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The Relationship Between Static Water Levels, Bedrock Topography, and Glacial Drift Thickness for the Cedarville, Greene County, Ohio Area

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Research & Scholarship SYMPOSIUM

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Cedarville, Ohio, is an area covered in glacial deposits from the Pleistocene age. During this time, the Silurian dolomitic bedrock was exposed and worn down. Glacial till composed of sand and gravel was deposited atop the dolomite in wake of the glaciers retreat. The combination of vuggy bedrock and permeability of the overlying sediments cause the area to be very conducive to aquifer storage and movement. This study attempts to determine the relationship between bedrock topography, till thickness, and static water level, as well as the implications for future drilling. Twenty-six (26) static water levels were measured in the field using a Solinst water level meter. Forty-eight (48) bedrock elevation readings were obtained from an Ohio Department of Natural Resources database. Over 700 surface elevation points for the study area were pulled from Google Earth and cross-referenced using USGS Topo maps. Data was compiled into Excel spreadsheets and then transferred to ArcGIS. Contour maps and geologic cross sections were drawn up to determine any patterns that might arise. Analysis of the data showed that a greater volume of till led to a proportionally higher static water level in the North, East, and Southern areas of study. In the Western portion of the area, water level to till and bedrock ratios were less predictable. In general, however, water levels seemed to be highest and most easily accessible when there was a large amount of unconsolidated sediment overlying the bedrock. In terms of ease of penetration, available water, and cost efficiency, these areas would be ideal for drilling new wells.