

Unconsolidated Aquifer Systems of Adams County, Indiana

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Six unconsolidated aquifer systems have been mapped in Adams County: the Till Veneer; the Hessen Cassel; the Bluffton Till; the Bluffton Till Subsystem; the Teays Valley and Tributary; and the Bluffton Complex (over buried valley with some potential). These systems comprise sediments deposited by, or resulting from, glaciers, glacial meltwaters, and post-glacial depositional events. Boundaries of these aquifer systems are commonly gradational, and individual aquifers may extend across aquifer system boundaries. Characteristics of the Hessen Cassel Aquifer System, and the Teays Valley and Tributary Aquifer System were previously described and mapped as part of the published Water Resource Availability in the Maumee River Basin, Indiana, Indiana Department of Natural Resources, 1996, and, therefore, are not redefined as part of the new county scale mapping.

Pre-Wisconsin and Wisconsin glacial sediments completely cover Adams County with the thickness of unconsolidated sediments being quite variable. The bedrock surface in the east-central, southwest and southeast portions of Adams County is relatively shallow. However, a deep buried bedrock valley is present in the south-central and southeast-central portions of the county, and a narrow tributary valley trends north to south through the middle of the county. Thickness of sediments overlying bedrock generally range from approximately 5 feet near the Wabash River in the southwestern portion of the county to as much as 385 feet where glacial sediments have filled pre-glacial valleys.

Regional estimates of aquifer susceptibility to contamination from the surface can differ considerably by location. Variations within geologic environments can result in a wide range of susceptibility to surface contamination. In addition, man-made structures such as poorly constructed water wells, unplugged or improperly abandoned wells, and open excavations can provide contaminant pathways that bypass the naturally protective clays.

Till Veneer Aquifer System

The Till Veneer Aquifer System has the most limited ground-water resources of the unconsolidated aquifer systems in the county. This system is mapped in portions of the southwest and southeast parts of the county in areas where the bedrock surface is shallow. The overlying unconsolidated deposits are commonly less than 50 feet.

There is little potential for ground water production in the Till Veneer Aquifer System. Nearly all wells started in this system are completed in the underlying bedrock aquifer system. Unconsolidated deposits consist primarily of clay and till materials. Where present, sand and gravel units are generally less than 5 feet thick.

This system is not very susceptible to contamination because of the low permeability of the near-surface materials. However, there are areas where the depth to bedrock is extremely shallow. These areas are slightly to moderately susceptible to contamination.

Hessen Cassel Aquifer System

The Hessen Cassel Aquifer System contains a few thin sand and gravel lenses occurring amidst thick sequences of tills and some fine-grained glaciolacustrine deposits. This aquifer system is characterized by an overall scarcity of productive zones. The sand and gravel lenses within the system are either confined within glacial till or are directly overlying bedrock. Yields for domestic wells typically range from 10 to 30 gallons per minute (gpm). There is one registered significant ground-water withdrawal facility (1 well) using the Hessen Cassel Aquifer System. Reported capacity for this well is 75 gpm. This facility provides energy production. In general, this system has low susceptibility to surface contamination.

Bluffton Till Aquifer System

The Bluffton Till Aquifer System consists of glacial till separated by thin intratill sand and gravel layers and attains a maximum thickness of approximately 80 feet. Saturated aquifer materials within this system include sand and/or gravel deposits commonly 5 to 30 feet thick.

Wells completed in this system are capable of meeting the needs of most domestic users in Adams County, however, approximately 40 percent of wells started in this system utilize the underlying bedrock aquifer. Wells producing from the Bluffton Till Aquifer System are typically 60 to 80 feet deep. Domestic well capacities are commonly 40 to 100 gpm, and static water levels generally range from 1 to 40 feet below the surface.

The Bluffton Till Aquifer System typically has a low susceptibility to surface contamination because intratill sand and gravel units are commonly overlain by thick glacial till. Shallow wells completed in this system are moderately susceptible to contamination.

Bluffton Till Aquifer Subsystem

Areas where unconsolidated materials are generally greater than 50 feet in thickness, yet have little aquifer potential, are mapped as the Bluffton Till Aquifer Subsystem. This subsystem is approximately 250 feet thick in some areas within the county. Potential aquifer materials within this system include thin intratill sand and gravel deposits.

Although a large percentage of wells in the area utilize the underlying bedrock aquifer system, the Bluffton Till Aquifer Subsystem is capable of meeting the needs of some domestic users. Well depths range from 78 to 220 feet. Potential aquifer materials include intratill sand and gravel deposits that range from 5 to 45 feet thick, and are capped by approximately 60 to 105

feet of till. Well yields range from 20 to 35 gpm, and static water levels range from 20 to 64 feet below land surface.

The Bluffton Till Aquifer Subsystem is generally not very susceptible to surface contamination because intratill sand and gravel units are overlain by thick till deposits.

Teays Valley and Tributary Aquifer System

The Teays Valley and Tributary Aquifer System lies within a buried pre-glacial bedrock valley at least 345 feet in depth, and includes outwash sand and gravel aquifer deposits that commonly range from 5 to 180 feet in thickness.

Domestic wells typically yield from 10 to 50 gpm and static water levels range from about 5 to 80 feet below surface. There is one registered significant ground-water withdrawal facility (2 wells) using the Teays Valley and Tributary Aquifer System. Reported capacities for these wells are 1650 and 2100 gpm. This facility provides public water.

This system has a low susceptibility to surface contamination because outwash sediments within the bedrock valleys are generally overlain by dense tills.

Bluffton Complex Aquifer System (over buried valley with some potential)

The Bluffton Complex Aquifer System is mapped in the south-central portion of Adams County. This system overlies a deep, well established pre-glacial valley at least 385 feet in depth and includes sand and gravel aquifer deposits that vary from relatively thin to massive in thickness and are typically overlain by thick till and clay. Wells completed in this system are typically completed at depths ranging from 60 to 250 feet, and produce from saturated aquifer materials that range in thickness from 1 to 128 feet, but are typically 5 to 35 feet thick. Static water levels range from about 10 to 55 feet below surface.

This system is capable of meeting the needs of most domestic and high-capacity users. Typical domestic well yields range from approximately 10 to 100 gpm. There are four registered significant ground-water withdrawal facilities (9 wells) using this system. Reported capacities for individual wells range from 100 to 900 gpm. The dominant use for these facilities is public water supply. Other uses include industry and irrigation.

The Bluffton Complex Aquifer System is not very susceptible to contamination where overlain by thick clay deposits. However, in some areas where surficial clay deposits are thin, the shallow aquifer, if present, is at moderate to high risk.

Registered Significant Ground-Water Withdrawal Facilities

There are six registered significant ground-water withdrawal facilities (12 wells) using unconsolidated aquifers in the county. These wells utilize the Bluffton Complex, Hessen Cassel, and Teays Valley and Tributary Aquifer Systems. Reported capacities for individual wells range from 75 to 2100 gpm. The dominant use for these facilities is public water supply. Other uses include irrigation and industry. Refer to the table for additional well details, and to the map for facility locations.

Map Use and Disclaimer Statement

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