Using *Petrel* 2007 and other Programs to Create a 3-D Geologic Model of the Quaternary Glacial Deposits in McHenry County, Illinois

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A 3-D geologic model of Quaternary glacial deposits in McHenry County, Illinois was created using *Petrel* 2007. This model was developed to better understand the stratigraphy of these units and to assess the hydrogeologic complexities within the local sand and gravel aquifer systems. Geologic data were compiled from stratigraphic borings, 1-D and 2-D geophysical data, and available water-well records. Initially, these data were visualized and interpreted in the 3-D environment using *ESRI ArcScene* and associated *ArcScene* tools developed by the Illinois State Geological Survey. These interpretations were then imported into *Petrel* 2007 to interpolate 3-D bounding surfaces of the glacial units within the study area. This model will be used to help assess groundwater resources for the county while also contributing to the overall understanding of local and regional glacial geology. Furthermore, preliminary facies models have been developed using Petrel applications, and they are valuable tools for understanding variability and uncertainty within the stratigraphic model. Petrel has historically been used mainly by the Petroleum industry for well field management and development. The results of this study indicate that Petrel also is a useful program for constructing 3D geologic models in the shallow subsurface.