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DEPARTMENT OF MINES
SOUTH AUSTRALIA

REPORT ON WATER SUPPLY FOR PROPOSED SETTLEMENT IN THE VICINITY OF THE WARATAH GYPSUM COMPANY'S LEASES AT KOWALKA, EYRE'S PENINSULA

A survey of existing wells was carried out in the vicinity of Lake MacDonnell for the purpose of discovering suitable supplies of water for the household, garden and industrial requirements of a small settlement.

A comprehensive survey of the underground waters of the area was previously made by Dr. R. Lockhart Jack. Numerous wells provided much valuable information. The writer concentrated on the collection of details of the more recent bores in the area. These are relatively few in number and in general have failed to produce supplies more satisfactory than the older series of bores.

Relative to underground water supplies the counties of Kintore and Way can be subdivided as follows:

1. The Recent Coastal Sand Dunes.
2. Gypsum Leases.
3. Mallee country away from the coast.

1. The Recent Coastal Sand Dunes.

A series of large sand dunes border much of the coast line. Adjacent to the gypsum leases they are large and on the move. They yield quite a fair stock water (one to two ounces of saline matter per gallon) along their margins at shallow depths but drift and the march of the dunes makes maintenance of the wells a problem. However, where the dunes are fixed by vegetation the problem is less acute. Normally a site is selected ten feet or less above the level of the landward swamps. Wells of this type can be spoiled easily by sinking too deeply as the layer of relatively fresh water is frequently shallow and is superimposed on very saline waters.

2. The Gypsum Leases

The Gupsum Leases occupy a swampy low-lying area at the back of the recent coastal dunes. An area of several square miles is covered by bedded deposits of massive crystal and seed gypsum and by superficial dune systems of seed and flour gypsum. Throughout this area water is struck at shallow depths normally ranging from one to four feet. Government and private wells have been sunk at many places particularly in the vicinity of low seed gypsum dunes.

The waters are suitable for stock, but it is extremely unlikely that any of them would be suitable for gardening or household purposes. In salinity they range from one to more than two ounces per gallon.

3. The Mallee Country bordering the Coast.

In this belt of country accumulations of sands and travertine limestones overlie sandstones and clays which may be members of the lignitic (?) Oligocene lacustrine sedimentary series. These sediments rest on granites and gneisses at shallow depths.

Of the numerous wells and bores which have been put down in this country practically all have cut small supplies of water at shallow depths before entering granite or gneiss. Nevertheless, from the viewpoint of the requirements of a settlement none of these bores can be relied on in both quality and quantity. Salinities range from about 30 to some hundreds of grains per gallon and supply rarely exceeds a few thousand gallons per day. In general the better waters are in small supply and are more in the nature of soakages. A point to be kept in mind when better quality waters are met with in this district is that these waters vary very considerably in composition horizontally. For this reason a water which is of satisfactory quality when first cut may later become too saline. On the other hand it may improve with continued use.

In general the results of boring and well-sinking to date in the neighbourhood offer little hope of a shallow water basin. Widespread travertine and the absence of sufficient boring to bedrock make satisfactory geological examination impossible.

SUMMARY AND RECOMMENDATIONS

Several adverse factors affect the possibilities of finding satisfactory supplies of underground water in the area. These include low rainfall, nearness to the sea, subdued topography and general geological structure. Statistics of existing bores are not encouraging. It is evident, in fact, that a source (or sources) of other than underground water must be sought.

There are three possibilities worth considering-

1. Construction of earth dam adjacent graded road at foot of slope (e.g. along Penong Road to Lake MacDonnell, near water conservation reserve, approximately one mile from Penong).
2. Construction of sheet iron or stone paved catchment and a large storage tank of suitable capacity.
3. Continuance of pipe line from Ceduna to Penong with a branch line to leases.

The Engineering and Water Supply Department should be approached for advice concerning these recommendations. Concerning points 1 and 2 above, it is to be noted that although the average annual rainfall for the past 45 years has averaged 12.45 inches, the annual variation is considerable. As examples, several extreme variants are listed below:

Year	1897	-	6.21 inches
"	1901	-	17.44 "
"	1916	-	19.32 "
"	1917	-	7.19 "
"	1926	-	6.58 "
"	1931	-	21.31 "
"	1942	-	15.91 "

Regarding point 2, a five acre galvanised catchment is installed at Uworra Siding to supply a one million gallon completely covered storage tank. Apparently a large safety

margin has been allowed in this case with the result that the amount of water stored has never fallen seriously. For a completely enclosed tank the loss by evaporation is relatively small and on the basis of catchment efficiency of approximately 90%, a rainfall of 12 inches per annum provides one quarter of a million gallons of water per acre of intake area. All buildings in the proposed settlement should be planned to ensure maximum roof run-off and storage capacity.

In view of the complications of the water position it is obviously impossible to recommend a site for settlement. However, from considerations of drainage and sanitation it would be quite inadvisable to consider a locality immediately on or about the lowlying gypsum leases.

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