

Water Resources and Use in Miami County

Data Sources: U.S. Geological Survey and Indiana Department of Natural Resources

| Withdrawal Location | | River |
|---------------------|--------|----------------|
| WELL | INTAKE | 7Q2 Flow (MGD) |
| ● | ▼ | < 10 MGD |
| ● | ▼ | 10 - 50 MGD |
| ● | ▼ | 50 - 100 MGD |
| ● | ▼ | 100 - 500 MGD |
| ● | ▼ | > 500 MGD |

| | | |
|---|---|---------------|
| ● | ▼ | Energy/Mining |
| ● | ▼ | Industry |
| ● | ▼ | Irrigation |
| ● | ▼ | Misc. |
| ● | ▼ | Public Supply |
| ● | ▼ | Rural Use |

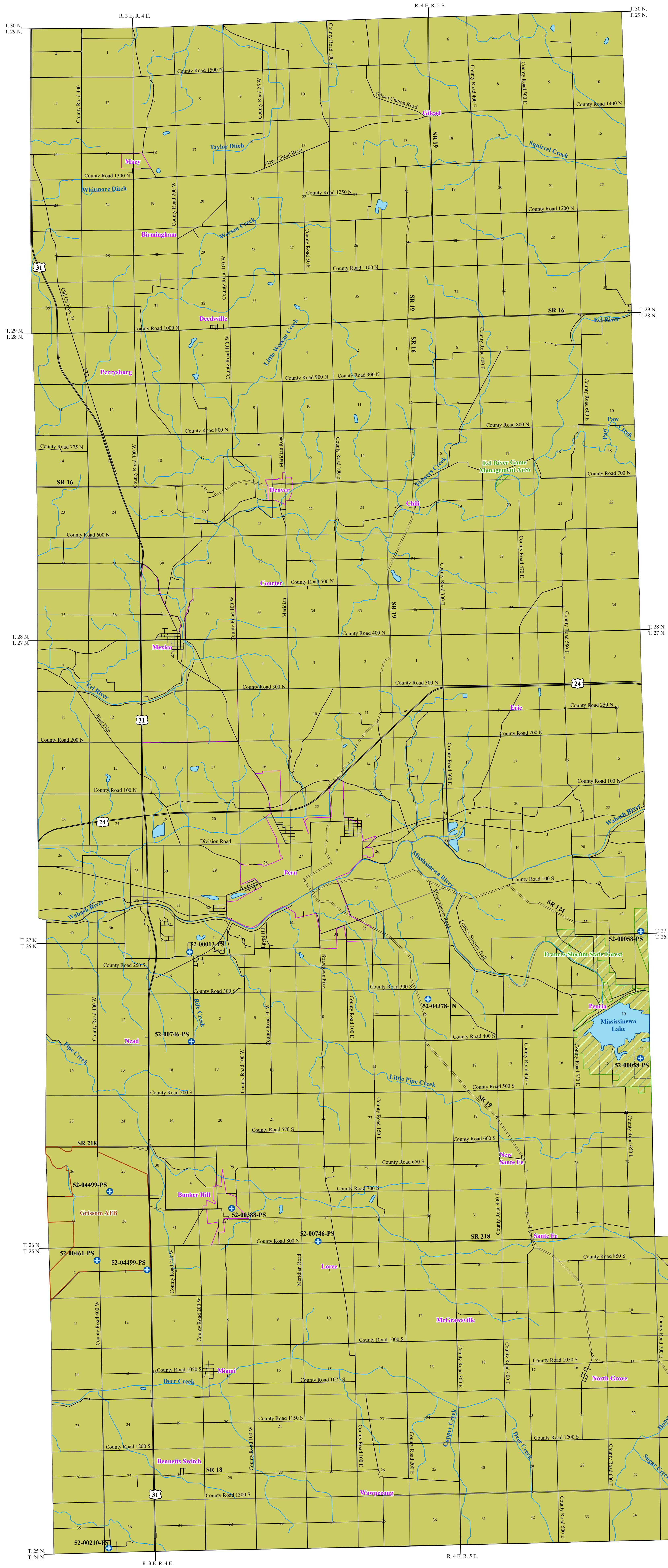
| | |
|---|-------------|
| ■ | Major Lakes |
| — | Interstate |
| □ | County |
| ⊠ | City |

INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

NORTH

0 1 2 4 Miles

BEDROCK AQUIFER SYSTEMS OF MIAMI COUNTY, INDIANA



The occurrence of bedrock aquifers depends on the original composition of the rocks and subsequent changes which influence the hydraulic properties. Post-depositional processes which promote jointing, fracturing, and solution activity of exposed bedrock generally increase the hydraulic conductivity (permeability) of the upper portion of bedrock aquifer systems. Because permeability in many places is greatest near the bedrock surface, bedrock units within the upper 100 feet are commonly the most productive aquifers.

One bedrock aquifer system is identified for Miami County: the Silurian and Devonian Carbonates. Rock types exposed at the bedrock surface include moderately productive to prolific limestones and dolomites with varying amounts of interbedded shale. Bedrock wells represent about 60 percent of all wells completed in this county. Most of the bedrock aquifers in Miami County are under confined conditions. In other words, the potentiometric surface (water level) in most wells completed in bedrock rises above the top of the water-bearing zone.

The Silurian and Devonian Carbonates Aquifer System in Miami County is overlain by unconsolidated deposits of varying thickness, ranging from less than one foot to over 350 feet. In general, the thickness of unconsolidated deposits increases from south to north. However, segments of the Mississinewa River and Wabash River valleys are cut into bedrock.

The yield of a bedrock aquifer depends on its hydraulic characteristics and the nature of the overlying deposits. Shale and clay act as aquitards, restricting recharge to underlying bedrock aquifers. However, fracturing and jointing may occur in aquitards, which can increase recharge to the underlying aquifers. Hydraulic properties of the bedrock aquifers are extremely variable.

The susceptibility of bedrock aquifer systems to surface contamination is largely dependent on the type and thickness of the overlying sediments. However, because bedrock aquifer systems may have complex fracturing systems, once a contaminant has been introduced into a bedrock aquifer system, it will be difficult to track and remediate.

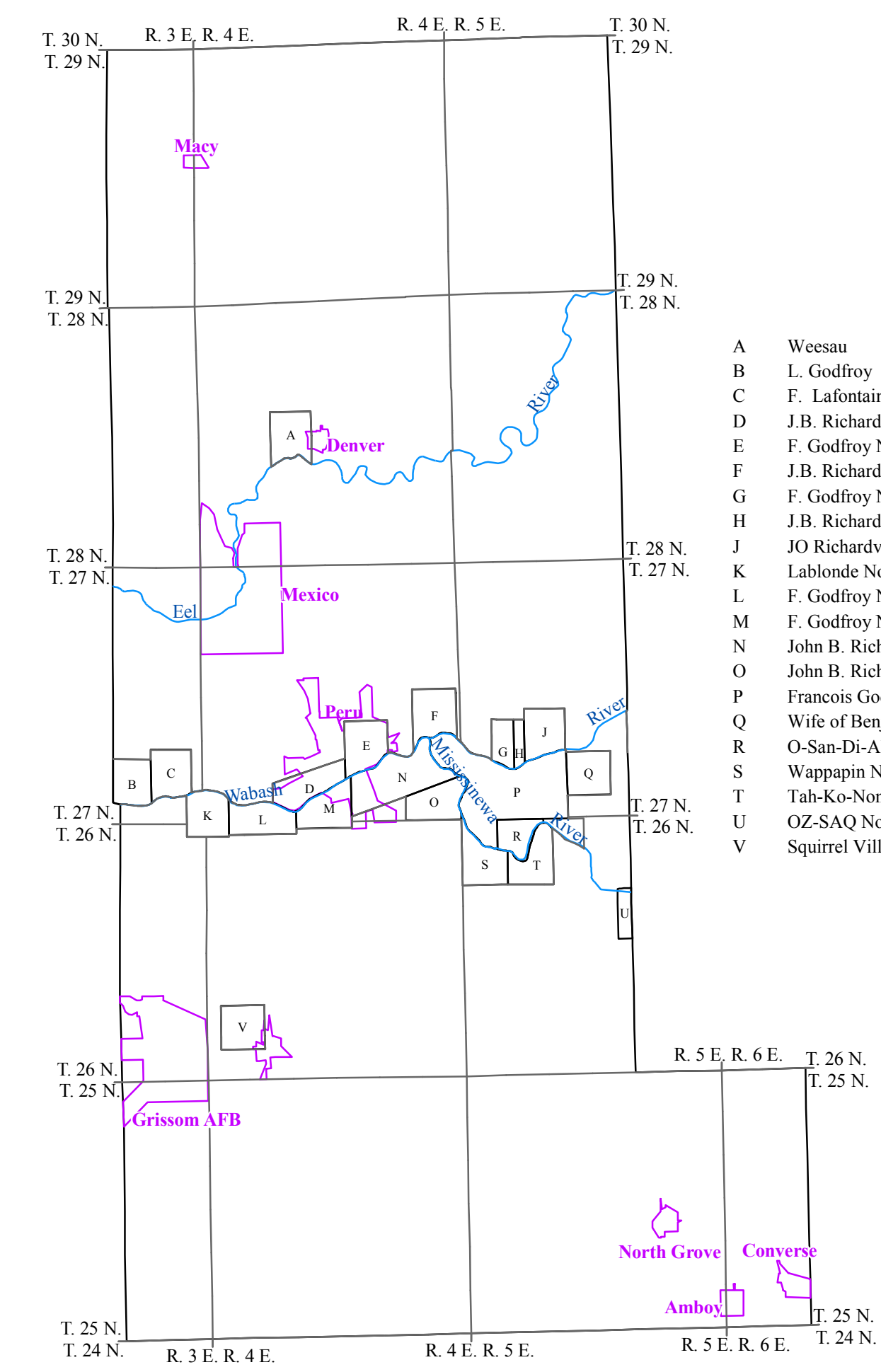
Silurian and Devonian Carbonates Aquifer System

