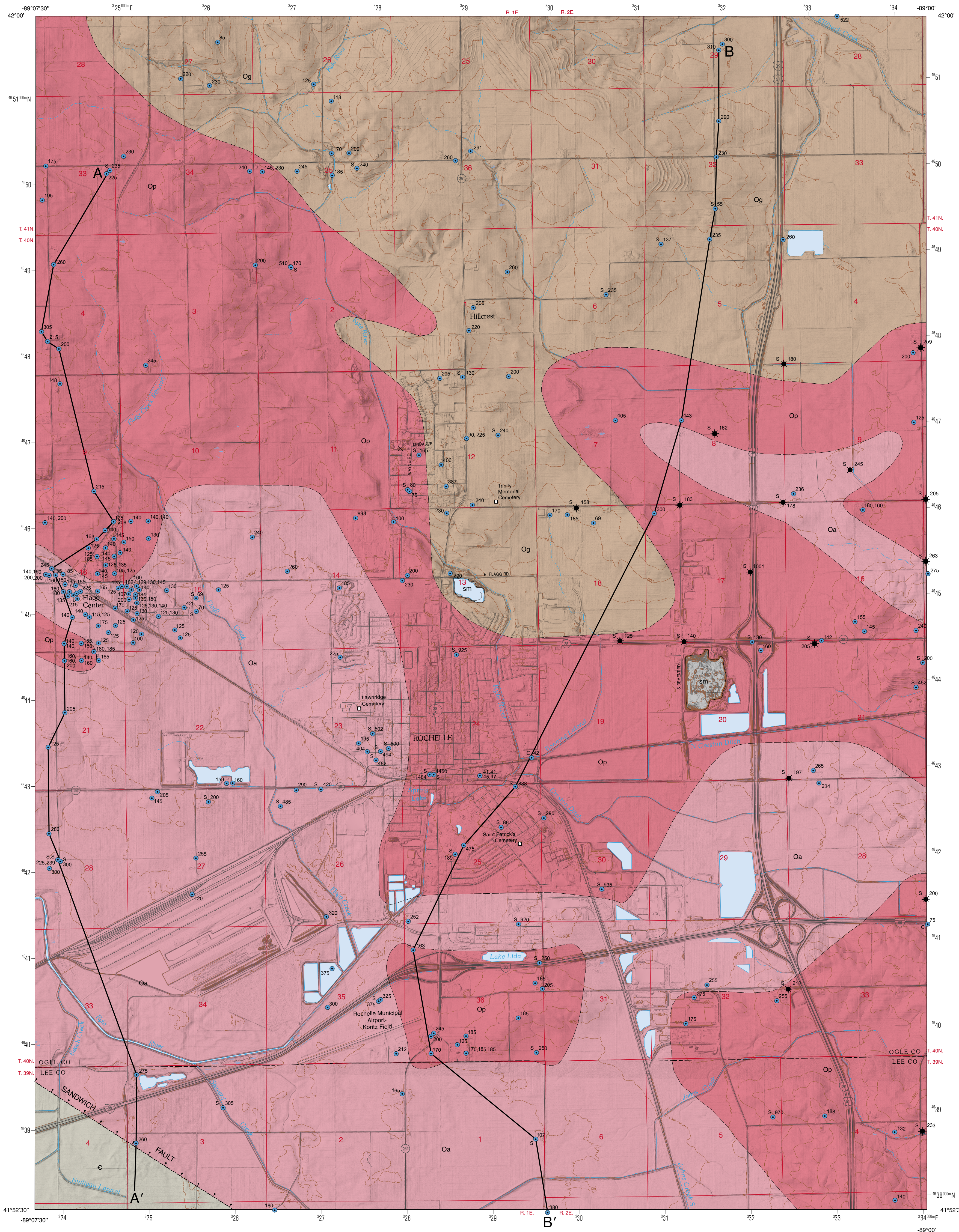


BEDROCK GEOLOGY OF ROCHELLE QUADRANGLE LEE AND OGLE COUNTIES, ILLINOIS

Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

STATEMAP Rochelle-BG

Franck Delpomdor
2019



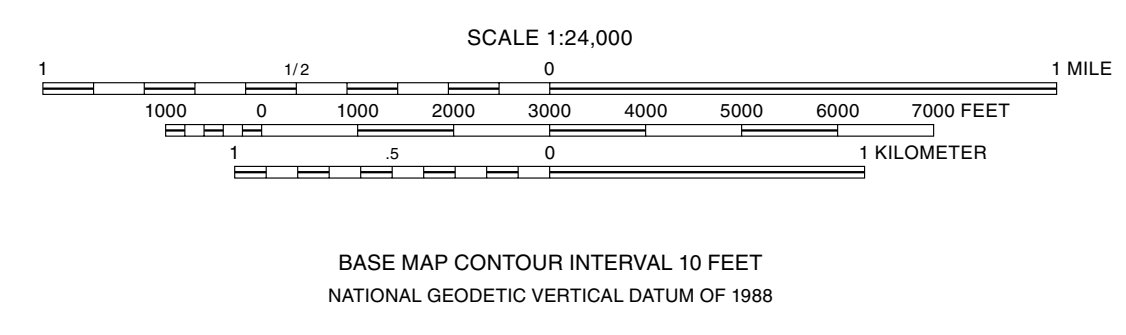
EXPLANATION		
System	Series	
	quarry	
Quaternary	Q surficial deposits (column only)	Holocene and Pleistocene
	Og Galena Formation	
Op Platteville Formation		
Ordovician	Oa Ancestral Group	
	Opdc Prairie du Chien Group (column only)	Ibexian
Cambrian	C Potlso Dolomite	St. Croixian
	C Franconia Formation	

Point Symbols	
Drill Holes from which subsurface data were obtained	
★	Oil and Gas Well
×	Sand and Gravel Pit
●	Water-well boring
S, C, 130	Labels indicate samples (S) or core (C). Numeric labels indicate total depth of boring in feet. Dot indicates boring is to bedrock.

Line Symbols	
---	Contact approximate
---	Contact concealed
---	Normal fault concealed; bar and ball on downthrown side
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 website.

Base map compiled by Illinois State Geological Survey from digital data (2018 US Topo) provided by the United States Geological Survey. Shaded relief derived from 2009 Lidar elevation data.
North American Datum of 1983 (NAD 83)
Projection: Transverse Mercator
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16



Geology based on field work by Franck Delpomdor, 2018-2019.
Digital cartography by Emily Bunse and Franck Delpomdor, Illinois State Geological Survey.
