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KENTUCKY GEOLOGICAL SURVEY
UNIVERSITY OF KENTUCKY, LEXINGTON
Donald C. Haney, State Geologist and Director

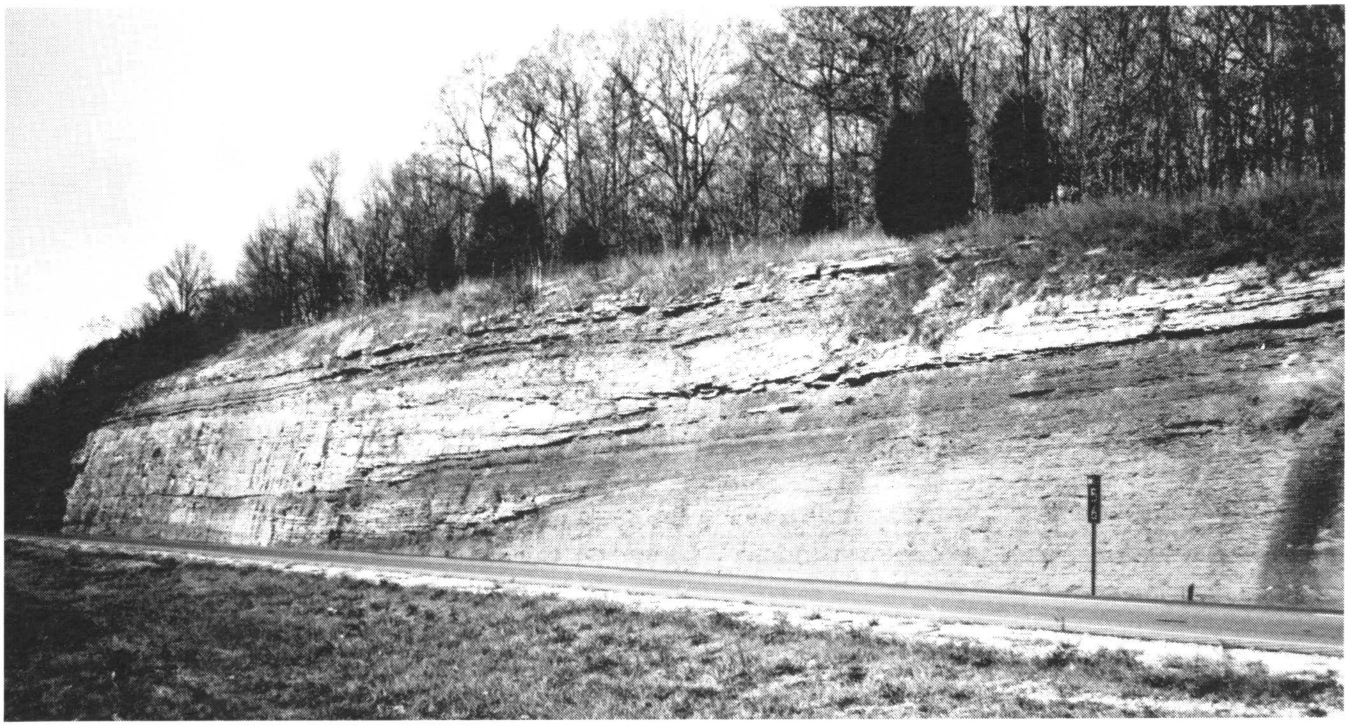
ROADSIDE GEOLOGY ALONG INTERSTATE HIGHWAY 75 IN KENTUCKY

Donald C. Haney and Martin C. Noger

SPECIAL PUBLICATION 16

Series XI, 1992

Kentucky River Fault System at Clays Ferry (mileage 97.0). This outcrop is along U.S. Highway 25 beneath the bridge where Interstate Highway 75 crosses the Kentucky River.



Sandstone interfingering with shale in the Breathitt Formation (mileage 56.0).

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COVER PHOTOGRAPHS

Front Cover: Pine Mountain Overthrust Fault between mileage markers 158 and 159 (Tennessee)

Back Cover: Deformed beds in the Breathitt and Pennington Formations near mileage marker 61 (Kentucky)

Photographs courtesy of Dr. Paul Edwin Potter, Department of Geology, University of Cincinnati

Cartography by Terry Hounshell

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WARNING

Kentucky law prohibits vehicles from stopping on the shoulders of limited–access highways except in case of emergency.

—Title 603 KAR 5:025 Sec 4

ROADSIDE GEOLOGY
ALONG INTERSTATE HIGHWAY 75 IN KENTUCKY

Donald C. Haney and Martin C. Noger

INTRODUCTION

Rock strata exposed along Kentucky's interstate highways and State parkways offer travelers a unique perspective of the Commonwealth's diverse and interesting geology. These strata and related geologic features can be readily observed in the roadcuts along most of the highways. To make it easier for travelers and others to recognize, appreciate, and better understand Kentucky's "highway geology" a series of geologic road logs have been constructed by the Kentucky Geological Survey. These road logs catalog and describe selected rock units and geologic features that can be observed from the roadway and reference them to highway mile markers. Road logs for some sections of the interstate and parkway system have already been published by various professional societies; however, most of these logs are too technical to be of interest to the general public.

The purpose of this road log is to describe the rock units and other significant features such as geologic faults, fossil localities, and stratigraphic boundaries exposed along the Kentucky section of Interstate Highway 75 (I–75). It will help travelers and others along I–75 to understand and appreciate how geology influences Kentucky's natural beauty. No formal training in geology is necessary to understand these descriptions. Major emphasis has been placed on the most prominent and easily recognizable features, and every effort has been made to avoid the use of technical jargon or specialized terms. Occasionally, however, use of technical terms is unavoidable, but explanations are provided when unfamiliar terms are used. In addition, a glossary of selected geologic terms has been included to help the reader understand words or terms that are not familiar. For persons interested in more detailed information about geologic features along and in the vicinity of I–75, a list of selected references is furnished.

This log will also serve as a useful reconnaissance tool for professional geologists and provide valuable information for certain aspects of highway planning.

GENERAL GEOLOGY

The geology of Kentucky is particularly interesting because the State lies in parts of four major structural geologic provinces: Appalachian Basin, Cincinnati Arch, Illinois (Eastern Interior) Basin, and Mississippi Embayment (Fig. 1). In the geologic past the Appalachian and Illinois Basins formed prominent depressions or sags separated in part by the Cincinnati Arch which was formed by the uplifting of rock layers. The results of these geologic processes, which occurred millions of years ago, can be seen today along much of I–75.

The Cincinnati Arch, a linear north–south trending band of broadly folded rocks, extends from the vicinity of Cincinnati, Ohio, to the Kentucky–Tennessee border (Fig. 1). From Cincinnati to just south of Lexington, I–75 is located near the crest of this linear trend (a distance of approximately 100 miles). As you travel along this section of Interstate Highway 75, you will see some of the oldest rock units exposed in Kentucky. South of Lexington the Cincinnati Arch curves to the southwest toward Nashville, and I–75 trends to the southeast into the Appalachian Basin (Fig. 1). From the bridge over the Kentucky River at Clays Ferry (mileage 98.4) to the Kentucky–Tennessee border, rocks exposed along the roadway get progressively younger (Fig. 2).

Figure 3 is a generalized stratigraphic column that shows the rock units exposed along I–75 and indicates their geologic ages. To make it easier to study and describe these stratigraphic units, geologists subdivide them into groups, formations, members, and beds. Rock units exposed along I–75 are classified by geologists as sedimentary rocks. These sedimentary rocks accumulated layer–by–layer, over long periods of time, generally in oceanic, coastal, or river–related environments. As a result, rock units become progressively younger from the bottom to the top (similar to a stack of newspapers in your garage). Keep this concept in mind as you make your geologic observations. Whether you are looking at a single layer of rock or a 100–foot–high roadcut, the rocks will get younger from the bottom to

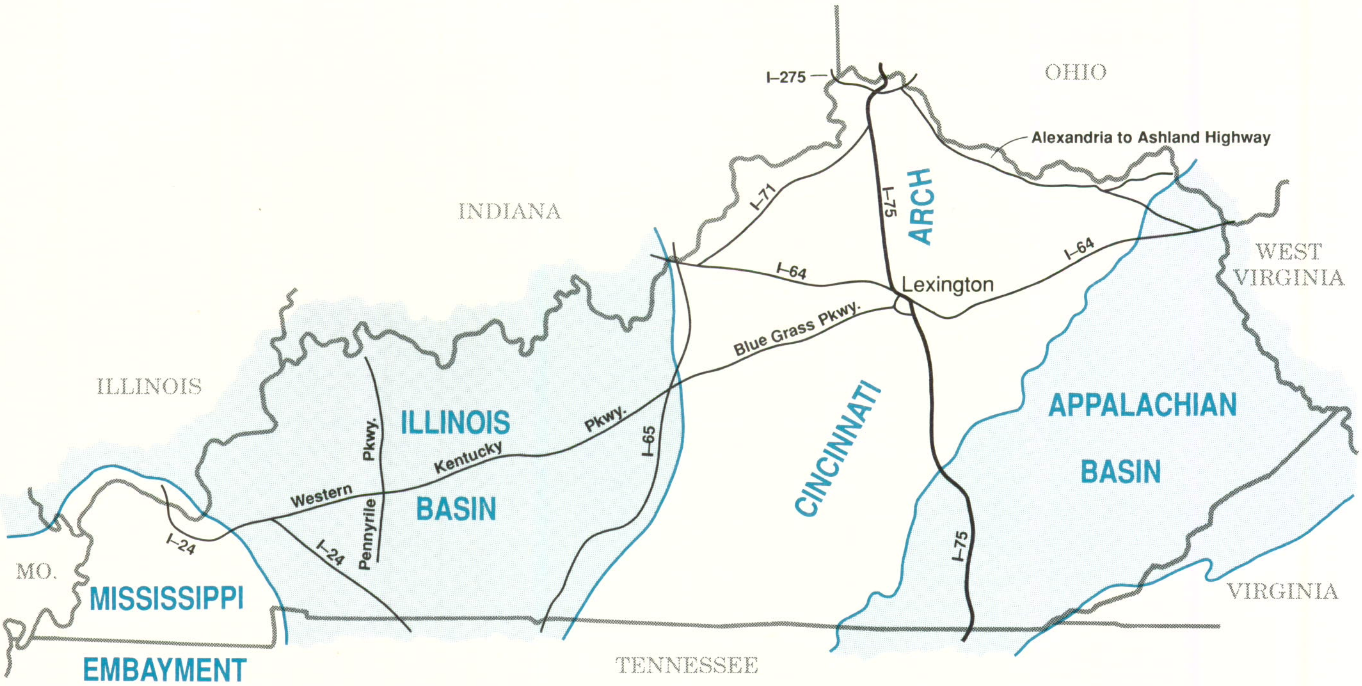


Figure 1. Major geologic provinces and selected interstate highways and parkways in Kentucky.

the top. This is a basic tenet of geology known as the "law of superposition."