The Silurian and Devonian Carbonates Aquifer System outcrops/subcrops throughout all of Miami County. The system includes carbonate rock units (limestone and dolomite) with some interbedded shale units. In Miami County, the system consists of the Pleasant Mills formation and Wabash formation of Silurian age, and the Moscatook group of Devonian age. The total thickness of the Silurian and Devonian Carbonates Aquifer System in the county ranges from about 100 feet to over 500 feet.

Wells penetrating the Silurian and Devonian Carbonates Aquifer System in this county have reported depths ranging from 35 to 500 feet, but are commonly 80 to 170 feet deep. The amount of rock penetrated in this system typically ranges from 35 to 120 feet.

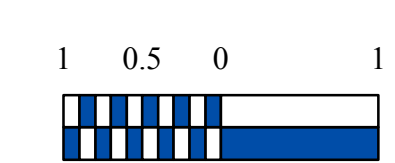
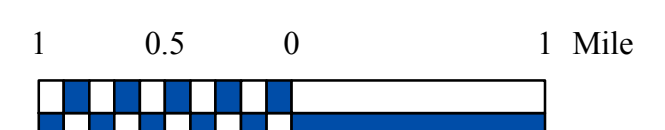
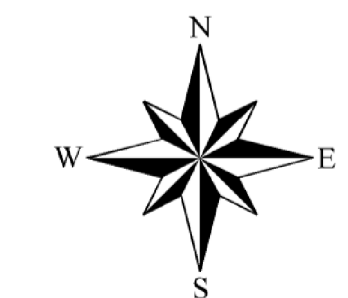
Wells completed in the Silurian and Devonian Carbonates Aquifer System are capable of meeting the needs of domestic and some high-capacity users in this county. Domestic well yields commonly range from 15 to 50 gallons per minute (gpm). Static water levels typically range from 15 to 60 feet below the land surface with a few reports of flowing wells in the county. There are 9 registered significant ground-water withdrawal facilities (25 wells) using the Silurian and Devonian Carbonates Aquifer System in Miami County. Reported high-capacity well yields range from 76 to 950 gpm. The dominant use for these facilities is public water supply.

This aquifer system is generally not very susceptible to surface contamination due to thick clay deposits over most of the county. However, areas where overlying clays are thin or absent are at moderate to high risk to contamination.

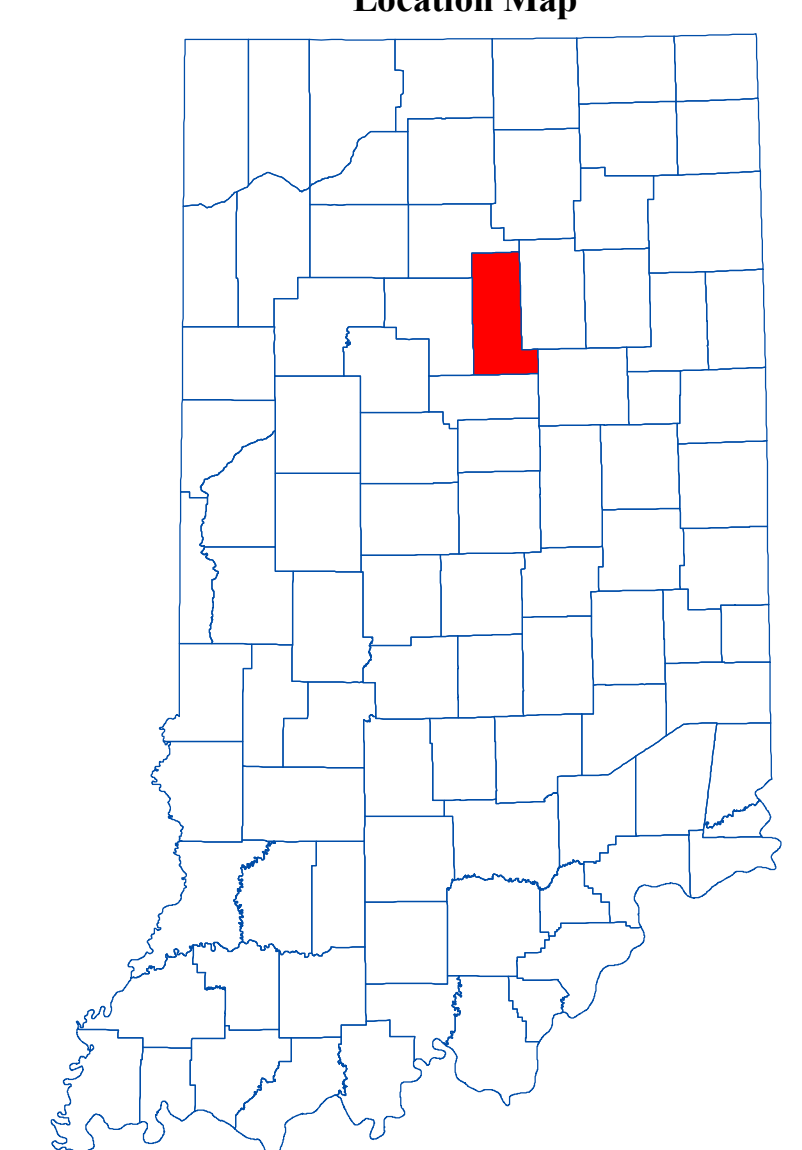
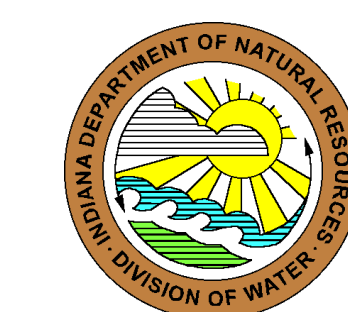


EXPLANATION

- Registered Significant Ground-Water Withdrawal Facility
- Stream
- County Road
- State Road & US Highway
- Municipal Boundary
- State Managed Property
- U.S. Military Base
- Lake & River



Location Map



Map Use and Disclaimer Statement

Map generated by Shirley A. Fitzwater and Andrew G. Dunkman
IDNR, Division of Water, Resource Assessment Section

