

2020 MUSKINGUM COUNTY COMPREHENSIVE PLAN

Compiled by: Muskingum County Planning Commission

Natural Resources Report

Natural Resources Task Force

Identifying our Natural Resources

The natural resources of Muskingum County have been inventoried extensively by local, state and federal agencies as well as producers. Data has been selected and combined to create about ten maps that present the extent and significance of the water, fossil fuels, soil productivity, and land cover. These are grouped into map sets 1) Surface Water Features; 2) Ground Water Availability; 3) Fossil Fuel Deposits; and 4) Land Productivity, Cover and Uses.

Surface Water Features Map Set

The set of two maps reveals the abundance of water provided by rainfall distributed evenly throughout the year.

1. Watersheds and Hydrologic Features

- Twelve major watersheds define the local stream drainage areas all of which are part of the Muskingum
- River Basin. Within each watershed, the ponds, lakes, streams and rivers are located.
- Major issues of surface water quality are sedimentation, acid drainage, and accelerated runoff.
- Streams and rivers have been greatly modified by channelization, navigation, and flood control.
- Wetlands areas have been greatly reduced by drawing and filling, but significant remaining areas are important to wildlife and water management.

2. Flood Hazard Zones and Slopes of 25% and Greater

- Flooding is the single greatest natural hazard to property and life in the county. Steep slopes present barriers to operation of equipment and control of erosion and storm water.
- Landslides are common, especially during wet seasons. These conditions produce hazards to utilities, structures and the water quality of streams, as well as safety hazards for operation of equipment.

Ground Water Availability Map Set

This set of three maps reveals the qualities of water available in geologic information. All of the sources must be drilled and pumped to be available. The recharge of the resources from infiltration of surface water is very slow. The pollution hazard indicates how vulnerable the ground water quality is to activities on the ground surface.

1. Depth to Ground Water Source Map

- Depth to ground water is an indication of the costs of drilling and pumping to obtain water.

2. Ground Water Yields Map (Gallons per Day)

- This is the amount of water that can be pumped on a continuous basis without depleting the aquifer. Most of the county area has relatively low yields adequate only for domestic use. Some areas are depleted by mining or contaminated by oil and gas drilling. Major aquifers parallel the large streams and valleys.

3. Ground Water Pollution Potential Map (DRASTIC)

- The DRASTIC model for evaluating ground water pollution was developed in 1987 by the US Environmental Protection Agency (EPA). The DRASTIC rating is based on 7 characteristics that are used to generate the DRASTIC Pollution Potential Index (DPPI). The higher the DPPI, the higher the pollution potential. The DPPI is useful when comparing more than one area. DRASTIC is an acronym for the following parameters used to develop a rating for a particular area: D - Depth to Water, R - Net Recharge, A - Aquifer Media, S - Soil Media, T - Topography, I - Impact of the Vadose Zone (Vadose is type of wetland soil), and C - Conductivity (Hydraulic) of Aquifer. The DRASTIC model would suggest that the greatest potential for pollution to water lies along the Muskingum River and Wakatomika Creek.
- Most drilling is into hard rock formations, but some valley aquifers are gravel and sand.
- Industrial and public well water fields are concentrated along major stream valleys. Significant contamination of ground water has occurred from industrial waste, old landfills, unsealed and abandoned wells, nutrients from farms and wastewater disposal. But generally ground water is safe and low cost.

Fossil Fuel Deposits Map Set

The fossil fuel set of maps illustrates the abundance of energy available from coal, oil and natural gas. The coal seams of the Pennsylvanian age rocks have been mined by deep shaft and drift mining and by strip mining. Massive amounts of coal are still remaining at greater depths. Oil and gas reserves are more spotty, and at greater depths.

1. Oil, Gas and Mineral Rights Map

- The mineral rights and location of oil and gas wells indicate the distribution of holdings of the energy reserves. Those areas on this map designated as "mineral rights" are taken from the Muskingum County Auditor's database. They represent an area where an individual owns the actual land and another individual/company owns the mineral rights under that property. Not indicated is the outright ownership by energy companies of

about one fourth of the land in the county. Large blocks of land are held for future mining in Adams, Monroe, Madison, Meigs, Rich Hill and Blue Rock Townships.

2. Inactive Fossil Fuel, Gravel, Sand and Limestone Mining Sites Map

- The map of abandoned underground mines, unrealized unreclaimed and reclaimed surface mining indicates the impact of coal mining on the character of the county. Underground mines are sometimes subject to collapse and subsidence or release of acid mine water.
- Surface mining has left a variety of mine soils that may not be productive or useful for future development.

Land Productivity, Cover and Uses Map Set

The land use set of three maps indicates the current land cover, the important farmland soils and the taxable land use categories for local property tax use.

