

# **INNOVATION - RENOVATION IN THE DESIGN AND CONSTRUCTION OF PERCOLATION WELL IN GROUND WATER RECHARGE**

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## **1. INTRODUCTION**

Clean drinking water is a prime necessity for life. There is a lot of rain, yet there is a shortage of drinking water as the rainfall is in form of high intensities of short durations. Most of the rain falling on ground tends to flow away rapidly leaving a little quantity of water for the recharge of ground aquifer. The rain water is the primary source of water. It does not matter how much rain pours, if it is not harvested. This highlights the need of implementing measures to ensure that the rain falling over a region is tapped as much as possible through water harvesting, either by recharging it into the ground water aquifers or storing in for direct use.

The river, lake, tube well, open well etc. are the secondary sources of drinking water with proper maintenance and monitoring.

## **2. STUDY IN WESTERN PART OF AUDA AREA**

AUDA has constructed number of percolation wells in AUDA reservation plots, gardens and other low laying areas. It is tried to work out the efficient system of percolation well in relation with the topography and sub soil strata in vastrapur area of AUDA.

AUDA does not have satisfactory water supply scheme of residential area, the only source is ground water/bore wells.

The high consumption rate has caused the rapid decline of ground water table.

There is a need to harvest the ample amount of rain water that mostly is lost to the river through the drains in absence of adequate areas. This would prevent the exhaustion of water in the aquifer from which is presently being drawn.

### 3. PERCOLATION WELL

It is an open unlined well penetrating the aquifer at a shallow depth of about 10-20 m. the well is generally located in broad open streambed or at the site, which provide a good collection pool of surface runoff. It is also used to drain roof top water into the aquifer if required. If there is an impervious layer above the aquifer, the well cuts it across and stabilizes direct connection of surface water with the aquifer. The percolation well acts as an injection mechanism. Generally a filter pit is constructed on the side of the well near ground level. A pipe connection is provided from the filter pit to drain down the filtered water into the well. (See Fig. No. 1)

### 4. INJECTION RECHARGING

Water is feed directly into the depleted aquifer by providing a conduit access, such as a tube well or shaft or collector wells. Recharge by injection is the only method for artificial recharge of confined aquifer or deep-seated aquifer with poor permeable overburden.

The recharge is instantaneous and there are no transit losses and evaporation losses.

(See Fig. No. 2)

### 5. STUDY OF EXISTING PERCOLATION WELLS IN WESTERN PART OF AUDA AREA

The study includes location of percolation wells, soil strata, soil testing, catchment area, topography, construction and maintenance of percolation wells:

A. Location of percolation wells:

Percolation wells in the following areas were studied:

(i.) Vejalpur	(ii.) Vastrapur	(iii.) Bodakdev	(iv.) Thaltej
(v.) Memnagar	(vi.) Ghatlodia	(vii.) Ranip	

These percolation wells were constructed in gardens, open spaces, low lying areas and on roadsides in AUDA area.

Locations of percolation wells were decided on the basis of topography and sub soil strata.

#### B. The depth and size of percolation wells:

Percolation wells were of the depth of 40-60 m approximately. The top aquifer is generally dry, which is to be recharged first and then subsequent aquifer, if possible.

The subsoil strata from existing G.L. to 40 m depth were as per the bore log. (See. Fig. No. 4)

C. Catchment area :

Generally the percolation wells were located on road side, on open space or gardens of AUDA. These wells had catchment areas of approximately 200 sq.m. (See Fig No. 3)

D. Construction details of percolation well:

600 mm dia borehole is done preferably by auger or percussion method.

E. Maintenance:

Filtration pit/tank is required to be cleared by removing all dust, pebbles, garbage etc, one in a year.

## 6. **SOIL TESTING:**

Soil testing was done to know the grain size distribution and atterberg's limit etc to identify the soil group.

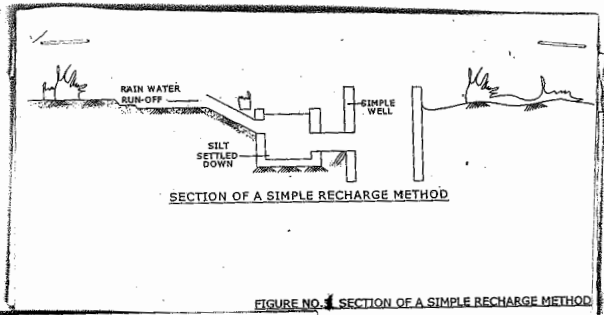


FIGURE NO. 1 SECTION OF A SIMPLE RECHARGE METHOD

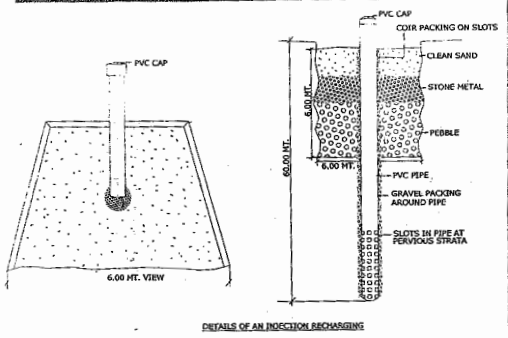


FIGURE NO. 2

