GEOLOGIC MAPPING AND MAP PREPARATION
FUNDED IN PART BY U. S. GEOLOGICAL SURVEY,
COOPERATIVE GEOLOGIC MAPPING PROGRAM
(COGEO MAP)

PREPARED BY
INDIANA DEPARTMENT OF NATURAL RESOURCES
INDIANA STATE GEOLOGICAL SURVEY
DR. NORMAN HESTER
DIRECTOR
BLOOMINGTON IN

GEOLOGIC QUADRANGLE MAP
ROCKVILLE AND BELLMORE QUADRANGLES
INDIANA

EXPLANATION OF SYMBOLS

SYMBOL	CONSOLIDATED	UNCONSOLIDATED
	INTRABASINAL CLASTS	COLLUVIUM
	CONGLOMERATE	GRAVEL
	SANDSTONE	SAND
	SILTSTONE	SILT
	SHALE	CLAY
	LIMESTONE	
	DOLOSTONE	
	ARGILACEOUS LIMESTONE	
	COAL	
	UNDERCLAY	
	PLANAR OR TROUGH CROSS-STRATIFICATION	
	CLIMBING RIPPLES	

GENERALIZED GEOLOGIC COLUMN

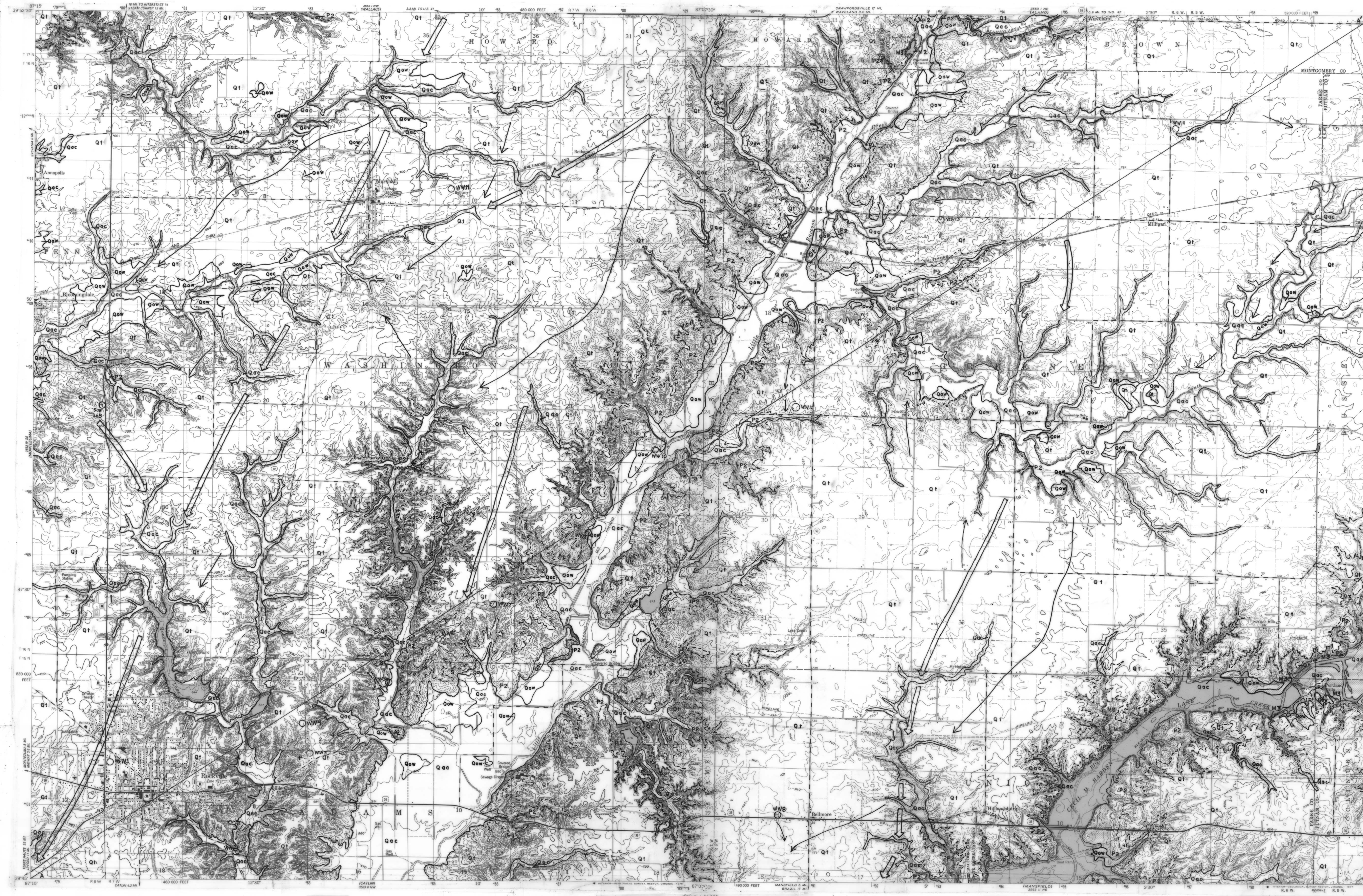
SYSTEM	SERIES	GLACIATION	GROUP	FORMATION	MEMBER OR BED	LITHOLOGY	THICKNESS IN FEET	DESCRIPTION
QUATERNARY	PLEISTOCENE AND HOLOCENE				Alluvium and Colluvium		0 to 60	Poorly sorted, structureless to slightly laminated clay, silt, sand and fine gravel deposits in modern stream beds and lowlands. Includes some colluvium along valley margins. Mapped where Eel, Genesee, and Shoals, soils are present based on soil survey of Parke county by Ulrich and others (1967). The above soils generally form on deposits more than four feet thick.
	PLEISTOCENE	WISCONSIN		Atherton (in part)	Glacial outwash		0 to 50 ?	Stratified, calcareous gravel and sand deposits present in alluvial terraces and in hills on the upland till plain. Thin deposits of outwash are present on bedrock defended terraces along Little Racoon Creek. Mapped where Camden, Ockley, Fox, and Warsaw soils are present, based on soil survey of Ulrich (1967). Outwash is commonly mantled with loess up to four feet thick.
				Wedron and Trafalgar	Glacial till		0 to 130	Non-bedded, unsorted clay, silt, sand, and gravel deposits form the till plain and areas of morainal topography. Generally mapped where Alford, Fincastle, Hennepin, Ragsdale, Reesville, and Russell soils are present (Ulrich 1967). The ridge which divides the drainages of Leatherwood and Roaring Creek to the northwest from the drainages entering the Little Racoon Creek to the south may be an end moraine or a buried end moraine. This divide seperates till of principally northern (Lake Michigan lobe, Wedron formation) derivation from till which is