1. Current Land Cover Map (Forest, Pasture, Cropland and Other)

- The land cover map is based on aerial photo analysis of vegetative cover and inferred land use. Tree cover is dominant in the county and represents a variety of conditions from young forest succeeding after farming has ceased to mature hardwood or conifer stands of timber. Pasture, hay land or range (reclaimed mine soils) are all grassland cover, some utilized for livestock, but much is mainly wildlife habitat. Crop land areas are mainly the less sloping, cultivated fields used for corn, soybeans, wheat, or fruit and vegetable production. Other areas are less extensive such as residential, parks, industrial, commercial, or urban uses.

2. Prime Farmland Soils of Muskingum County Map (map located after Agriculture Task Force section) The important farmland soils map is a ranking of soil resources according to their ability to produce cultivated crops without damage to the environment. Prime farmland soils are mostly level to gently sloping, deep, fertile soils. Soil productivity is based on:

- Ability to store and supply moisture (AWC)
- Ability to store and release nutrients (CEC) Protection from flooding (flood hazard)
- Protection from high water table (drainage)
- Protection from erosion (<6-8% slope)
- Not urban or developed
- Total prime farmland soils in Muskingum County in 1988 were 88,000 Acres or 21.0% of the land area.
- Locally important farmland soils are nearly as productive for farming as prime but do not meet some criteria. These are mostly more sloping soils subject to excessive erosion if

cultivated, but well suited to grazing or hay crop production. Locally important soils were 91,000 acres or 21.7% of land area in 1988. 113,634 acres in 2020 or 26.4% of land.

3. Current Land Use for Taxation (map located after section on “History of Muskingum County”)

Eleven classes are recognized based on tax parcel appraisals by the Muskingum County Auditor:

- All other value is mostly untaxed public property such as the Zanesville Airport Agriculture is land enrolled in the (CAUV) Current Agricultural Use Valuation program that sets the tax rate based on farmland productivity rather than appraised valuation.
- Commercial is land use for commercial business such as retail or recreation. Residential is land used for dwellings
- Mine is land that is held and used for mining of underground resources; mainly limestone
- Industrial is land used for manufacturing or warehousing, but includes sand and gravel and limestone operations.
- Cemeteries - nontaxable parcels
- Schools and churches – nontaxable parcels
- Passive means no active use of land, no structures or management – most parcels are held for coal resources
- Abated is mostly industrial or commercial parcels that have tax abatement agreements
- Parks – Public lands – not taxed

Book:

The Home Water Supply; by Stu Campbell

Recommendations by Natural Resources Task Force

In the ten years that have passed since the initial comprehensive plan the natural resource base has not changed much. The land use on that base has changed some. Increased development and the change in weather patterns as well as the intensity of rainfall has increased the need for stormwater management. The management of stormwater is needed from both an erosion and water quality standpoint.

The use of land for mining and for oil and gas extraction has been reduced because of economic and regulatory factors. These could change when different conditions are present. Deep well shale oil and gas extraction has increased the need for injection well sites. If the injection wells are not sited properly they can pose a potential hazard to ground water.

Impairments and impacts to surface water have come to light because of the blue green algae issue in Lake Erie and the dead zone or hypoxia zone in the Gulf of Mexico. In the coming years, water quality will become an increasingly larger issue because of land use impacts on it. Based on information from USGS only 2.5% of the water on earth is considered freshwater.

There was also some discussion about recycling to help reduce waste and potential surface water pollution.

Purpose:

The Natural Resources Task Force recognizes that the natural resources of Muskingum County have been inventoried extensively by local, state, and federal agencies as well as local private industry associated with mining and drilling. Data has been selected and combined to create ten maps that present the extent and significance of water, fossil fuels, soil productivity, and land cover.

