

Mada  
Vol 11  
Dec 66

Water Storage in Underground  
And its Dilution  
Sternau, Refael

The need to have underground ponding  
Gross distribution of rain in Israel [...] At the present 85% of the water potential is utilized [...]

The NWC

A general description and function. The need for perennial storage, in addition to Lake Tiberias. A surface storage space can not be efficient [...], hence hydrologists looked for underground storage sites.

Non saturated aquifer layer

Israeli aquifers' water level has been decreased. Example of the central stone aquifer [...] description [...] and the sand coastal aquifers [...]. Their volumes have increased due to excessive pumping. They can be also used for flood and reclaimed waters [...]

Water Recharge - How?

One way - by drills [...] Problems of salinity of the recharged water, its direction and velocity [...]. Concentrations of the two water substances [...]

Results of experiments

Results were very close to the predictions (Drawing 3 shows much similarity to Drawing 2).

There was only a little influence of the "natural" water flow - i.e. the water flow towards its draining outlet. If lower quality water is recharged by drill, the first water pumped

after <sup>the</sup> recharge would be of lower quality.

Two ways to improve water quality (..)

If higher quality water is recharged into a lower water quality aquifer - the water quality will decrease as pumping time increases. The stone aquifer is different.

Drawing 6. In this aquifer the natural water flow amounts to 3 m/day, which is relatively high.

Drawing 7.

### Actual operation

Storing water of higher salinity than the aquifer's original salinity can be done. In the sand aquifer the salinity <sup>of the recharged water</sup> will gradually decrease. In the stone aquifer the salinity of the recharged water will be similar to the aquifer's salinity from the beginning, and if there is a difference, it will disappear very fast. On the other hand, in the long term, there is a problem of slow but constant salination of the stone aquifer water itself.

However, since within a few years the diversion project of Lake Tiberias' saline springs will be completed, the NWC's salinity will be lower than at the present. At that time dilution will not be needed for the recharged water. Until then recharge does not endanger the ground water.

In the winter of 1964/5 tens of mcm <sup>of</sup> the NWC's water were recharged.

1964/65 - 41 mcm

1965/66 - 39 mcm

1966/67 - 23 mcm

This winter - 170 mcm