mainly of northeastern (Huron-Erie lobe, Trafalgar formation) derivation. Till of northern derivation is found in the northwest corner of the map area. Till is commonly mantled with loess less than six feet thick. This silt may exceed six feet in thickness where it has been washed into broad shallow depressions. Till derived colluvium one to three feet thick is the surface material on steep slopes.
								Quaternary deposits overlie erosionally truncated (all) Pennsylvanian and Mississippian units described below
PENNSYLVANIAN	ATOKAN		Raccoon Creek	Unit P-2	Minshall coal; Upper Block coal; Lower Block coal		125	
	MORROWAN			Unit P-1			0 to 240	Both P-1 and P-2 consist of three major lithofacies described below. (1) Coal / Paleosol facies- Thin, discontinuous rooted coals and paleosols consisting of gray underclays, commonly containing root traces and bioturbation. (2) Crossbedded sandstone facies- Medium to coarse grained, moderately well sorted quartz arenites. Quartz pebble conglomerates commonly occur near the basal unconformity. Intraformational clasts of ironstone and goethite-cemented siltstone along with coal rip-up clasts are common. Primary sedimentary structures include stacked sets of planar and trough cross-stratification with set thickness ranging from a few inches to ten feet. Straight channeled, discontinuous, shoestring sandstone bodies generally have scoured bases and unimodal paleoflow direction. Sandstone thicknesses range from 3 to 70 feet, and range in width from tens of feet to 3300 feet. (3) Interbedded sandstone / mudstone facies- Gray to dark gray mudstones and fine to medium grained, discontinuous sandstones. Bedding varies from lenticular - to wavy - to flaser bedded with concomitant increase in sandstone. Flaser bedded sandstones locally contain climbing ripples with clay drapes. Trace fossils include: ZOOPHYCUS, LOCKEIA, CHONDRITES, PLANOLITES, CONOSTICHUS, CRUZIANA, CURVOLITHUS, AND SCALARITUBA, as well as unnamed shrimp and unidentified arthropod tracks.
								P-2 overlies P-1 and erosionally truncated St. Louis and St. Genevieve Limestone formations. P-1 overlies erosionally truncated (all) Mississippian units described below.