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This map has not undergone the formal Illinois Geologic Quadrangle map review process. Whether or when this map will be formally reviewed and published depends on the resources and priorities of the ISGS.
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ADJOINING QUADRANGLES		
1	2	3
4	5	6
7	8	

1 Stillman Valley
2 Kings
3 Fairdale
4 Chana
5 Creston
6 Ashton
7 Steward
8 Lee

APPROXIMATE MEAN DECLINATION, 2019

ROAD CLASSIFICATION	
Interstate Route	State Route
U.S. Route	Local road

SYSTEM	SERIES	GROUP	FORMATION/MEMBER	GRAPHIC COLUMN	THICKNESS (feet)	UNIT		
QUATERNARY	HOLOCENE		Surficial deposits		15-240	A		
ORDOVICIAN	MOHAWKIAN	Platteville	Dunleith		+15	B		
			Quimby's Mill		15	C		
			Nachusa		19-24	D		
			Grand Detour		40-42	E		
			Mifflin		10-15	F		
	Ancestral	Ancestral	Glenwood		45-70	H		
			St. Peter		80-440	H		
			IBEXIAN	Prairie du Chien	Shakopee		50-260	I
					New Richmond			
					Oneota			
ST. CROIXIAN	ST. CROIXIAN	Potosi		140-250	J			
		Franconia						

- Geologic features**
- Brachiopod
 - ⊙ Drusy quartz
 - ⊙ Glauconite
 - ⊙ Rugose coral
 - ~ Erosion surface (unconformity)
 - △ Chert nodule
 - ⊙ Gastropod
 - △ Oolitic chert
 - Hardground surface
 - Gradual or sharp contact

A Quaternary surficial deposits Clay, silt, sand and gravel. Clay is gray with sand and silt layers. Silt is brown gray to yellow. Sand is light gray to yellow gray, locally argillaceous, fine to coarse grained, poorly sorted. Grains are subrounded to rounded tabular sand quartz. Gravels are angular to subrounded, and are composed of chert, quartz, igneous and metamorphic rocks and local underlying sedimentary rocks. The contact with the underlying units is unconformable.