When geologists talk about rocks getting younger or older, what exactly does this mean? Unfortunately rocks are not like trees; you can't cut them open and count the number of rings to determine their age. Generally, sedimentary rocks such as those present along I–75 do not contain the radioactive elements (such as uranium or strontium) necessary to determine geologic age by radiometric dating methods (referred to by geologists as an absolute date). Therefore, a relative age is all that can be determined for most sedimentary rock units. Relative age refers to the way in which one rock unit (such as unit A) is related to another unit (such as unit D). Is it younger than unit D (above), older than unit D (below) or approximately the same age as unit D (laterally equiv-

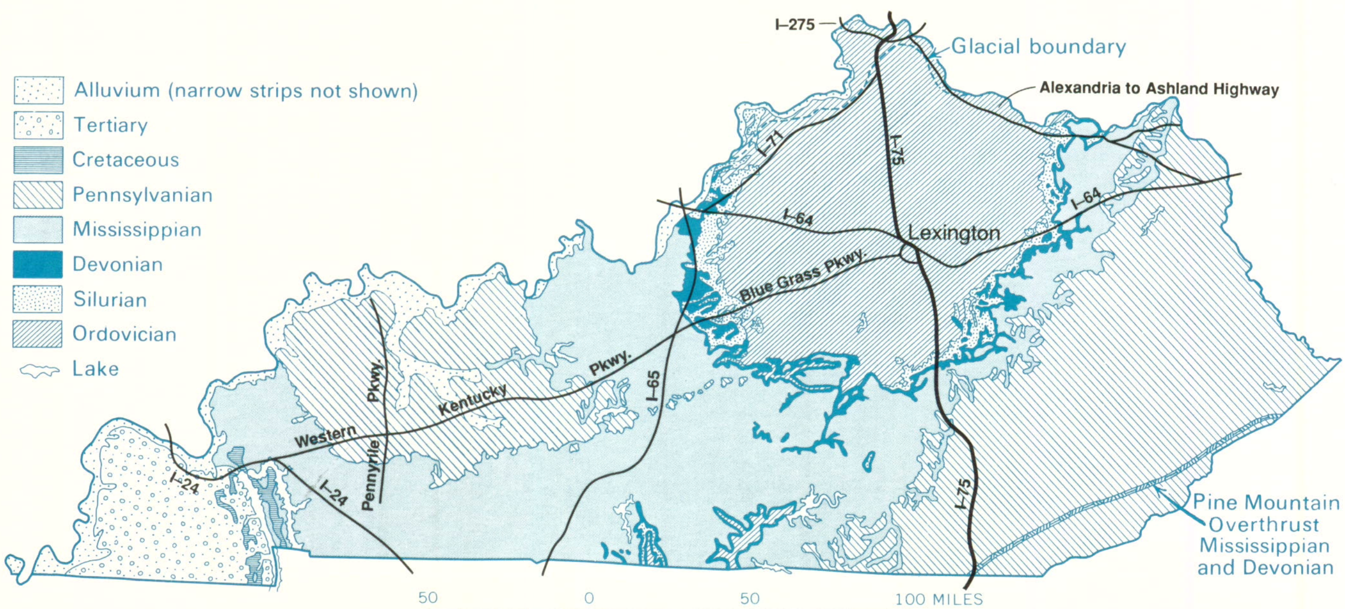


Figure 2. Generalized geologic map of Kentucky showing selected interstate highways and parkways.

alent)? Note the use of "superposition" to determine the relative age of layered rock units.

Another way the relative age of a rock unit can be determined is by using certain distinctive fossils. To most geologists, looking for and collecting fossils is simply a means of acquiring a better understanding of various rock units. But many geologists and non–geologists alike find "fossil hunting" (just for the fun of it) to be an exciting and rewarding experience. For this reason several known fossil localities along I–75 are noted on the road log.

From north to south, I–75 traverses rocks of Ordovician, Silurian, Devonian, Mississippian, and Pennsylvanian ages (Fig. 3). In general, rock units in the Ordovician, Silurian, Devonian, and Mississippian Systems (Fig. 3) were deposited in an oceanic environment (on ocean floors), and those in the Pennsylvanian (Coal Measures) and Quaternary Systems were formed in a terrestrial or continental (mainly river deposits) environment. A more detailed discussion of the geologic history of rock units exposed in Kentucky is presented by McGrain (1983).

As can be noted in Figure 3, various types of sedimentary rocks such as limestone, shale, sandstone, and coal occur in Kentucky. Each of these rock types reacts differently to the processes of weathering and erosion. For instance, limestone tends to dissolve slowly, forming caves and sinkholes (many sinkholes can be observed around Lexington). Shale, because it is composed of clay minerals, tends to weather relatively quickly and forms poorly draining soils (not particularly good for agriculture). Conversely, sandstones, which generally consist of cemented quartz grains, are generally very resistant to weathering and tend to form ridges and steep cliffs (such as those in the gorge of the Cumberland River near Cumberland Falls). Because of these differences, a wide variety of scenic splendor awaits the traveler along I–75.

SCENIC TERRAINS ALONG INTERSTATE HIGHWAY 75

While traveling along I–75, note the different types of terrain you can observe. When natural landforms (lay of the land) differ significantly from one area to another, it usually indicates the areas are underlain by different types of rocks. These different areas are known as physiographic regions. The major physiographic regions crossed by I–75 are shown on Figure 4. Following are brief descriptions of the physiographic regions crossed by I–75:

Outer Blue Grass—Characterized by gently rolling uplands that are underlain by interbedded limestone and shale.

Eden Shale Belt—Hilly topography formed by impervious and easily eroded shales.

Inner Blue Grass—Limestone terrain with low relief marked by numerous sinkholes. The world–famous horse farms of central Kentucky are located in this region.

The Knobs—A narrow belt of ridges and cone–shaped hills separated by broad, shale–floored valleys and underlain by siltstone and silty shale.

Mississippian Plateaus—Upland area of complex sinkholes and thick residual soils underlain predominantly by limestone.

Pottsville Escarpment—Narrow band of sinuous ridges and deep narrow valleys underlain by quartz sandstone.

Eastern Kentucky Coal Field—region of irregular, narrow–crested ridges and deep valleys with very little bottom land. This region is one of the most important coal–producing areas in the world.

Most of the physiographic boundaries are noted on the strip maps as I–75 crosses from one region to the next.

An especially interesting area is located approximately 2.5 miles south of the Kentucky–Tennessee border (Tennessee mileage 158.9) where I–75 crosses the Pine Mountain Overthrust Fault. Along this fault, older rock units have been pushed up and over younger units; the strata dip steeply to the southeast forming Pine Mountain, a hogback–type ridge. These older rock strata have been moved approximately 10 miles from the southeast.

ROAD LOG

Geologic units are shown on continuous strip maps that extend approximately 0.5 mile on either side of I–75. The construction of these continuous strip maps was possible because of the availability of detailed 1:24,000–scale (1 inch on the map equals 2,000 feet on the ground) geologic maps for the entire State. The names of the geologic quadrangle maps along the Kentucky portion of I–75 are shown in Figure 5.

The road log and continuous strip maps begin in northern Kentucky, along an east–west segment of I–275 that intersects I–75, and continue southward along I–75 across the Kentucky–Tennessee boundary to mile marker 156 in Tennessee. All descriptions of rock strata and geologic features are referenced to highway mile markers that are located at 1–mile intervals along I–75; mileage markers are the same on both sides of the highway. Where the highway crosses state boundaries, mileage figures are reset at zero. Please note that mile marker 1 on the Kentucky portion of I–75 is at the southern end of the highway at the Kentucky–Tennessee border, and mileage numbers increase from south to north.

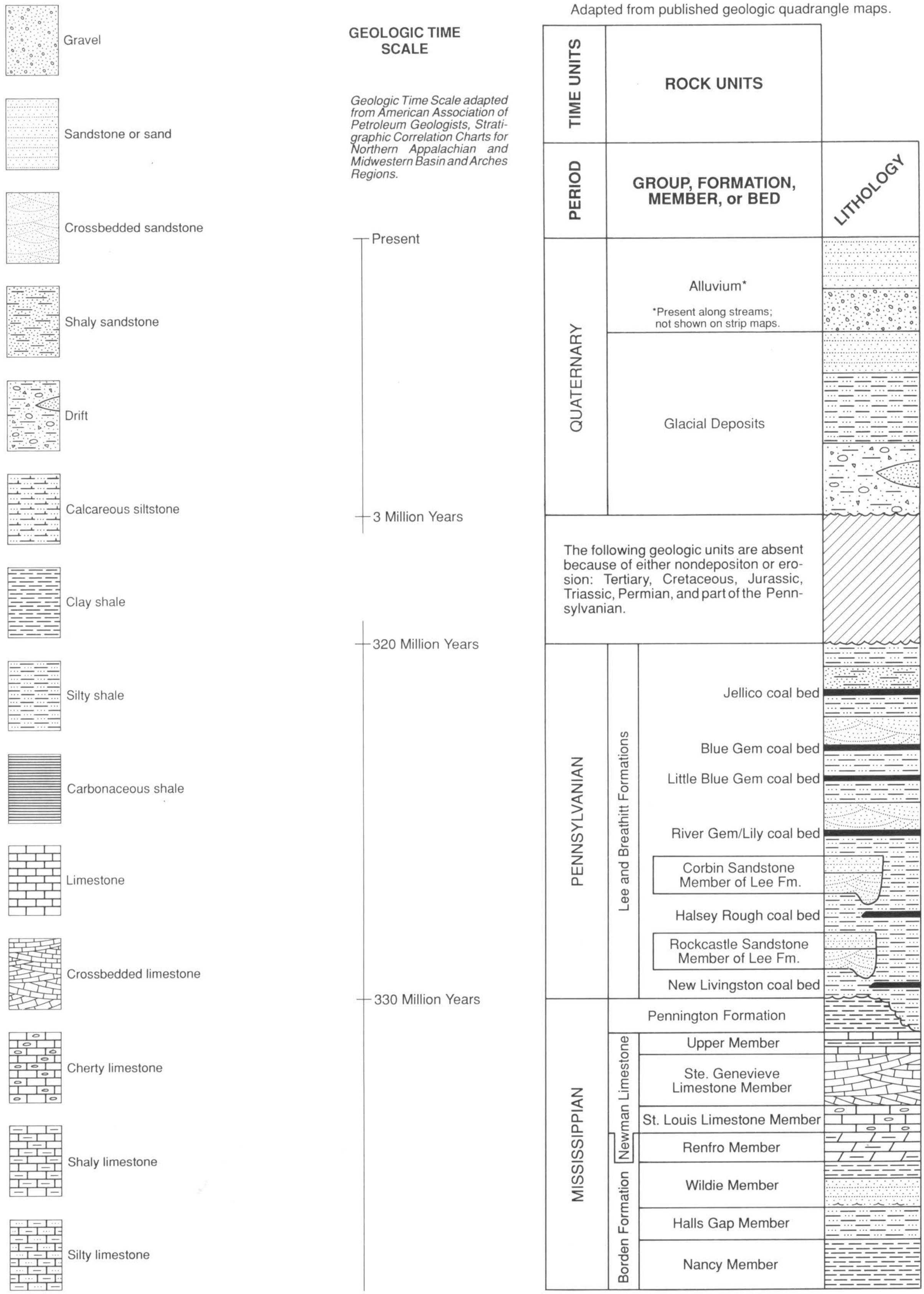


Figure 3. Generalized stratigraphic column showing rock units along Interstate Highway 75.

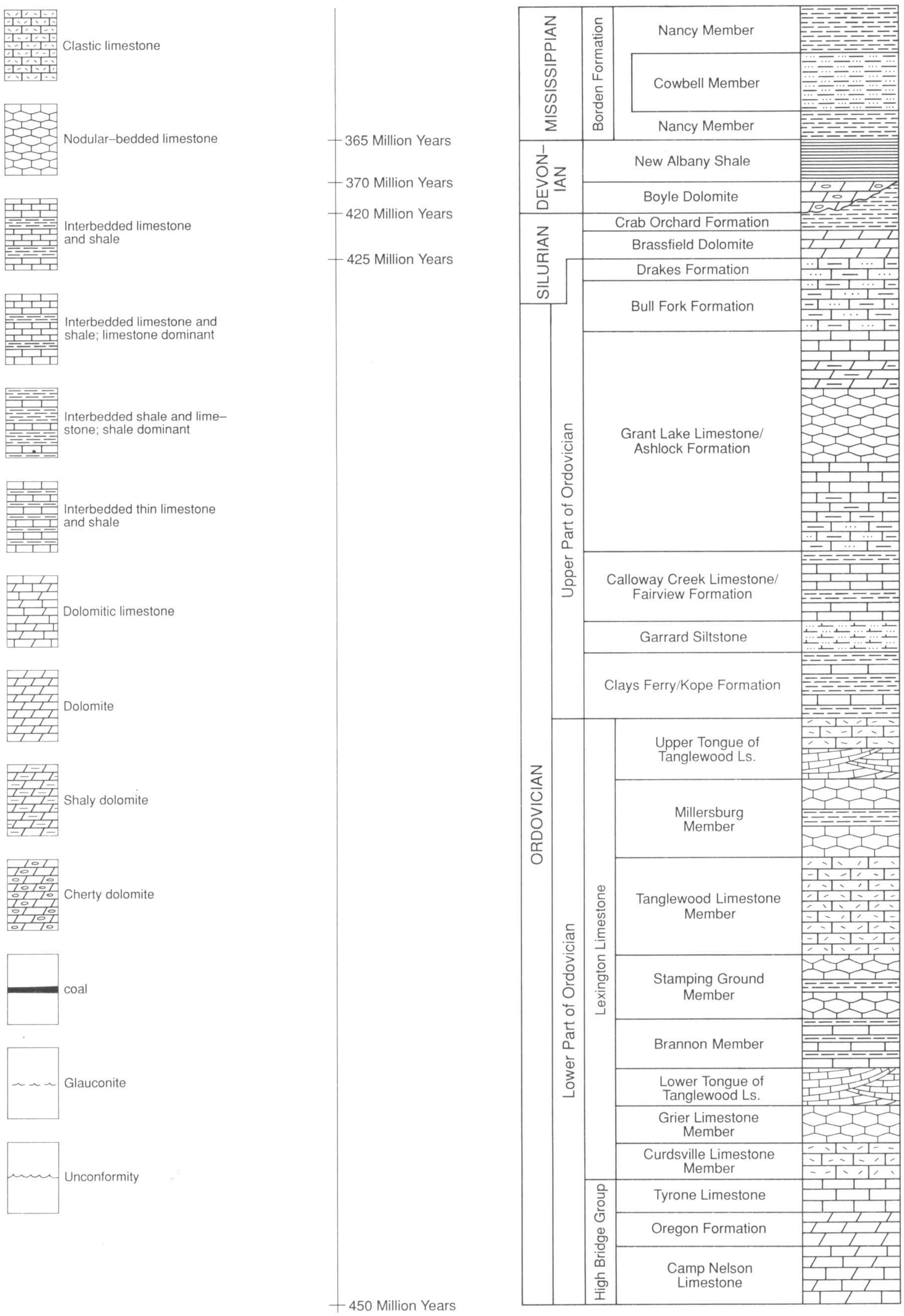


Figure 3 (continued).

