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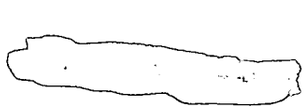

DEPARTMENT OF SUPPLY AND DEVELOPMENT.

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

REPORT No.
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WATER SUPPLY INVESTIGATION ON HERMANNSBURG MISSION STATION, N.T.

by

G. F. Joklik.

Canberra

25th March, 1952.

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INTRODUCTION

Hermannsburg Mission Station is situated 80 miles west of Alice Springs. In the winter of 1951, Pastor Albrecht, the Superintendent of the Mission, made a request for government assistance in the location of underground water supplies. Early in October, G.F. Joklik and S.A. Tomich, of the Bureau of Mineral Resources, spent five days on the station and picked seven sites for possible water bores.

Throughout this report, reference is made to the accompanying map.

CLIMATE, SOIL AND VEGETATION.

The annual rainfall in the Alice Springs district generally ranges from 0 to 10 inches. Missionary Plain which includes the Hermannsburg Mission Station, is very sandy. Spinifex forms a large part of the vegetation. The area covered by Hermannsburg Mission Station gives the impression of being very poor cattle country; the terrain is not of a type generally associated with large underground water supplies.

PHYSIOGRAPHY.

The Finke River, on the eastern bank of which Hermannsburg Mission was built, drains Missionary Plain, which occupies a broad valley between the Mac Donnell Ranges to the north and the James Range to the south; both ranges strike approximately east, and the Finke cuts south through both. The Mac Donnell Ranges shed most of their water onto Missionary Plain and into the Finke along narrow valleys which strike east. From the James Range, on the other hand, there is very little flow-off onto Missionary Plain. Most of the water which falls on it is diverted into the Finke, and is then carried south through the range into the desert. The Mac Donnell Ranges therefore exert more control over the underground water resources on Missionary Plain than the James Range.

Gosse Range, near the western boundary of the Mission Station, forms a natural amphitheatre three miles in diameter. The depression is drained by only one creek.

GEOLOGY.

According to Madigan (1932), the James Range near Hermannsburg comprises Ordovician sandstone and quartzite. Along the front of the range, the beds dip gently north. The Mac Donnell Ranges include rocks ranging in age from supposedly Proterozoic to Post-Ordovician. The predominating rock-types are sandstone and quartzite and the general dip of the beds is to the south. In both systems of ranges limestones are poorly represented.

NATURAL WATER RESOURCES

Some good soaks on the Finke River are being used by cattle. These are close to the northern boundary of Missionary Plain. Ellery's Creek also contains some fairly reliable soaks. Water is supplied to the Mission Homestead from a spring in a little gorge near the foot of the James Range. The locality is named Kaprilia Springs, and a pipe-line connects it to the Homestead, four miles east-north-east.

PREVIOUS WORK.

The only systematic work which has been done on the station to ensure a sufficient water supply for stock has been the scooping-out of three dams, all near the southern limit of the water shed from the Mac Donnell Ranges. Although they serve their purpose well under normal conditions, they are not dependable in a drought.

The Mission authorities have spent a large sum of money on a boring programme in the course of which several holes were carried to a depth of over 600 feet. The sites for the bore holes were selected by water-diviners who were not acquainted with the local physiography. Their efforts were concentrated at the following places:-

(1) A group of bore holes was put down in an area of from two to five miles south of the present bore site No. 2. No water was struck. The distance from the intake beds, which dip fairly steeply, is too great.

(2) One bore hole was put down approximately three miles north-east of Gosse's Range. This was a dry hole. There is no obvious water trap near this locality.

(3) Some attempts were made on the bank of Rudall's Creek near the centre of Missionary Plain. Again, the distance from the intake beds was too great.

(4) A dry bore hole was put down a little north of the Mission Homestead. The drainage there is south, and no water from the James Range could possibly be struck there.

(5) In a bore hole on Ellery's Creek a little water was struck at 60 feet from the surface. The hole was then carried down to a great depth without success. A tank was built and a windmill erected, but the effect of this bore is, if anything, harmful, as it drains a good soak in the creek-bed only fifty yards distant.

THE PROPOSED BORE SITES.

Seven sites for bore holes were selected. A compromise was struck between the sites at which water was most likely to be struck and the requirements of the stock, as explained by the head stock-man.

Site No. 1. The first and most obvious choice was a site on the only creek which drains the Gosse Range. Any water which escapes from this solid rock basin must pass through this outlet. If water was struck in this locality, some good grazing country would be opened up.

Sites Nos. 2 & 3. A water supply is required near the north-western corner of the station to relieve the drain on west dam, and to make possible the utilization of some good grazing country near the foot of the Mac Donnell Ranges. The two sites selected are adjacent to a good road and make full use of the watershed from the Mac Donnells. Site 2 is on a grassy flat near the junction of two broad creeks, a bo hole at this site should be carried to a greater depth than hole at site 3.