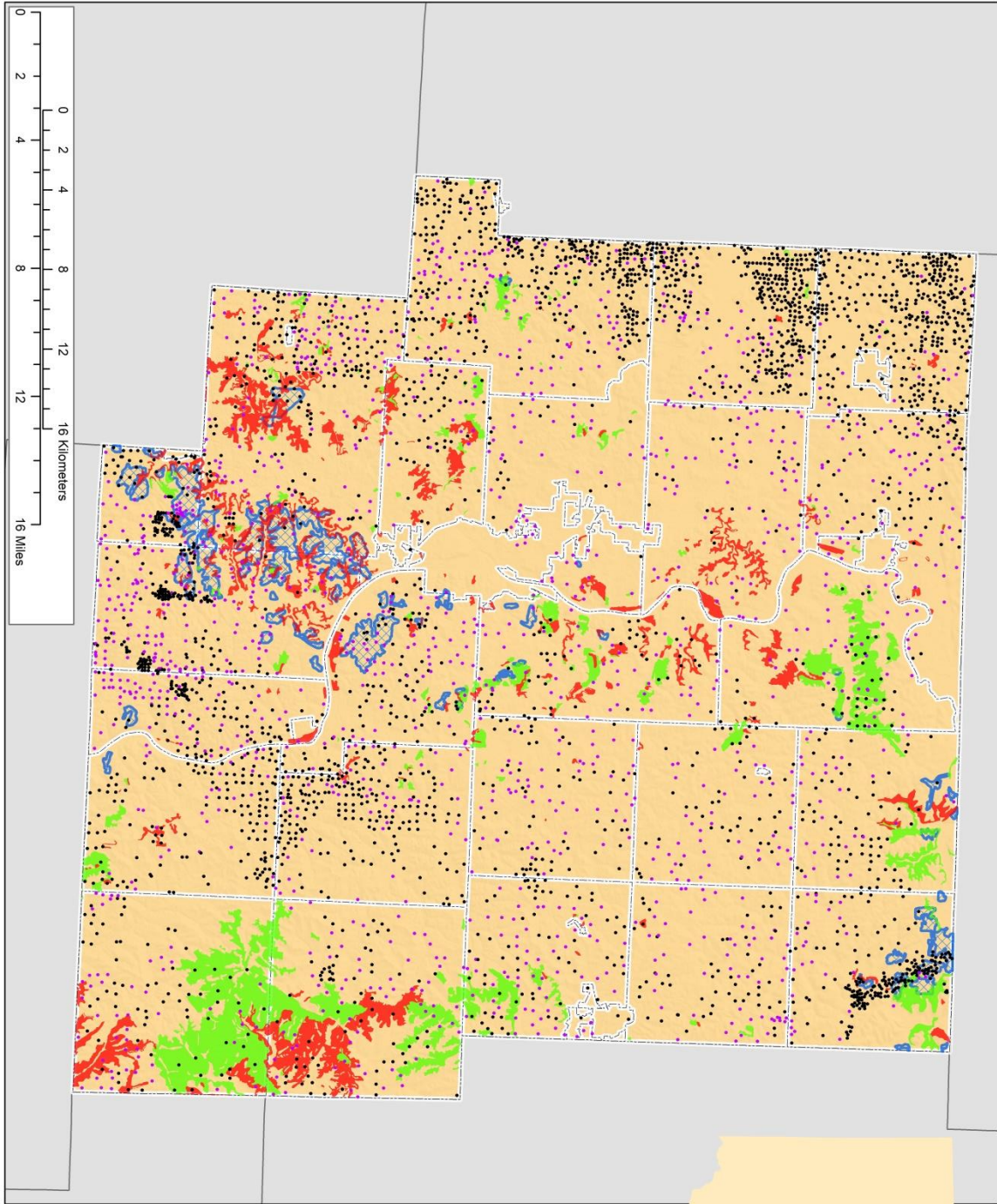
Goals:

- Surface Water (Watersheds; Flood Hazard and Steep Slopes)
- Create and enforce storm water regulations for all departments
- Promote restoration of wetland on hydric soils
- Encourage separation of storm water and sanitary water
- Recognize flash-flood hazard along small streams not identified on the 100 year flood plain
- Ground Water (Ground Water Yield; Ground Water Depth; Ground Water Pollution Potential)
- Establish groundwater protection area for all public water supplies
- Limit expansion of public water to proposed and existing high density development areas.
- Seal/plug existing abandoned wells (water, gas, and oil).
- Require guaranteed water supply/source within the land purchase contract for lands used for residential development (to be implemented by the Muskingum County Planning Commission)
- Address injection well sites
- Mining and Drilling (Mineral Rights, and Oil/Gas Well Sites; Mining Sites)
- Develop GIS map identifying ownership of land for future coal, gravel, and limestone mining sites
- Investigate and set standards for development of reclaimed strip mine lands
- Require title search including mineral rights and easements for all land transfers
- Productivity and Land Use (Current Land Use; Current Land Cover; Important Farmland Soils)
- Continue and expand educational programs on land resource management
- Provide information on what you need to know before you move into the county
- Recommend that Muskingum County Commissioners become Ohio Agricultural Easement Purchase Program (AEPP) sponsors to protect farmland

- Muskingum Soil and Water Conservation District is Local Sponsor for the Local Agricultural Easement Purchase Program (LAEPP)
- Investigate “Agricultural Security Area” (ASA) designation for productive farmland
- Continue local government support of Forest Current Agricultural Use Valuation (CAUV) program
- Land Use Strategy - Valuable Resource Areas
- Use land adjacent to existing development
- Encourage redevelopment of brownfield areas
- Promote the use of reclaimed mine lands served by utilities

Avoid development of:

- 100 Year flood hazard areas and flood pool easements
- Riparian buffer areas (limited to perennial streams)
- Existing and potential wetlands (hydric soils)
- Very steep slope (> 25%) or unstable / slip prone (wet or expansive clays) sites
- Un-reclaimed strip mine land brownfields can be developed if done properly.



