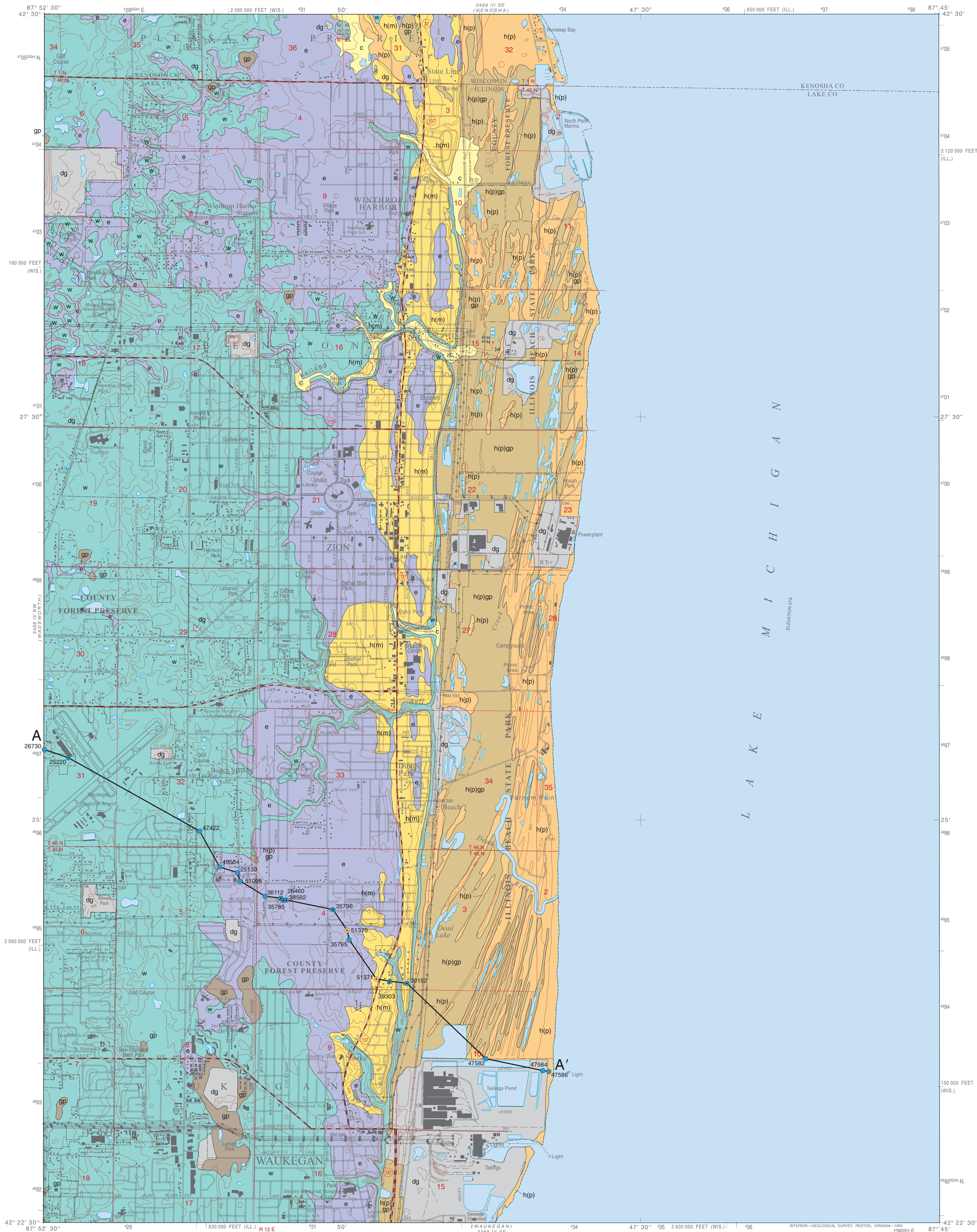


SURFICIAL GEOLOGY OF ZION QUADRANGLE LAKE COUNTY, ILLINOIS AND KENOSHA COUNTY, WISCONSIN

STATEMAP Zion-SG

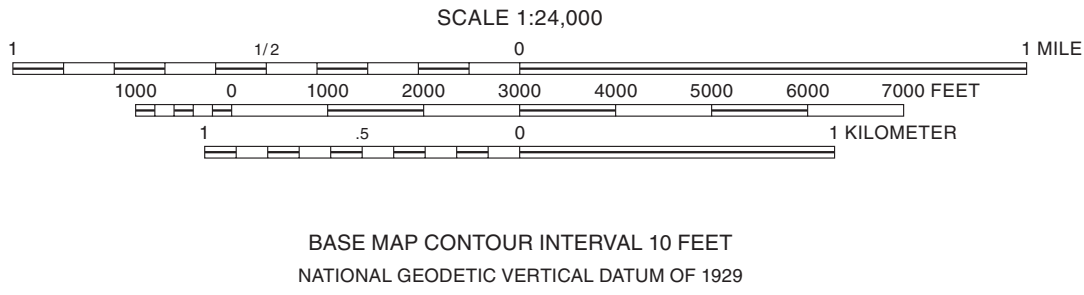
Michael L. Barnhardt
2009



Base map compiled by Illinois State Geological Survey from digital data (Digital Line Graphs) provided by the United States Geological Survey. Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1960. Revised from aerial photographs taken 1988. Field checked 1992. Map edited 1993.

North American Datum of 1983 (NAD 83)
Projection: Transverse Mercator
10,000-foot ticks: Illinois State Plane Coordinate system, east zone (Transverse Mercator)
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16

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Geology based on field work by Michael L. Barnhardt, 2008–2009.

Digital cartography by Jennifer E. Carrell and Jane E.J. Domier, Illinois State Geological Survey.

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QUATERNARY DEPOSITS

Description	Unit	Interpretation
HUDSON EPISODE (~12,000 years before present [B.P.] to today)		
Fill, compacted land, or other disturbed material; highly variable in grain size (may range from clay to gravel), and may contain construction and mining debris; typical thickness: variable	Disturbed ground dg	Human-disturbed deposits modified during construction of buildings, roads, and landfills; includes excavations in gravel pits and quarries
Silt and clay; occasional sand lenses; trace gravel; stratified; brown to yellowish brown; loose to compact; may be mottled and gleyed; some bedding; organic-rich in places; typical thickness: 1 to 20 feet	Cahokia Formation (floodplain deposits) c(p)	Postglacial (modern) stream sediments deposited on active floodplains; derived mainly from eroded loess and diamicton; overlies outwash sand and gravel along lake bluff; may overlie or interfinger with lacustrine silt and clay; includes silty slopewash deposits along footslope and minor drainage-ways on moraines
