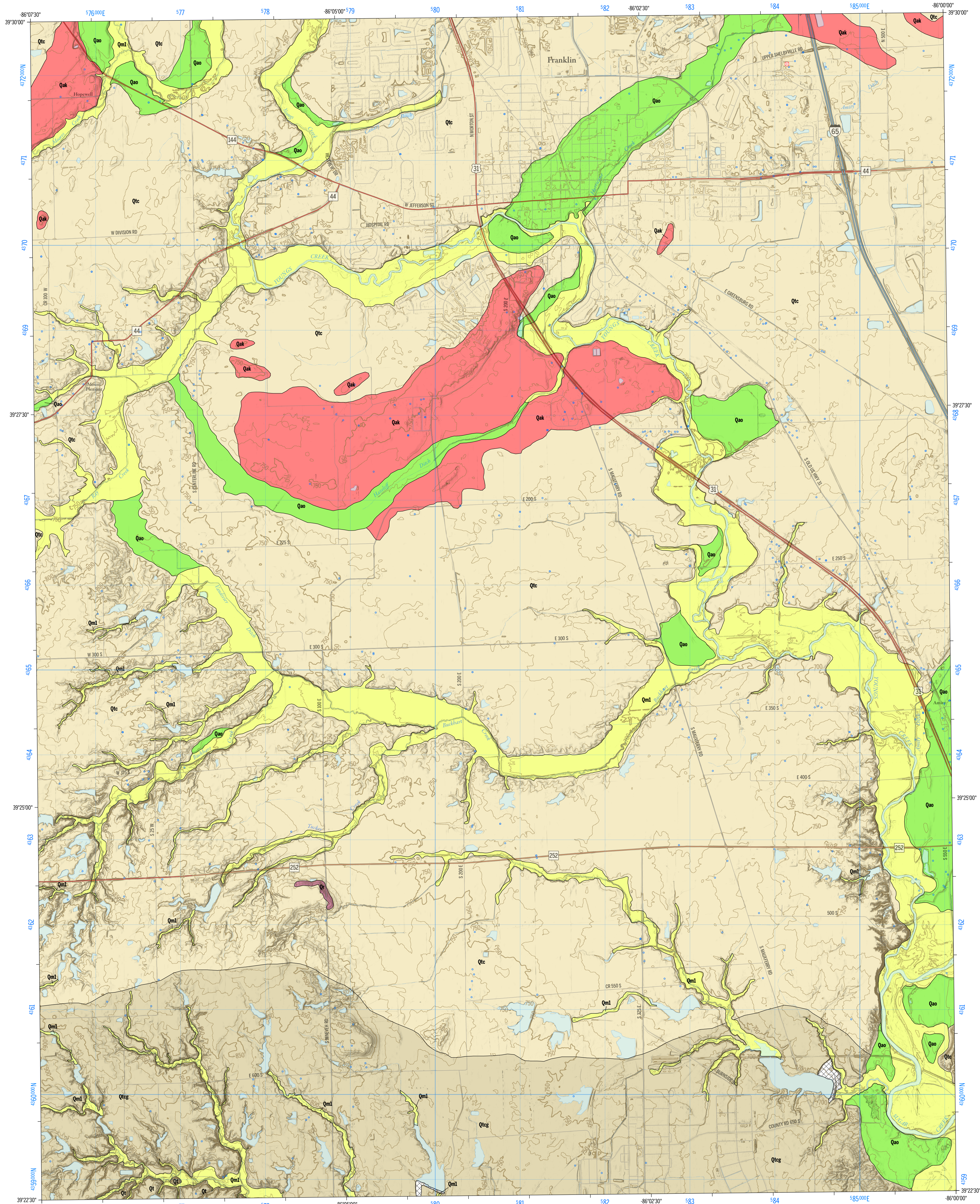


Preliminary Map Showing Quaternary Geology of the Franklin 7.5-Minute Quadrangle, Indiana

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INTRODUCTION

The Franklin 7.5-minute quadrangle is situated near the maximum limit of Wisconsin Episode glacial deposits in southeastern Johnson County, Indiana. Till of the Trafalgar Formation (Wisconsin Episode), sourced from the Huron-Erie Lobe, dominates the surficial geology of the quadrangle. Areas of Wisconsin Episode outwash (Atherton Formation) are found in the Sugar Creek, Youngs Creek, and Hurricane Creek valleys and within former meltwater pathways not occupied by modern streams. Kame deposits (sand and gravel) are found in the northern half of the quadrangle and are part of a larger kame complex in central Johnson County. Holocene (post-glacial) alluvium is found in the valleys of Sugar, Youngs, Nineveh, Buckhart, and Ray Creeks and tributaries. Unconsolidated sediment thickness generally increases from southwest to northeast across the quadrangle, from less than 15 ft along the southwestern margin of the quadrangle to more than 200 ft in the far northeastern corner of the quadrangle. This transition of bedrock topography represents the buried northern end of the Knobstone Escarpment. The quadrangle contains two significant bedrock paleovalleys, one in the south-central part of the quadrangle that parallels the buried Knobstone Escarpment and one in the northeast corner of the quadrangle that is part of a large bedrock valley extending north into Marion County. The Quaternary sediments in the western half of the quadrangle are underlain by Mississippian Borden Group siliciclastic rocks. In the eastern half of the quadrangle, the Devonian-Mississippian New Albany Shale and Devonian Muscatatuck Group carbonate rocks subcrop under thick Quaternary sediment cover.