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MUSKINGUM COUNTY, OHIO

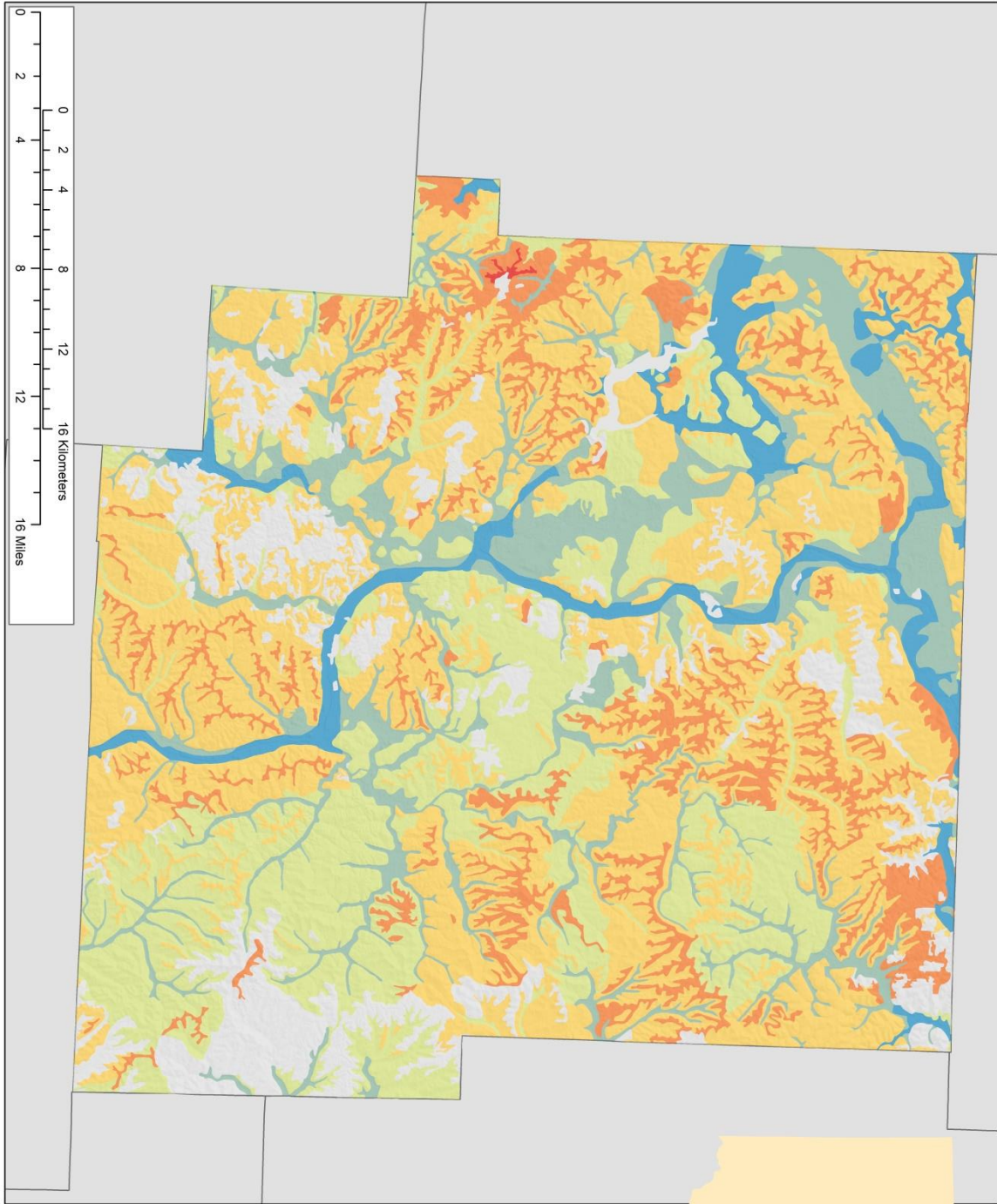
ABANDONED OIL & GAS WELLS WITH MINE LANDS