Sand; fine and medium; well sorted; loose; may be mixed with organics, including layers of peat; some thin lenses of clay; typical thickness: 1 to 12 feet	Henry Formation (Parkland facies) h(p)	Windblown sand in dunes and sheet-like deposits between active shoreline of Lake Michigan and wave-eroded bluff; local relief generally less than 12 feet; interdune swales often contain peat, muck, and organic-rich sand; eolian facies of Henry Formation
Peat, muck, marl, and organic-rich sediment; may contain interbeds of silt, clay, and very fine to fine sand; black to dark brown; sediment may be gleyed and mottled; soft to firm; snail shells common; typical thickness: 1 to 10 feet	Grayslake Peat gp	Organic-rich sediments accumulated in low-lying depressions, drainageways, and on floodplains; may include small areas of open water; locally intertongued with modern alluvium, or lake sediment; commonly found around lakes and marshes and channels connecting bodies of water; intermixed with sand dunes along Lake Michigan beach-ridge plain
Sand and peat, muck, marl, and organic-rich sediment; intermixed dune sand and peat in back dune area; fine and medium sand with trace silt and clay; peat and silt and clay content increases in lower-lying areas; stratified; typical thickness 1 to 12 feet	Henry Formation (Parkland facies) and Grayslake Peat, intermixed h(p)gp	Former active dunes now heavily vegetated; intervening swales are often saturated; may contain silt and clay and fine sand deposited in splays by wave overwash into shallow ponds and lagoons; complex intermixture of Henry Formation, Parkland facies, and Grayslake Formation peat; found only in beach-ridge plain

WISCONSIN EPISODE (Late) (~25,000 years–12,000 B.P.)