MISSISSIPPIAN	VALMEYERAN		Blue River	Saint Genevieve Ls			100	The St. Genevieve Limestone formation consists of skeletal and micritic limestone which commonly contains small crinoids, bryozoan and brachioipods. Poorly exposed .
				Saint Louis Ls			100	The St. Louis Limestone formation can be divided into two parts. The upper part consists of gray, micritic, peletal , and skeletal limestone which contains large bryozoan, crinoids, brachiopods, chert nodules, and discontinuous beds of mottled, light- and dark-gray dense chert. The limestones are interbedded with gray calcareous shales. The lower portion consists of interbedded gray to green clays and brownish-gray dolomitic siltstones and gray micritic limestones. Scattered exposure in map area.
			Sanders	Undifferentiated			95	Upper Sanders (Salem Limestone formation) consists of interbedded fine-grained, argillaceous dolostone, and dense, dark-gray to dark-brown, argillaceous limestone. Limited exposure. Other formations of the Sanders group are not exposed in the map area. The facies of the middle and lower Sanders, and of the Borden Group are described as they appear in exposures north this area. Middle Sanders (Harrodsburg Limestone formation) contains gray, coarse-grained, bioclastic calcarenite and calcirudite. Shale lenses up to 2 feet thick, dolostone and argillaceous limestone are present near the base of the formation in some places. Lower Sanders (Ramp Creek formation) contains interbedded dolostone, limestone, and minor siltstone. Limestone is gray, coarse-grained, bioclastic grainstone, and rudite, contains chert, brachiopods, and bryozoans, and is very argillaceous in places. Dolostone is gray to brownish-yellow, fine to coarse-grained, geodes and chert are common.
			Borden	Undifferentiated			greater than 150	Upper Borden (Edwardsville Formation) contains: gray, argillaceous, bioturbated siltstone; fine-grained sandstone in thin, discontinuous beds; and thin, discontinuous lenses and bioherms of crinoidal limestone. Middle Borden (Spickert Knob Formation) is a mixture of silt and silty shale in discontinuous lenses. This coarsening upward interval includes some fine-grained sandstone and argillaceous limestone near the top. Lower Borden (New Providence Shale Formation) is green-gray and purple shale.