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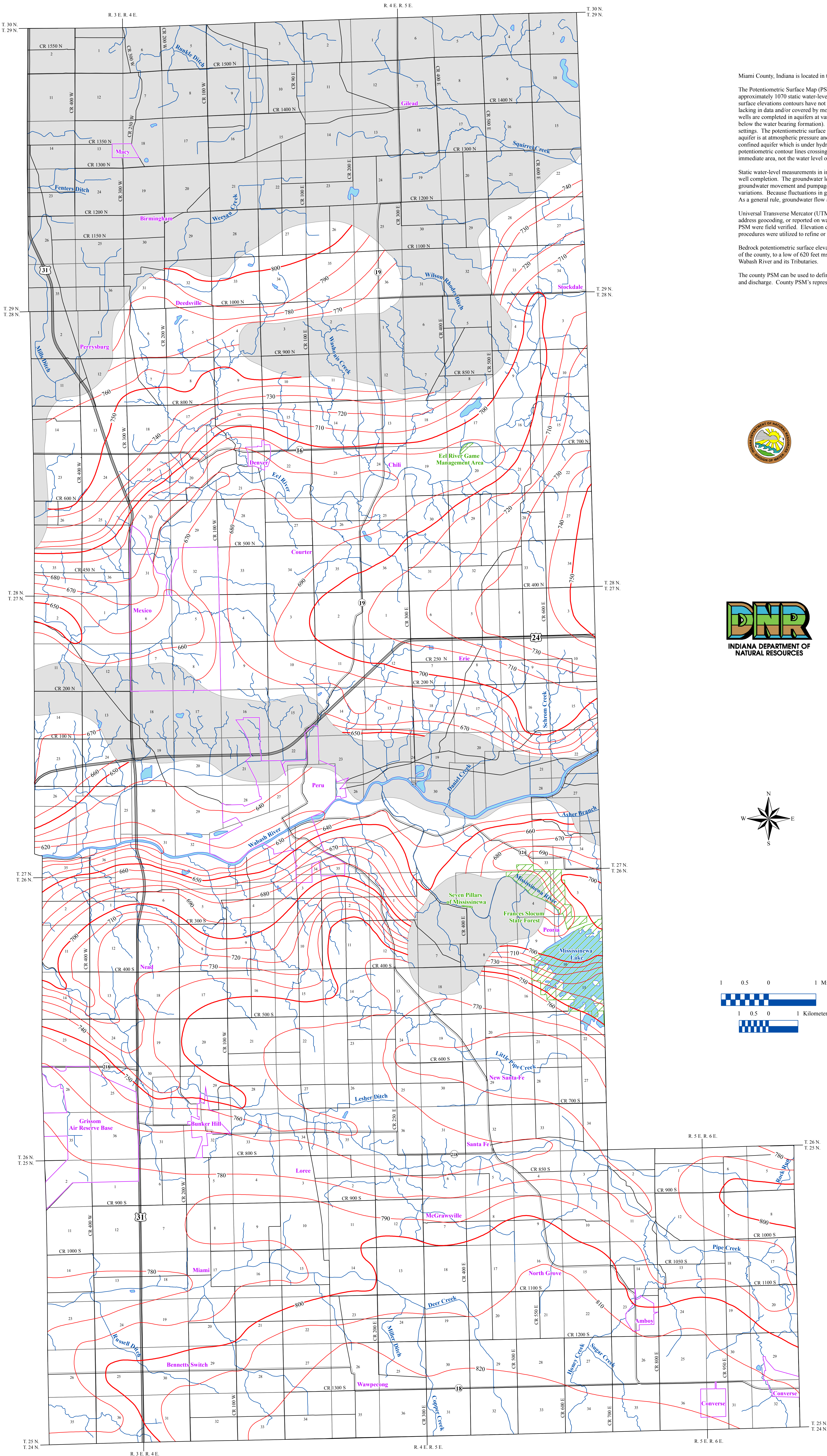
This map was created from several existing shapefiles. Township and Range Lines of Indiana (line shapefile, 20020621), Land Survey Lines of Indiana (polygon shapefile, 20020621) and County Boundaries of Indiana (polygon shapefile, 20020621), were all from the Indiana Geological Survey and based on a 1:24,000 scale, except the Bedrock Geology of Indiana (polygon shapefile, 20020318), which was at a 1:500,000 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.

Bedrock Aquifer Systems of Miami County, Indiana

by
Gerald A. Unterreiner
Division of Water, Resource Assessment Section

November 2007

POTENTIOMETRIC SURFACE MAP OF THE BEDROCK AQUIFERS OF MIAMI COUNTY, INDIANA



Miami County, Indiana is located in the north-central section of the state and lies within the Upper Wabash River Basin.

The Potentiometric Surface Map (PSM) of the bedrock aquifers of Miami County was mapped by contouring the elevations of approximately 1070 static water-levels reported on well records received primarily over a 50 year period. The bedrock potentiometric surface elevations contours have not been extended through some portions of northern and central Miami County. These areas are lacking in data and/or covered by more prolific unconsolidated deposits that limit the necessity to complete wells in bedrock. These wells are completed in aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer is at atmospheric pressure and will not rise in a well above the top of the water bearing formation, in contrast to water in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation. The potentiometric contour lines crossing through Missisquoi Lake represent the potentiometric surface of the groundwater in the immediate area, not the water level of the reservoirs, which are man-made features.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement and pumping. Therefore, measured static water-levels in an area may differ due to local or seasonal variations. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. As a general rule, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

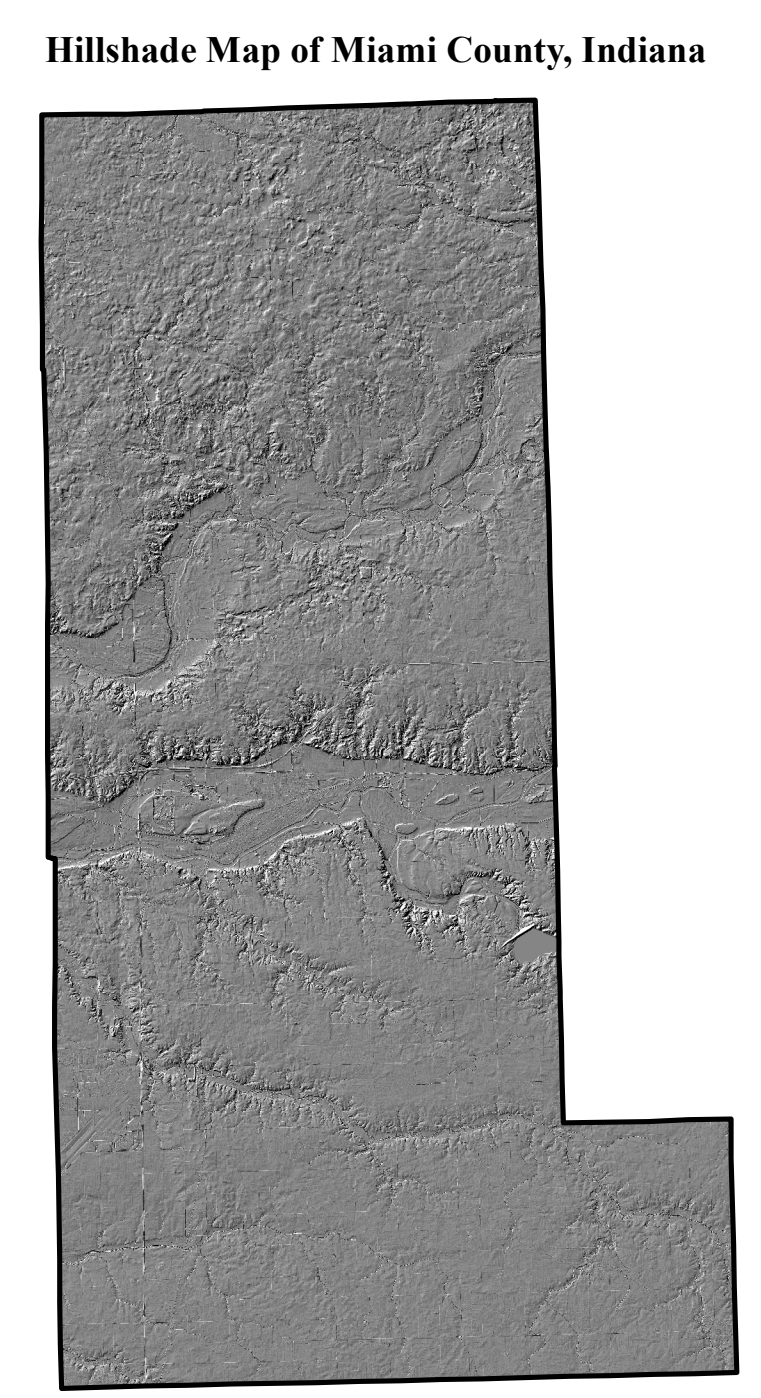
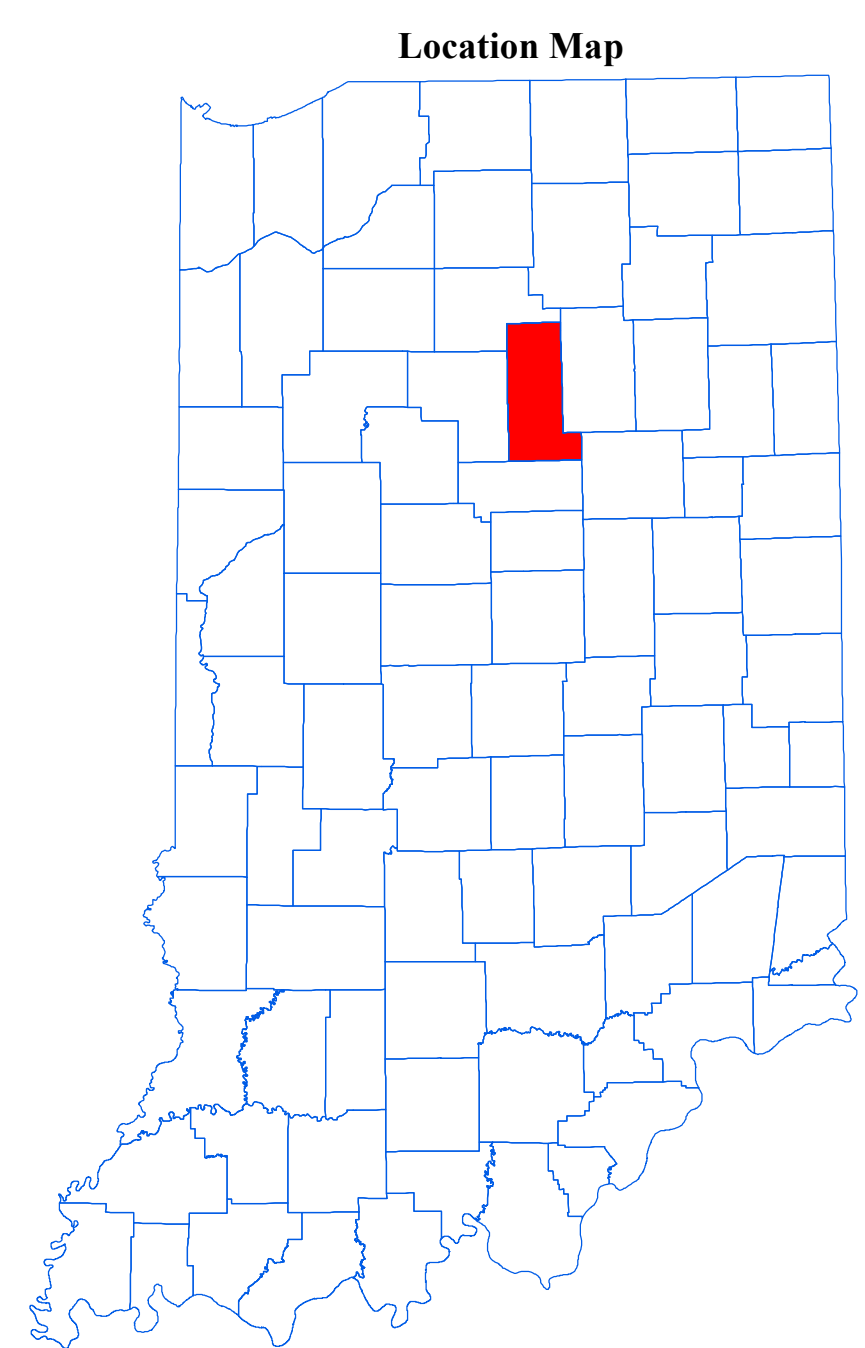
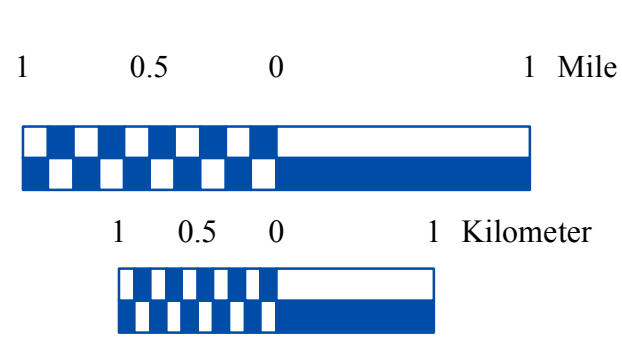
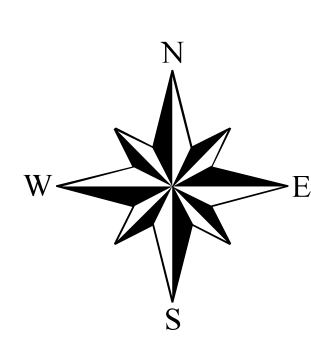
Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records; however, the location of the majority of the water well records used to make the PSM were field verified. Elevation data were obtained from a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Bedrock potentiometric surface elevations in Miami County range from a high of 820 feet mean sea level (msl) in the southern section of the county, to a low of 620 feet msl along the west-central edge of the county. Groundwater flow direction is generally toward the Wabash River and its Tributaries.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.



