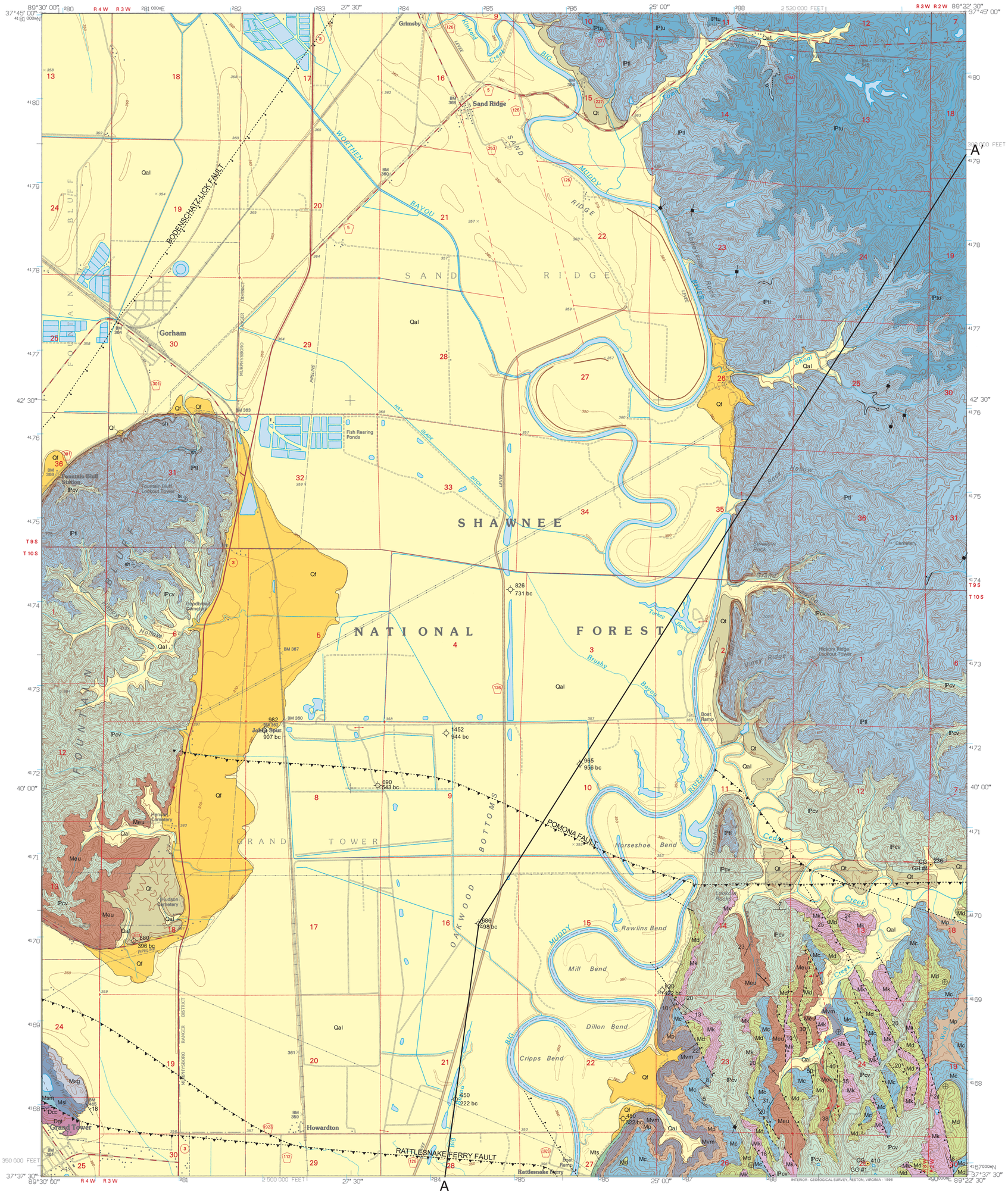
BEDROCK GEOLOGY OF GORHAM QUADRANGLE
JACKSON COUNTY, ILLINOIS

Mary J. Seid, Joseph A. Devera, and Allen L. Weedman
2009

Institute of Natural Resource Sustainability
William W. Shilts, Executive Director
ILLINOIS STATE GEOLOGICAL SURVEY
E. Donald McKay III, Interim Director

