



Integration of Geophysics, Remote Sensing and Hydrogeochemical to Evaluate Groundwater Potential of West Tahta area, Sohag Governorate, Upper Egypt.

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Abstract.

The western desert is subjected to extensive reclamation process in the last decade. The study of the groundwater possibilities in this desert is of great, because the water resources are rare and thus constitute a major problem obstacle to reclamation. The groundwaters are the main source of water in the dry regions and these resources can be evaluated by the geoelectrical survey, hydrogeological investigation and hydrochemical evaluation. Several vertical electrical sounding (VES) using Schlumberger array have been conducted and interpreted to probe the groundwater bearing layers and mapping their geometrical configuration. The hydrogeological parameters of the existing aquifer were also estimated to define the direction of water flow, recharge and discharge of groundwater. Chemical analysis of collected water samples evaluated to identify the origin of water and water type as well as define the quality of the aquifer for different purposes. The geoelectrical data which represented in three profiles, directed perpendicular to the axis of the Nile Valley show, that the study area has four layers. Surface layer which represented clay or dry sand and gravel, the second layer represented recent sand; the third layer is saturated sand which represented the aquifer in the area. Thickness of aquifer decreases in the west due to limestone and increase in the eastern direction of the section this also clear in the depth contour map. The last layer is represented by clay which acts as the base of the aquifer. Groundwater depth contour map show, the depth to water increase from the east to west and groundwater level contour map show, the flow of groundwater from west to east in the direction of the River Nile. The chemical analysis of 39 samples, surface (3 samples) and groundwater samples (36 samples) are done to define the water type, recharge and discharge of the aquifer as well as evaluate the water for different purposes. The study area is one of the most dynamic and highly changing areas in Egypt for the last two decades. The area has been affected by many natural and human activities. Results obtained from interpretation remote sensing data TM 1988 and Egypt sat 1