

The situation in Pakistan indicates that country is nearing conditions of chronic water-stress below 1,000 m³.

In Hayatabad and Peshawar region depends almost on the ground water resources. With rapid population growth and urbanization, the water usage also increased many fold. Water requirement increases day by day. The continued abstraction of ground water has resulted in over-pumping and consequent lowering of ground water table in many areas. Efforts to recharge the depleting aquifers need to be undertaken immediately.

5-Hydro-Geological Characteristics

5-1 Hydrology

Hayatabad township is bound by Malagori and Khyber hill in west and south, in the east is Peshawar City and in north are small villages and recently developed townships. A very large township under development is the Regi Lalama which is double in size as compared to Hayatabad. On south is the Bara River while down north is River Kabul. Ground water is the major source of public water supply. The Peshawar Municipality, and its surrounding areas like cantonment and other settlements form a part of main hydrological basin. The aquifers, which are encountered here are the parts of the major aquifer system of Peshawar valley basin. As the sediments play an important role in hydraulic and geometric nature of aquifer, hence it is imperative to have a brief understanding about the deposition of alluvial sediments. Peshawar is a closed basin surrounded by hills on all sides, which have made it an intermountain basin. The sediment from the hills were brought into the basin by the stream originating in them and finally terminating into the basin. The basin exhibited semi lacstrin environments of deposition resulting in accumulation of thick clays in the central part, however, Hayatabad township is different than other parts of the basin because there the proximity of the hills resulted in the deposition of coarser material like gravels and boulders.

There are two major aquifer systems: Phratic (water table) aquifer system and Confined (artesian) aquifer system. Water table aquifer is found to a depth of 125 meters below ground surface and is mainly composed of coarse sand and gravels. Pumping test data of various tube wells in Hayatabad satellite town indicate good hydraulic properties of this aquifer system.

5-2 Bore hole logs

The following Table-28 shows information about bore hole logs of several tube wells with in the various Phases of Hayatabad and Peshawar.

TABLE-28

**WATER TABLE DEPTH AND DRAW DOWN WITHIN PESHAWAR
REGION**

Location of Tube wells	Water Table depth (m)	Limit of depth from which water (m)	Length of well screen (m)	Discharge (m³/hr)	Draw down
PMC office	-	45-86	2	45	12
Chan Agha Colony	14	42-64	22	67.5	3
Khyber Colony	12	37-61	18	22.5	1
Shahi Bagh Well-1	2	24-67	10	45	15
Shahi Bagh Well-5	3	21-86	17	32.4	9
Hayatabad Phase-II	47	64-125	43	134	7
Hayatabad Phase-III	36	78-149	28	101	6
Hayatabad Phase-IV	40	72-149	30	101	6
Hayatabad Phase-V	45	91-145	29	101	6

The aquifer in Hayatabad Town is deeper as compared to other parts of Peshawar City and yield from the individual tube well is generally greater. Recently drilled tube-wells in Hayatabad Town have an average yield of about 102m³/hour, where as the Peshawar city area has an average yield of about 43 m³/hour. The gravel aquifer is interspersed with clay and its total depth from water is about 43 meters. Water table depth of shahi Bagh, Peshawar city ranges between 2-3 meters.

There is appreciable amount of ground water available in form of storage in pore spaces of the sediments. Transitivity values of the aquifer vary depending upon the lithology and storing between 500 to 2000 m²/day. This suggests that sufficiently porous and permeable strata lie beneath the ground surface. The water-depth in Hayatabad is recorded to be around 45 meters near the hills and about 1 meter near Kabul river (10-15 km away) where logged conditions exist.