

Potentiometric Surface Map of the Unconsolidated Aquifers of Well County, Indiana

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Wells County is located in northeastern Indiana and is situated within two major drainage basins. The majority of the county lies in the Upper Wabash River Basin, while the east-central and northeast corner are situated in the Maumee River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Wells County was mapped by contouring the elevations of about 100 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The mapped potentiometric surface contours are primarily for the upper 100 feet of the unconsolidated materials and utilize data for wells 100 feet or less in depth. If the shallow data was sparse or unavailable in an area, deeper wells were used to complement the mapping.

The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer is at atmospheric pressure and will not rise in a well above the top of the aquifer, in contrast to groundwater in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement and pumpage. Therefore, measured static water-levels in an area may differ due to local or seasonal variations. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. As a general rule, but certainly not always,

groundwater flow approximates the overlying topography and intersects the land surface at major streams.

Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records. The location of the majority of the water well records used to make the PSM were field verified. Elevation data were obtained from a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Potentiometric surface elevations range from a high of 840 feet mean sea level (msl) in the southwestern section of the county, to a low of 770 feet msl in the northwest. Groundwater flow direction in the northwestern portion of the county is generally towards the northwest, and to the northeast in the northeast part of the county. In the southwestern section of the county, groundwater flow direction trends to the north-northwest towards the Salamonie River. Unconsolidated potentiometric surface elevation contours have not been extended throughout much of the county. These areas are either lacking data or unconsolidated deposits are thin or unproductive.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.