STATEMAP Gorham-BG



GEOLOGIC UNITS

Quaternary	Qal	Alluvial deposits	Pleistocene and Holocene
	Qf	Fan deposits	
	Qt	Terrace deposits	
	Unconformity		
Pennsylvanian	IPtu	Upper Tradewater Formation b, Boskydell marine zone	Desmoinesian
	IPtl	Lower Tradewater Formation c, unnamed coal sh, unnamed shale Ls, unnamed limestone lens	Atokan
	IPcv	Caseyville Formation	Morrowan
	Unconformity		
Mississippian	Meu	Elviran undifferentiated	Chesterian
	Mk	Kinkaid Limestone	
	Md	Degonia Sandstone	
	Mc	Clore Formation	
	Mp	Palestine Sandstone	
	Mvm	Vienna Limestone through Menard Limestone	
	Mts	Tar Springs Sandstone	
	Unconformity		
	Msg	Ste. Genevieve Limestone	Valmeyeran
	Msl	St. Louis Limestone	
	Msm	Salem Limestone	
	Unconformity		
Devonian	Dgt	Grand Tower Limestone	Middle
	Dcc	Clear Creek Chert	Lower

Symbols

- 40 — Strike and dip of bedding; number indicates degree of dip
- Vertical bedding
- Horizontal bedding
- Vertical joint

Drill Holes
from which subsurface data were obtained

- Oil test hole
- Stratigraphic boring

GC ○ 880 / GG #1 ○ 498 bc
Upper left labels indicate geophysical log (o), or core (c).
Lower left label indicates core name.
Upper right numeric labels indicate total depth of boring in feet.
Lower right label indicates depth to Beech Creek (bc) in feet.
Dot indicates location accurate within 100 feet.

Line Symbols
dashed where inferred, dotted where concealed

- Contact
- Normal fault or rotational slump fault; bar and ball on downthrown side
- Reverse fault; triangle on upthrown 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 Web site.

Base map compiled by Illinois State Geological Survey from digital data (Raster Feature Separates) provided by the United States Geological Survey. Compiled from imagery dated 1946. Revised from imatery dated 1993. PLSS and survey control current as of 1947. Contours and elevations current as of 1946. Partial field check by US Forest Service 1994. Map edited 1996.

North American Datum of 1983 (NAD 83)
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

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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
SUPPLEMENTARY CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Geology based on field work and map compilation by Mary J. Seid, Joseph A. Devera, 2008–2009, and Allen L. Weedman, 1991.

Digital cartography by Jane E.J. Domier and Steven M. Radil, 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.

The Illinois State Geological Survey and the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this document and accept no liability for the consequences of decisions made by others on the basis of the information presented here. The geologic interpretations are based on data that may vary with respect to accuracy of geographic location, the type and quantity of data available at each location, and the scientific and technical qualifications of the data sources. Maps or cross sections in this document are not meant to be enlarged.