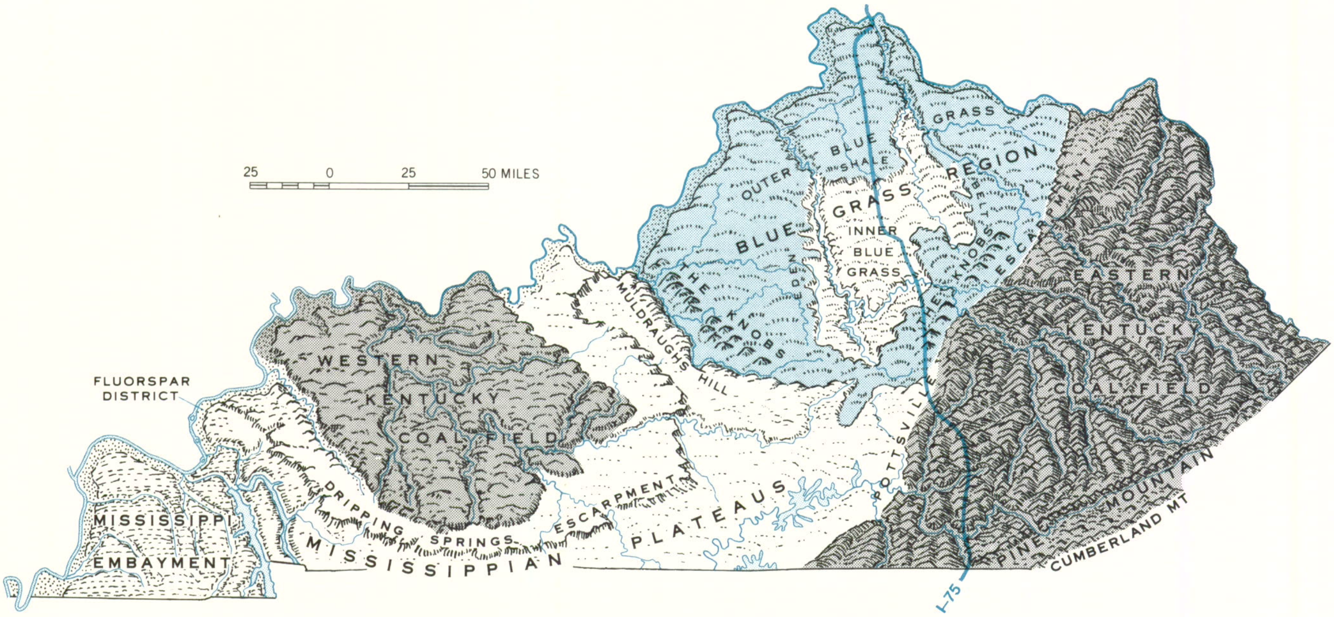


Figure 4. Physiographic diagram of Kentucky showing Interstate Highway 75.

SELECTED REFERENCES

Cobb, J. C., Chesnut, D. R., Jr., Hester, N. C., and Hower, J. C., 1981, Coal and coal–bearing rocks of eastern Kentucky (Annual Geological Society of America Coal Division Field Trip, November 5–8, 1981): Kentucky Geological Survey, Series 11, Plate 1.

Chesnut, D. R., Jr., in press, Geologic highway cross sections: Interstate Highway 75, Conway, Kentucky, to Jellico, Tennessee: Kentucky Geological Survey, Series 11, Map and Chart Series 3.

Cressman E. R., 1973, Lithostratigraphy and depositional environments of the Lexington Limestone (Ordovician) of central Kentucky: U.S. Geological Survey Professional Paper 768, 61 p.

Cressman, E. R., and Noger, M. C., 1976, Tidal–flat carbonate environments in the High Bridge Group (Middle Ordovician) of central Kentucky: Kentucky Geological Survey, Series 10, Report of Investigations 18, 15 p.

Dever, G. R. Jr., Hester, N. C., Ettensohn, F. R., Moody, J. R., and Cobb, J. C., 1979, Stop 3: Newman Limestone (Mississippian) of east–central Kentucky and Lower Pennsylvanian slump structures, *in* Ettensohn, F. R., and Dever, G. R. Jr., eds., Carboniferous geology from the Appalachian Basin to the Illinois Basin through eastern Ohio and Kentucky (Guidebook, Ninth International Congress of Carboniferous Geology, Stratigraphy Field Trip No. 4): University of Kentucky, p. 175–181.

Greb, S. F., and Chesnut, D. R., Jr., 1992, Transgressive channel filling in the Breathitt Formation (Upper Carboniferous), Eastern Kentucky Coal Field, U.S.A.: Sedimentary Geology, vol. 75, p. 209–221.

Greb, S. F., and Chesnut, D. R., Jr., 1991, Paleoecology of estuarine complex in the Lower Breathitt Formation (Pennsylvanian), central Appalachian Basin: Kentucky Geological Survey, Series 11, Open–File Report OF91–1.

Kepferle, R. C., Noger, M. C., Meyer, D. L., and Schumaker, G. A., 1987, Stratigraphy, sedimentology, and paleontology (Upper Ordovician) and glacial and engineering geology of northeastern Kentucky and southern Ohio (Guidebook and road log for Geological Society of Kentucky 1987 field conference): Kentucky Geological Survey, Series 11, 18 p.

McFarland, A. C., 1943, Geology of Kentucky: University of Kentucky Press, 531 p.

McGrain, Preston, 1955, Geology of the Cumberland Falls State Park area: Kentucky Geological Survey, Series 9, Special Publication 7, 33 p.

McGrain, Preston, 1975, Scenic geology of Pine Mountain in Kentucky: Kentucky Geological Survey, Series 10, Special Publication 24, 34 p.

McGrain, Preston, 1983, The geologic story of Kentucky: Kentucky Geological Survey, Series 11, Special Publication 8, 74 p.

Sedimentation Seminar, 1981, Mississippian and Pennsylvanian section on Interstate 75, south of Jellico, Campbell County, Tennessee: Tennessee Division of Geology, Report of Investigations 38, 42 p.

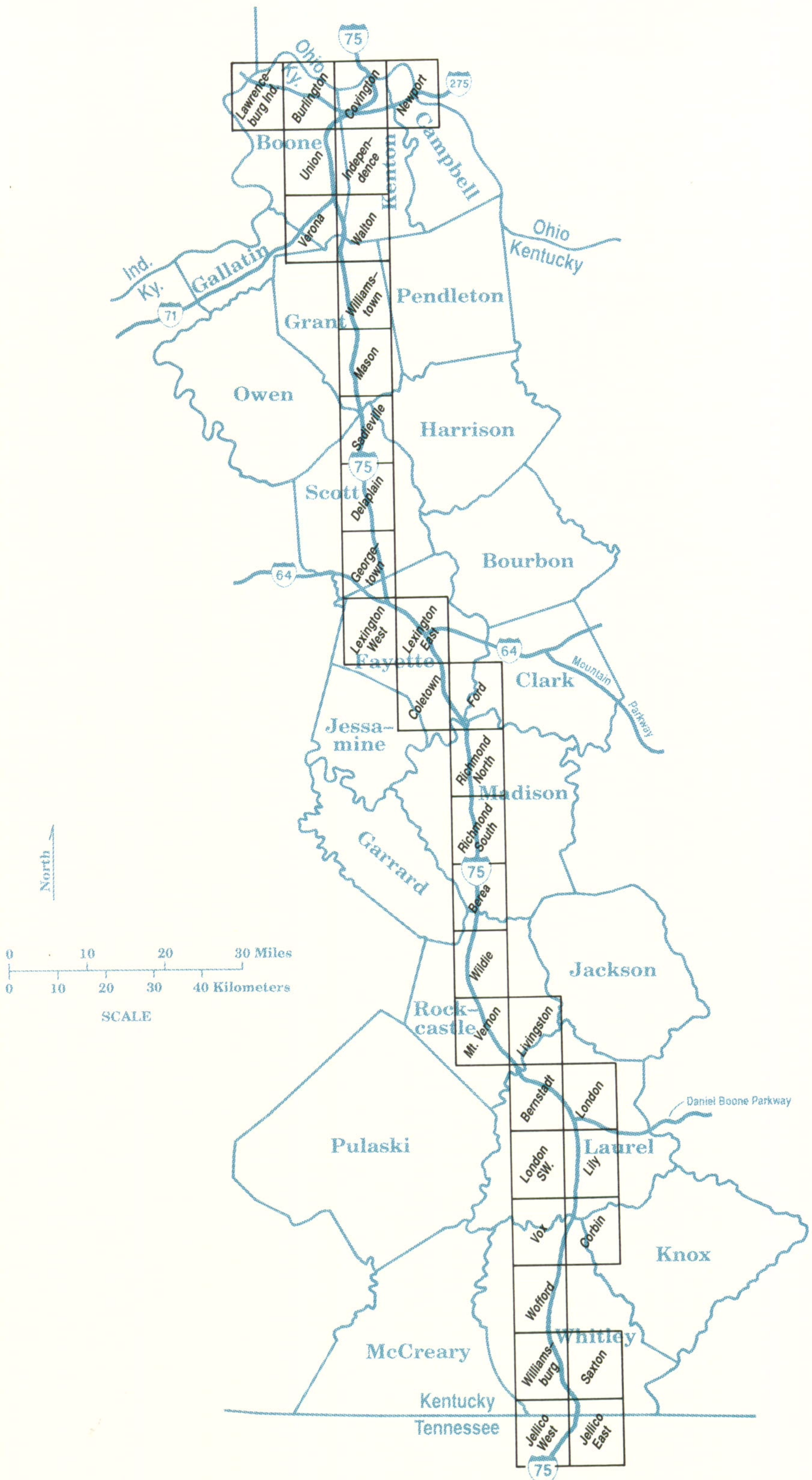


Figure 5. Geologic quadrangle maps along Interstate Highway 75. These detailed maps are at a scale of 1:24,000 (1 inch on the map equals 2,000 feet on the ground), and geologic units that are present at the earth's surface are shown in various colors. Copies of these maps may be purchased from the Kentucky Geological Survey at the University of Kentucky in Lexington.

SELECTED GEOLOGIC TERMS

Arch—A geologic structure formed by upward folding of rock layers.

Basin—A geologic structure formed by downward folding of rock layers.

Bed—*See* Stratigraphic units

Bedding—The arrangement of rocks in layers of varying thickness and form.

Clay minerals—Group of extremely small, platy minerals that are the major component of shale.

Concretion—A rounded, compact mass of mineral matter found in sedimentary rocks.

Crinoid columnal—Individual button–shaped disc that makes up the fossil stem of a crinoid, or sea lily.

Crossbedding—Arrangement of rock layers wherein minor beds are inclined at an angle to the main bedding.

Cross section —Vertical profile through a geologic feature.

Dolomite—Sedimentary rock composed chiefly of the mineral dolomite (calcium magnesium carbonate).