B Galena Formation Dolomite, buff, slightly argillaceous to pure, medium grained. Beds are thin to medium and mottled, vuggy in the pure dolomite, separated by light green bentonite and gray shale partings. At the base of the formation, chert nodules are common particularly in the argillaceous dolomite. The top is not observed. Fossils are sparse. Dunleith unit is well exposed in the top of an inactive Macklin Inc. quarry located south East Flagg Rd. one mile north-northeast of the Rochelle City Clerk building at Rochelle (NW NW Sec. 20, T4N, R1E). The contact with the Quimby's Mill Member is gradational.

C Quimby's Mill Member Dolomite, slightly argillaceous and chert. The formation is divided into 3 lithologic units, from the top to the base: (1) the Strawbridge unit consisting of 2-12 inches thick beds of fine-grained buff to light brownish gray in fresh exposure, pure to slightly argillaceous dolomite, cherty and mottled at the base, separated by thin argillite partings, (2) the Shullsburg unit consisting of 1-4 inches thick beds of buff slightly argillaceous and cherty dolomite, and (3) the Hazel Green unit consisting of 2-6 inches thick beds of fine-grained dark buff to gray moderately argillaceous and cherty dolomite. Fauna is sparse. Tabulate coral *Foerstephyllum* is observed in the Hazel Green unit. Quimby's Mill Member is well exposed and 13 feet thick in the lower and middle part of an active Macklin Inc. quarry located southeast South Dement Rd. and East Illinois Route 38 two miles northeast of the Rochelle City Clerk building at Rochelle (SE NE NW Sec. 20, T4N, R2E). The base is gradational with the underlying Nachusa Member.

D Nachusa Member Dolomite, light gray to blue-gray in fresh exposure, yellow buff or yellow orange when weathered, and chert. Three distinct lithologic units are identified from the top to the base: (1) the Everett unit consisting of 4-12 inches thick massive and tabular beds of pure dolomite with a band of 1/4 inch-size chert nodules, (2) the Elm unit consisting of 2-8 inches thick beds of slightly argillaceous dolomite with scattered chert nodules, and (3) the Eldena unit consisting of 1-6 inches thick slightly wavy to tabular beds of medium-grained pure to slightly argillaceous dolomite and thin gray-green to dark brown shale partings. To the west to the Rochelle Quadrangle, an iron-rich hardground omission surface is observed, but in the Rochelle Quadrangle, this surface is not observed. Fossils are generally moderately abundant in the lower part and include gastropods, brachiopod *Opikina*, tabulate coral *Foerstephyllum*, rugose coral *Streptelasma*, and trace fossils *Palaeophycus* and *Chondrites*. Nachusa Member is exposed and 24 feet thick in an active Macklin Inc. quarry located southeast South Dement Rd. and East Illinois Route 38 two miles northeast of the Rochelle City Clerk building at Rochelle (SE NE NW Sec. 20, T4N, R2E). The lower contact is gradational with the Grand Detour Member.

E Grand Detour Member Dolomite, light gray to light buff, pure to argillaceous, fine grained and thin green-gray to dark brown shale partings. The base of the formation consists of 4-10 inches thick tabular pure dolomite beds with gray, white if weathered, chert nodules. The fauna is abundant and includes brachiopods, crinoids, gastropods, tabulate and rugose corals *Foerstephyllum* and *Streptelasma*, cephalopods, trilobites and lithistid sponges (Worthen, 1875; Kolata, 2015). The uppermost part of the Grand Detour Member is exposed and 42 feet thick in an active Macklin Inc. quarry located southeast South Dement Rd. and East Illinois Route 38 two miles northeast of the Rochelle City Clerk building at

Rochelle (SE NE NW Sec. 20, T4N, R2E). The contact with the Mifflin Member is not observed.

F Mifflin Member Dolomite, light gray in fresh exposures, light yellow buff to white when weathered, predominantly argillaceous, very fine to fine grained and thin greenish gray shale partings. Mifflin Member is locally very fossiliferous and contains various well-preserved brachiopods, bivalves, gastropods, bryozoans, ostracods, echinoderms and trilobite fragments (Kolata, 2015). The formation is not exposed in the quadrangle, but the water well (API no. 121412606400, at 90-100 feet deep) penetrated approximately the upper 10 feet of the Mifflin Member.

