Institute of Natural Resource Sustainability
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ILLINOIS STATE GEOLOGICAL SURVEY
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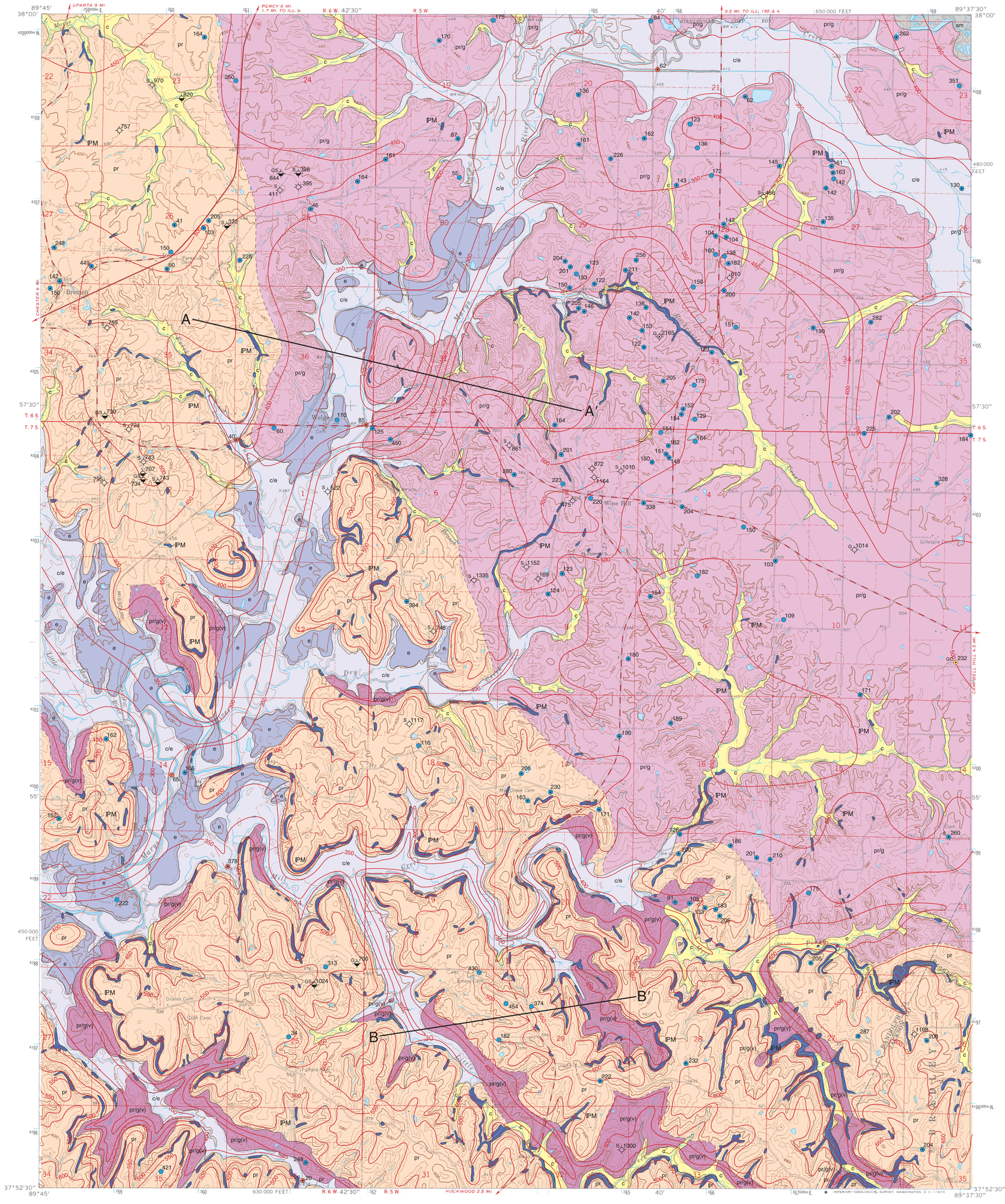
SURFICIAL GEOLOGY OF WELGE QUADRANGLE
RANDOLPH AND JACKSON COUNTIES, ILLINOIS

W. John Nelson and David A. Grimley
2010

Illinois Geologic Quadrangle Map
IGQ Welge-SG



Base map compiled by Illinois State Geological Survey from digital data (Raster Feature Separates) provided by the United States Geological Survey. Topography by photogrammetric methods from aerial photographs taken 1965. Field checked 1968.

North American Datum of 1927 (NAD 27)
Projection: Transverse Mercator
10,000-foot ticks: Illinois State Plane Coordinate system, west zone (Transverse Mercator)
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16

Recommended citation:
Nelson, W.J., and D.A. Grimley, 2010, Surficial Geology of Welge Quadrangle, Randolph and Jackson Counties, Illinois: Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Welge-SG, 1:24,000, report, 6 p.

SCALE 1:24,000

1 1/2 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

BASE MAP CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Geology based on field work by W. John Nelson, 2005–2006, and data analysis by David A. Grimley, 2009.

Digital cartography by Jane E.J. Domier, Shannon M. Geegan, Steven M. Radil, and Jennifer E. Carrell, Illinois State Geological Survey.

