

**SURFICIAL MATERIAL GEOLOGIC MAP OF THE KIRKWOOD 7.5' QUADRANGLE
ST. LOUIS AND JEFFERSON COUNTIES, MISSOURI**

Geology and Digital Compilation by
Bradley A. Mitchell

2012

OFM-12-615-GS



**MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
GEOLOGICAL SURVEY PROGRAM
P.O. BOX 250, ROLLA MO 65402-0250
www.dnr.mo.gov/geology
573-368-2100**

**THIS MAP WAS PRODUCED UNDER A
COOPERATIVE AGREEMENT WITH
THE UNITED STATES GEOLOGICAL SURVEY**

Permission must be obtained to visit privately owned land

PHYSIOGRAPHY

The Kirkwood quadrangle lies within the Dissected Till Plains Section of the Central Lowland Province of the Interior Plains Physiographic Division. The lowest recorded elevation is 387 feet mean sea level (msl) and occurs within the Meramec River valley in the southeast of the quadrangle. The highest elevation on the quadrangle occurs in the loess covered uplands near the northern boundary of the quadrangle and is greater than 680 feet msl. Total relief on the Kirkwood quadrangle is approximately 300 feet.

GEOLOGICAL OVERVIEW

The Kirkwood quadrangle is underlain primarily by deposits of Paleozoic limestone and shale. The upland area in the northeast of the quadrangle has exposures of Pennsylvanian-age Cherokee and Marmaton Groups which are cyclic Desmoinesian Series deposits of shale, limestone, sandstone and coal. The Mississippian-age St. Louis, Salem, and Warsaw Formations underlie much of the southwest of the quadrangle except for areas where the Meramec River and its tributaries have incised into the Mississippian-age Burlington-Keokuk Formation.

DESCRIPTION OF MAP UNITS

- Qsilt** **QUATERNARY SILT-CAPPED ALLUVIUM** – This unit has been deposited by the Meramec River and its tributaries. The approximate upper 15 feet of these deposits are composed predominantly of silt with variable amounts of clay and organic material. The material residing below the silt is predominantly sand and gravel to the top of bedrock. The thickness of this unit ranges from less than 10 feet where the floodplain transitions to uplands to more than 100 feet where the Meramec River has incised the Paleozoic bedrock. The water table is approximately 10 to 30 feet below ground surface, resulting in an interval of saturated sand and gravel more than 50 feet thick. This unit is included in the cross sections as Quaternary silt-capped alluvium.
- Ql** **QUATERNARY LOESS** – This unit is a wind-blown deposit of silt and clayey silt with occasional pockets of clay, sand and gravel. The unit is composed of two separate loess layers, the Roxana below and the Peoria above (Goodfield, 1965). The total thickness of the two units may reach 100 feet. The Roxana is higher in clay content and may have a paleosol developed in the upper few feet. The contact between the two units forms a potential slide plane in areas of high topographic relief. The loess overlies Pennsylvanian-age bedrock comprised of limestone and shale creating two unique environments. Where the loess is thin, the limestone may be karstic. Where the underlying unit is predominantly shale, water will perch, destabilizing the contact zone. Where the loess rests upon shale, the slide potential is increased.
- Qtd** **QUATERNARY TERRACE DEPOSIT** – The terrace deposits in the quadrangle are slightly different than previously mapped terrace deposits (Brill, 1991; Harrison, 1997; and Goodfield, 1965). All were deposited during fluvial events, leaving the terrace above low flow stage of the river. After high stage flow returned to normal, low lying areas within the terrace were filled with organic clay material. This zone has a very low shear wave velocity and underlies many types of infrastructure.
- k** **KARST** – These areas have high concentrations of sinkholes, caves and other karstic features due to the solutional weathering of the Mississippian and Pennsylvanian-age limestone underlying this area. These areas are typically found in the upland regions of the quadrangle.
- R** **RESIDIUM** – The areas of residual material are found on the slope and toe slope of high relief areas. The content is dependent on the bedrock parent material but typically has a high clay content with fragments of parent material.
- Pb** **PALEOZOIC BEDROCK** – The exposures in this quadrangle are typically found in areas of high topographic relief.
- A—A'** Line locates the placement of the cross section with end line symbols.
- Public Land Survey System including Spanish land grants.