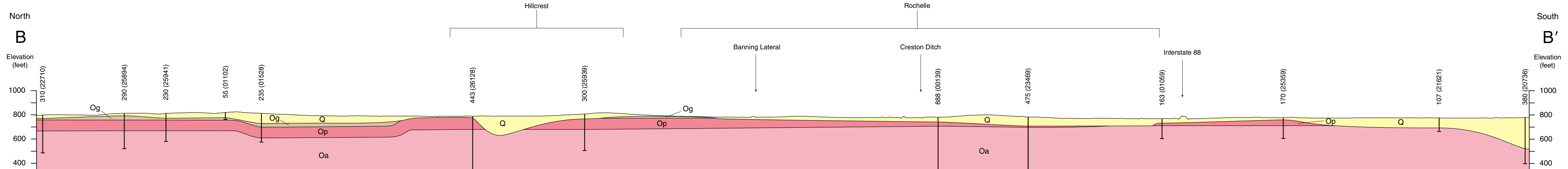
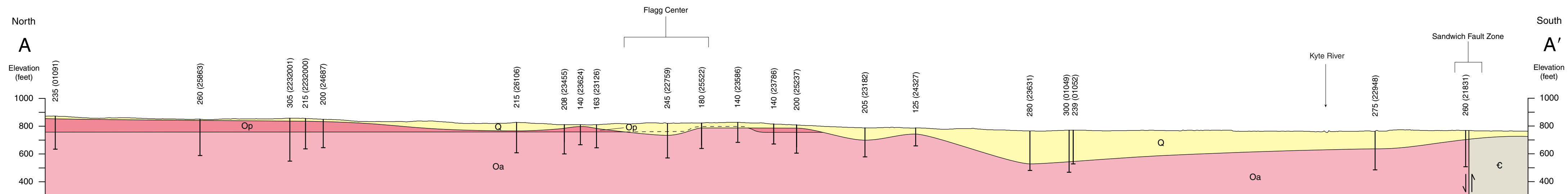
G Pecatonica Member Dolomite, light gray in fresh exposures, light buff or yellow-gray when weathered, slightly argillaceous to pure, fine grained and thin light green-gray shale partings. Near the contact with the Glenwood Formation, the formation consists of St. Peter Sandstone-like quartz sand grains. Phosphatic nodules and hardground omission surfaces are described at the base (Kolata, 2015). Fossils are sparse, but a few beds in the middle part of the member contain brachiopods, bryozoans, ostracods, corals, trilobites and echinoderms (Willman and Kolata, 1978). Pecatonica Member is not exposed in the quadrangle, but water wells (API numbers 12141002200, 121410013800, 121410013300, 121410106100, 121410109100, 121410019400, 12103241700, 121412606400) were drilled approximately 40-70 feet into the Pecatonica Member. The variation of thickness marks an unconformity with the underlying Ancestral Group.

H Ancestral Group Shale, siltstone, sandstone and dolomite. Ancestral Group is divided into 2 formations, from the top to the base: (1) the Glenwood Formation consisting of light brown or greenish gray shale, siltstone, sandstone and dolomite, and (2) the St. Peter Sandstone consisting of light gray to white in fresh exposure, light yellow brown when weathered, very fine- to coarse-grained quartz arenite. Glenwood Formation is subdivided into 4 distinct lithologic units, from the top to the base: (1) the Harmony Hill Shale Member consisting of medium-grained dark maroon greenish gray or dark maroon thin laminated silty and sandy shale, (2) the Loughridge Sandstone Member consisting of light brown or greenish gray argillaceous and silty sandstone, (3) the Daysville Dolomite Member consisting of greenish gray argillaceous, chalky, silty or sandy dolomite, and (4) the Kingdom Sandstone Member consisting of greenish gray argillaceous and silty sandstone, locally pyritic. Sandstone dominantly consists of a quartz arenite, very fine grained with scattered coarse grains, well rounded, thinly bedded, locally dolomitic, friable and poorly lithified. Ancestral Group is largely fossiliferous. Ancestral Group is not exposed in the quadrangle. Water wells (API numbers 121410019400, 121410122800, 121410105800, 121410013300, 121410109100, 121032417000) cross 45-70 feet thick of the Glenwood Formation, while the water wells (API numbers 121410104600, 121410013300, 121410122800, 121032417000) show 80 to 440 feet of the St. Peter Sandstone. Glenwood Formation is combined with the underlying St. Peter Sandstone on the geologic map. Glenwood Formation and the St. Peter Sandstone are assigned to the Ancestral Group. The lower contact is marked by a major unconformity (Sauk unconformity) with the underlying Prairie du Chien Group.