Legend
MAP SYMBOL

- Plugged Oil
- RECLAIMED OIL
- UNRECLAIMED STRIP
- ABANDONED UNDERGROUND MINE

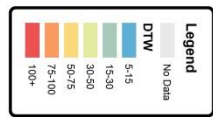


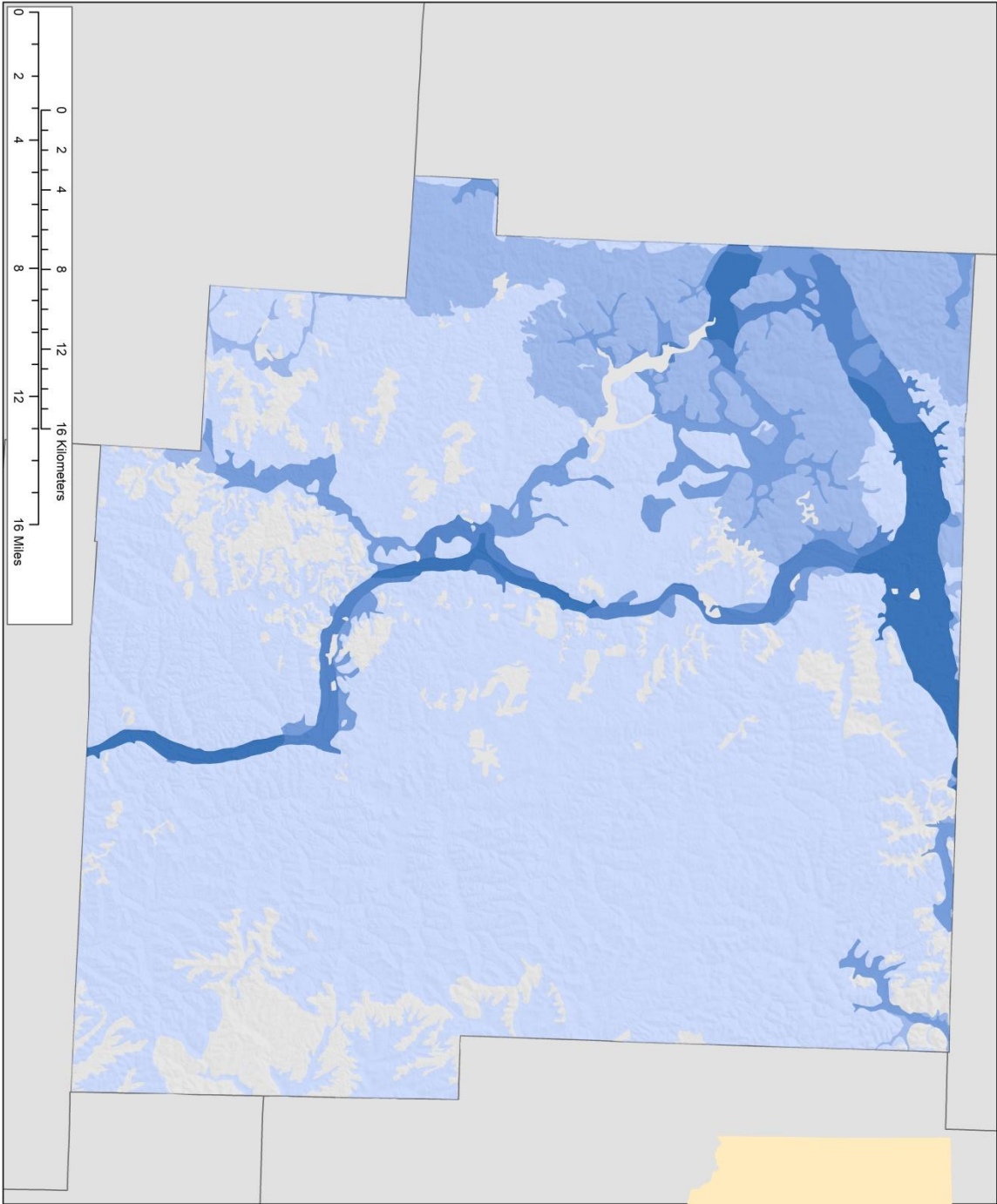


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DEPTH TO GROUND WATER

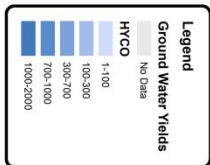


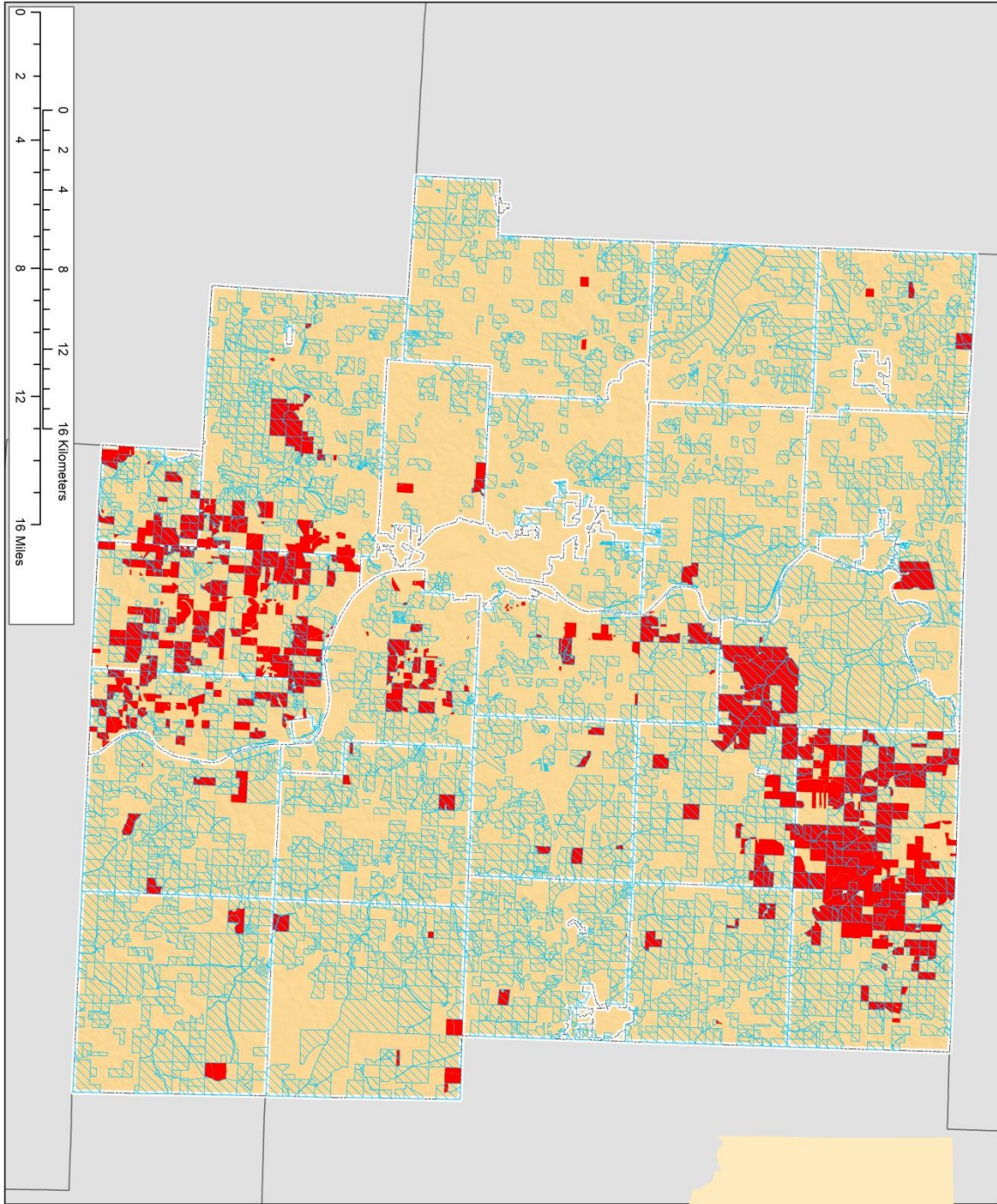