- EXPLANATION**
- Line of equal elevation, in feet above mean sea level
 - Potentiometric Contour interval 10 feet
 - Stream
 - County Road
 - State Road
 - US Highway
 - Municipal Boundary
 - State Managed Property
 - Lake & River
 - No Aquifer Material or Limited Data



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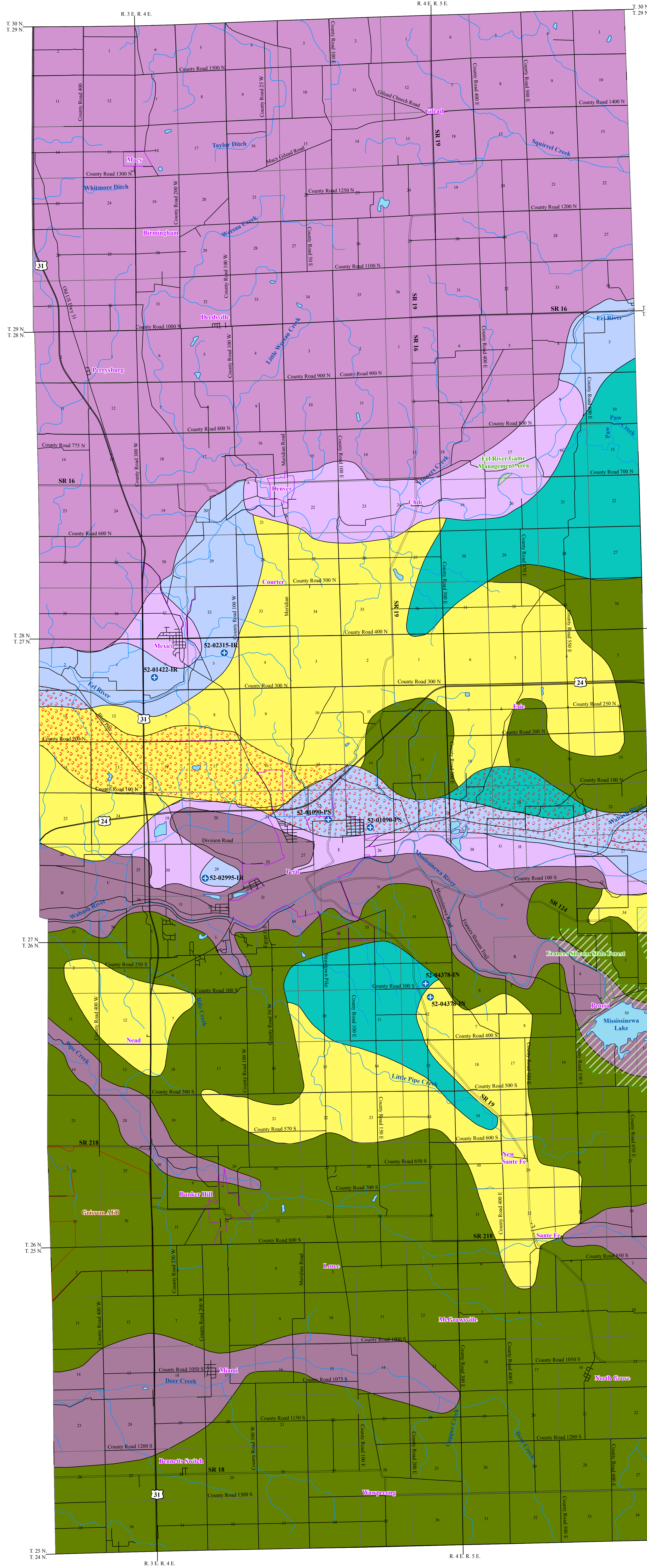
Map generated by Joel D. Sanderson
IDNR, Division of Water, Resource Assessment Section

Potentiometric Surface Map of the Bedrock Aquifers of Miami County, Indiana
by
Glenn E. Grove
Division of Water, Resource Assessment Section

June 2013

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, 20020621), 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. Hydrography, Streams (NHD) (line shapefile, 20081218), Rivers (NHD) (polygon shapefile, 20081218), Lakes (NHD) (polygon shapefile, 20081218) was from the U.S. Geological Survey and the U.S. Environmental Protection Agency, and based on a 1:24,000 scale. Managed Lands IDNR: N (polygon shapefile, 20100920) was from the Indiana Department of Natural Resources and based on a 1:24,000 scale. Digital Elevation Model image is derived from the Indiana OrthoLiDAR Statewide Collection Program (2011). Bedrock No Aquifer Material and Limited Data (polygon shapefile, Grove 2013) Potentiometric Surface Map of the Bedrock Aquifers of Miami County, Indiana (line shapefile, Grove, 2013) was based on a 1:24,000 scale.