Site No. 4. There is an urgent need for a water bore close to the Mission Homestead. The reason for the failure of a bore hole a little north of the Homestead has already been given. Site 4 was selected close to the foot of the James Range to ensure full use of the northerly flow-off from the range.

Site No. 5. A water supply mid-way between the soaks on the Finke River and on Ellery's Creek would open up a further large area of grazing country. Site 5 is close to the foot of the Mac Donnell Ranges and a bore there should strike water at moderate depth.

Sites Nos. 6 & 7. The soaks on Ellery's Creek near the southern border of Missionary Plain are not reliable. Some good grass country extends south-east from Ellery's Creek along the foot of the James Range; two alternative sites were selected to tap a drainage system from the range. Site 7 is closer to the intake beds, whilst Site 6 is at the junction of two large flow-off channels. Site 6 should be tested to greater depth than Site 7.

REFERENCE.

Madigan, C.T., 1932:- The Geology of the Western Mac Donnell Ranges, Central Australia. Quarterly Journal, Geol.Soc. of London, V. lxxxviii pp. 672-711.

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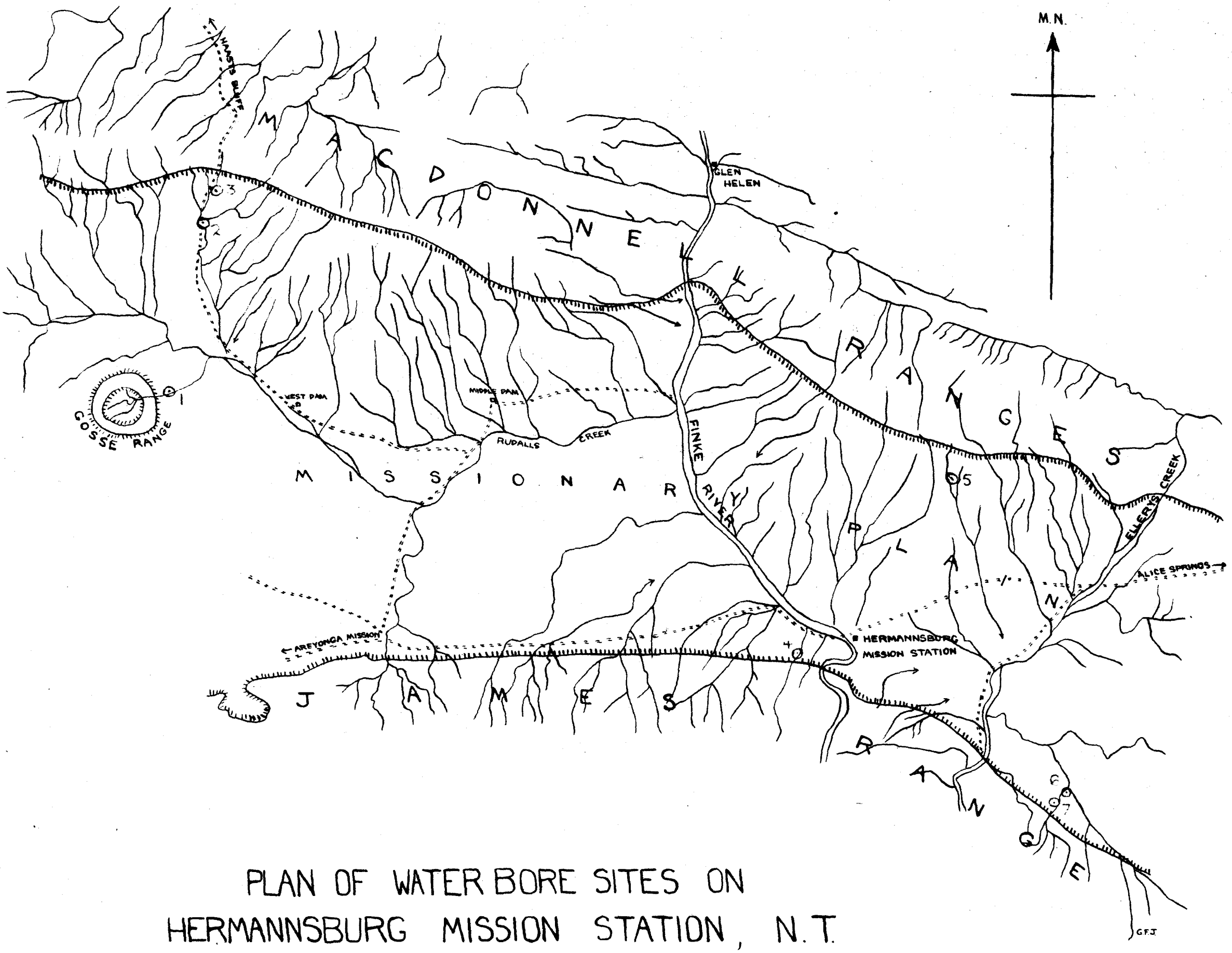

PLAN OF WATER BORE SITES ON HERMANNSBURG MISSION STATION, N.T.

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