Sand, fine to coarse with variable amounts of gravel; stratified; typical thickness: 10 to 35 feet	Henry Formation (Ravina facies) (cross section only) h(r)	Nearshore lacustrine facies of Henry Formation; occurs along Lake Michigan in active wave zone; underlies beach-ridge complex; thickness decreases toward the lake bluff and eastward under Lake Michigan to a water depth of about 30 to 50 feet.
Silt and clay; massive to bedded; dark gray to light gray; calcareous; soft to hard; compact; may be sticky and plastic; very fine and fine sand common along bedding planes; occasional inclusions and lenses of light gray to white silt; some wood fragments; very few clasts; generally abrupt upper and lower contacts; typical thickness: 5 to 25 feet	Equality Formation e	Postglacial and glacial proglacial lake deposits that infill low-lying areas, or depressions in drainage channels and where water was impounded behind moraines, such as the Highland Park Moraine; at the surface, these sediments may interfinger with or be overlain by alluvium and organic-rich deposits.
Sand and gravel; stratified; occasionally massive; yellowish to grayish brown; calcareous; loose; sand is very fine to very coarse, very well to poorly sorted; gravel is very fine to coarse, very well to very poorly sorted; trace to little amounts of silt and clay, frequently as thin beds; typical thickness: 5 to 120 feet	Henry Formation (Mackinaw facies) h(m)	Proglacial fluvial (outwash) sediments exposed along the Lake Michigan bluff as terraces above present lake level; deposited by meltwater originating along the glacier terminus located to the northeast
Diamicton; silty clay loam to silty clay; dark gray to yellowish brown; massive; calcareous; compact; firm to very hard; pebbly with occasional cobbles and boulders; commonly contains silt and sand inclusions and sand and/or gravel lenses; may contain pebble-free, silty and clayey zones with strongly expressed laminations that may be interbedded with the diamicton; lenses of saturated silt and very fine sand are loose and runny; typical thickness: 50 to 200 feet	Wadsworth Formation w	Subglacial and ice-marginal sediments (till) deposited from Wadsworth glacial ice; sediment that melted out on top of the glacier or along the ice margin was reworked by slope processes and water; laminated sequences may be more than 40 feet thick, but their areal extent is irregular and difficult to delineate; extensive areas and thicknesses of bedded sand, silt, and clay may be intermixed with diamictons of mudflow and meltout origin along the ice margin.

PRE-QUATERNARY DEPOSITS

SILURIAN PERIOD (–443 to 416 million years B.P.)

Rock; predominantly dolomite overlain locally by shale; upper surface is commonly fractured with crevices and solution cavities; some oil staining	Bedrock (cross section only) —	Bedrock buried by ~100 to 250 feet of Quaternary sediments
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Data Type

- Stratigraphic boring
- Water well boring
- Boring labels indicate the county number. Dot indicates boring is to bedrock.
- Contact

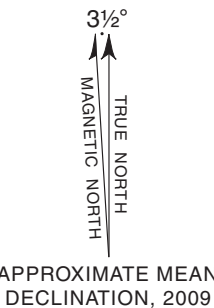
A—A' Line of cross section

Note: The county number is a portion of the 12-digit API number on file at the ISGS Geological Records Unit. Most well and boring records are available online from the ISGS Web site.



1	2	3
4	5	
6	7	8

ADJOINING QUADRANGLES
1 Pleasant Prairie, WI
2 Kenosha, WI
3 Lake Michigan
4 Wadsworth, IL
5 Lake Michigan
6 Libertyville, IL
7 Waukegan, IL
8 Lake Michigan



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