UNCONSOLIDATED AQUIFER SYSTEMS OF MIAMI COUNTY, INDIANA



Seven unconsolidated aquifer systems have been mapped in Miami County: the Till Veneer, the Bluffton Till, the Bluffton Till Subsystem, the Bluffton Complex, the Natural Lakes and Moraines, the Wabash River and Tributaries Outwash System, and the Wabash River and Tributaries Outwash Subsystem. These systems comprise sediments deposited by resulting from glacial, glacial meltwaters, and postglacial precipitation events. Boundaries of these aquifer systems are commonly gradational, and individual aquifers may extend across aquifer system boundaries.

The thickness of unconsolidated deposits in Miami County is quite variable, because glacial material has been deposited over an uneven bedrock surface. In general, the thickness of unconsolidated deposits increases from south to north in Miami County and is over 360 feet thick south of Gilead. However, segments of the Mississippian River and Wabash River valleys are cut into bedrock. The thickness of unconsolidated sediments exceeds 250 feet in a buried bedrock valley, which cuts across the center of the county from east to west before turning slightly northward.

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

In Miami County, the Till Veneer Aquifer System encompasses areas where the unconsolidated material is predominantly thin till overlying bedrock. This system also includes thin alluvium overlying bedrock along some of the major streams. The Till Veneer Aquifer System is mapped, in places, within the southern half of Miami County. This system has the most limited ground-water resources of the unconsolidated aquifer systems in the county. Total thickness of the Till Veneer Aquifer System generally ranges from about 25 to 50 feet.

Nearly all wells started in the Till Veneer Aquifer System in Miami County are completed in the underlying bedrock. Potential aquifers within this system include shallow sand and/or gravel layers. The few wells completed in the Till Veneer Aquifer System in this county range from 34 to 48 feet deep.

This system is generally not very susceptible to contamination from surface sources because of the low permeability of the near-surface materials. However, there are areas where protective clay layers are thin or absent. These areas are very susceptible to contamination.

Bluffton Till Aquifer System

The Bluffton Till Aquifer System primarily consists of glacial till with intratill sand and gravel layers. In Miami County, this aquifer system ranges in thickness from about 50 feet to over 250 feet.

Wells completed in the Bluffton Till Aquifer System are capable of meeting the needs of most domestic and some high-capacity users in Miami County. However, 5 percent of wells started in this system utilize the underlying bedrock aquifer. Saturated aquifer materials include sand and/or gravel deposits that are commonly 10 to 20 feet thick and are generally overlain by 10 to 50 feet of till. Wells producing from the Bluffton Till Aquifer System are typically 70 to 140 feet deep. Domestic well capacities are commonly 15 to 60 gallons per minute (gpm). Static water levels generally range from 30 to 80 feet below the surface. There is 1 registered significant ground-water withdrawal facility using the Bluffton Till Aquifer System. The facility's two wells in this system each have a reported pumping rate of 60 gpm.

This system overlies part of a buried bedrock valley northwest of Peru. The wells completed in this portion of the system produce from both shallow and deep aquifers, and range in depth from 100 to 250 feet. Saturated sand and gravel layers are typically 10 to 20 feet thick.

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 limited aquifer potential, are mapped as the Bluffton Till Aquifer Subsystem in Miami County. The subsystem in this county ranges from about 45 feet to 200 feet thick. However, the depth to bedrock is generally less than 100 feet. Potential aquifer materials include intratill sand and gravel deposits. Where present, aquifer materials are typically capped by till that is commonly 15 to 60 feet thick.

More than 90 percent of wells started in the Bluffton Till Aquifer Subsystem in Miami County are completed in the underlying bedrock aquifer system. However, this subsystem is capable of meeting the needs of some domestic users in the county. The few wells producing from the Bluffton Till Aquifer Subsystem are completed at depths of 45 to 190 feet. Intratill sand and gravel aquifer materials are typically about 10 feet thick. Domestic well yields are commonly 10 to 15 gpm and static water levels are generally 15 to 50 feet below the surface.

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

Bluffton Complex Aquifer System

The Bluffton Complex Aquifer System is characterized by unconsolidated deposits that are quite variable in materials and thickness. Aquifers within the system range from thin to thick and include single or multiple intratill sands and gravels. The aquifers are highly variable in depth and lateral extent and are typically confined by thick clay layers. The total thickness of unconsolidated deposits ranges from about 50 feet to over 250 feet.

This system is capable of meeting the needs of domestic and high-capacity users in Miami County. Saturated aquifer materials in the Bluffton Complex Aquifer System are generally 10 to 30 feet thick and are overlain by a till cap which is commonly 30 to 70 feet thick. Wells in this system are typically completed at depths ranging from 60 to 120 feet. Domestic well yields are commonly 15 to 60 gpm and static water levels are generally 25 to 70 feet below the surface. There is 1 registered significant ground-water withdrawal facility utilizing this system. The facility's one high-capacity well has a reported pumping rate of 240 gpm.

This system overlies part of a buried bedrock valley east of Peru, just north of the Wabash River valley. The few wells completed in this portion of the system produce from both shallow and deep aquifers, and range in depth from 70 to 175 feet. In places, the total saturated thickness of the aquifer exceeds 80 feet.

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.

Natural Lakes and Moraines Aquifer System

In Miami County, the Natural Lakes and Moraines Aquifer System normally contains at least two potential sand and gravel aquifers, one near the surface, the other at depth. In places, the near-surface aquifer is absent and surficial clays over 100 feet thick are present. The total thickness of unconsolidated deposits in this system in Miami County ranges from about 110 to over 360 feet.

This system is capable of meeting the needs of domestic and some high-capacity users in Miami County. Wells completed in the Natural Lakes and Moraines Aquifer System range in depth from 30 to 360 feet but are typically completed at depths ranging from 75 to 150 feet. Sand and gravel aquifers are generally 10 to 15 feet thick and are overlain by a till cap which is commonly 60 to 140 feet thick. Domestic well yields are typically 10 to 60 gpm and static water levels are generally 20 to 50 feet below the surface.

The near-surface aquifers of the Natural Lakes and Moraines Aquifer System are highly susceptible to surface contamination where they are directly connected to surficial sands and gravels. The deeper sand and gravel aquifers are generally overlain by thick clay deposits and are slightly susceptible to contamination.

Wabash River and Tributaries Outwash Aquifer System

The Wabash River and Tributaries Outwash Aquifer System is mapped along sections of the Wabash River and Ellettsville River in Miami County. Sand and gravel from the melting glaciers (outwash) were deposited in the stream valleys. The total thickness of unconsolidated deposits in this system is over 200 feet in this county.

This system is capable of meeting the needs of domestic and high-capacity users in Miami County. Wells in the Wabash River and Tributaries Outwash Aquifer System are typically completed at depths ranging from 50 to 130 feet. Sand and gravel aquifers are commonly 15 to 50 feet thick and are generally capped by silt, sandy clay, or clay ranging from 5 to 50 feet thick. However, in many places, the protective cap layer is missing and unsaturated sand and gravel deposits lie above the productive aquifer. Domestic well yields in the Wabash River and Tributaries Outwash Aquifer System are commonly 15 to 60 gpm and static water levels are generally 10 to 30 feet below the surface. There are 4 registered significant ground-water withdrawal facilities (7 wells) in this system in Miami County. Reported capacities range from 300 to 2100 gpm.

In places, this system overlies segments of a deep buried bedrock valley. The wells completed in this portion of the system produce from both shallow and deep sand and gravel aquifers, and range in depth from 30 to 175 feet. In places, the total saturated thickness exceeds 100 feet.