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4		5
6	7	8

ADJOINING QUADRANGLES
1 Walsh
2 Steeleville
3 Percy
4 Chester
5 Willisville
6 Belgique
7 Rockwood
8 Raddle

1°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 2010

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
State Route

QUATERNARY DEPOSITS

Description	Unit	Interpretation
HUDSON EPISODE (~12,000 years before present (B.P.) to today)		
Mixed rock and earth; in abandoned surface coal mine at northeastern corner of quadrangle	Surface mines: sm	**Fill material and mined-out areas**
Silt, clay, sand, gravel, and boulders; stratified to massive; some sand and gravel (mainly sandstone fragments) is common along Little Mill Creek; silty along Mill and Piney Creeks; up to 20 feet thick	Cahokia Formation: c	**Alluvium (river deposits);** on floodplains of modern streams; sediment derived from decomposed bedrock and from slope wash of silt and diamicton from upland areas that was transported and reworked by streams
Silt, clay, and fine sand; massive to stratified; Equality Formation is generally more fine grained but may include some sand lenses; 5 to 80 feet thick	Cahokia over Equality Formation: c/e	**Alluvium (river deposits);** on floodplains of modern streams; overlying slackwater lake sediments (see description of Equality Formation)
WISCONSIN EPISODE (~55,000–12,000 years B.P.)		
Silt, clay, with fine sand; interlayered gray silt and yellowish brown, fine sand exposed in a cutbank of Mary's River south of the center of Sec. 14, T7S, R6W; bridge borings indicate clayey to sandy silt, massive to stratified, with gravel at the base in contact with bedrock; occurs in a terrace (just above 400 feet above sea level) 10 to 15 feet above the modern floodplain along Mary's River valley; up to 80 feet thick	Equality Formation: e	**Slackwater lake sediment;** deposited when the Mississippi River was flooded with glacial meltwater, causing tributary valleys to become periodically inundated with backwater lakes, after which the Mary's River channel and floodplain were inset into the former lake plain
Silt loam; upper part typically mottled yellowish gray to light yellowish brown (Peoria Silt); lower third or so is less strongly mottled medium brown with a slight pinkish cast (Roxana Silt); both portions are massive, friable, and tend to stand in vertical banks; combined thickness ranges from a feather-edge to about 20 feet; mantles all uplands, but mapped as this unit only where the silts rest on Paleozoic bedrock or on thin glacial deposits over bedrock	Peoria and Roxana Silts (overlying thin or patchy Glasford Formation over bedrock): pr	**Loess (windblown silt);** derived dominantly from the Mississippi River floodplain by prevailing westerly winds during times when the valley was aggrading with sediment from glacial meltwater; modern soil profile is developed in the upper portion of the Peoria Silt; the Farmdale Geosol (a weak interstadial soil) is developed into the upper Roxana Silt; the landscape is primarily bedrock controlled; may be underlain by thin and discontinuous Glasford Formation
ILLINOIS EPISODE (~200,000–130,000 years B.P.)		
Silt loam (Peoria and Roxana Silts) overlying pebbly silty clay loam, silty clay, and diamicton (Glasford Formation); Glasford Formation deposits range from olive, brownish and bluish gray where less weathered to yellowish brown to orange mottled (pedogenically altered) where more weathered by the Sangamon Geosol (interglacial soil); generally stiff, silty clay to clayey silt with intermixed sand and less than 5% pebbles and larger rocks; massive and unsorted except in sand lenses also showing distorted lamination; rock types include erratic cobbles and boulders up to 10 feet across; joints are stained with iron oxide and outline irregular polygons; overlies Paleozoic bedrock or possibly older Quaternary deposits (lake sediments, outwash, older diamicton); total thickness of Quaternary deposits may be up to 150 feet but are generally much thinner	Peoria and Roxana Silts over Glasford Formation: pr/g	**Till and ice-marginal sediment;** entrained in Illinois Episode continental ice sheets and left behind when the ice receded and melted; the strongly developed Sangamon Geosol formed in the upper part of the Glasford Formation during the Sangamon interglacial episode approximately 130,000 to 75,000 years B.P; during the Wisconsin Episode, the till plain was mantled with the Roxana and Peoria Silt. Subsequent stream erosion has revealed underlying bedrock in a few places; however, the landscape is dominated by glacial deposits.
Silt loam (Peoria and Roxana Silts) overlying pebbly silty clay loam, silty clay, and diamicton (Glasford Formation); sediments are poorly exposed; lithologies similar to upland Glasford Formation; numerous large boulders of locally derived sandstone; occurs as flat-topped, terrace-like, or lobate deposits along streams in the southern part of the quadrangle; thickness is poorly constrained	Peoria and Roxana Silts over Glasford Formation (valley deposits): pr/g(v)	**Till and ice-marginal sediment;** may be related to thicker tongues of glacial ice in valleys or, alternatively, remnants of till that were protected from erosion along sloping areas (mainly in the lee of glacial ice flow to the southwest); includes some areas of more recent colluvium (slope deposits)

PALEOZOIC BEDROCK

Description	Unit	Interpretation
PENNSYLVANIAN and MISSISSIPPIAN PERIODS (330 to 310 million years B.P.)		
Sandstone, siltstone, shale, limestone, mudstone, coal; underlies entire map area; outcrops confined to stream valleys, bluffs, and human-made excavations; rock layers dip gently northeast so that the youngest (Pennsylvanian) strata occur at the northeastern corner of map area; further details on rock units in Nelson (2007)	Bedrock: IPM	**Deltaic, shallow marine, coastal, swamp-wetland, and fluvial sedimentary rocks;** details of bedrock geology presented by Nelson (2007)

Drill Holes
from which subsurface data were obtained

- Engineering boring
- Stratigraphic boring
- Water well
- Dry hole
- Dry hole - show of gas
- Dry hole - show of oil

CGS 35 — Labels indicate core (c), geophysical log (o), or samples (s). Numeric label indicates total depth of boring in feet. Dot indicates location accurate within 100 feet.

Line Symbols
dashed where inferred

- Contact
- 350 — Structure contours of elevation of bedrock surface, contour interval 50 feet
- A—A′ — Line of cross section

Note: Well and boring records are on file at the ISGS Geological Records Unit and are available online from the ISGS Web site.