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

For more information contact:
Institute of Natural Resource Sustainability
Illinois State Geological Survey
615 East Peabody Drive
Champaign, Illinois 61820-6964
(217) 244-2414
http://www.isgs.illinois.edu

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Raddle
2 Oraville
3 Murphysboro
4 Altenburg
5 Pomona
6 Neelys Landing
7 Wolf Lake
8 Cobden

APPROXIMATE MEAN DECLINATION, 2009

ROAD CLASSIFICATION

SYSTEM	SERIES	STAGE	FORMATION	MEMBER or BED	GRAPHIC COLUMN	THICKNESS (feet)	UNIT
QUATERNARY	PLEISTOCENE AND HOLOCENE			Alluvium, fan, and terrace deposits		0–200	A
PENNSYLVANIAN			Upper Tradewater	Boskydell marine zone (trace fossils)		130–?	B
						5–20	C
	ATOKAN		Lower Tradewater	unnamed coals		150–250	D
	MORROWAN		Caseyville			200–260	E
MISSISSIPPIAN	CHESTERIAN	ELVIRAN	Kinkaid Ls	Negli Creek		0–30	F
			Degonia Sandstone			100–120	G
			Clore	Ford Station Oolite bed / Tygett Ss / Cora Ls		60	H
			Palestine Ss			20–30	I
			Menard Limestone	Oolite bed		110–130	J
				Waltersburg / Vienna Ls			
			Tar Springs Sandstone			90	K
	Lower Chesterian faulted out or not exposed in this quadrangle						
	VALMEYERAN		Ste. Genevieve Limestone	Shetlerville Levias		220–300	L
			St. Louis Limestone			200–250	M
			Salem Limestone			250–350	N
Upper Devonian-Lower Mississippian faulted out or not exposed in this quadrangle							
DEVONIAN	MIDDLE	EIFELIAN	Grand Tower Limestone	Dutch Creek Sanstone		40	O
	LOWER	EMSIAN	Clear Creek Chert			only upper part exposed	P

A Alluvium, fan, and terrace deposits Sand, gravel, silt, and clay. Generally light gray to brown gray, coarse to fine grained, poorly sorted. Unconformable contact with unit below.

B Upper Tradewater Formation Sandstone, shale, and limestone (described as separate unit below). Sandstone is light brown, sublitharenite, fine to coarse grained; dark grains, mica, interstitial clay, quartz pebbles common; bedding ranges from thin to thick, cross bedded. Shale is light gray to medium gray, plant fragments common, fissile. Gradational contact with unit below.

C Boskydell marine zone Sandstone and limestone. Occurs locally; discontinuous and not mappable. Ferruginous sandstone with abundant trace fossils, flaggy bedding, clay drapes, micaceous. Limestone is gray wackestone, interbedded with clay, has hourglass weathering; trace fossils include *Zoophycus* isp., *Psammichnites plummeri*, *Diplichnites* isp., *Cruziana* isp., *Protovergeneria*, and *Lockeia* isp.; macrofossils include spiriferids, productids, chonetids, crinoids, bellerophontid gastropods, rugose corals, and fenestrate bryozoans. Gradational contact with unit below.

D Lower Tradewater Formation Sandstone, siltstone, shale, and coal. Sandstone is dark brown on weathered surface, light brown on fresh surface, sublitharenite to quartz arenite, fine to coarse grained, well to poorly sorted, thin to massively bedded, lenticular, cross bedded; intense iron staining and liesegang banding are common; mica, small dark and pink grains, interstitial clay and chert pebbles are abundant in places, but it can be a relatively clean quartz arenite; thin zones of rhythmically laminated bedding occur. Siltstone is gray, flaggy, micaceous in places. Shale is medium gray, fissile. Coal is poorly developed, thin, and discontinuous. Scoured and disconformable contact with unit below.

E Caseyville Formation Sandstone, siltstone, shale, and conglomerate. Sandstone is light brown on a fresh surface, quartz arenite, dominantly fine to medium grained, but coarser grains and abundant quartz pebbles occur in places and are diagnostic of the formation; well to poorly sorted, cross bedded, ripple marked beds occur, calcareous in places, prominent iron staining and liesegang banding in places; weathered surface is pocky and forms sapping alcoves at the base of large bluffs. Siltstone is gray, laminated with medium grained sandstone and gray shale, carbonaceous, pyritic in places, microcrossbedded, and contains contorted bedding, flame structures, and calcareous bands. Shale is light gray, micaceous in places, weakly fissile, partly silty, sandy and calcareous in places, and poorly exposed. Conglomerate includes large gray and black rounded limestone clasts and is cemented with quartz pebbles and gray sandstone; the sand matrix is extremely well indurated and appears glassy, as if sand grains are welded together. Scoured contact and angular unconformity with unit below.