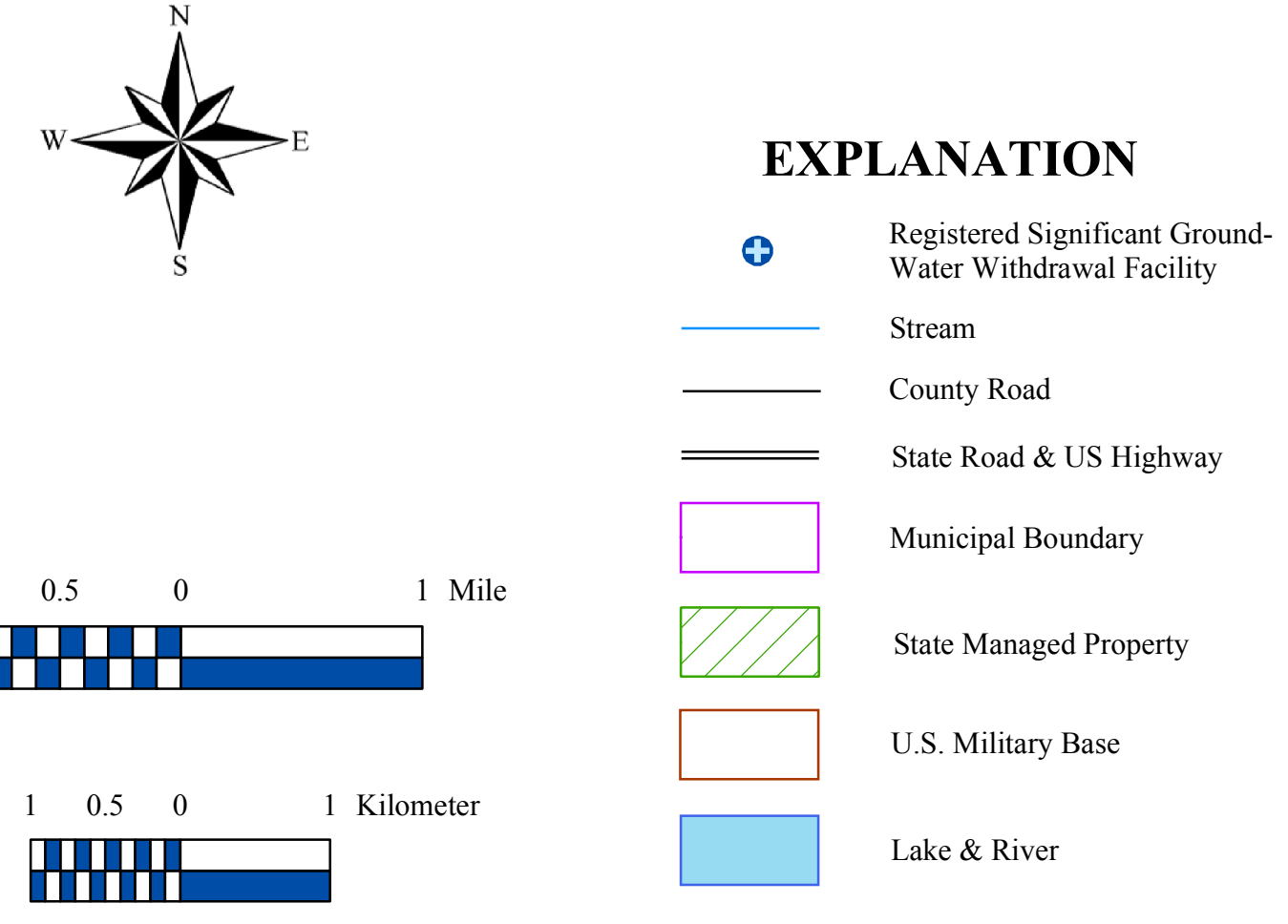
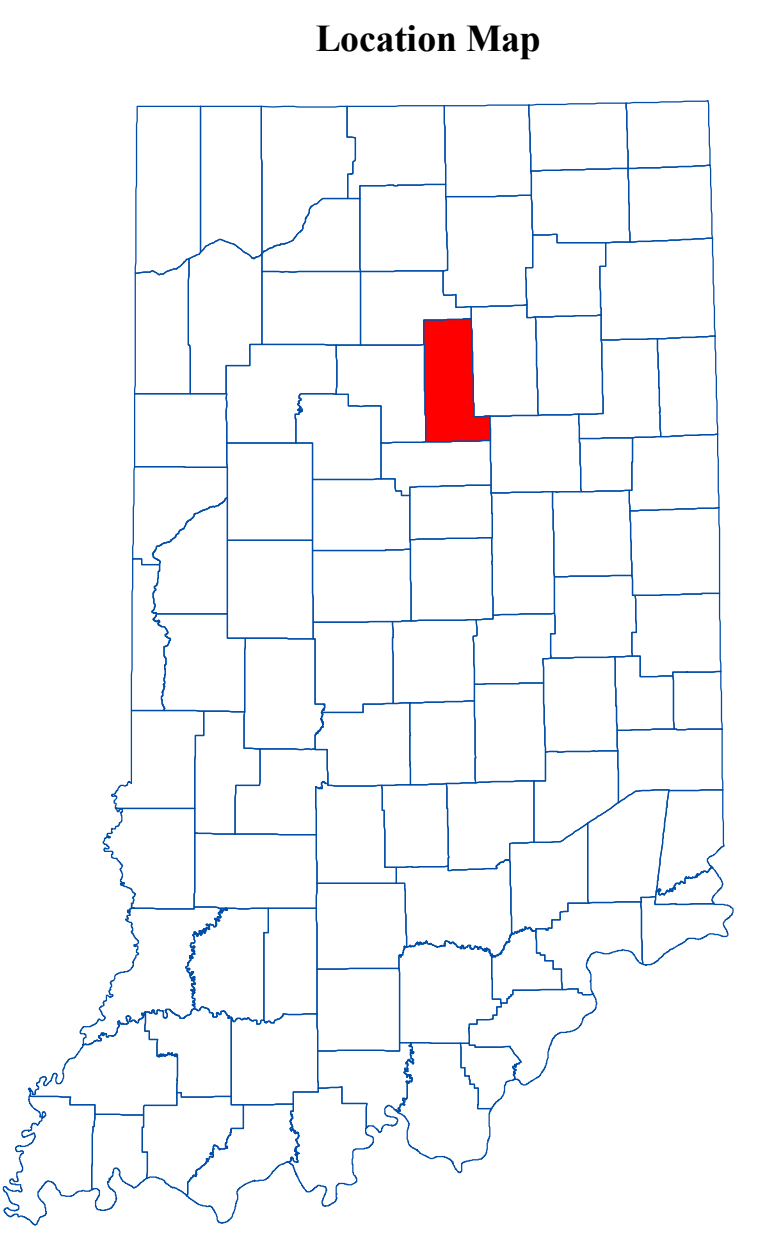
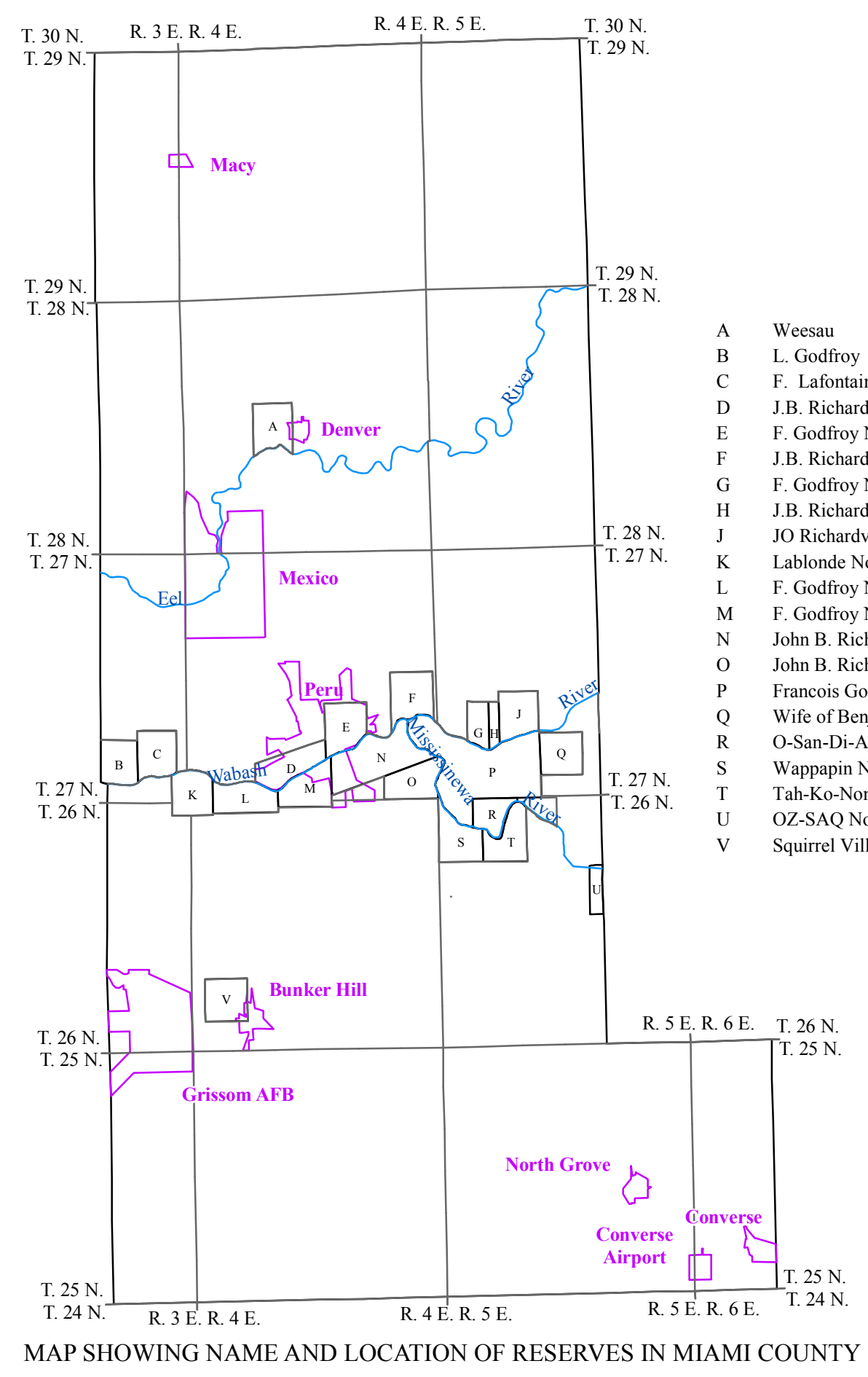
This system is moderately susceptible to surface contamination where overlying clay or silt deposits are present. However, areas that lack overlying clay or silt deposits are highly susceptible to contamination.