Produced by the Missouri Department of Natural Resources, Division of Geology and Land Survey, Geological Survey Program, Funded by the United States Geological Survey, National Earthquake Hazards Reduction Program, Award # G11AP20174, 2011. Topography was derived from a USGS 10 meter Digital Elevation Model using contouring software. Features were edited to the USGS 38090-E4-TF-024, 1993, Kirkwood 7.5' quadrangle and digital aerial photography from 2007 and 2009. Field checked in 2012. Universal Transverse Mercator (UTM), Zone 16, North American Datum 1983 (NAD 83).

SCALE 1:24,000

1 0.5 0 0.5 1 2 Kilometers

1000 500 0 500 1000 2000 Meters

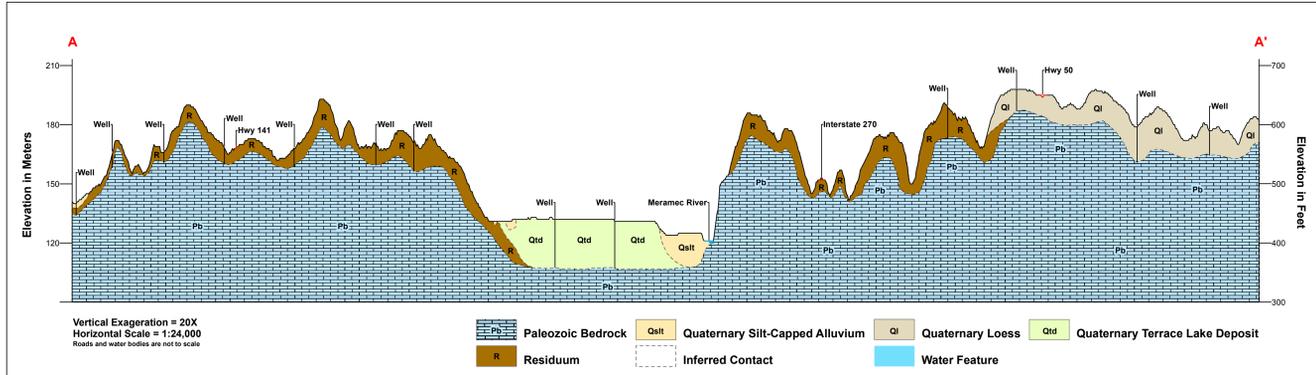
1 0.5 0 0.5 1 Miles

1000 500 0 500 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 Feet

17th and 18th Streets North
Division of Geology and Land Survey
2012 Report Series Publication
-9-99 East, Field Strength: 02773.0-1

Road and Contour Symbolology

- Interstate Highways
- Missouri Highways
- Light Duty Roads
- Railroad
- Elevation Contour
- Index Contour
- Contour Interval



BIBLIOGRAPHY

- Brill, K.G., 1991, Geologic Map of St. Louis City and County, Missouri; Division of Geology and Land Survey, Missouri Department of Natural Resources, OFM-91-0259, scale 1:62,500.
- Goodfield, A.G., 1965, Pleistocene and surficial geology of the City of St. Louis and the adjacent St. Louis County, Missouri; unpublished Ph.D. dissertation, University of Illinois, Urbana, IL, 206p., 6 pl.
- Harrison, R.W., 1997, Bedrock Geologic Map of the St. Louis 30' x 60' Quadrangle, Missouri and Illinois; U.S. Geological Survey, Miscellaneous Investigations Series Map I-2533, scale 1:100,000.
- Lutzen, E.E., and Rockaway, J.D., 1971, Engineering Geology of St. Louis County, Missouri; Missouri Geological Survey and Water Resources, 23p., 1pl.
- Missouri Department of Natural Resources, 2007, Well Logs, Wells Certified, Bedrock, Roads, IMOP, in Missouri Environmental Geology Atlas (MEGA); Division of Geology and Land Survey, Missouri Department of Natural Resources.
- Thompson, T. L., 1995, The stratigraphic succession in Missouri, v. 40 rev.; Division of Geology and Land Survey, Missouri Department of Natural Resources, 190 p.
- Williams, R.A., Odum, J.K., Stephenson, W.J., and Herrmann, R.B., 2007, Shallow P- and S-wave velocities in the St. Louis region, Missouri-Illinois: Earthquake Spectra, v. 23, no. 3, 711-726.

