

SYSTEM	SERIES	MEMBERS AND BEDS	GRAPHIC COLUMN	THICKNESS OF COAL (in.)	THICKNESS (ft)	DESCRIPTION UNIT	DESCRIPTION
PENNSYLVANIAN	Pottsville (Pottsville)	Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
		Pottsville					
MISSISSIPPIAN	Clinton	Clinton					
		Clinton					
		Clinton					
		Clinton					
		Clinton					
		Clinton					
		Clinton					
		Clinton					
		Clinton					
		Clinton					

STRUCTURAL GEOLOGY

The Eddyville Quadrangle lies along the southern margin of the Illinois Basin; sedimentary strata dip regionally slightly west of north at 1 to 3 degrees. This pattern is strongly modified by six named structures shown on the geologic map. From north to south, these are the New Burnside Anticline, the Battle Ford Syncline, the McCormick Anticline, the Bay Creek Syncline, the Shawneetown Fault Zone, and the Lusk Creek Fault Zone. The New Burnside Anticline, near the northern edge of the quadrangle, has a slightly sinuous axis trending east-west. It is a narrow, asymmetrical fold. The northern limb is generally steeper, with dips of 15° to 30°, compared to 5° to 15° on the south flank. The crest is gentle in some places, but in other places it is a sharp hinge. Parallel subordinate anticlines, synclines and monoclines are present. Numerous faults also have been mapped. Some strike parallel with fold axes and tend to pass laterally into sharp flexures. Other faults, mainly north of the anticlinal axis, strike east-northeast. All exposed faults are high-angle normal. Total structural relief on the New Burnside Anticline is 250 to 400 feet. The anticline terminates abruptly on the east side of Blackman Creek, but faulting continues farther east.

The Battle Ford Syncline, named herein for Battle Ford Creek, is 1/2 to 1 mile south of and parallel with the New Burnside Anticline, and is roughly 8,000 feet wide. The syncline has a gently dipping south flank, a broad trough, and a moderately dipping north flank. The eastern end of the Battle Ford Syncline is abruptly closed off in the vicinity of Blackman Creek. A northeast-trending fault crosses the syncline near its eastern end.

The McCormick Anticline follows a gently curving course westward from Section 1, T.11S., R.6E., to Section 11, T.11S., R.5E. This fold is similar in geometry to the New Burnside Anticline, but the McCormick has greater relief. A vertical relief of 650 feet within a distance of 2000 feet occurs at the western edge of the quadrangle. Both fold axes and faults along the McCormick Anticline tend to form a right-stepping or echelon pattern. So far as is known, surface faults are high-angle normal; however, a seismic profile indicates thrust faulting at depth. The New Burnside and McCormick Anticlines are interpreted on the cross-section as thin-skinned folds associated with thrust faults that ramp upward from a décollement (probably in pre-Mississippian rocks). Normal faulting along these anticlines is believed to be the product of a later episode of deformation.

The Bay Creek Syncline, named herein for Bay Creek, is about 7,000 to 10,000 feet south of the crest of the McCormick Anticline. The synclinal axis curves from west-northwest to southwest. Like the Battle Ford Syncline, the Bay Creek Syncline is broad and gentle. The Bay Creek Syncline is gradually closed off near the east edge of the map, as it approaches the Shawneetown Fault Zone.

Only a small segment of the Shawneetown Fault Zone lies within the Eddyville Quadrangle. Two faults have been mapped, forming a narrow graben that strikes slightly east of north in Sections 24 and 25, T.11S., R.6E. The Shawneetown Fault Zone is part of the Rough Creek-Shawneetown Fault System, which extends 115 miles across southeastern Illinois and western Kentucky.

The Lusk Creek Fault Zone crosses the southeastern corner of the Eddyville Quadrangle and intersects the southern end of the Shawneetown Fault Zone. The Lusk Creek consists of northeast-trending parallel faults in a zone 600 to 1400 feet wide. The faults dip steeply southeast and include both normal and reverse dip-slip faults. The net displacement is down to the southeast; the downthrown block is known as the Dixon Springs Graben. Within the Lusk Creek Fault Zone are narrow dikes of rock older than those found on either side of the zone. The geometry of the fault zone indicates two episodes of post-Pennsylvanian movement: The first reverse with the southeast side upthrown, the second normal with the southeast side downthrown (Nelson, 1986). Seismic profiles reveal that the Lusk Creek Fault Zone is a major crustal feature. Along with the Rough Creek-Shawneetown Fault System, the Lusk Creek formed the northwestern margin of a major graben in the late Proterozoic to early Cambrian time.

ECONOMIC GEOLOGY

Unsuccessful exploration for oil and gas, and limited exploitation of coal, fluorspar, and related minerals have taken place in the Eddyville Quadrangle.