DIVISION OF PENNSYLVANIAN UNITS

The Raccoon Creek group in the mapped area is formally composed of the Brazil and Mansfield formations. The Brazil formation is defined as those rocks that occur between the top of the Minshall coal member and the base of the Lower Block coal member (Shaver et al 1986).
Thus, the Raccoon Creek Group in the mapped area has been informally subdivided into two mappable units, P-1 and P-2. P-1 is believed to be stratigraphically equivalent to the upper part of the Mansfield formation and P-2 equivalent to the Brazil formation. The contact between P-1 and P-2 is based on the following criteria:
(1) correlation of mined coals identified by Powell (1968) as the Lower Block coal member,
(2) utilization of coal palynology studies along Roaring creek (Peppers 1979 and 1982),
(3) correlation of major sandstones (capping Mississippian paleotopographic hills and dipping 15 to 20 feet per mile) across the map area to the upper most part of the Mansfield formation (Furer, I.G.S., unpublished regional subsurface cross section).

VERTICAL SCALE

Meters	Feet
	10
	20
10	30
	40
	50
	60
20	70
	80
	90
30	100



Base by U. S. Geological Survey
Rockville 1976
Bellmore 1963 revised 1976

EXPLANATION

UNCONSOLIDATED DEPOSITS

Holocene

Qac — Alluvium / Colluvium

Wisconsinan

Qow — Glacial outwash

Qt — Glacial till (Undifferentiated Trafalgar and Wedron formations)

BEDROCK

Pennsylvanian

P2 — Informal Pennsylvanian map unit (Brazil formation equivalent)

P1 — Informal Pennsylvanian map unit (Mansfield formation equivalent)

Mississippian

M4 — Saint Genevieve Limestone formation

M3 — Saint Louis Limestone formation

M2 — Sanders Group (Undivided)

M 1 — Borden Group (Undivided)

Contact
Solid line where accurately located, short dashes for inferred contact. Contact between unconsolidated deposits and bedrock is also dashed where former are thin.
Long dashes are used only on cross-section where thicknesses are based on data from projected drill holes.

A — A' Line of cross-section

○ SDH 368 Survey drill hole
Number indicates I. G. S. index number.

○ WW 1 Water well used in cross-section
Number is key for cross-section location.

Coal Mines
Locations follow map of Powell (1968)

- Slope or drift mine
S - Strip mine
+ - Shaft mine

Outcrop
Area exposed during mapping, other mapped bedrock is covered by a veneer of soil or unconsolidated deposits.

Modified land
Land extensively modified by excavation of coal.

Mined coals
(Powell,1968)

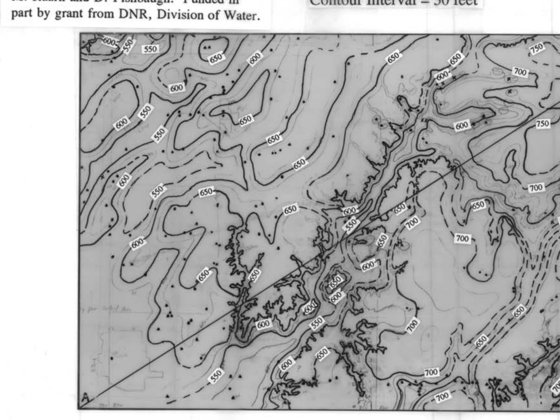
M — Minshall coal
UB — Upper Block coal

Approximate location of axis of pre-Pennsylvanian paleovalleys (based on data from outcrop, wells, and map of sub-Pennsylvanian surface by Keller, 1990). Well and outcrop data for the elevation of the sub-Pennsylvanian surface are projected parallel to these arrows for the cross-section.

Approximate location of axis of pre-Quaternary paleovalleys shown on bedrock topography inset map (based on data from outcrop, drill holes, and preliminary coal maps of Powell, 1968). Well and outcrop data for bedrock elevation are projected parallel to these arrows for the cross-section.

Bedrock topographic map generated by M. Ruark and D. Fishbaugh. Funded in part by grant from DNR, Division of Water.

Bedrock Surface Map
Contour Interval = 50 feet



Control point for bedrock topography
• - drill hole
× - seismic or engineering test data

NOTES

Contributions to mapping of the Quaternary System:
Gray, Henry H., 1989.
Hosteter, W. D. et al., 1989.
Ulrich, H. P. et al., 1967.
Contributions to mapping of the Bedrock:
Droste, J. B. and D. L. Carpenter, 1990.
Fishbaugh, D. A. et al., 1989.
Keller, S. J., 1990.

REFERENCES

Droste, J. B., and D. L. Carpenter, 1990, Subsurface Stratigraphy of the Blue River Group (Mississippian) in Indiana: Indiana Department of Natural Resources, Geological Survey Bulletin 62, 45 p.

