5.0 Model Inputs

Hydrogeologic model construction requires geographic, geologic, and hydrologic data to produce a realistic flow model. The input data used to construct the model were derived from various published data as well as collected field data within the project area. The following is a discussion of the input data parameters.

5.1 Model Boundaries

The 50.7-square mile modeled area, shown in **Figure 4**, includes eight watershed subbasins (ERRI, 1997). The lateral boundaries of the model coincide with the surface water divides and/or hydrogeologic boundaries. At the model boundaries, it is assumed that surface water divides and groundwater divides are coincident. Consequently, all of the model boundaries are considered "no-flow" boundaries. The top boundary of the model coincides with the surface topography within the project area. A digital elevation model (DEM) was used to determine the elevation of the model's top boundary (**Figure 5**). The data used in the modeling effort was derived from the U.S. Geological Survey (USGS) National Elevation Dataset DEM coincident with the Berlin, Central City, New Baltimore, and Stoystown 7.5-minute US Geological Survey quadrangles (USGS, 2014a). The basal boundary of the model is coincident with the base of the Pottsville Group. The basal model depth was chosen based on the maximum well depths reported in the study area (DCNR, 2014).

The modeled aquifer system is comprised of a mixture of unconfined and confined aquifers based on the resultant potentiometric head configuration. For example, a shallow well may draw water from a shallow, unconfined aquifer while a deeper, neighboring well may draw from a deep, confined aquifer.

5.2 Geographic Data

The locations of surface water and other geographic features are also required for construction of the hydrogeologic model. Stream locations were imported to the model from the National Hydrography Dataset (NHD; USGS, 2014b). Elevations of the streams were derived from the digital elevation model. The hydrogeologic model treats streams as either perennial (existing year-round) or ephemeral (drying up during some periods of the year). From a modeling standpoint, the only distinction between the two types of stream is that perennial streams can either receive groundwater as base flow or contribute water to the groundwater system, whereas ephemeral streams can only receive groundwater. For modeling purposes, the streams in the study area were determined to be