The Illinois State Geological Survey has records of nine petroleum test holes in the quadrangle. All were dry holes, and no significant shows of oil or gas were reported. Most wells were targeted for Mississippian strata on the McCormick and New Burnside Anticlines. The Texas Pacific #1 Mary Strick hole, Section 2, T.11S., R.6E., holds the current depth record for Illinois at 14,942 feet. This well bottomed in Cambrian sandstone. The Texas Pacific #1 Well et al. hole finished drilling at 6,200 feet in Silurian shale. The other seven wells had total depths of 1,500 to 2,300 feet and finished in Mississippian strata.

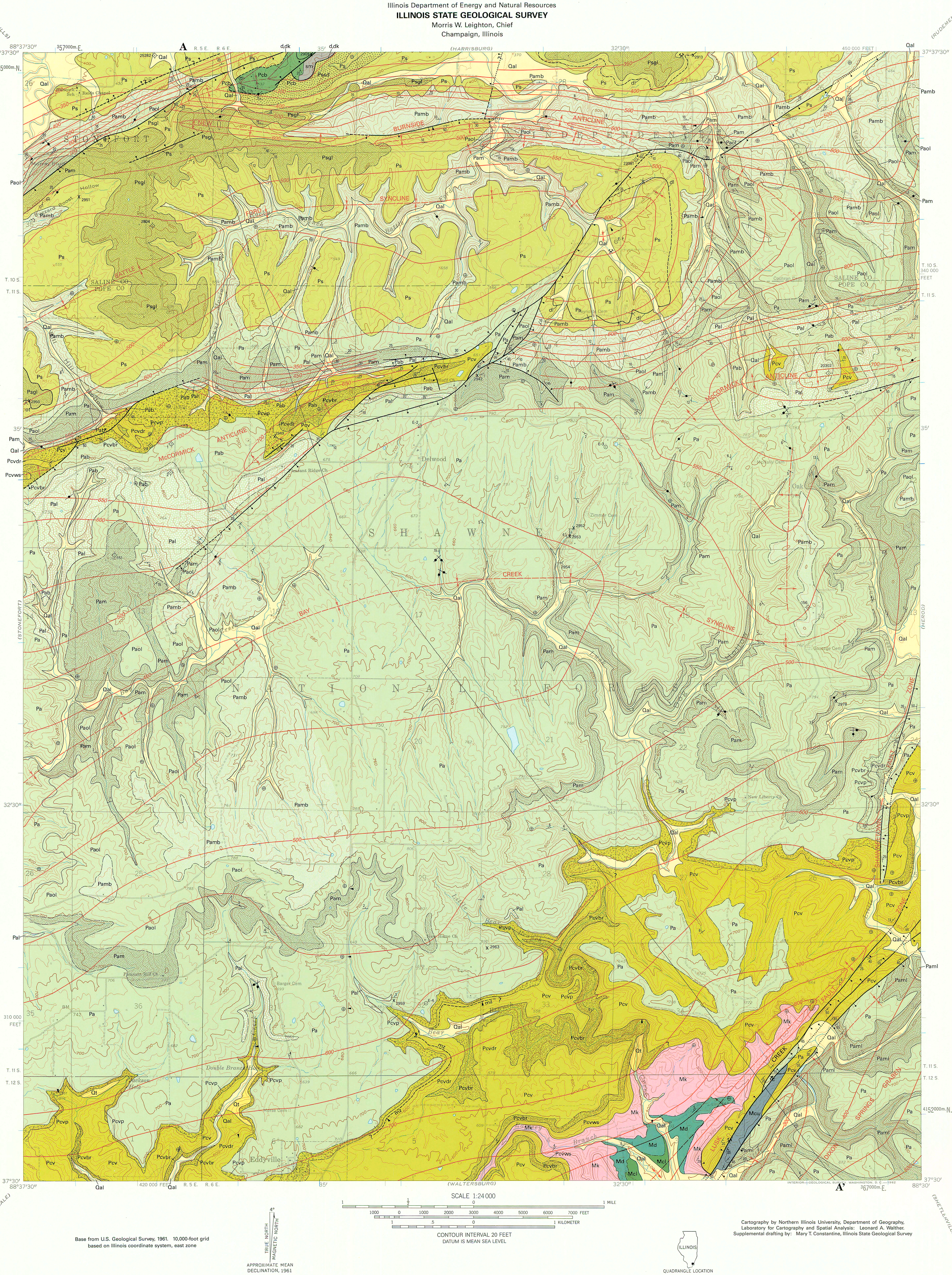
Surface mining of the Davis and Dekoven Coals took place in the early 1970's at the Brown Brothers Excavating No. 1 Mine, NE 1/4 Section 30, T.10S., R.6E. These coals were, respectively, about 4 feet and 3.5 feet thick. A small area of unmined Davis and Dekoven coal remains northwest of the Brown Brothers mine. The Delwood Coal Bed occurs in a triangular structural basin northeast of Delwood village, and in part of Sections 27 and 28, T.10S., R.6E., at the north edge of the quadrangle. Borholes and surface exposures show this coal is 2 to 3.5 feet thick, commonly containing a 2- to 4-inch clay parting near the middle. All this coal is believed to exist at depths less than 100 feet. Only small-scale mining of this coal for local use, in small drift mines, has taken place.

