UNCONSOLIDATED AQUIFER SYSTEMS OF RIPLEY COUNTY, INDIANA

INDIANA DEPARTMENT OF NATURAL RESOURCES

EXPLANATION

- Registered Significant Groundwater Withdrawal Facility
- Stream
- County Road
- State Road & US Highway
- Interstate
- Municipal Boundary
- USGS Closed Contours (Mostly Karst Depressions)
- Jefferson Proving Ground
- State Managed Property
- Lake & River

1 0.5 0 1 Mile

1 0.5 0 1 Kilometer

Location Map

Dissected Till and Residuum Aquifer System

Muscatatuck Plateau / Dearborn Upland Till Aquifer System

Muscatatuck Plateau / Dearborn Upland Till Aquifer Subsystem

Three unconsolidated aquifer systems have been mapped in Ripley County: the Dissected Till and Residuum, the Muscatatuck Plateau / Dearborn Upland Till, and the Muscatatuck Plateau / Dearborn Upland Till Aquifer Subsystem. These aquifer systems comprise sediments that were primarily deposited by (or resulted from) glaciers and their meltwaters, or are thin, eroded residuum (a product of bedrock weathering). Boundaries of these aquifer systems are commonly gradational and individual aquifers may extend across aquifer system boundaries. Generally, the most notable physical differences between the aquifer systems in this county are the thickness of saturated aquifer materials and the total thickness of unconsolidated materials.

The thickness of unconsolidated sediments in Ripley County is quite variable. In much of the county, especially in the south, unconsolidated materials overlying bedrock are typically less than 30 feet thick. However, in northeastern Ripley County, because glacial deposits are generally thicker than they are in the rest of the county, the thickness of unconsolidated materials exceeds 110 feet in places.

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.

The Dissected Till and Residuum Aquifer System, which covers about 95 percent of Ripley County, has the most limited groundwater resources of the unconsolidated aquifer systems in the county. Unconsolidated materials of this aquifer system predominantly consist of thin, eroded bedrock residuum and pre-Wisconsin tills. Also included in this aquifer system in many stream valleys are relatively thin deposits of alluvium and colluvium. Total thickness of this system in the county typically ranges from about 10 to 50 feet.

There is little potential for water production in the Dissected Till and Residuum Aquifer System in Ripley County. However, this aquifer system is commonly chosen for well development rather than the underlying bedrock. Large-diameter bored (bucket-rig) wells are typically used in this county to produce water from thin sands within the predominantly clay and silt materials of this aquifer system. These sands are commonly less than 2 feet thick; however, in places there are several thin sand seams separated by tills within the saturated zone. Static water levels in this aquifer system are typically between 14 and 26 feet below land surface. Commonly constructed at depths of 30 to 50 feet with 30-inch diameter porous casing, these wells are built to maximize storage. Thus, although these wells typically yield only 0.5 to 3 gallons per minute (gpm), they are generally adequate for livestock and domestic use. The Dissected Till and Residuum Aquifer System is transected by the Muscatatuck Plateau Till / Dearborn Upland Till Aquifer Subsystem. The boundaries between these systems are transitional in many areas of the county. Because of the generally low permeability of the near-surface materials, this system is not very susceptible to contamination from surface sources.

The Muscatatuck Plateau / Dearborn Upland Till Aquifer System is mapped in two small areas in the northern part of Ripley County. The unconsolidated deposits overlying bedrock consist of dominantly pre-Wisconsin glacial materials that range in thickness from 20 to more than 65 feet.

This aquifer system is capable of meeting the needs of domestic and some high-capacity users in Ripley County. Wells in the Muscatatuck Plateau / Dearborn Upland Till Aquifer System are completed at depths from 30 to 92 feet. However, most wells are commonly completed with 30-inch diameter porous casing to allow for maximum storage with depths ranging from 35 to 50 feet. Potential aquifer materials within the glacial till include discontinuous intratill sand and gravel units. Individual sand and gravel units within this system typically range from 8 to 30 feet thick capped with 4 to 28 feet of clay. Domestic well yields are typically 10 to 35 gpm and static water levels range from 6 to 24 feet below the land surface. There are 2 registered significant groundwater withdrawal facilities (5 wells) using the Muscatatuck Plateau / Dearborn Upland Till Aquifer System. The reported yields for the high-capacity wells range from 150 to 300 gpm.

The Muscatatuck Plateau / Dearborn Upland Till Aquifer System has a low susceptibility to surface contamination because intertill sand and gravel units are generally separated from the surface by till layers within the system.

The Muscatatuck Plateau / Dearborn Upland Till Aquifer Subsystem is mapped as several small areas, mostly located in the northern part of Ripley County. The subsystem is mapped similar to the Wabash Lowland Till Aquifer System. However, potential aquifer materials are generally thinner and potential yields are less in the subsystem.

In adjacent counties, this aquifer system is a limited resource, as evidenced by the lack of wells actually producing from the available unconsolidated deposits. However, in Ripley County, nearly all of the reported wells penetrating this system were completed in unconsolidated materials rather than in the underlying bedrock. Potential aquifer materials within the glacial till include discontinuous intratill sand and gravel units. Individual sand and gravel units within this system typically range from 2 to 14 feet thick and are capped with 10 to 40 feet of clay. Wells in the Muscatatuck Plateau / Dearborn Upland Till Aquifer Subsystem are commonly completed at depths ranging from 35 to 60 feet with 30-inch diameter porous casing to allow for maximum storage. Static water levels are typically 14 to 28 feet below land surface, so multiple saturated sand and/or gravel units are commonly utilized in a single well. Domestic wells typically yield from 1 to 10 gpm.

This subsystem is generally not very susceptible to surface contamination because intertill sand and gravel units are generally overlain by thick till deposits. Wells producing from shallow aquifers are moderately to highly susceptible to contamination.

Map generated by Jennifer Mc Millan, 2004
Updated by Scott H. Dean, 2011
IDNR, Division of Water, Resource Assessment Section

Map Use and Disclaimer Statement

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This map was created from several existing shapefiles. Township and Range Lines of Indiana (line shapefile, 20020621), Land Survey Lines of Indiana (polygon shapefile, 20020621) and County Boundaries of Indiana (polygon shapefile, 20050621), were all from the Indiana Geological Survey and based on a 1:24,000 scale. Draft road shapefiles, System1 and System2 (line shapefiles, 2003), were from the Indiana Department of Transportation and based on a 1:24,000 scale. Populated Areas in Indiana 2000 (polygon shapefile, 20021000) was from the U.S. Census Bureau and based on a 1:100,000 scale. Streams27 (line shapefile, 20000420) was from the Center for Advanced Applications in GIS at Purdue University. Managed Areas 96 (polygon shapefile, various dates) was from IDNR. Unconsolidated Aquifer Systems coverage (Schrader, 2004; modified, Scott, 2010) was based on a 1:24,000 scale.

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