

REPORT ON SPRING AT BAGDAD

This report is based upon a visit of inspection made at the request of Messrs. Gillow, Brett and Corney of Bagdad. These gentlemen own orchards on the western side of the Bagdad Valley, about one mile north of the Bagdad railway station. There is little or no hope of obtaining surface or underground water on their properties without pumping to an excessive height. Recently they have been considering the possible utilisation of a spring situated about a mile to the west of Mr. Gillow's residence and at an altitude of 470 feet therefrom.

The spring is a seepage of water in the bed of a steep gully which has a generally southerly trend. The country in the immediate vicinity of the spring is occupied by sandstones of the Triassic system. These consist of small grains of sand which are released when the rock weathers and form a sandy soil.

The bottom of the gully in the vicinity of the spring is several yards wide and is filled by alluvial material. Judging by the material thrown out of a trench and from the statements of Messrs. Gillows &c. there is a depth of several feet of sand beneath about 9 inches of soil. This sand is practically free from clayey material and quickly silts in from the sides of the trench. This sand contains the water of the spring and yields it rapidly judging by the statements made as to the filling of the trench when emptied.

The spring has no definite seepage point, but seeps out to the surface along a length of about 100 feet. Several old pits have been sunk in various places and it is stated that they have never been dry.

About 200 feet down from the spring the gully is broken by a steep fall caused by sandstone cliffs. The water is not visible at the surface here and apparently passes underground.

The people interested desire to use the water from the spring and conduct it by piping to their orchards and houses.

It was their intention to make a dam at the southern side of the spring to collect and store the water and desired advice as to the suitability of the proposal. A dam could certainly be constructed and it would collect and store the water, but it would have to be well constructed and would be comparatively expensive. The running sand would be difficult material to hold and in which to prevent leaking of water from the dam. An impervious wall of puddled clay or concrete would be necessary to prevent leakage and it would have to be taken right to, and a short distance into the bedrock on both the bottom and sides of the gully. Further on the uphill side it would be difficult and costly to prevent the sand from running into the dam and filling it up.

It would be a much more satisfactory and probably cheaper method to collect the water from a large trench or excavation at the spring and conduct it away and arrange for storage elsewhere. The storage could take the form of underground concrete tanks which could be constructed by the party and would be a much more satisfactory method of storing the water.

No matter what excavation is made at the spring, silting will probably always occur and periodical visits for emptying it will be necessary.

The first essential should be the determination of the quantity of water which the spring will yield.

Calculations are of no use in attempting to arrive at this amount. The catchment area of the gully is stated to be about 100 acres and the average rainfall is about 24 inches. The water in the spring represents that portion of the water draining from this catchment area which moves underground down the sandy deposits in the gully instead of flowing on the surface. This would indicate that a fairly satisfactory supply should be obtained which cannot however be expressed accurately in figures. A test should be run by putting a pipe into the trench after emptying it of water and then measuring the quantity which flows during a given time preferably several hours. The remainder of the scheme could then be more definitely designed.

As there is a difference in height of 470 feet the pipe line would have to be broken at several points to lessen the pressure on the pipes. One such point would conveniently be above Mr. Smith's house, another at the highest point of Mr. Corney's orchard, and possibly another between the latter point and Mr. Gillow's House. The highest point of Mr. Corney's orchard might be conveniently used as a site for a concrete tank for storage. Other storage tanks could be put in at required places on the other two properties. The size of the tanks would depend upon the flow from the spring.

The pipe line would also depend upon the flow. If it does not exceed 1500 gallons per day, a half-inch pipe would be large enough. If in excess of this a three-quarter or one inch pipe would be necessary.

Automatic ball valves could be used where desired at the storage tanks to stop the flow in the pipes if desired.

It must be stressed as already stated above that everything depends upon the flow from the spring. The flow should be sufficient with reasonable storage to supply domestic needs for the four properties and the question of irrigating the orchards should be considered from the point of view that surplus water could be used for this purpose.

P. B. Nye.  
GOVERNMENT GEOLOGIST.

Mines Department,  
Hobart.

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