I Prairie du Chien Group Dolomite, sandstone, shale, and chert. Prairie du Chien Group comprises 3 distinct lithologic units, from the top to the base: (1) the Shakopee Dolomite, (2) the New Richmond Sandstone, and (3) the Oneota Dolomite. Shakopee Dolomite is blue-gray in fresh exposures, white to greenish gray when weathered, argillaceous to pure, crystalline, fine to medium grained dolomite, locally with white to light gray oolitic chert, buff siltstone and thin light greenish gray shale partings. New Richmond Sandstone is very difficult to differentiate due to its small thickness. It consists of very fine to medium grained, light gray to white, St. Peter Sandstone-like quartz arenite. Oneota Dolomite consists of me-

dium to coarse grained light brown gray pure dolomite with white to light gray chert. Fossils are rare but gastropods, cephalopods and algal mats have been reported (Templeton, 1942; Willman and Buschbach, 1975; Kolata, 2015). Fifty to two hundred sixty feet thick of the Prairie du Chien Group are recognized in the water and structure test wells (API numbers 121410004700, 121410104300, 121410104600, 121410104400, 121410029000, 121410013900, 121410013300, 121032417000, and 121410024300), but no exposures are observed in the quadrangle. Shakopee Dolomite is combined with the underlying New Richmond Sandstone and Oneota Dolomite on the geologic map, and they are assigned to the Prairie du Chien Group. The contact with the Cambrian rocks was not observed in the studied area. However, Willman and Buschbach (1975) reported that the Prairie du Chien is either conformable with the underlying Cambrian rocks or unconformable with the St. Peter Sandstone.

J Cambrian Dolomite and dolomitic sandstone. The Cambrian rocks include, from the top to the base, the Potosi Dolomite and Franconia Formation. Potosi Formation consists of fine to coarse grained, pinkish gray to yellow buff, pure, crystalline, glauconitic dolomite with abundant cavities and vugs filled by drusy quartz. Slightly glauconitic at the top, and glauconitic and sandy at the base. Franconia Formation comprises very fine-grained to medium-grained, light gray to yellow gray, glauconitic and dolomitic sandstone. Fauna is sparse, but a few beds contain fragments of brachiopods and crinoids. A maximum of two hundred fifty feet of the Potosi Dolomite and Franconia Formation are observed in the water wells with API numbers 121032417000, 121410013300, 121410104400, 121410004700, 121410029000 and 121410013900. The water well API no. 121410104400 and structure test API no. 121410024300 sample sets crossed deepest Cambrian rocks, which include, from the top to the base: (1) the Ironton-Galesville Sandstones consisting of approximately 160 feet thick medium- to coarse-grained white to light pinkish buff poorly sorted St. Peter Sandstone-like quartz arenite in a dolomitic matrix, (2) the Eau Claire Formation consisting of approximately 300 feet thick of gray brownish to buff slightly argillaceous to pure dolomite, locally glauconitic and sandy, and fine- to medium-grained gray dolomitic sandstone, and (3) the uppermost part of the Mt. Simon Sandstone consisting of two hundred feet thick of reddish to pale pinkish, locally yellow buff, medium- to coarse-grained, locally partly conglomeratic, poorly to moderately sorted, quartz arenite and thin red micaceous shale partings. Fossils are rare.



Horizontal scale: 1 inch = 2,000 feet
Vertical scale: 1 inch = 500 feet
Vertical Exaggeration: 4x

Well labels indicate total depth in feet followed by 5 digit unique number portion of API number in parentheses.

- surficial deposits
- ⊙ Galena Formation
- ⊙ Platteville Formation
- ⊙ Ancestral Group
- ⊙ Cambrian
- Well Boring
- Contact, accurate
- Fault, accurate, arrows show relative motion