The Wisconsin Episode maximum limit is located within one mile south of the southern boundary of the quadrangle. Radiocarbon ages from the adjacent Trafalgar 7.5-minute quadrangle indicate the Laurentide Ice Sheet reached its maximum extent just after 23,700 years ago. A second glacial limit, marked by the Crawfordville Moraine (Wayne, 1965) in the adjacent Trafalgar 7.5-minute quadrangle, crosses the southern end of the Franklin 7.5-minute quadrangle. The Crawfordville Moraine represents the limit of a readvance that occurred 21,700 years ago. This preliminary geologic map is an interim geologic map product that documents progress in mapping the Quaternary geology of Johnson County, Indiana. The stratigraphic framework for Quaternary units of Indiana (Wayne, 1963) was used in assigning map units.

REFERENCES

Wayne, W. J., 1963, Pleistocene formations in Indiana: Indiana Geological Survey Bulletin 25, 85 p.

Wayne, W. J., 1965, The Crawfordville and Knightstown Moraines in Indiana: Indiana Geological Survey Report of Progress 28, 15 p.

Martinsville Formation (Holocene)

Qml Alluvium
Silt loam generally less than 15 ft thick. First- and second-order tributaries generally have alluvium less than 5 ft thick. Unit overlies Mississippian Borden Group, Devonian-Mississippian New Albany Shale, or Devonian Muscatatuck Group bedrock, diamicton (till) of the Trafalgar Formation (map unit Qtc, Qtcg), and outwash of the Atherton Formation (map unit Qao).

Atherton Formation (Wisconsin Episode)

Qao Outwash
Sand and gravel, up to 25 ft thick. Located within former meltwater pathways. Generally covered by less than 5 ft of loess (Peoria Loess Member, Atherton Formation).

Qak Kame sediments
Sand and gravel, up to 30 ft thick. Located outside of major meltwater pathways. Generally covered by less than 5 ft of loess (Peoria Loess Member, Atherton Formation).

Trafalgar Formation (Wisconsin Episode)

Qtcg Center Grove Till Member
Silt loam diamicton generally less than 30 ft thick. Generally covered by less than 5 ft of Wisconsin Episode loess (Peoria Loess Member, Atherton Formation). Maximum age of 23,700 cal yr BP.

Qtc Cartersburg Till Member
Silt loam diamicton generally less than 30 ft thick. Generally covered by less than 5 ft of Wisconsin Episode loess (Peoria Loess Member, Atherton Formation). Maximum age of 21,500 cal yr BP based on correlation of the Crawfordville Moraine in Johnson and Morgan Counties (Wayne, 1965). Separated from the underlying Center Grove Till Member by a fossiliferous silt, the Vertigo alpestris oughtroni bed (Wayne, 1963).

Undifferentiated (Quaternary)

Qr Residium
Weathered siliciclastic Mississippian Borden Group bedrock generally less than 5 ft in thickness. Less than 5 ft of loess (Peoria Loess Member, Atherton Formation) can mantle or be incorporated into residuum, especially on hillslopes.

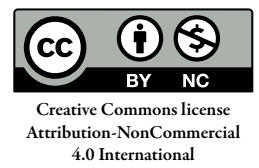
Anthropogenic (Modern)

Disturbed or made land
Includes quarries and excavation/fill associated with infrastructure.

— Contact—Identity and existence certain, location accurate
• Water wells (IDNR, 2019)
□ Gamma-ray log (IGS, 2012)

ACKNOWLEDGMENTS AND DISCLAIMER

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MAP INFORMATION

Digital cartography by Matthew R. Johnson.

Topographic shading based on 2011–2013 Indiana Lidar data.

Transportation network from OpenStreetMap.org (© OpenStreetMap contributors).

Hydrography from U.S. Geological Survey National Hydrography Dataset (local resolution).

Projection: Universal Transverse Mercator (UTM), Zone 16N.

Horizontal Datum: North American Datum of 1983 (NAD83).

Indiana Department of Natural Resources, Division of Water, Resource Assessment Section (IDNR), 2019, WATERWELLS_IDNR_IN.SHP: Water Well Locations in Indiana (Indiana Department of Natural Resources, Point Shapefile)

Indiana Geological Survey (IGS), 2012, GAMMA_RAY_LOGS_IGS_IN: Wells with Natural Gamma-Ray Logs or Physical Samples in Unconsolidated Sediments in Indiana (Indiana Geological Survey, 1:100,000, Point Shapefile)

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