

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

by  
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Grant County, Indiana is located in the north-central section of the state. The entire county lies almost wholly within the Upper Wabash River Basin. A small south-central portion of Grant County is within the White and West Fork White River Basin.

The Potentiometric Surface Map (PSM) of the bedrock aquifers of Grant County was mapped by contouring the elevations of approximately 1300 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 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 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.

The bedrock potentiometric surface elevation contours have not been extended through portions of northern and central Grant County. This area is lacking in data and/or covered by more

prolific unconsolidated deposits that limit the necessity to complete wells in bedrock. In this area, glacial sediments with thicknesses more than 400 feet in places have filled a deep buried bedrock valley, the Lafayette (Teays) Bedrock Valley System.

Universal Transverse Mercator (UTM) coordinates for the water wells were obtained in the field, determined through address geocoding, or reported on water well records by the drillers. However, 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.

Bedrock potentiometric surface lines in Grant County range from a southerly high of 870 feet mean sea level (msl) near the towns of Fowlerton and Hackleman, to a northward low of 740 feet msl just above the headwaters of Mississinewa Lake. Groundwater flow direction is generally to the west and northwest, and towards major streams in the county; the Mississinewa River and its tributaries, and Pipe Creek.

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.