possibilities at Table Cape butter factory, Wynyard.

W.L. Matthews

The Table Cape Butter Company is interested in obtaining an underground supply of water, as surface water available to the factory requires the installation of a filtering system. A private drilling company has drilled a hole to 100 m and has obtained about 1,350 l/h, but about ten times this amount is needed for the factory. A request was made for advice as to whether drilling in another area or deepening the existing bore would yield greater quantities of water. The factory is situated on the east bank of Big Creek between the Bass Highway and the railway line (fig. 61).

GEOLOGY

The township of Wynyard is situated on the Wynyard Plain, a relatively flat area which rises to about 23 m above sea level, which Gee (1971) regards as being a pre-Oligocene-Miocene surface that was later exhumed and covered with sand, clay and gravel, probably in Pleistocene times. Gee records that these sediments range in thickness from about 7 m near the coast to at least 16 m inland.

These Quaternary deposits are underlain by the Wynyard Tillite of Permo-Carboniferous age. The tillite unit which Banks (1962) regarded as being at least 580 m thick is shallow dipping, sometimes very gently folded, interbedded tillite, conglomerate, siltstone and sandstone. The bore was put down between the factory and Big Creek and entered tillite at less than 3 m. The cuttings from the bore appear to be mainly of siltstone. A trench for a new part of the factory, dug approximately at right angles to the creek which was 20 m long and about 5 m deep, reached the tillite unit over much of the excavation. Exposures of tillite can be seen along Big Creek (which has cut deeply into Wynyard Plain) upstream from the factory and along the by-pass road just south of the main part of Wynyard. The Quaternary deposits in the vicinity of the factory, appear to be thin, consisting of even-grained sand with clay and gravelly clay at lower levels.

HYDROLOGY

There are two possible sources of underground water in the area: the Quaternary deposits and the tillite.

Joints and other partings would supply most of the water that could be obtained from the tillite unit and these fractures could be expected to be more open near the surface than at greater depths. Unless a fault plane which has not been clay filled or some other rock type is struck, it seems unlikely that much more water would be obtained by extending the bore any deeper. The area of land owned by the factory is about 2 hectares and it is not expected that conditions for groundwater in the tillite would vary to any great extent over this area.

The other possible source of water is the superficial deposits. If extensive beds of gravel or sand were to occur in the factory area, adequate supplies of water could be obtained. From the drilling, trenching and creek exposures, these deposits appear to be thin in the area around the factory.