Erosion—Natural processes that result in the wearing away and removal of materials in the earth's crust running water, waves and currents, moving ice, or wind.

Fault—A fracture in the earth's crust along which rock units on either side have slipped past each other.

Formation—*See* Stratigraphic units.

Fossil—Any portion of a plant or animal preserved in rock.

Geologic age—Periods of geologic time during which the corresponding rock units were deposited.

Geologic province—An extensive region characterized by similar rock types, structural features, and geologic history.

Geologic Quadrangle Map—A map on which the distribution and nature of rock units and the occurrences of geologic features, mineral deposits, and fossil localities are shown.

Glauconite—A green iron–rich mineral.

Group—*See* Stratigraphic units.

Hogback—A sharp–crested ridge formed by steeply inclined layers of resistant rocks.

Limestone—A sedimentary rock composed of calcite (calcium carbonate), the main mineral in sea shells.

Lithology—The physical character of a rock, including color, mineralogic composition, and grain size.

Member—*See* Stratigraphic units.

Oolite—A small round accretionary body found in some limestones.

Overthrust fault—A break in the earth's crust along which younger rock units have been moved at a low angle over older rock units.

Physiographic region—Area in which the pattern of landforms differs significantly from that in adjacent areas.

Quartz—An important rock–forming mineral composed of silicon and oxygen.

Radiometric dating methods—A means of determining the age of rock units based on nuclear decay of naturally occurring radioactive isotopes that are present in certain minerals.

Relief—The vertical difference in elevation between the hilltops (highest elevation) and valleys (lowest elevation) of a given region.

Roadcut—Rock exposure created by highway construction.

Road log—A descriptive record of geologic features and their locations along a roadway.

Rock unit—A distinct body of rock consisting of identifiable lithologic types.

Sandstone—Sedimentary rock generally composed of quartz grains that have been cemented together.

Sedimentary rocks—Rocks resulting from the consolidation of loose sediments that have accumulated in layers.

Shale—Thin–layered sedimentary rock composed of cemented clay minerals.

Siltstone—Sedimentary rock composed mainly of very small quartz grains.

Sinkhole—A generally circular topographic depression formed by dissolution of limestone bedrock.

Strata—Tabular or sheet–like layers of sedimentary rock.

Stratigraphic column—Diagram that shows in a single column the sequence of rock units and the subdivisions of part or all of geologic time.

Stratigraphic units:

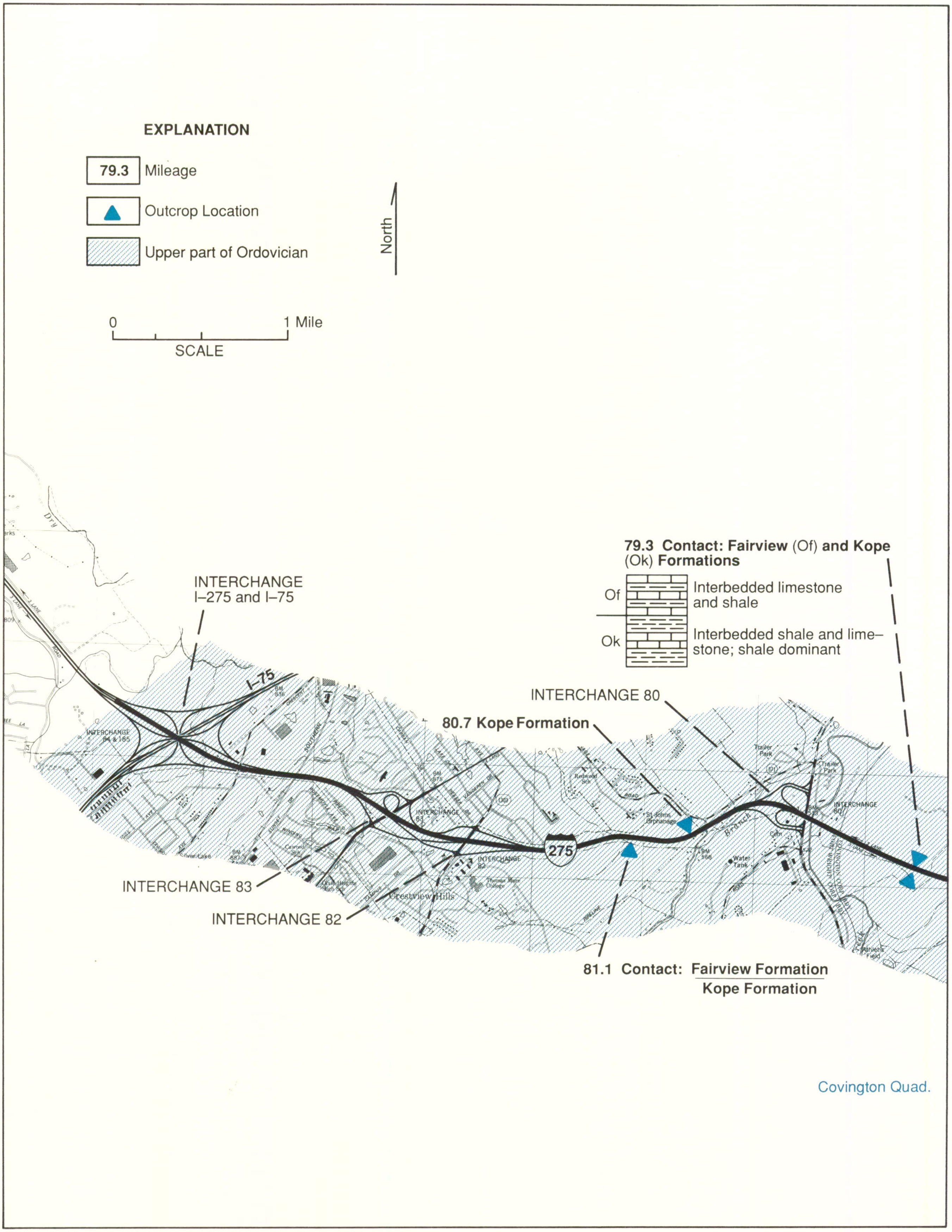
- **Group**—A major stratigraphic unit containing two or more formations.
- **Formation**—A body of rock characterized by identifiable lithologic components; the basic rock unit used in stratigraphic classification.
- **Member**—Subdivision of a formation, which is distinguishable from adjacent parts of the formation.
- **Bed**—A rock unit lower in rank than a member, which has a distinctive lithology.

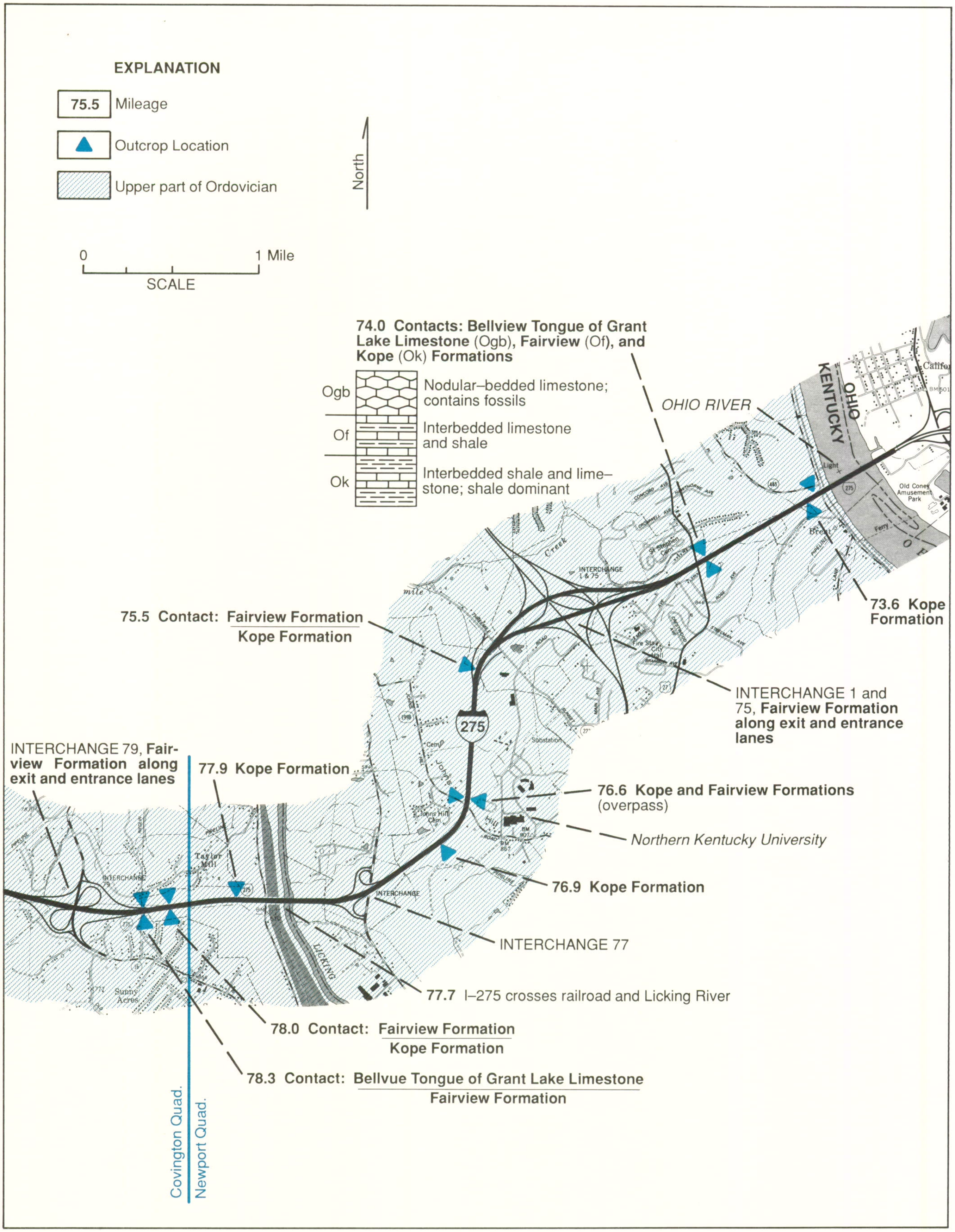
Structural geologic province—A region whose geologic structure differs significantly from that of adjacent regions.

Topography—The general configuration of a land surface, including its relief and the position of natural and man–made features.

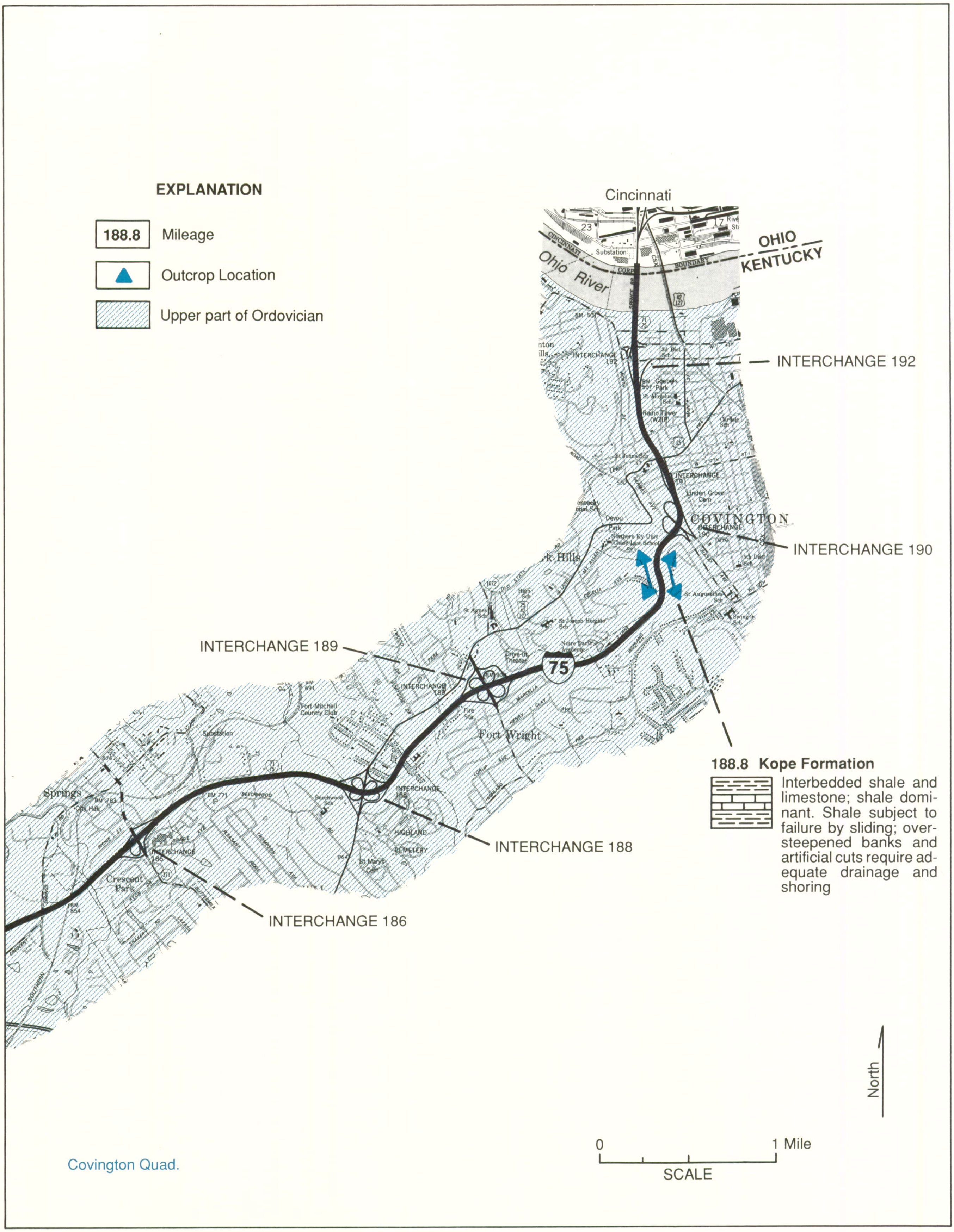
Unconformity—A break or gap in the geologic record where a rock unit is overlain by another that is not next in the stratigraphic succession.