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GROUND WATER YIELDS PER HOUR

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1001 North Main Street, Ste. 100
Newark, OH 43055





Muskingum County
 Planning Commission
1077 North Main Street, Ste. 2000
 Logan, OH 44646

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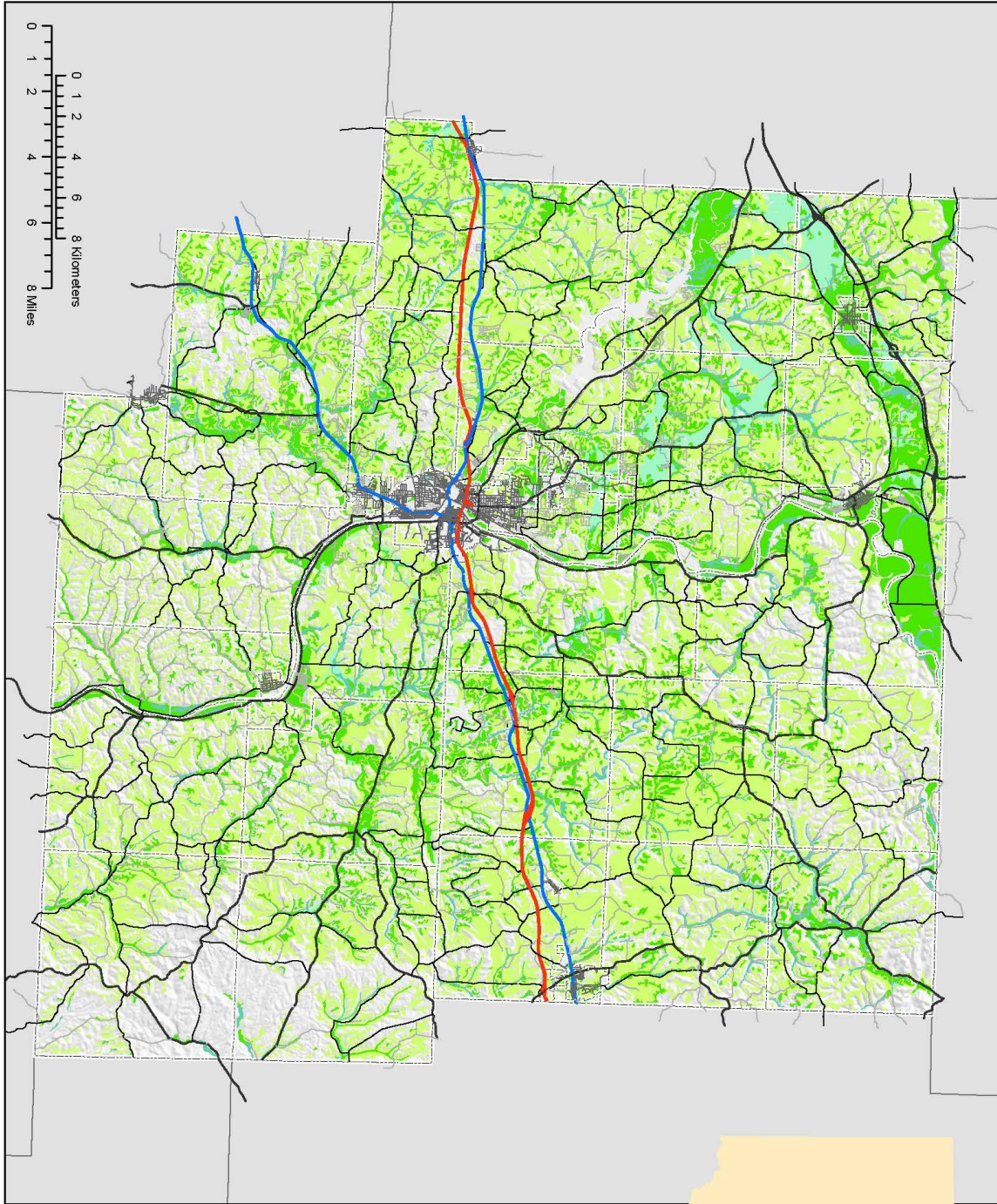
OIL, GAS & MINERAL MAP



