

# **Potentiometric Surface Map of the Unconsolidated Aquifers of Clinton County, Indiana**

by  
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Clinton County is located in the west-central section of Indiana, and is bounded by the counties of Tippecanoe, Carroll, Howard, Hamilton, Boone, and Montgomery. The northern two-thirds of Clinton County lies in the Upper Wabash River Basin, the majority of the southern portion is located in the Middle Wabash River Basin, and the southeast corner is situated in the White and West Fork White River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Clinton County was mapped by contouring the elevations of 1517 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 thickness of the unconsolidated deposits in Clinton County is highly variable due to glacial material deposited by several episodes of glaciations, with deposits ranging from about 100 feet thick in the southwest corner of the county, to greater than 400 feet in the southeastern section (Scott, 2008). Of the 1517 wells set in Clinton County, 707 are 100 feet or less in depth, with the remaining 810 wells ranging between 100 feet up to a maximum of 350 feet in depth. 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, wells greater than 100 feet in depth 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 920 feet mean sea level (msl) in the southeastern corner of the county, to a low of 650 feet msl in the northwestern portion. Groundwater flow direction in the Upper Wabash River Basin is generally to the west-northwest, and towards South Fork Wildcat Creek. Groundwater flow direction within the Middle Wabash River Basin is generally toward the south-southwest.

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.

Scott, 2008: Unconsolidated Aquifer Systems of Clinton County, Indiana. Indiana Department of Natural Resources, Division of Water, Aquifer Systems Map 52-A.