F Kinkaid Limestone Limestone and shale. Mostly dark gray crinoidal wackestone to packstone, lime micrite with conchoidal fracture at base, medium bedded; becomes shaly in places and can include shale beds a few feet thick; fossils include brachipods, Bellerophontid gastropods, crinoids, and *Chaetetes* sp.; *Girvanella* sp. is diagnostic of this unit. Sharp contact with unit below.

G Degonia Sandstone Sandstone, siltstone, shale, and claystone. Sandstone is white to light brown quartz arenite, fine grained, well sorted, generally very thinly bedded but is a massively bedded bluff former in this quadrangle; dominantly quartz, but 1-2% dark or green mineral grains, and calcareous in places; dark coaly layers and pyrite nodules scattered throughout. Siltstone is rhythmically laminated with dark to light gray shale, wavy bedded, and calcareous in part. Shale is very dark gray to black, non-fissile, non-calcareous, and non-fossiliferous. Claystone is green, red, olive, purple, and non-calcareous. The thin bedded nature and abundance of primary sedimentary structures in sandstone layers can differentiate this unit from the Caseyville. In outcrop, sandstone is well-exposed, and siltstones and shales are not exposed. Sharp contact with unit below.

H Clore Formation Limestone and shale. Ford Station Member is brownish gray crinoidal wackestone, becomes clay-rich in places, and öolitic grainstone occurs at the base. Dolostone with a yellowish weathered rind is diagnostic of the upper part of the Ford Station member and is informally referred to as the "yellow bed". Tygett member is dark gray silty shale, laminated, non-fissile, with thin silt lenses and layers in places; trace fossil *Teichichnus* ichnosp. (horizontal, gutter stacked trace fossil) occurs. Cora member is interbedded limestone and shale; limestone is medium gray wackestone to packstone; shale is dark gray, non-fissile, non-calcareous; fossils include myalinids, crinoids, fenestrate bryozoans, Archimedes sp., rhomboporid bryozoans, pelmatozoa, *Composita subquadrata*, *Anthracospirifer increbescens*, and productid brachiopods. Sharp contact with unit below.

I Palestine Sandstone Sandstone. Light brown to white quartz arenite, fine grained, thin bedded, lenticular, and thin sand waves occur. Sharp contact with unit below.

J Menard Limestone, Waltersburg Formation, and Vienna Limestone Limestone, siltstone and shale. Menard Limestone is dominantly light to medium brown-gray packstone to grainstone, but light gray micrite and shaly wackestone beds occur throughout; mostly medium bedded, but sometimes appears thick bedded on weathered face; very öolitic and cross bedded in lower part; several thick medium gray or greenish gray shale beds occur throughout; fossils include öolites, brachiopods, bivalves, myalinids, and crinoids. Vienna Limestone and Waltersburg are very thin and are not differentiated in this quadrangle. Vienna Limestone is a cherty limestone and a few feet thick. Waltersburg is a siltstone about 1' thick. Sharp contact with unit below.

K Tar Springs Sandstone Sandstone. White on fresh surface, fine grained, medium bedded with thin, tabular interbeds. Basal contact not seen in quadrangle.

L Ste. Genevieve Limestone Limestone. Facies range among öolitic grainstone, fossil grainstones, and packstones, light gray to white; thick to medium bedded; grainstones are cross bedded; white chert nodules scattered in the middle part; important fossils include: *Platycrinites penicillus*, found typically as disarticulated crinoid columnals. They are diagnostic and are oval shaped with calcareous nodes around the periphery. The small brachiopod, *Pugnoides ottumwa* is representative. The limestone can be dolomitized near fault zones. Basal contact was not observed.