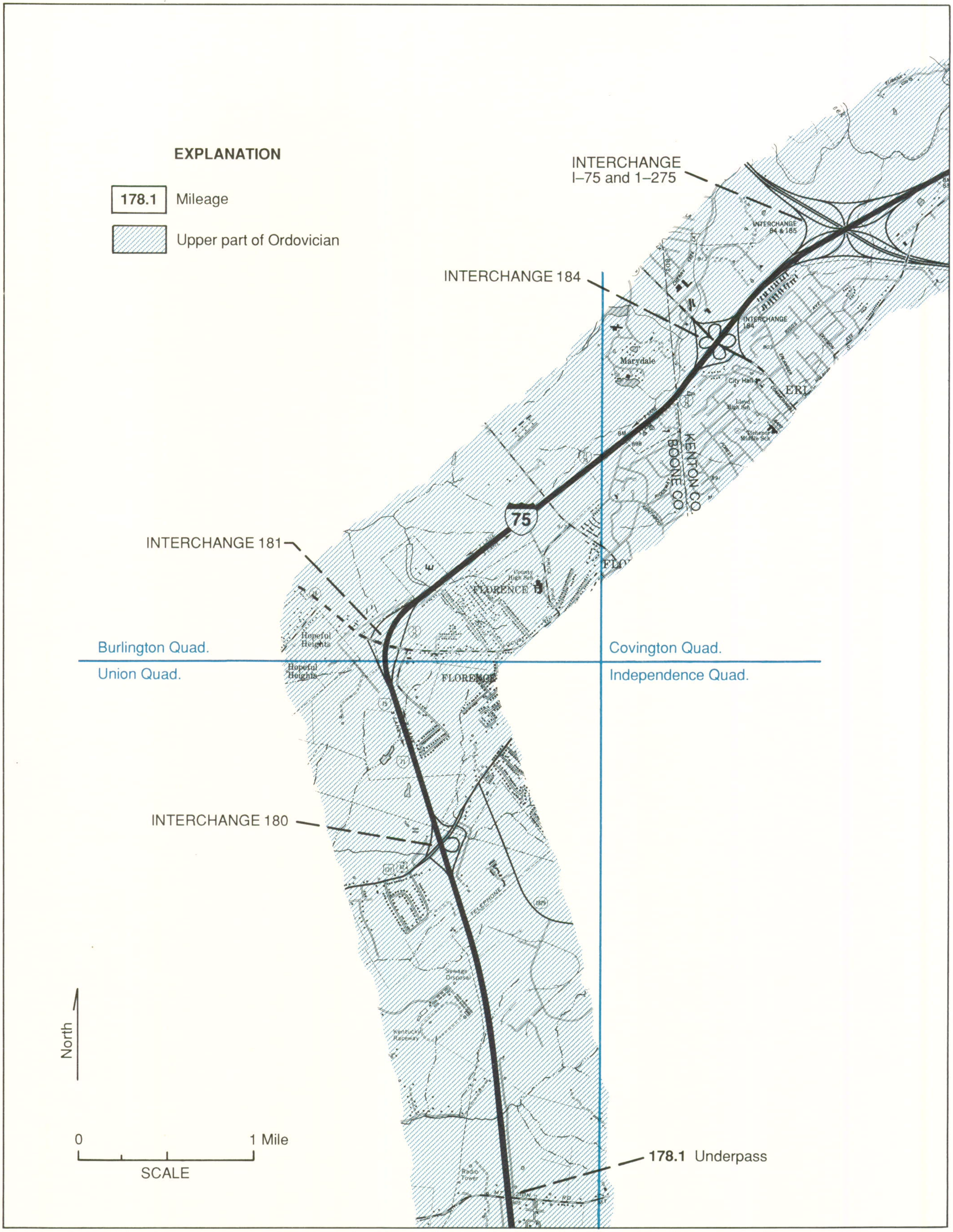
Weathering—The complex processes that combine to decompose solid rock into soil.

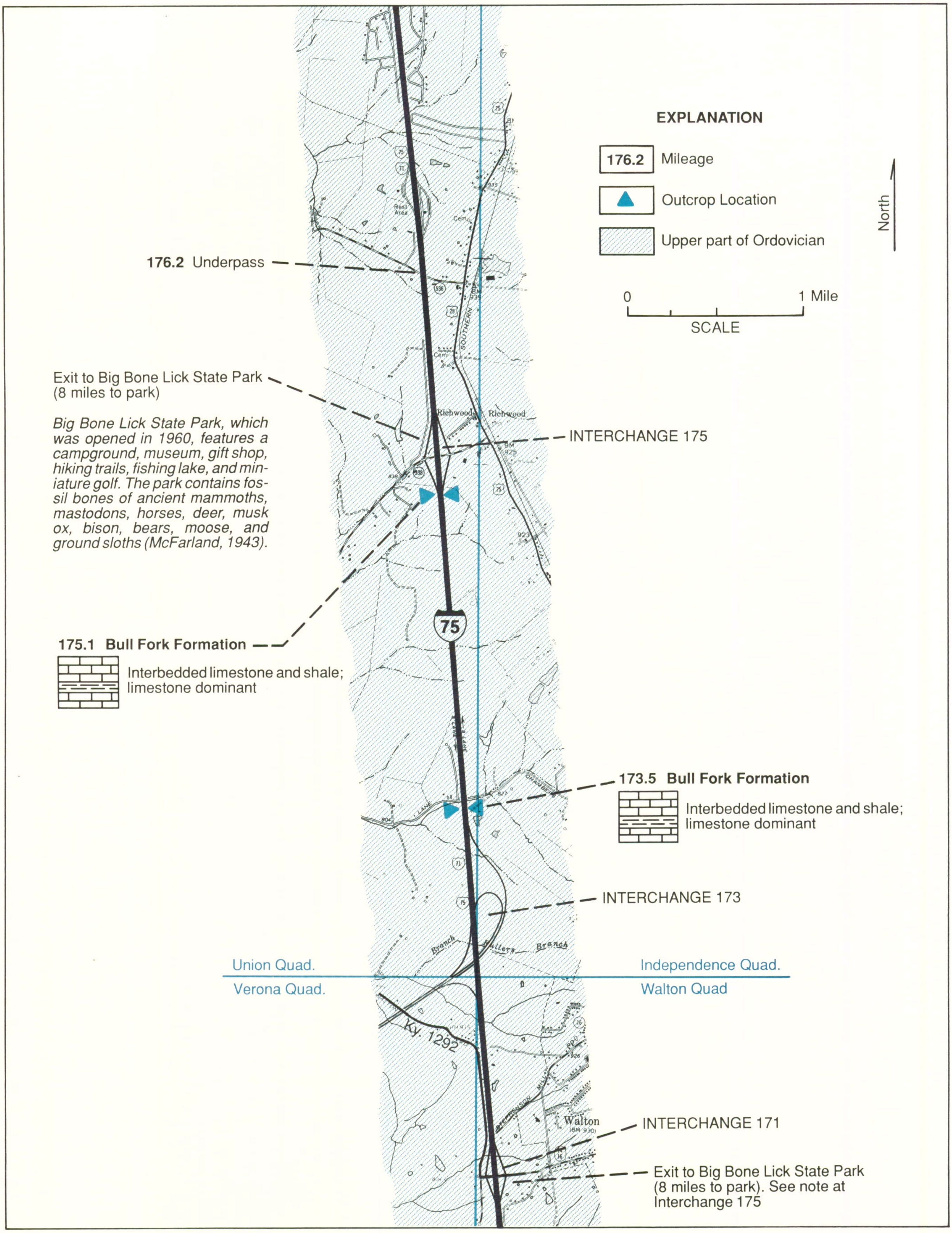

EXPLANATION
79.3 Mileage
Outcrop Location
Upper part of Ordovician
North
0
1 Mile
SCALE
INTERCHANGE I–275 and I–75
I–75
INTERCHANGE 83
INTERCHANGE 82
INTERCHANGE 80
80.7 Kope Formation
275
79.3 Contact: Fairview (Of) and Kope (Ok) Formations
Of
Interbedded limestone and shale
Ok
Interbedded shale and lime–stone; shale dominant
81.1 Contact: Fairview Formation / Kope Formation
Crestview Hills
Covington Quad.

