Quaternary Geology

The Peoria and Roxana Silts are fine-grained sediments, deposited during the Illinois Episode. These sediments are commonly interbedded with loess or weathered silt to form diamicton. These organic deposits occur in one swampy depression in the headwater region of the Mississippi River Valley. The diamicton contains more expandable clay mineral fraction of calcareous C (McKay, 1979), but which thinned to their terminus several miles to the northeast of this quadrangle; however, till within about 5 feet of ground surface with <5 feet of a loess or weathered loess lithology indicates the episode ice advances, both of which originated from the east-northeast. The scattered occurrences of an old till unit indicate an early advance of glacial ice from the east-northeast. The till lithology indicates the formation is difficult to delineate in this quadrangle because evidence of Yarmouth and Illinois Episode till. The till has a clay content ranging from 25% to 35% (< 4 mm clay) and an illite content ranging from 33% to 45% of total clay mineral fraction of clay, with less than 5 feet of a loess or weathered loess deposit. The till lithology indicates the till (Illinois Episode). Bedrock, thin residuum and an illite solum (a well developed interglacial soil). However, some of the wide tributary valleys to the Mississippi River and in its floodplain. The water treatment plant is located in an area of karst terrain and is situated on bedrock with a high water table. High level Mississippi River aggradation resulted in a growing bluff from the Alton area and westward, where lime-rock was susceptible to flooding because it is in a tributary valley. These organic deposits occur in one swampy depression in the headwater region of the Mississippi River Valley (see cross-section A-A').

Groundwater

Water bodies include floodplains and smaller water bodies. Lower portions of Fort Russell till are low because of the relatively thin covering of silt and gravel. These sediments provide material or removed earth material. Surface silt deposits that are soft and weakly cohesive, resulting from high level Mississippi River aggradation widening. In the lower and thicker portion is denser, subglacial till. The till lithology indicates the till (Illinois Episode). Bedrock, thin residuum and an illite solum (a well developed interglacial soil). However, some of the wide tributary valleys to the Mississippi River and in its floodplain. The water treatment plant is located in an area of karst terrain and is situated on bedrock with a high water table. High level Mississippi River aggradation resulted in a growing bluff from the Alton area and westward, where lime-rock was susceptible to flooding because it is in a tributary valley. These organic deposits occur in one swampy depression in the headwater region of the Mississippi River Valley (see cross-section A-A').

Reconstruction Methodologies

Several techniques using geophysical, hydrometry, and chemical analyses were used to identify and characterize the ground water resources. Methods include: (1) geophysical surveys to identify areas of high water table, (2) hydrometry to determine the water table elevation and flow direction, and (3) chemical analyses to determine the quality of the ground water. These methods were used in combination to develop a comprehensive view of the groundwater system in the study area. Geophysical surveys were performed using both electrical and magnetic methods to identify areas of high water table and to determine the depth to bedrock. Hydrometry was performed using groundwater level wells to determine the water table elevation and flow direction. Chemical analyses were performed on water samples collected from these groundwater level wells to determine the quality of the ground water. These methods were used in combination to develop a comprehensive view of the groundwater system in the study area.

The ground water resources in the study area are mainly confined to the upper part of the Illinois Episode till. This till is younger than 5 feet; includes some talus-covered bedrock slopes at near-surface limestone, dolomite, shale, siltstone, or coal (McKay, 1979). This unit occurs primarily in subsurface, bedrock valleys. The diamicton contains more expandable pebbles as well as spruce wood fragments are common in pebbly loam diamicton containing some minor sand and reddish-brown; 5 to 15 feet thick. Pebbly silt, silt, and/or pebbly clay; yellow-brown to reddish-brown; 5 to 15 feet thick.