A drift mine that operated about 1955 lies at the west edge of the map in Section 2, T.11S., R.5E. The Oldtown Coal Bed in the lower part of the Spoon Formation was mined, and reportedly was 3.5 feet thick at this mine. This coal is not known to occur elsewhere in the Eddyville Quadrangle. Other lenticular coals in the Abbott and Caseyville Formations have been dug for local use, but are not known to exceed 2 feet thick.

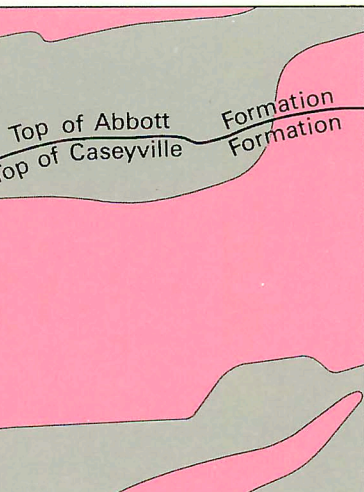
Fluorspar and accessory minerals were mined during the 1940's at the Lost 40 Mine, a shallow shaft mine in the E. 1/2 Section 3, T.12S., R.6E. The ore deposits occurred in veins along the Lusk Creek Fault Zone (Weller et al., 1952; Klamer, 1982). Prospect pits and slight mineralization were observed elsewhere along the fault zone. Additional resources may exist at greater depth along the Lusk Creek Fault Zone.

REFERENCES CITED

- Klamer, John S., 1982, Geologic map of the Lusk Creek roadless area, Pope County, Illinois: U.S. Geol. Survey, Misc. Field Studies Map MF-1405-A.
- Nelson, W. John, 1986, Structural history of Lusk Creek Fault Zone (abstract): Geol. Society of America, North Central Section, Abstracts with Programs, vol. 18, no. 4, p. 317.
- Weller, J. Marvin, Robert M. Grogan, and Frank E. Tippie, 1952, Geology of the fluorspar deposits of Illinois: Illinois State Geol. Survey, Bulletin 76, 147 p.



EXPLANATION	
Qt	Talus and colluvium
Qal	Alluvial deposits; may be underlain by lacustrine deposit.
hc	Carbonate Formation
hc	Houchin Creek Coal Member
d.k.	Davis and Dekoven Coal Members, Davis at base, Dekoven about 50R higher
Psd	sub-Davis sandstone
Ps	Psgl, golden sandstone
dt	Delwood Coal Bed
ot	Oldtown Coal Bed
Pamb	Abbott Formation
Paol	Murray Bluff Sandstone Member
Paol	olive shale
Pam	Pam, middle Abbott sandstone
Pam	Pam, middle and lower Abbott sandstone, in Dixon Springs Graben
Pal	lower Abbott sandstone
Pab	Pab, basal Abbott shale and sandstone
Pcov	Caseyville Formation
Pcov	Pounds Sandstone Member
Pcov	Drury Member
Pcov	mz, massive zone
Pcov	Battery Rock Sandstone Member
Pcov	Wayside Member
Mk	Kinkaid Limestone
Md	Degonia Formation
Mcl	Clore Formation
Mcu	Chesterian undifferentiated (in Lusk Creek Fault Zone)
Mvu	Valmeyeran undifferentiated (cross section only)
LINE SYMBOLS: Dashed where inferred; dotted where concealed	
Contact	
Coal bed	
Fault: bar and ball on downthrown side	
Anticline	
Syncline	
Line of cross section	
Structure contour (see index map below)	
SYMBOLS	
Strike and dip of bedding (representative sample). Number indicates degree of dip	
Horizontal bedding	
Vertical joints	
Joints, direction of dip indicated	
Abandoned mine shaft, small surface mine or prospect pit	
Abandoned coal adit or drift mine	
Coal exposure with ISGS coal maceration and palynological analysis number	
Outcrop of special note, shown where contact, map unit, or fault was well exposed at time of mapping	
Surface-mined area	
ISGS cored test hole	
Oil test hole, with ISGS county number	



GEOLOGIC MAP OF THE EDDYVILLE QUADRANGLE, ILLINOIS