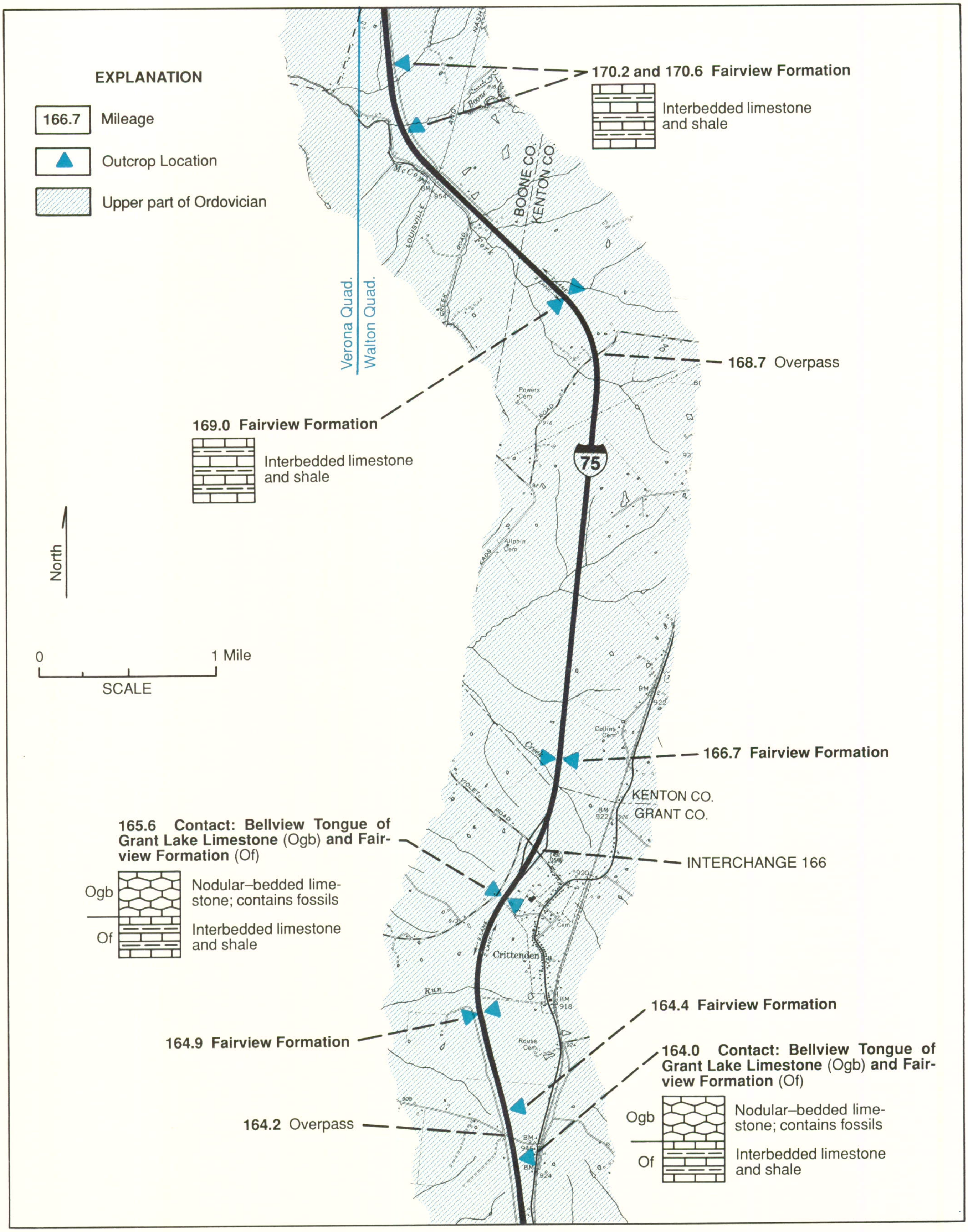


EXPLANATION
75.5 Mileage
Outcrop Location
Upper part of Ordovician
North
0
1 Mile
SCALE
74.0 Contacts: Bellview Tongue of Grant Lake Limestone (Ogb), Fairview (Of), and Kope (Ok) Formations
Ogb
Nodular–bedded limestone; contains fossils
Of
Interbedded limestone and shale
Ok
Interbedded shale and lime–stone; shale dominant
OHIO RIVER
OHIO
KENTUCKY
Old Coney Amusement Park
73.6 Kope Formation
75.5 Contact: Fairview Formation / Kope Formation
INTERCHANGE 1 and 75, Fairview Formation along exit and entrance lanes
275
INTERCHANGE 79, Fairview Formation along exit and entrance lanes
77.9 Kope Formation
76.6 Kope and Fairview Formations (overpass)
Northern Kentucky University
76.9 Kope Formation
INTERCHANGE 77
77.7 I–275 crosses railroad and Licking River
78.0 Contact: Fairview Formation / Kope Formation
78.3 Contact: Bellvue Tongue of Grant Lake Limestone / Fairview Formation
Covington Quad.
Newport Quad.
LICKING
Taylor Mill
Sunny Acres

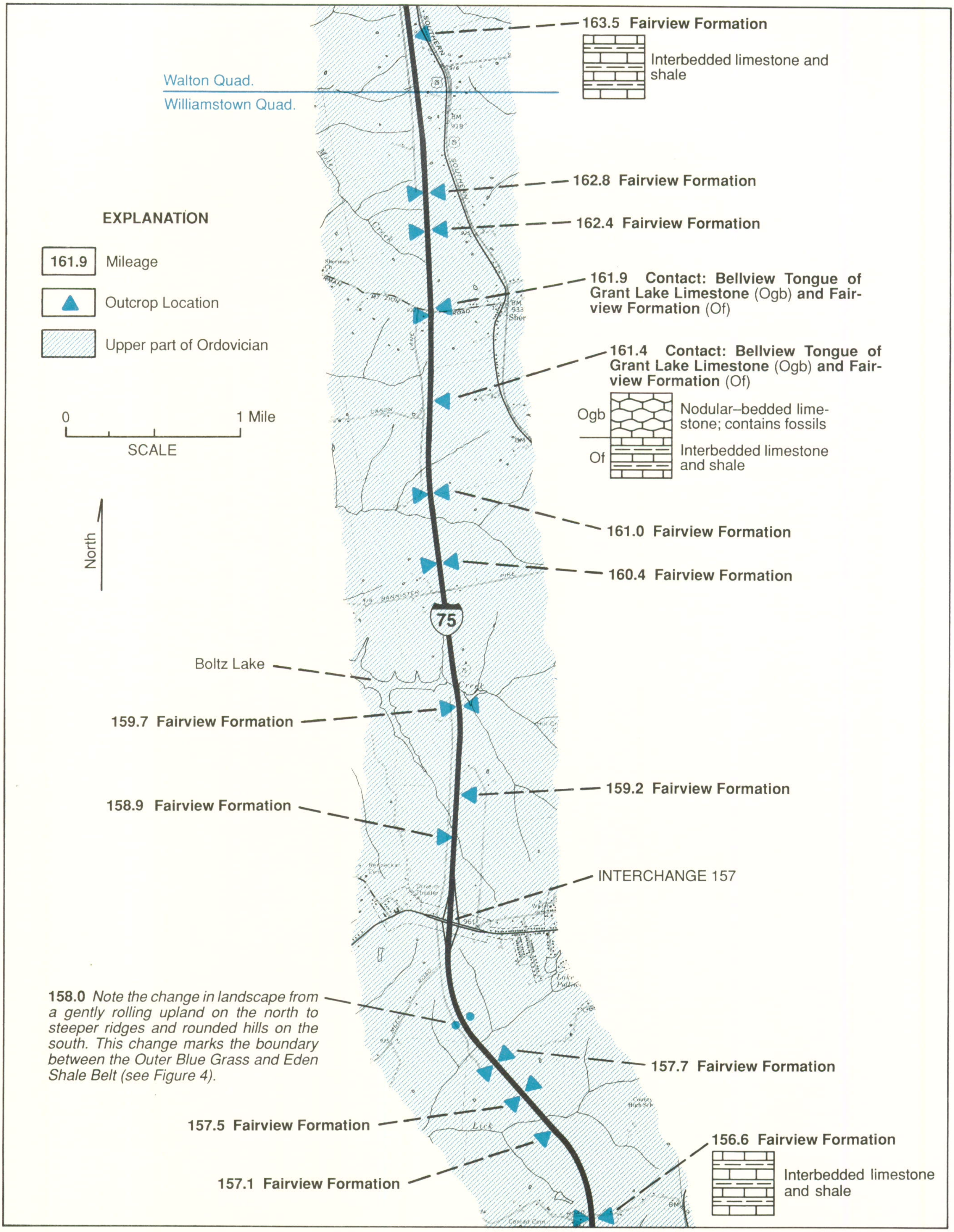

EXPLANATION
188.8 Mileage
Outcrop Location
Upper part of Ordovician
Cincinnati
OHIO
KENTUCKY
Ohio River
INTERCHANGE 192
COVINGTON
INTERCHANGE 190
INTERCHANGE 189
Fort Wright
Crescent Park
INTERCHANGE 188
INTERCHANGE 186
75
188.8 Kope Formation
Interbedded shale and limestone; shale dominant. Shale subject to failure by sliding; oversteepened banks and artificial cuts require adequate drainage and shoring
North
0
1 Mile
SCALE
Covington Quad.

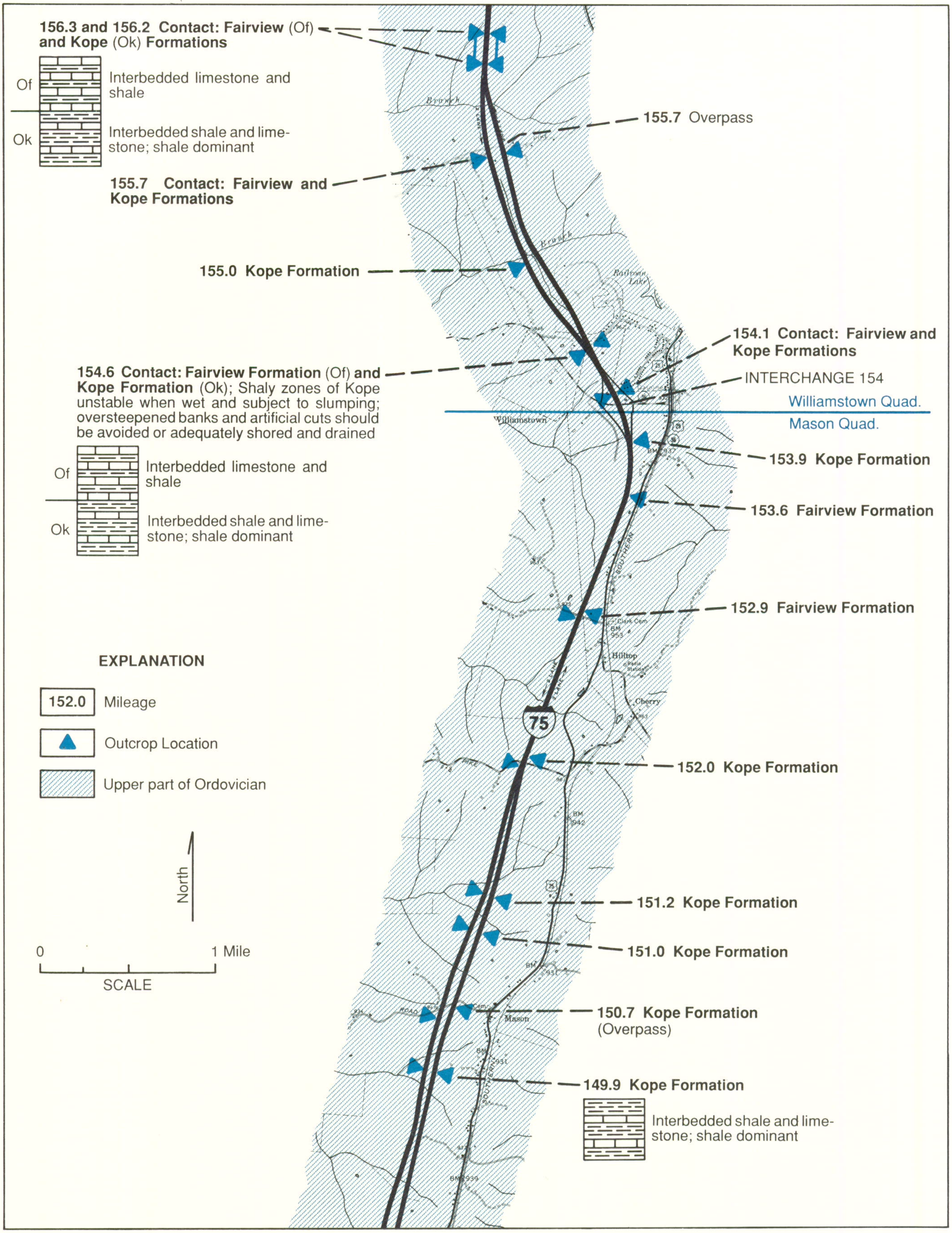

EXPLANATION
178.1 Mileage
Upper part of Ordovician
INTERCHANGE
I–75 and 1–275
INTERCHANGE 184
INTERCHANGE 181
INTERCHANGE 180
Burlington Quad.
Union Quad.
Covington Quad.
Independence Quad.
KENTON CO.
BOONE CO.
75
Marydale
FLORENCE
North
0
1 Mile
SCALE
178.1 Underpass


EXPLANATION
176.2 Mileage
Outcrop Location
Upper part of Ordovician
North
0
1 Mile
SCALE
176.2 Underpass
Exit to Big Bone Lick State Park (8 miles to park)
Big Bone Lick State Park, which was opened in 1960, features a campground, museum, gift shop, hiking trails, fishing lake, and miniature golf. The park contains fossil bones of ancient mammoths, mastodons, horses, deer, musk ox, bison, bears, moose, and ground sloths (McFarland, 1943).
INTERCHANGE 175
Richwood
75
175.1 Bull Fork Formation
Interbedded limestone and shale; limestone dominant
173.5 Bull Fork Formation
Interbedded limestone and shale; limestone dominant
INTERCHANGE 173
Union Quad.
Verona Quad.
Independence Quad.
Walton Quad
Ky. 1292
Walton
INTERCHANGE 171
Exit to Big Bone Lick State Park (8 miles to park). See note at Interchange 175