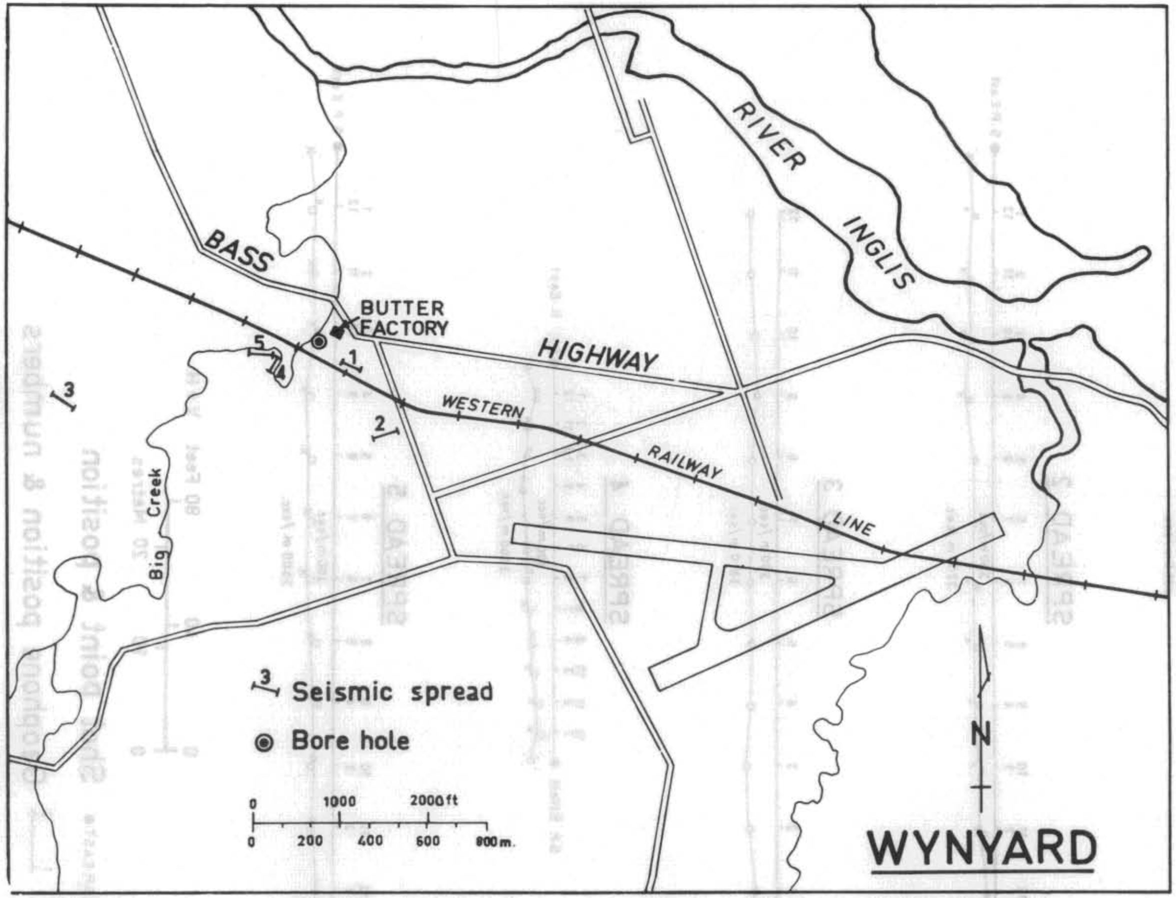

Figure 61. *Table Cape butter factory, location of seismic spreads.*

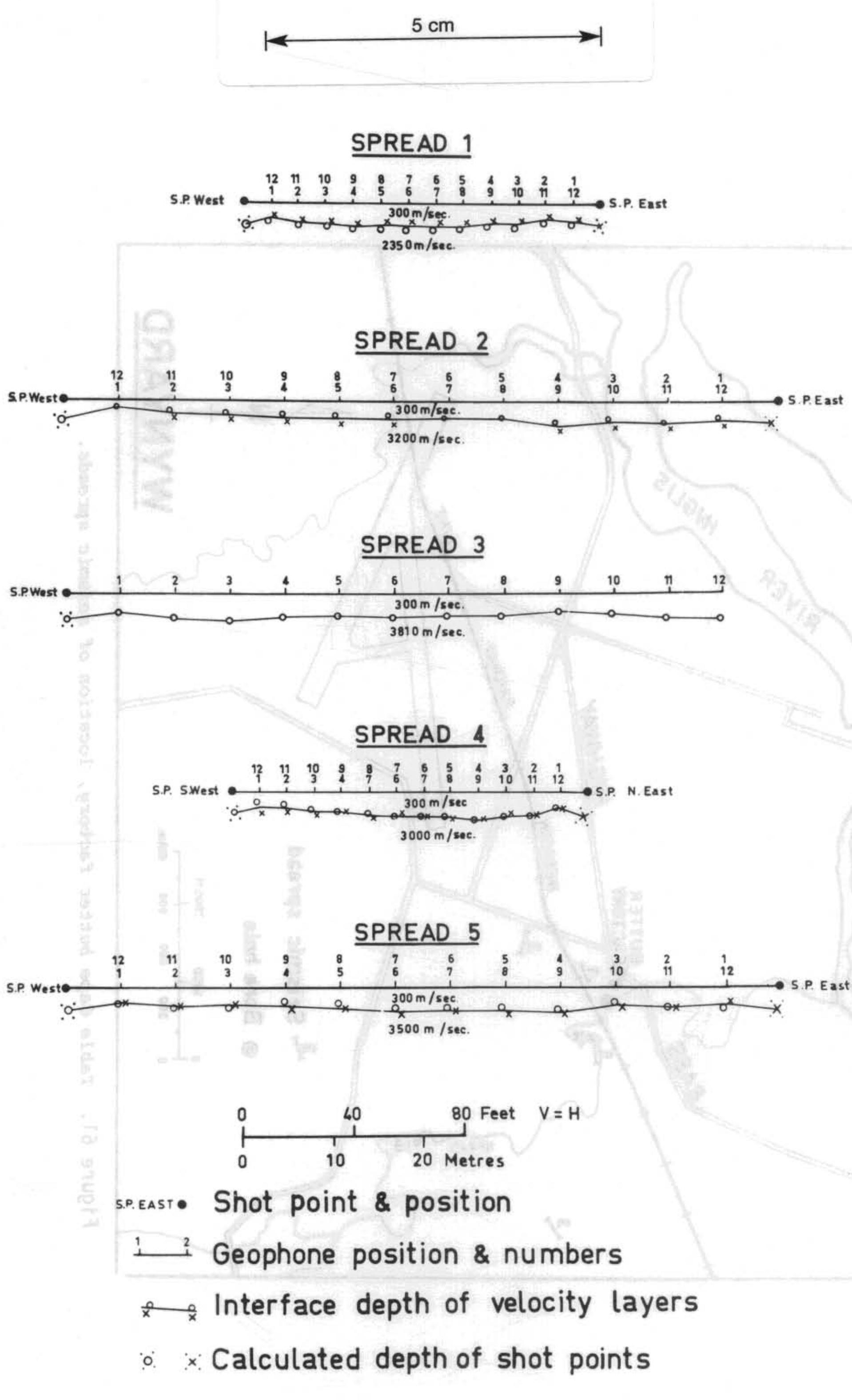

Figure 62. *Table Cape butter factory, seismic profiles.*

Five seismic spreads were fired on land owned by the factory and in the surrounding area in an attempt to locate deeper Quaternary deposits. All spreads were fired from both ends except for Spread 3 which was only fired from the western end. The interpretation of these spreads is shown in the accompanying cross sections. The material with a seismic velocity of about 300 m/s is interpreted as Quaternary deposits and the material with a seismic velocity of 2,350-3,810 m/s is interpreted as Wynyard Tillite, the variation probably being due to differing degrees of weathering and perhaps jointing. As can be seen from the profiles, the indicated thickness of the Quaternary deposits is no more than about 3 m in the areas examined by seismic means. Since the creek has cut to below this level in most places, it is unlikely that these deposits could supply the required quantity of water.

CONCLUSIONS

It is unlikely that very much greater quantities of water would be obtained by deepening the existing bore unless other unpredictable structures or rock types are encountered. The suggested thickness of the tillite indicates that a considerable depth could be drilled before any appreciable rock change might occur although the complete tillite unit may not be present in this area. No great lateral variation in jointing or rock type within the tillite, could be expected in the area owned by the company, although such variations could occur in some parts of the Wynyard area. Although these areas could yield greater quantities of underground water, their location would be largely a matter of chance.

The Quaternary deposits near the factory appear to be too thin to yield appreciable supplies of water. In areas remote from the factory they are thicker, as indicated by Gee (1971).

REFERENCES

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