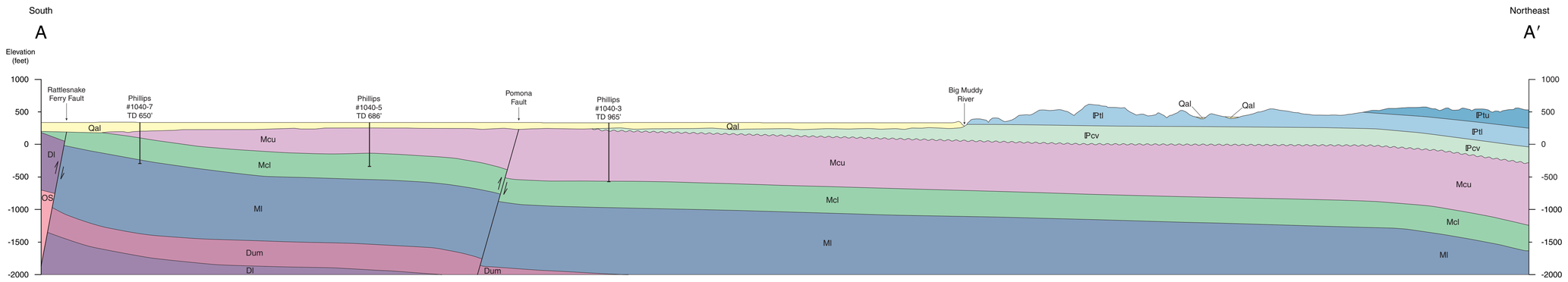
M St. Louis Limestone Limestone and shale. Gray to medium gray lime-mudstone (sublithographic) displays conchoidal fracture; thick to massively bedded; white to light gray chert occurs in ovoid nodules with variegated light and dark gray banding in some. Fossil wackestones and rare packstones occur. Fossils, where they occur, are dominated by echinoderms, including disarticulated and complete crinoids and echinoids. Boundstones occur in the lower part of the unit and are primarily composed of *Acrocyathus proliferum* and *Acrocyathus floriformus*. Shale is medium gray, bluish gray, and green and occurs in thin beds between limestone beds. Basal contact was not observed.

N Salem Limestone Limestone, shale and dolostone. The top part is brownish dolostone with thin gray shale partings; öolite beds occur in the upper central and lower parts; Endothyrid foraminifera abundant in some beds. Lower part was not observed due to faulting.

O Grand Tower Limestone Limestone. The upper limestone is brown gray and thinly bedded; the basal part is light gray to medium gray sandy limestone. The lower part yields thick cross bedded limestone overlain locally by boundstones, which are composed of *Hexagonaria* and Stromatoporoids. In places, a white sandstone laterally grades into a light gray crinoidal grainstone. Brachiopods are common—some beds are entirely composed of chonetid packstone facies. Unconformable contact with unit below.

P Clear Creek Chert Chert and limestone. White to light brownish yellow, thin to medium bedded, fossiliferous chert; some limestone beds occur throughout with sandy beds near the top; brachiopods and trilobites occur as internal casts and external molds and are common in some beds; vertical burrows have been observed; stylolites are prominent. Locally unconformable and sharp contact with unit below.

South A — A′ Northeast



Qal Alluvial deposits
IPtu Upper Tradewater Formation
IPtl Lower Tradewater Formation
IPcv Caseyville Formation
Mcu Chesterian above and including Beech Creek
Mcl Chesterian below Beech Creek
Ml Lower Mississippian below Chesterian
Dum Upper and Middle Devonian
Dl Lower Devonian
OS Ordovician and Silurian undifferentiated

Horizontal scale: 1 inch = 2,000 feet
Vertical scale: 1 inch = 1,000 feet
Vertical exaggeration: 2×