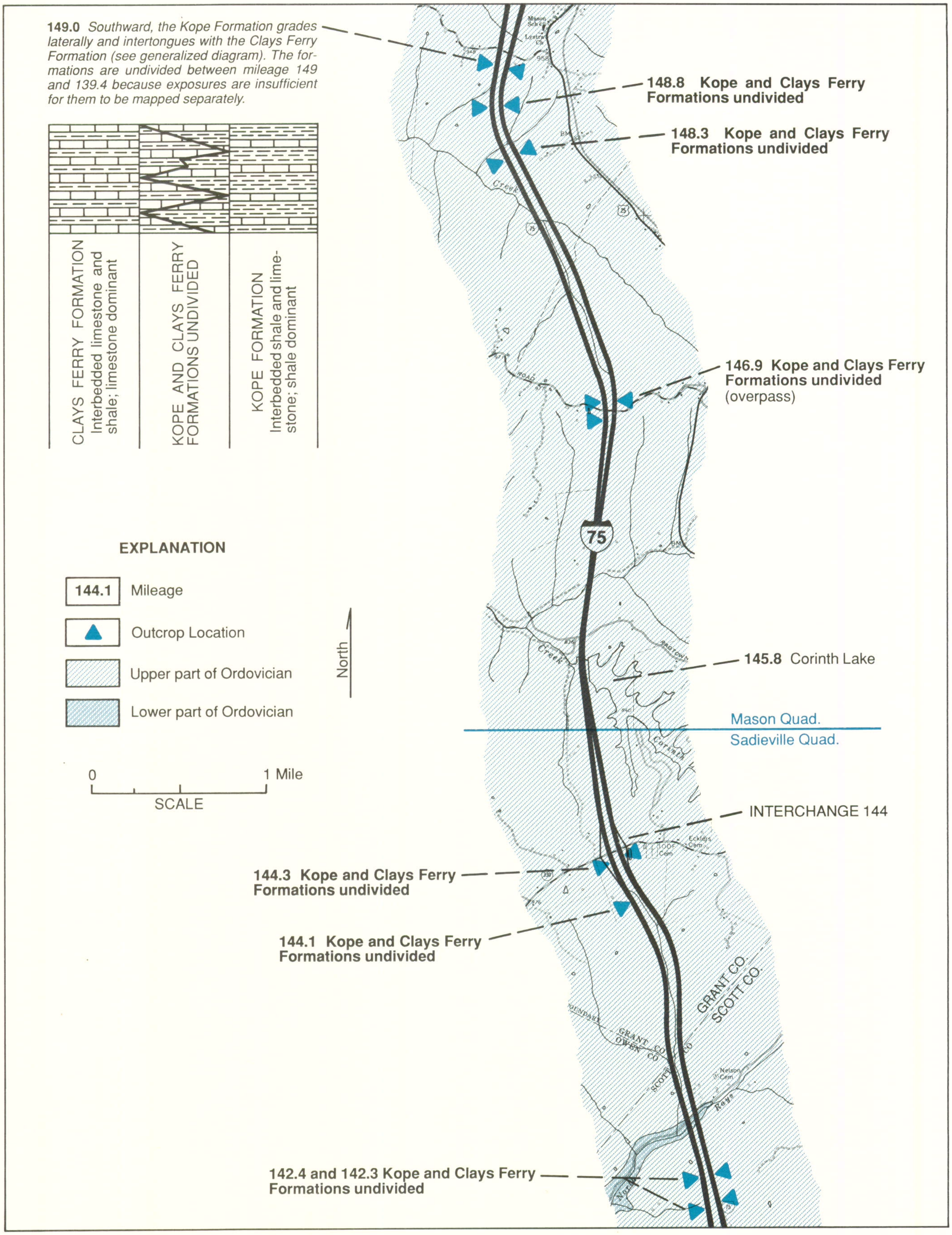


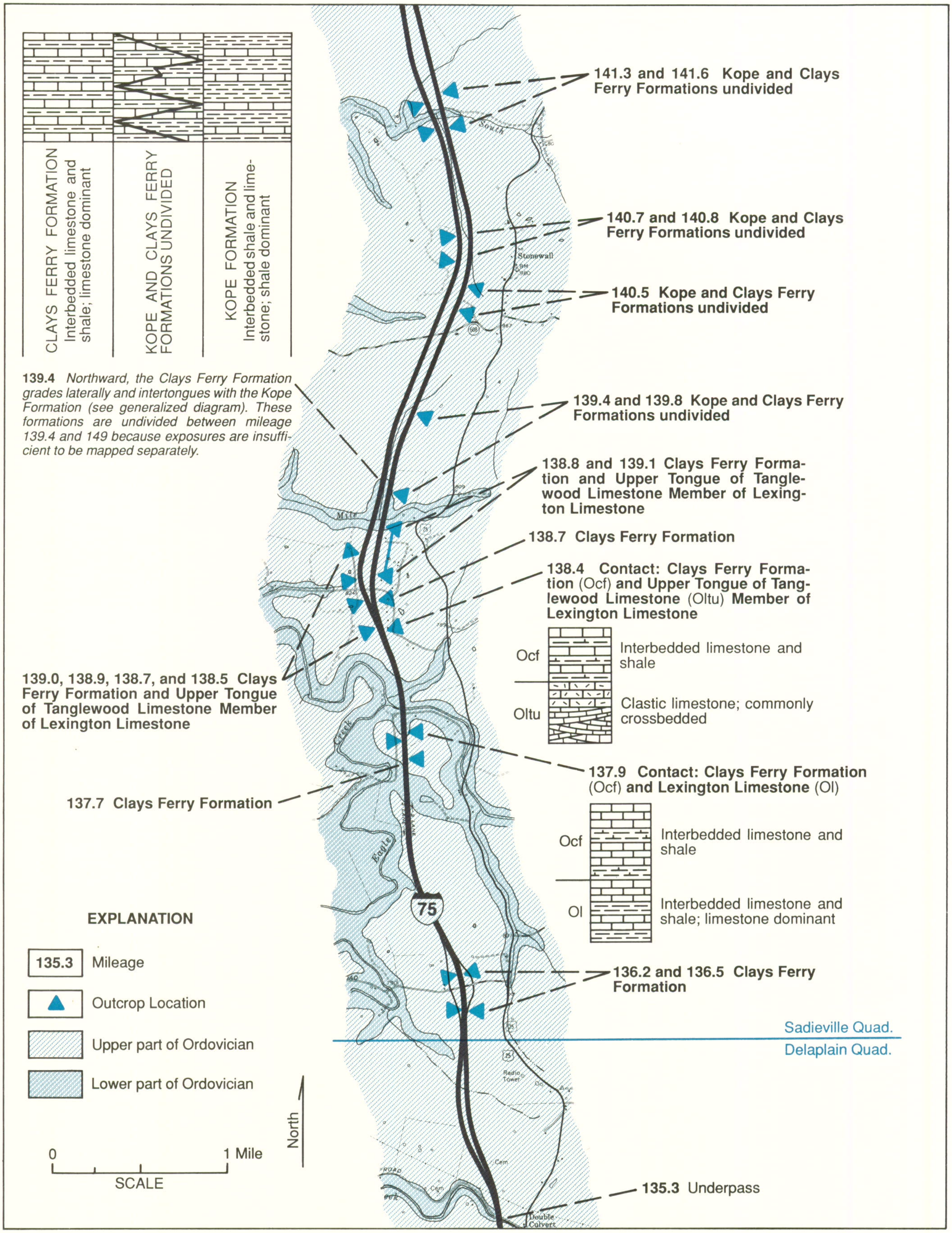
EXPLANATION
166.7 Mileage
Outcrop Location
Upper part of Ordovician
North
0
1 Mile
SCALE
Verona Quad.
Walton Quad.
BOONE CO.
KENTON CO.
170.2 and 170.6 Fairview Formation
Interbedded limestone and shale
168.7 Overpass
169.0 Fairview Formation
Interbedded limestone and shale
75
166.7 Fairview Formation
KENTON CO.
GRANT CO.
165.6 Contact: Bellview Tongue of Grant Lake Limestone (Ogb) and Fairview Formation (Of)
Ogb
Nodular–bedded limestone; contains fossils
Of
Interbedded limestone and shale
INTERCHANGE 166
Crittenden
164.4 Fairview Formation
164.9 Fairview Formation
164.0 Contact: Bellview Tongue of Grant Lake Limestone (Ogb) and Fairview Formation (Of)
164.2 Overpass
Ogb
Nodular–bedded limestone; contains fossils
Of
Interbedded limestone and shale

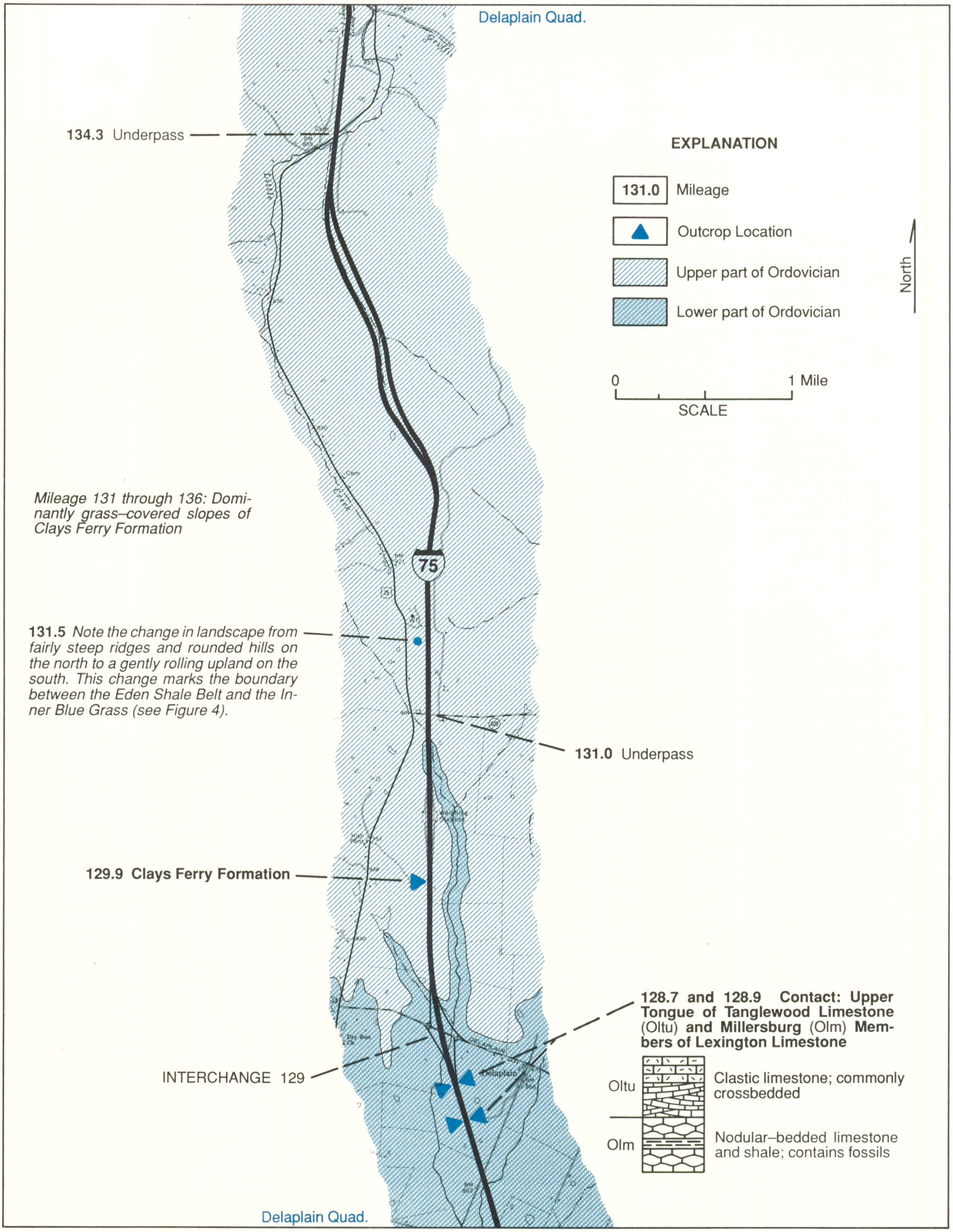

163.5 Fairview Formation
Interbedded limestone and shale
Walton Quad.
Williamstown Quad.
162.8 Fairview Formation
162.4 Fairview Formation
EXPLANATION
161.9 Mileage
Outcrop Location
Upper part of Ordovician
161.9 Contact: Bellview Tongue of Grant Lake Limestone (Ogb) and Fairview Formation (Of)
161.4 Contact: Bellview Tongue of Grant Lake Limestone (Ogb) and Fairview Formation (Of)
Ogb
Nodular–bedded limestone; contains fossils
Of
Interbedded limestone and shale
0
1 Mile
SCALE
North
161.0 Fairview Formation
160.4 Fairview Formation
75
Boltz Lake
159.7 Fairview Formation
159.2 Fairview Formation
158.9 Fairview Formation
INTERCHANGE 157
158.0 Note the change in landscape from a gently rolling upland on the north to steeper ridges and rounded hills on the south. This change marks the boundary between the Outer Blue Grass and Eden Shale Belt (see Figure 4).
157.7 Fairview Formation
157.5 Fairview Formation
156.6 Fairview Formation
Interbedded limestone and shale
157.1 Fairview Formation



