

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

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Lake County, Indiana is located in the northwestern corner of the state and is bounded by the state of Illinois along its western border, Lake Michigan to the north, and Porter, Jasper and Newton counties to the east and south. The county is situated within two major drainage basins of which the northern portion is located within the Lake Michigan Region, with the southern section of the county within the Kankakee River Basin.

The Potentiometric Surface Map (PSM) of the Unconsolidated Aquifer Systems of Lake County was mapped by contouring the elevations of 3357 static water-levels reported on well records received 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 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 water bearing formation, in contrast to water 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 groundwater pumpage. Therefore, current site specific conditions may differ due to local or seasonal variations in measured static water-levels. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. Groundwater flow is naturally from areas of recharge toward areas of discharge. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

The objective in creating county PSM's is to map static water-levels in the upper 100 feet of unconsolidated materials. If a section of a county has few located wells in the 30 to 100 feet interval, then the static water-levels in wells completed between 101 to 200 feet, if available, are used to complement the area.

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; however, the location of the majority of the water wells used to make the PSM were not field verified. Elevation data were either obtained from topographic maps or a digital elevation

model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Unconsolidated potentiometric surface elevations in Lake County range from a high of approximately 720 feet mean sea level (msl) in the east-central section of the county, to a low of about 590 feet msl in the northern portion. Generalized groundwater flow direction appears to emanate from the central part of the county and flows in a northerly direction in the upper half of the county, parallel to Lake Michigan, and in a southerly direction in the lower half of the county, towards the Kankakee River.

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.