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

by

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Whitley County, Indiana is located in the northeast portion of the state bounded by Kosciusko, Noble, Allen, Huntington, and Wabash counties in the west, north, east, south and southwest, respectively. Whitley County is situated within the Upper Wabash River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Whitley County was mapped by contouring the elevations of 2051 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in unconsolidated 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. Artesian wells from the unconsolidated aquifers have been located along an unnamed tributary of Eel River on the Western border of Whitley County.

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 contours were determined based on the amount of data and the degree of change in water levels between wells in each mapped area.

Data collected to generate PSM were standardized and validated for competency. Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or determined based 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 derived from LiDAR based digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Unconsolidated static water levels in Whitley County range from a high of approximately 890 feet mean sea level (msl) in the northwestern portion of the county, to a low of approximately 750 feet msl near Aboite Creek and Little River in the southeastern corner of Whitley County. Groundwater flow direction within Whitley County is generally toward Eel River for most of the county. In the northwestern portion of the county groundwater flow direction takes more of a westerly direction toward Kosciusko County. In the far southeastern corner of the county groundwater flow direction is southeast towards Aboite Creek and Little River in adjacent Allen and Huntington Counties.

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.