INTRODUCTION

An opinion on the possibility of obtaining an adequate supply of domestic quality groundwater in the vicinity of the Palm Valley Chalet was requested by Mr. T. Goodluck, Alice Springs representative of Amcut Transport Industries. The Chalet is located 80 miles west-south-west of Alice Springs and 8 miles south of Hermannsburg Mission. It is on the south bank of Palm Creek, one mile upstream from its junction with the Finke River.

GEOLOGY

The area is underlain by red-brown medium grained poorly sorted sandstone, with minor inter-beded red-brown siltstones, belonging to the Pariniarra Formation. The maximum exposed thickness of the formation in this area is approximately 4,500 feet, including an interval of siltstones at the base which is 600 feet thick. The Pariniarra Formation is in turn underlain by the Heronrie Sandstone, which is a cross-beded fine to medium grained quartz sandstone.

There is a shallow anticlinal structure, whose axis strikes approximately east, between the Chalet and Hermannsburg. The crest of this structure is approximately 4 miles north of the junction of Palm Creek and the Finke River, and at this point it is estimated that the depth to the top of the Heronrie Sandstone is 3,000 feet. A shallow synclinal structure occurs to the south of the anticline and has its axis striking approximately east. This axis passes the Chalet, where the depth to the Heronrie Sandstone is estimated to be approximately 3,600 feet.
HYDROLOGY AND PREVIOUS DRILLING

No bores have penetrated the Caramina Sandstone in the Palm Valley area, but it is known from other areas that the formation is a reliable source of good supplies of good quality groundwater.

Similarly, there are no bores in the Palm Valley area within the lower part of the sandstone of the Farnijarra Formation, but three bores at Ayungga Native Settlement (30 miles to the west) produce supplies of 1000 g.p.h. of domestic quality water from this part of the section.

An aquifer which produces 1000 g.p.h. of domestic water is known in the upper part of the sandstone of the Farnijarra Formation in the vicinity of Palm Valley. This aquifer was intersected at 450 feet in bore F51/13-153, four miles south of Marranupburg Mission. From an interpretation of the structure of the area however, a bore drilled at the Chalet would commence at a stratigraphical level below this aquifer.

The existing bore at the Chalet is 150 feet deep, and produces approximately 200 g.p.h. of domestic quality water.

The standing water level at bore F51/13-153 is 26 feet below natural surface, and at the existing Chalet bore standing water level is approximately at natural surface.

GROUNDWATER PROSPECTS AT PALM VALLEY

The most reliable aquifers in the area are within the Caramina Sandstone but this formation occurs at depths which are both uneconomic and beyond the range of normal percussion drilling rigs. The known aquifers near the base of the Farnijarra Formation are also too deep, being everywhere more than 1500 feet deep, and nearly 3000 feet deep at the Chalet.
The aquifer near the top of the sandstone of the Parinjarro Formation is probably above the piezometric surface in the vicinity of the Chalet. Hence, the particular area concerned is underlain by approximately 1000 feet of sandstones whose hydrological characteristics are unknown. However, at least one aquifer of low yield is present within the top 200 feet of this interval and it is quite possible that further aquifers will be present. A hole to at least 600 feet is recommended to test the groundwater potential at the Chalet. One deep hole, rather than several shallow holes, would be the most efficient way to test the area. The exact location of the hole is not critical.

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