Legend

- Oil & Gas Leasehold
- Severed Mineral Rights





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PRIME FARMLAND SOILS

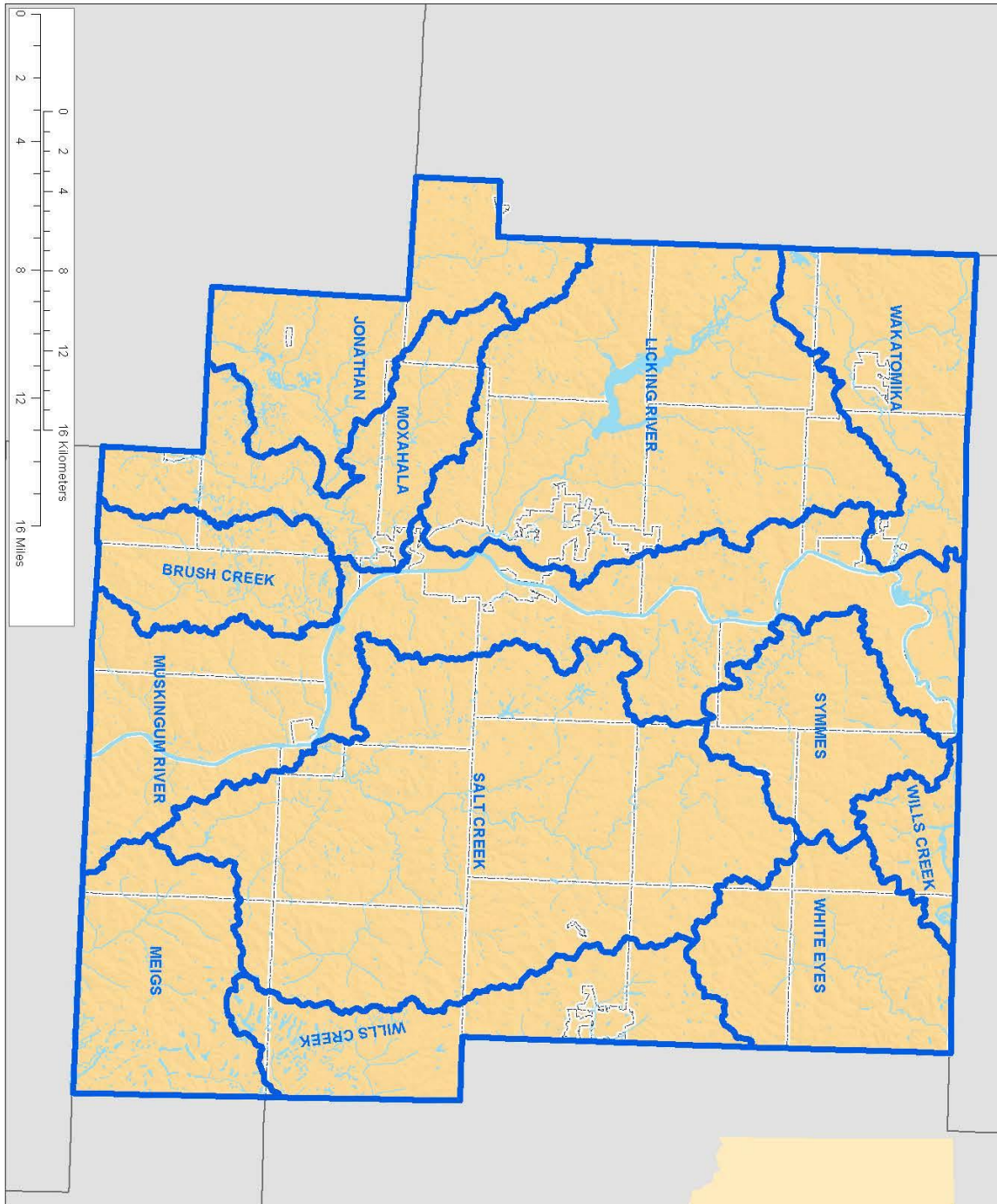
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Legend