Wabash River and Tributaries Outwash Aquifer Subsystem

In Miami County, the Wabash River and Tributaries Outwash Aquifer Subsystem is mapped along portions of the Wabash River and Ellettsville River. Total thickness of unconsolidated deposits overlying bedrock ranges from about 45 to over 200 feet.

The Wabash River and Tributaries Outwash Aquifer Subsystem has the potential to meet the needs of domestic and some high-capacity users. The wells in this system are typically completed at depths ranging from 40 to 70 feet. Saturated aquifer materials include sand and gravel deposits that are commonly 10 to 20 feet thick. Domestic well yields typically range from 15 to 60 gpm with static water levels of 10 to 35 feet below the surface.

The aquifer materials in the Wabash River and Tributaries Outwash Aquifer Subsystem are generally overlain by 5 to 30 feet of silt or clay. However, in many places, this layer is missing and unsaturated sand and gravel deposits lie above the productive aquifer. Areas within this aquifer system 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.



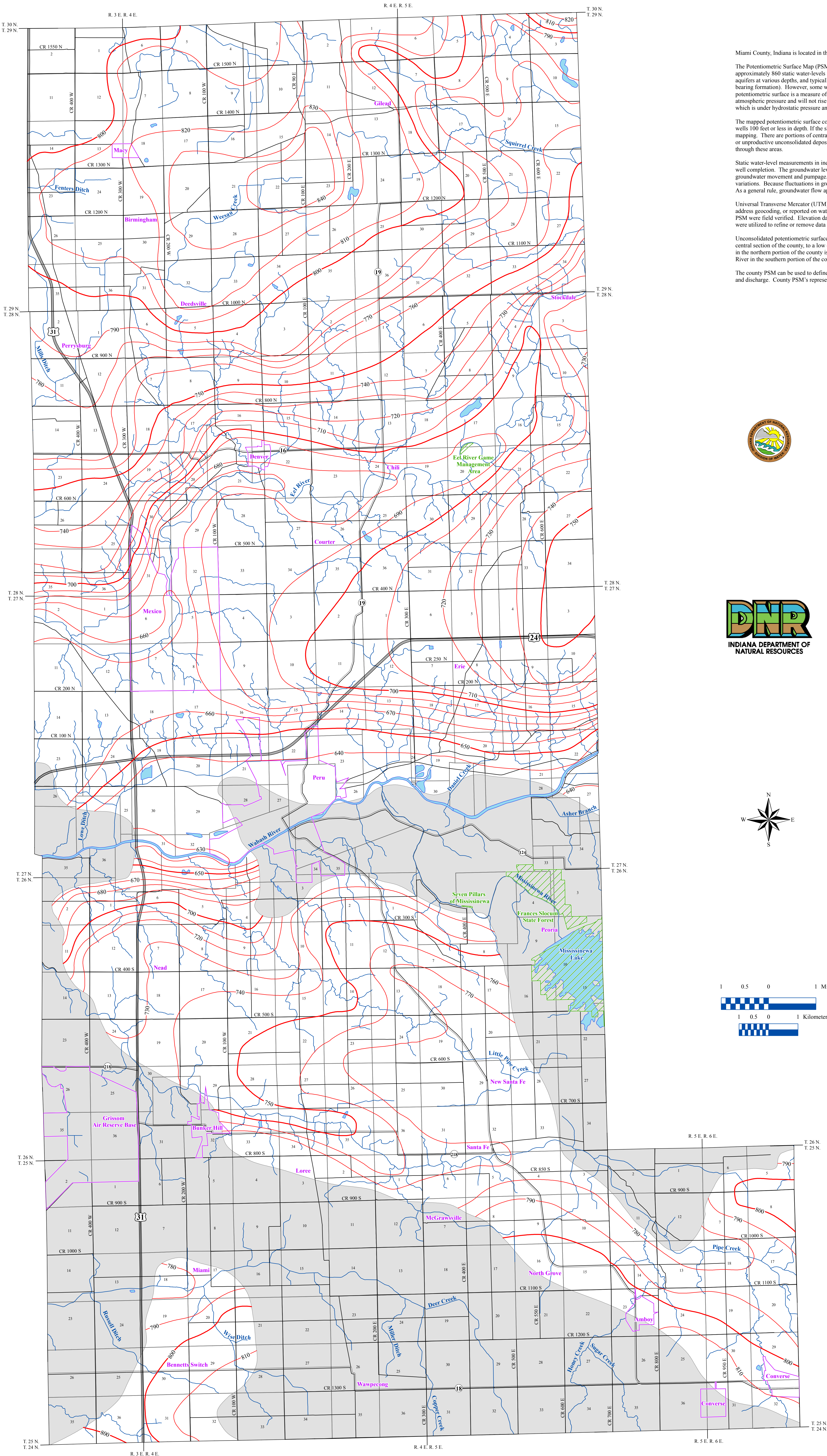
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Unconsolidated Aquifer Systems of Miami County, Indiana
 by
 Gerald A. Unterreiner
 Division of Water, Resource Assessment Section
 November 2007

POTENTIOMETRIC SURFACE MAP OF THE UNCONSOLIDATED AQUIFERS OF MIAMI COUNTY, INDIANA



Miami County, Indiana is located in the north-central section of the state and lies within the Upper Wabash River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Miami County was mapped by contouring the elevations of approximately 800 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer is at atmospheric pressure and will not rise in a well above the top of the water bearing formation, in contrast to water in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

The mapped potentiometric surface contours are primarily for the upper 100 feet of the unconsolidated materials and utilize data for wells 100 feet or less in depth. If the shallow data was sparse or unavailable in an area, deeper wells were used to complement the mapping. There are portions of central and southern Miami County where unconsolidated well data is lacking and/or covered by thin or unproductive unconsolidated deposits and the unconsolidated potentiometric surface elevations contours have not been extended through these areas.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement and pumping. Therefore, measured static water-levels in an area may differ due to local or seasonal variations. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. As a general rule, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

