

# **Potentiometric Surface Map of the Bedrock Aquifers of Allen County, Indiana**

by

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Allen County, Indiana is located in the northeastern portion of the state and is bounded by the state of Ohio along its eastern border, with Dekalb, Noble, Whitley, Huntington, Wells and Adams counties adjacent to the north, west and south respectively. The eastern two-thirds of the county is situated within the Maumee River Basin, with the western third situated within the Wabash River Basin.

The Potentiometric Surface Map (PSM) of the bedrock aquifers of Allen County was mapped by contouring the elevations of over 2200 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in bedrock 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 (water table) 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 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 contour type was determined based on the amount of data and the degree of change in water levels between wells in each mapped area. The map is shaded where the data is insufficient or the water bearing material is limited.

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 well records used to make the PSM were address geocoded. 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.

Bedrock static water levels in Allen County range from a high of 833 feet mean sea level (msl) in the northwest section of the county, to a low of 631 feet msl in the north-central portion. Groundwater flow direction within the Maumee River Basin is generally from south to north, south of the Maumee River, and northwest to southeast, north of the Maumee River. Groundwater flow direction within the Wabash River Basin is towards the Wabash 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.