- Prime Farmland
- Local Importance
- Prime Farmland
- Prime if Deeded
- Prime if Deeded and Protected



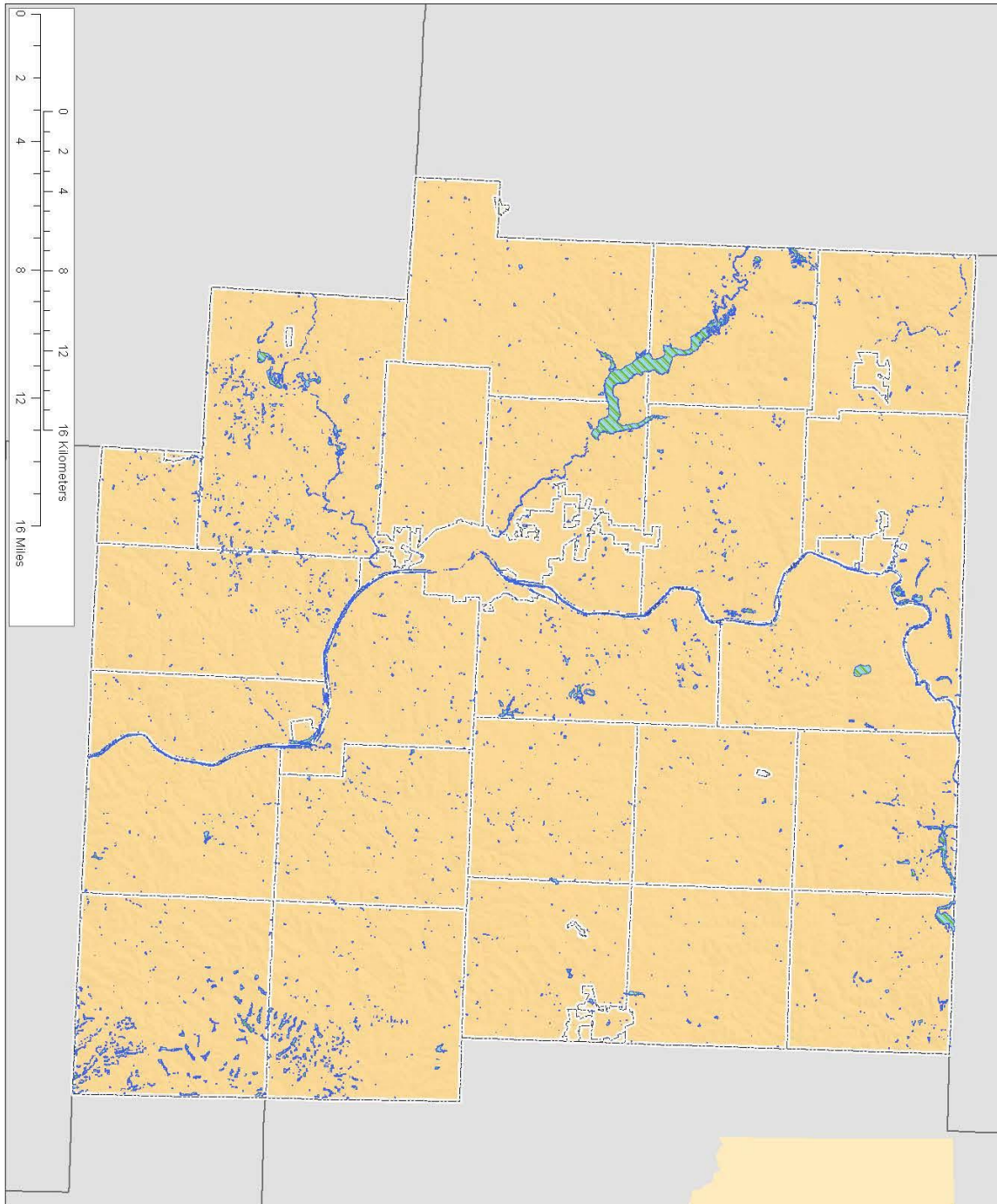


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W A T E R S H E D S





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W E T L A N D S