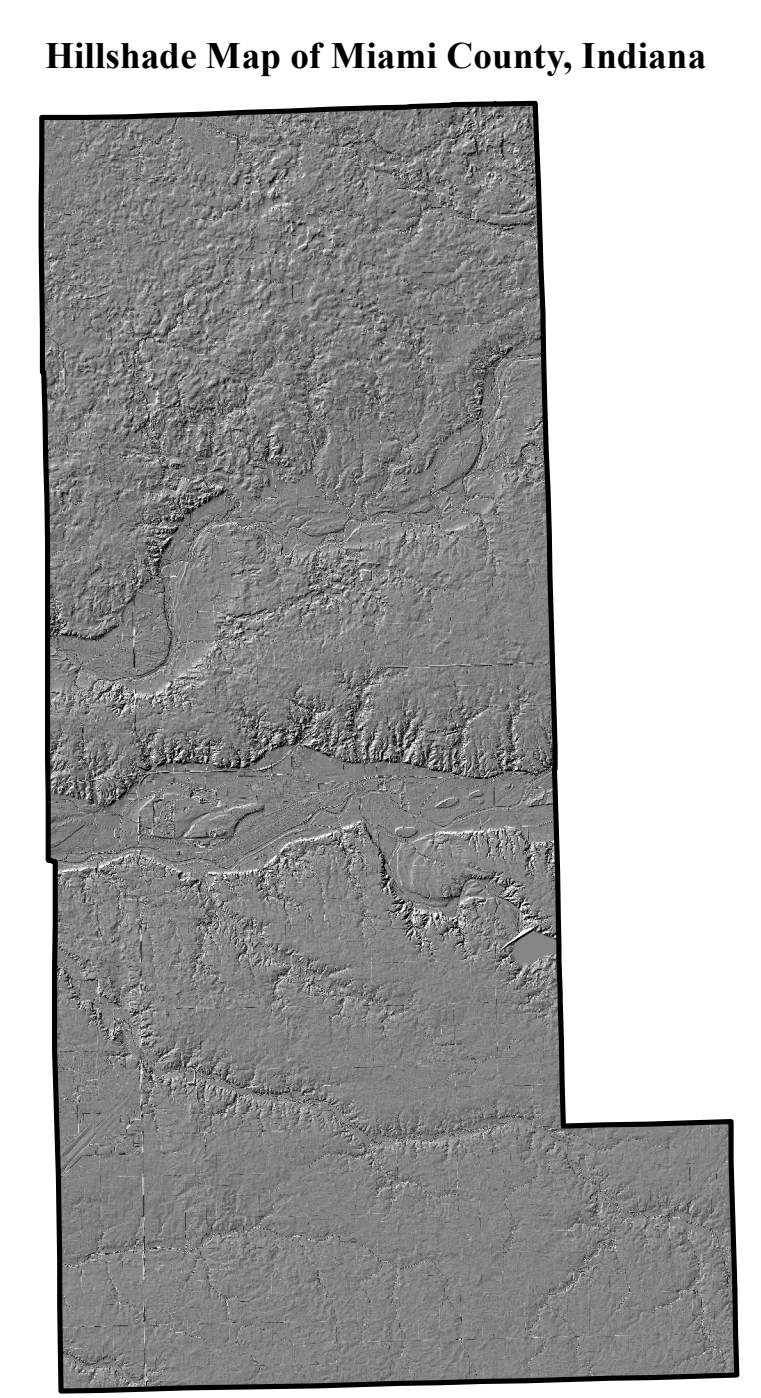
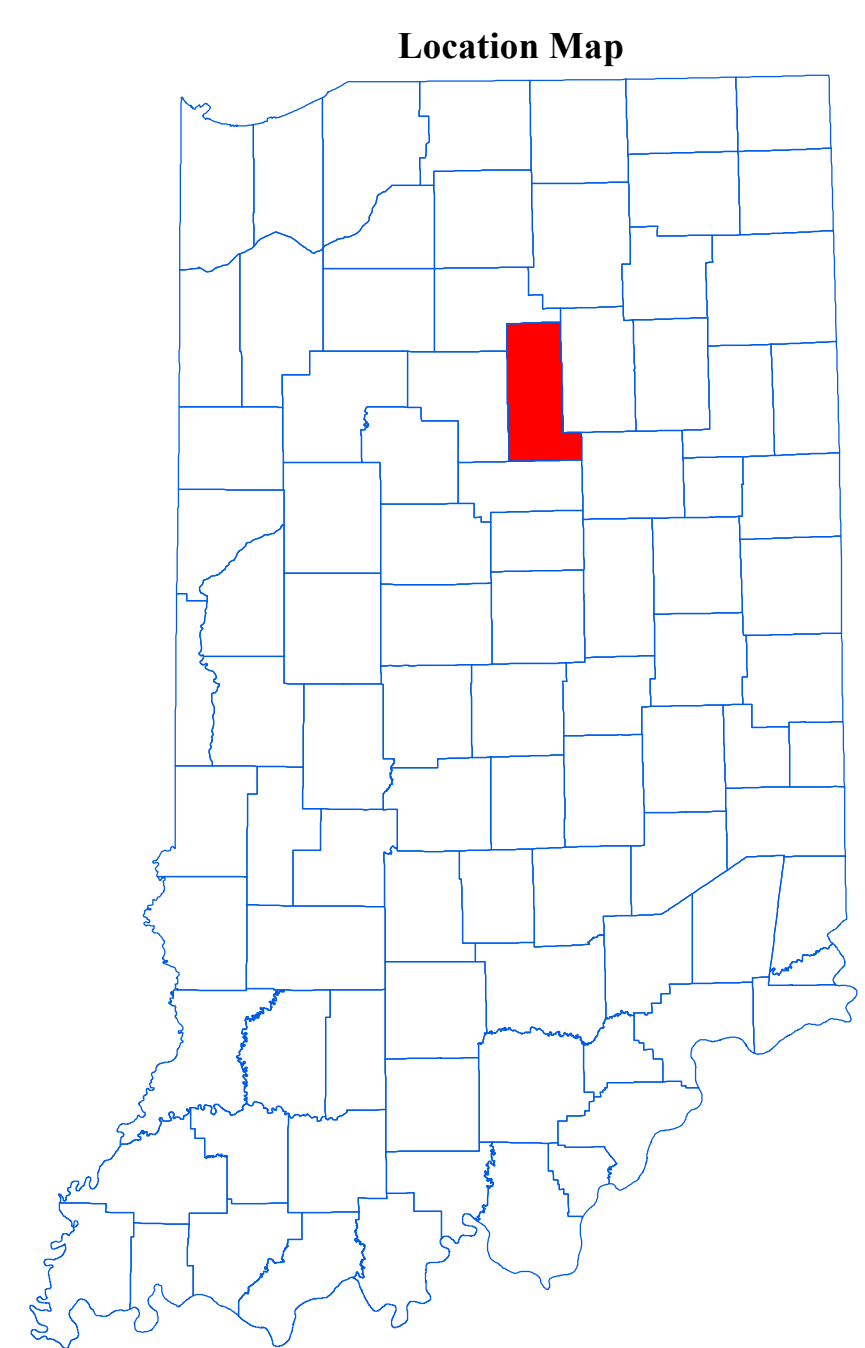
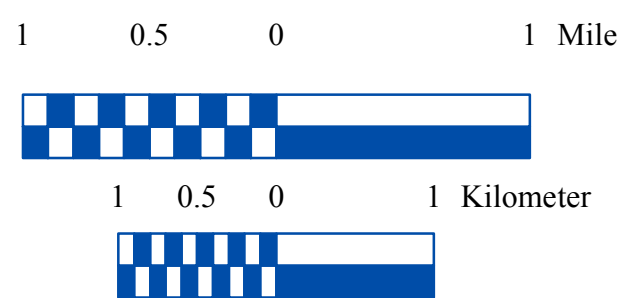
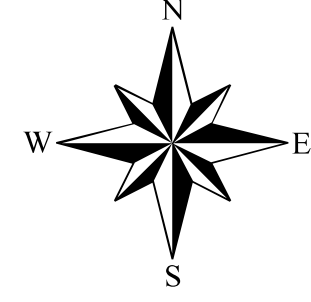
Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records; however, the location of the majority of the water well records used to make the PSM were field verified. Elevation data were obtained from a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Unconsolidated potentiometric surface elevations in Miami County range from a high of 840 feet mean sea level (msl) in the north-central section of the county, to a low of 630 feet msl in the west-central portion along the Wabash River. Groundwater flow direction in the northern portion of the county is generally to the south-southeast toward the Eel River and north-northwest toward the Wabash River in the southern portion of the county.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.



- EXPLANATION**
- Line of equal elevation, in feet above mean sea level
 - Potentiometric Contour interval 10 feet
 - Stream
 - County Road
 - State Road
 - US Highway
 - Municipal Boundary
 - State Managed Property
 - Lake & River
 - No Aquifer Material or Limited Data



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.

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, 20020621), 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. Hydrography, Streams (NHID) (line shapefile, 20081218), Rivers (NHID) (polygon shapefile, 20081218), Lakes (NHID) (polygon shapefile, 20081218) was from the U.S. Geological Survey and the U.S. Environmental Protection Agency, and based on a 1:24,000 scale. Managed Lands (IDNR: N) (polygon shapefile, 20100920) was from the Indiana Department of Natural Resources and based on a 1:24,000 scale. Digital Elevation Model image is derived from the Indiana OrthoLIDAR Statewide Collection Program (2011). Unconsolidated No Aquifer Material and Limited Data (polygon shapefile, Grove 2013) Potentiometric Surface Map of the Unconsolidated Aquifers of Miami County, Indiana (line shapefile, Grove, 2013) was based on a 1:24,000 scale.

Potentiometric Surface Map of the Unconsolidated Aquifers of Miami County, Indiana
by
Glenn E. Grove
Division of Water, Resource Assessment Section

June 2013

Miami County

