

# **Unconsolidated Aquifer Systems of Jay County, Indiana**

By

Randal D. Maier

Division of Water, Resource Assessment Section

April 2007

Five unconsolidated aquifer systems have been mapped in Jay County: the Till Veneer; the Bluffton Till; the Bluffton Till Subsystem; the Bluffton Complex; and the Wabash River and Tributaries Outwash Subsystem. Boundaries of these aquifer systems are commonly gradational, and individual aquifers may extend across aquifer system boundaries.

Pre-Wisconsin and Wisconsin glacial sediments completely cover Jay County. However, the thickness of unconsolidated sediments is quite variable. The bedrock surface in portions of central, northeastern and southwestern Jay County is shallow. However, deep buried bedrock valleys are present throughout the county. Thickness of sediments that overlie bedrock generally range from 10 feet near the Wabash River to as much as 450 feet where glacial sediments have filled pre-glacial valleys.

Regional estimates of aquifer susceptibility to contamination from the surface can differ considerably from local reality. Variations within geologic environments can cause variation in 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 generally mapped in the central, northeast and southwest portions of the county in areas where the bedrock surface is shallow and the overlying unconsolidated deposits are commonly less than 50 feet.

There is little potential for ground water production in the Till Veneer Aquifer System in Jay County. Clay materials dominate the unconsolidated deposits, but in some isolated areas thin, fine-grained sand and gravel units, commonly less than 5 feet thick, are present. Large diameter bucket wells may be successful in meeting the needs of some domestic users. However, all reported wells in the mapped area are completed in the underlying bedrock and there are no wells that produce from the Till Veneer Aquifer System.

Because of the generally low permeability of the near-surface materials, this system is not very susceptible to contamination from surface sources. However, there are areas where bedrock is extremely shallow. These areas are moderately susceptible to contamination.

## **Bluffton Till Aquifer System**

In Jay County the Bluffton Till Aquifer System is mapped throughout the county. The system typically consists of thick clay with intermittent sands and gravels that in places are up to 220 feet in total thickness. Well depths generally range from 65 to 120 feet below surface. Potential aquifer materials include sands and/or gravels that typically range from 5 to 15 feet thick and are overlain by 50 to 110 feet of clay with intermittent sands.

In the northwest corner of Jay County this system overlies a deep, well established buried bedrock valley. Few wells are reported in this area. Depth to the bedrock surface is up to 450 feet with sand and gravel aquifer deposits about 10 feet thick. Reported domestic capacity is about 15 gallons per minute (gpm).

In the south-central portion of the county bedrock is up to 280 feet deep. However, the potential of deep sand and gravel resources is unknown.

The Bluffton Till Aquifer System is capable of meeting the needs of domestic and some high-capacity users. Domestic well capacities are generally 10 to 20 gpm. Static water levels are commonly 25 to 45 feet below surface. This aquifer system is generally not very susceptible to surface contamination because intratill sand and gravel units are overlain by thick till deposits.

## **Bluffton Till Aquifer Subsystem**

The Bluffton Till Aquifer Subsystem is mapped throughout most of Jay County. The subsystem is mapped similar to that of the Bluffton Till Aquifer System. However, potential aquifer materials are thinner and potential yield is less in the subsystem than the Bluffton Till Aquifer System.

Although approximately 92 percent of wells in the area utilize the underlying bedrock aquifer system, the subsystem is capable of meeting the needs of some domestic users. Well depths range from 50 to 150 feet. Potential aquifer materials include thin, intratill sand and gravel deposits that are generally less than 6 feet thick and are capped by 45 to 95 feet of till. Well yields are generally less than 10 gpm and static water levels range from 10 to 80 feet below land surface. The subsystem is generally not very susceptible to surface contamination because intratill sand and gravel units are overlain by thick till deposits.

## **Bluffton Complex Aquifer System**

The Bluffton Complex Aquifer System is mapped in the northwest corner and portions of the southern half of Jay County. This system includes unconsolidated deposits that are quite variable in materials and thickness. Sand and gravel aquifer deposits vary from thin to massive and are typically overlain by a thick till. In places the system also exhibits multiple layers of outwash and till above the primary aquifer resource.

Typical well depths range from 70 to 140 feet. Reported aquifer materials are up to 120 feet thick. However, typical aquifer thicknesses are 5 to 25 feet. These aquifer deposits are commonly overlain by till with intermittent sands and gravels that are generally 35 to 120 feet thick. The multiple intermittent sands and gravels range from 1 to 50 feet thick but are typically less than 15 feet.

In the northwest and south-central portions of the county the Bluffton Complex overlies pre-glacial valleys as deep as 450 feet to the northwest and 310 feet in the southern mapped area. Deep aquifer materials range from 3 to 60 feet thick with reported yields ranging from 5 to 150 gpm. Static water levels range from 20 to 89 feet below surface.

The Bluffton Complex Aquifer System is capable of meeting the needs of domestic and high-capacity users. Typical domestic yields range from 15 to 60 gpm. Static water levels commonly range from 10 to 45 feet below surface. This aquifer system is not very susceptible to contamination because thick clay deposits overlie aquifer materials.

### **Wabash River and Tributaries Outwash Aquifer Subsystem**

The Wabash River and Tributaries Outwash Aquifer Subsystem is mapped along two sections of the Salamonie River; one to the west of Portland and another west of Pennville. There are very few wells completed in this subsystem. However, several test and production wells for the Town of Pennville note adequate potential for domestic and some high-capacity users. Well depths are generally 60 feet below surface. Aquifer materials are commonly capped by silt, sandy clay, or clay ranging from 10 to 30 feet thick. Sand and gravel aquifer deposits generally range from 25 to 55 feet thick. There is one registered significant water withdrawal facility (2 wells) in the outwash subsystem in Jay County. Yield for each well is 160 gpm and static water levels are 13 feet below surface.

Areas within these aquifer systems that have overlying clay or silt deposits are moderately susceptible to surface contamination; whereas, areas that lack overlying clay or silt deposits are highly susceptible to contamination.

### **Map Use and Disclaimer Statement**

We request that the following agency be acknowledged in products derived from this map:  
Indiana Department of Natural Resources, Division of Water.

This map was compiled by staff of the Indiana Department of Natural Resources, Division of Water using data believed to be reasonably accurate. However, a degree of error is inherent in all maps. This product is distributed “as is” without warranties of any kind, either expressed or implied. This map is intended for use only at the published scale.