Fishbaugh, D. A., Erik P. Kvale, and Allen W. Archer, 1989, Association of Tidal and Fluvial Sediments Within Lower Pennsylvanian Rocks, Turkey Run State Park, Parke County, Indiana: Department of Natural Resources Geological Survey Guidebook to AAPG1989 Eastern Section Meeting, 46 p.

Gray, Henry H., 1989, Quaternary Geologic Map of Indiana: Indiana Department of Natural Resources, Geological Survey, Miscellaneous Map 49.

Hosteter, W. D., and others, 1989, Soil Survey of Montgomery County, Indiana:
U. S. Department of Agriculture, Soil Conservation Service, in cooperation with Purdue University Agricultural Experiment Station, Issued August, 1989.

Hutchison, Harold C. 1976, Geology of the Catlin-Mansfield Area, Parke and Putnam Counties, Indiana: Indiana Department of Natural Resources, Geological Survey Bulletin 54.

Keller, Stanley J., 1990, Maps of Southwestern Indiana Showing Geology and Elevation of the Sub-Pennsylvanian Surface: Indiana Department of Natural Resources, Geological Survey, Miscellaneous Map 51.

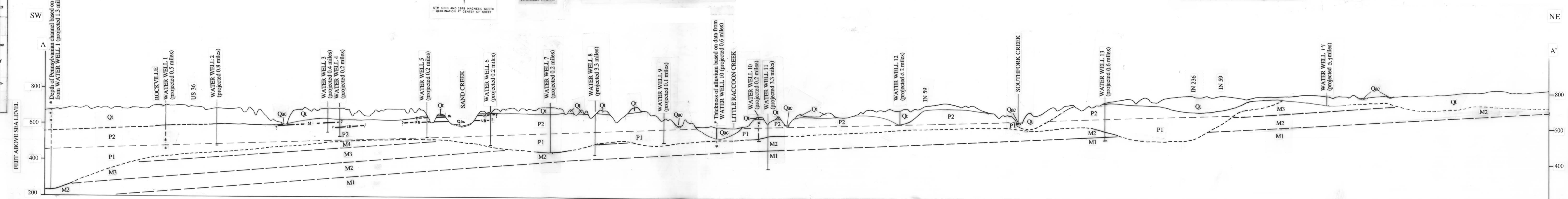
Peppers, R. A., 1979, Coal Palynology, in Eggert, D.L., and Phillips, T. L., Environments of Plant Deposition, Coal Balls, Paper Coals, and Gray Shale Floras in Fountain and Parke Counties, Indiana: Field Trip Guidebook, Ninth International Congress of Carboniferous Stratigraphy and Geology, p. 19 to 29, and 54 to 60.

Peppers, R. A., 1982, Palynology of Coals Along Roaring Creek, in Eggert, D.L., and Phillips, T. L., Environments of Deposition, Coal Balls,Cuticular Shale, and Gray Shale Floras in Fountain and Parke Counties, Indiana: Indiana Geological Survey Special Report 30, p. 14 to 19.

Powell, R. L., 1968, Distribution, Structure, and Mined Areas of Coals in Parke County and Southern Vermillion County, Indiana: Indiana Department of Natural Resources, Geological Survey, Preliminary Coal Map, no. 13.

Shaver, R. H., and others, 1986, Compendium of Paleozoic Rock Unit Stratigraphy in Indiana - A Revision: Indiana Department of Natural Resources, Geological Survey Bulletin, no. 59, 203 p.

Ulrich, H. P., and others, 1967, Soil Survey of Parke County, Indiana: U. S. Department of Agriculture, Soil Conservation Service, in cooperation with Purdue University Agricultural Experiment Station, Series 1949, no. 12, Issued April, 1967.



CROSS SECTION A - A' SHOWING CONFIGURATION OF LAND SURFACE, UNCONSOLIDATED DEPOSITS, BEDROCK SURFACE, AND ROCK UNITS .
VERTICAL EXAGERATION X 10

GEOLOGIC MAP OF ROCKVILLE AND BELLMORE QUADRANGLES, PARKE COUNTY, INDIANA

by
David A. Fishbaugh
Revisions and Editing
J. Nathan Way
1993