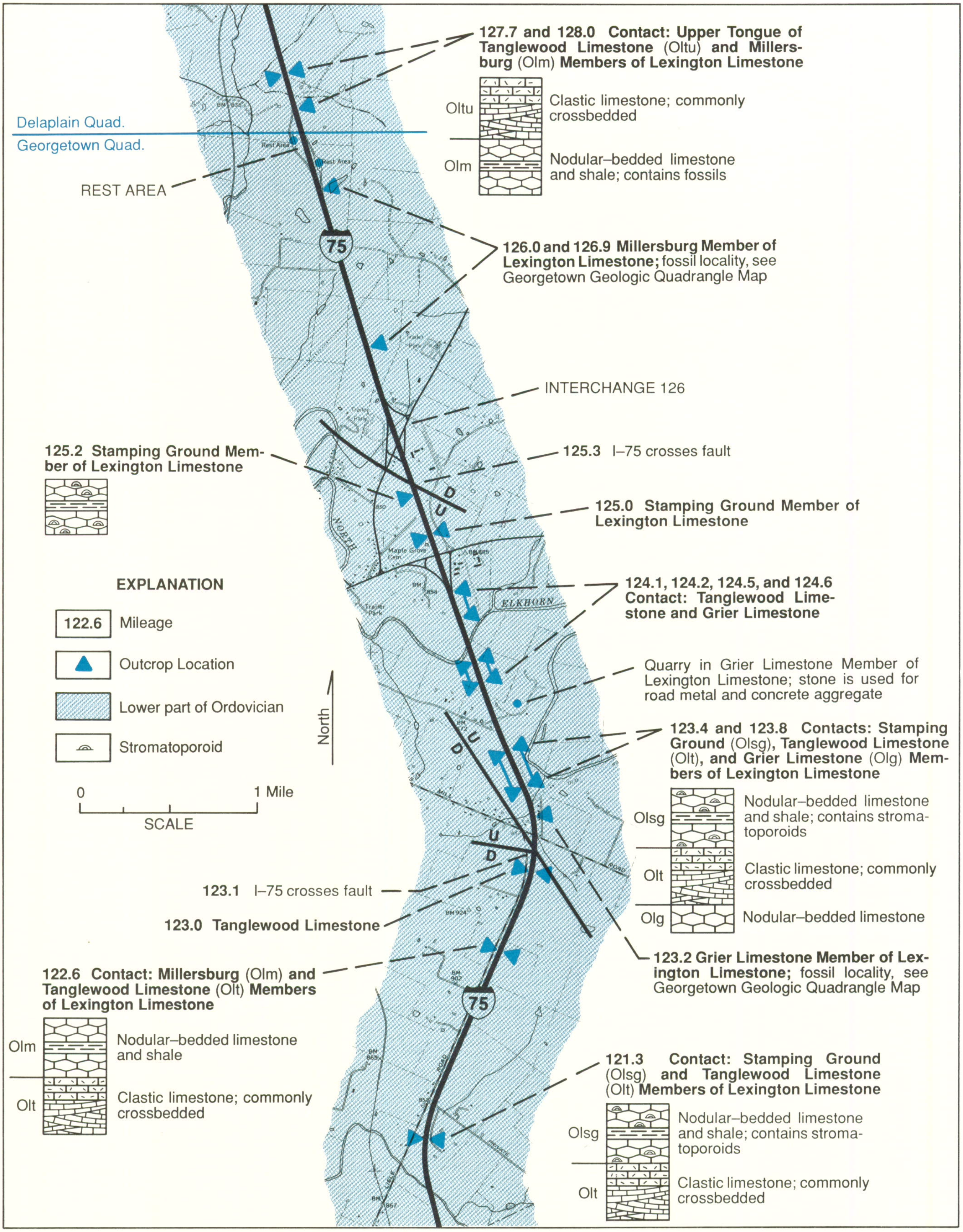
156.3 and 156.2 Contact: Fairview (Of) and Kope (Ok) Formations
Of
Interbedded limestone and shale
Ok
Interbedded shale and limestone; shale dominant
155.7 Overpass
155.7 Contact: Fairview and Kope Formations
155.0 Kope Formation
154.1 Contact: Fairview and Kope Formations
INTERCHANGE 154
Williamstown Quad.
Mason Quad.
154.6 Contact: Fairview Formation (Of) and Kope Formation (Ok); Shaly zones of Kope unstable when wet and subject to slumping; oversteepened banks and artificial cuts should be avoided or adequately shored and drained
Of
Interbedded limestone and shale
Ok
Interbedded shale and limestone; shale dominant
153.9 Kope Formation
153.6 Fairview Formation
152.9 Fairview Formation
EXPLANATION
152.0 Mileage
Outcrop Location
Upper part of Ordovician
75
152.0 Kope Formation
North
0
1 Mile
SCALE
151.2 Kope Formation
151.0 Kope Formation
150.7 Kope Formation (Overpass)
149.9 Kope Formation
Interbedded shale and limestone; shale dominant
Williamstown
Hilltop
Cherry
Mason


149.0 Southward, the Kope Formation grades laterally and intertongues with the Clays Ferry Formation (see generalized diagram). The formations are undivided between mileage 149 and 139.4 because exposures are insufficient for them to be mapped separately.
CLAYS FERRY FORMATION Interbedded limestone and shale; limestone dominant
KOPE AND CLAYS FERRY FORMATIONS UNDIVIDED
KOPE FORMATION Interbedded shale and limestone; shale dominant
148.8 Kope and Clays Ferry Formations undivided
148.3 Kope and Clays Ferry Formations undivided
146.9 Kope and Clays Ferry Formations undivided (overpass)
75
EXPLANATION
144.1 Mileage
Outcrop Location
Upper part of Ordovician
Lower part of Ordovician
North
0
1 Mile
SCALE
145.8 Corinth Lake
Mason Quad.
Sadieville Quad.
INTERCHANGE 144
144.3 Kope and Clays Ferry Formations undivided
144.1 Kope and Clays Ferry Formations undivided
GRANT CO.
SCOTT CO.
142.4 and 142.3 Kope and Clays Ferry Formations undivided

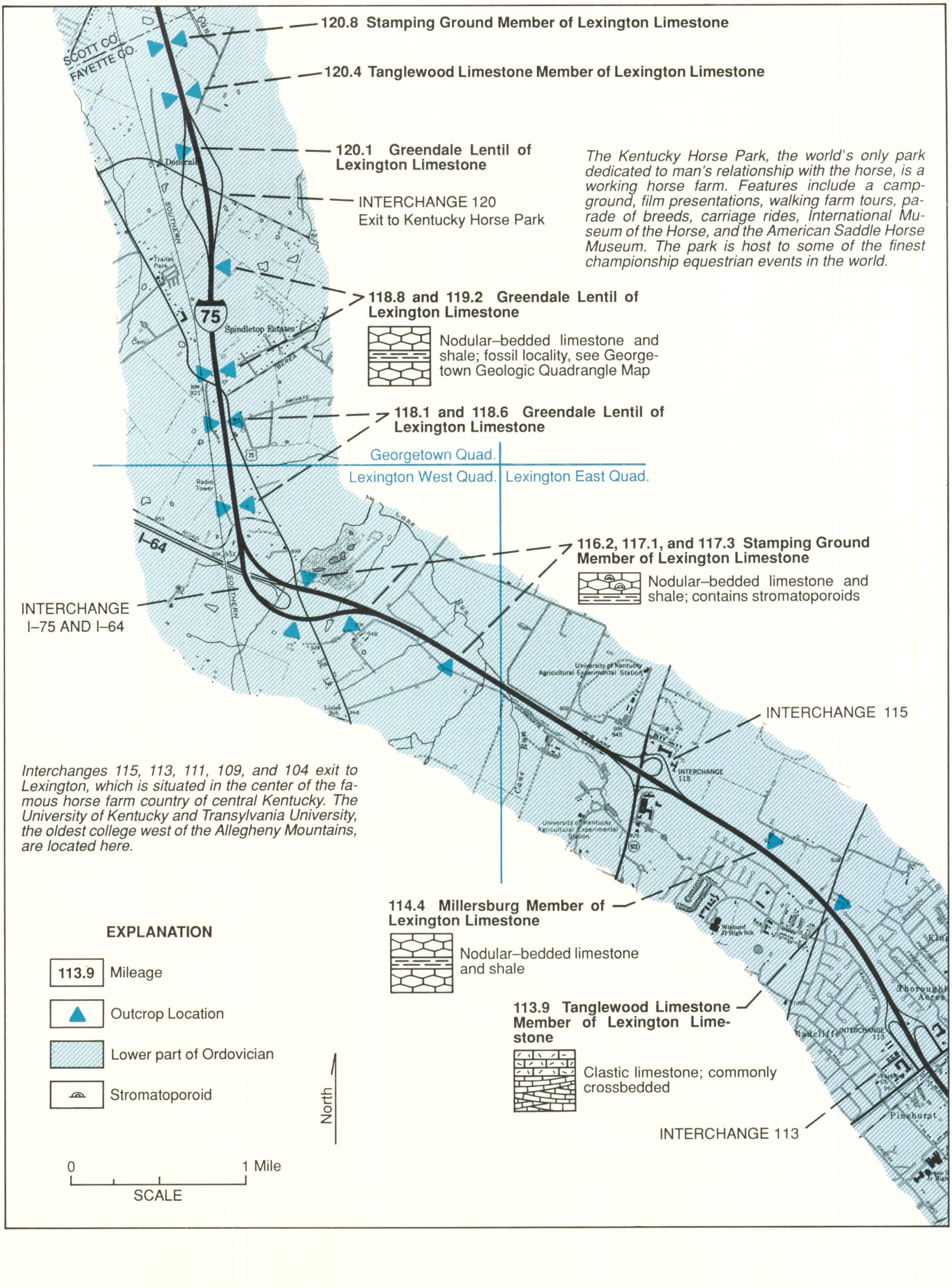

CLAYS FERRY FORMATION
Interbedded limestone and shale; limestone dominant
KOPE AND CLAYS FERRY FORMATIONS UNDIVIDED
KOPE FORMATION
Interbedded shale and limestone; shale dominant
139.4 Northward, the Clays Ferry Formation grades laterally and intertongues with the Kope Formation (see generalized diagram). These formations are undivided between mileage 139.4 and 149 because exposures are insufficient to be mapped separately.
141.3 and 141.6 Kope and Clays Ferry Formations undivided
140.7 and 140.8 Kope and Clays Ferry Formations undivided
140.5 Kope and Clays Ferry Formations undivided
139.4 and 139.8 Kope and Clays Ferry Formations undivided
138.8 and 139.1 Clays Ferry Formation and Upper Tongue of Tanglewood Limestone Member of Lexington Limestone
138.7 Clays Ferry Formation
138.4 Contact: Clays Ferry Formation (Ocf) and Upper Tongue of Tanglewood Limestone (Oltu) Member of Lexington Limestone
Ocf
Interbedded limestone and shale
Oltu
Clastic limestone; commonly crossbedded
139.0, 138.9, 138.7, and 138.5 Clays Ferry Formation and Upper Tongue of Tanglewood Limestone Member of Lexington Limestone
137.9 Contact: Clays Ferry Formation (Ocf) and Lexington Limestone (Ol)
Ocf
Interbedded limestone and shale
Ol
Interbedded limestone and shale; limestone dominant
137.7 Clays Ferry Formation
136.2 and 136.5 Clays Ferry Formation
Sadieville Quad.
Delaplain Quad.
135.3 Underpass
75
Stonewall
Radio Tower
Double Culvert
EXPLANATION
135.3 Mileage
Outcrop Location
Upper part of Ordovician
Lower part of Ordovician
0
1 Mile
SCALE
North



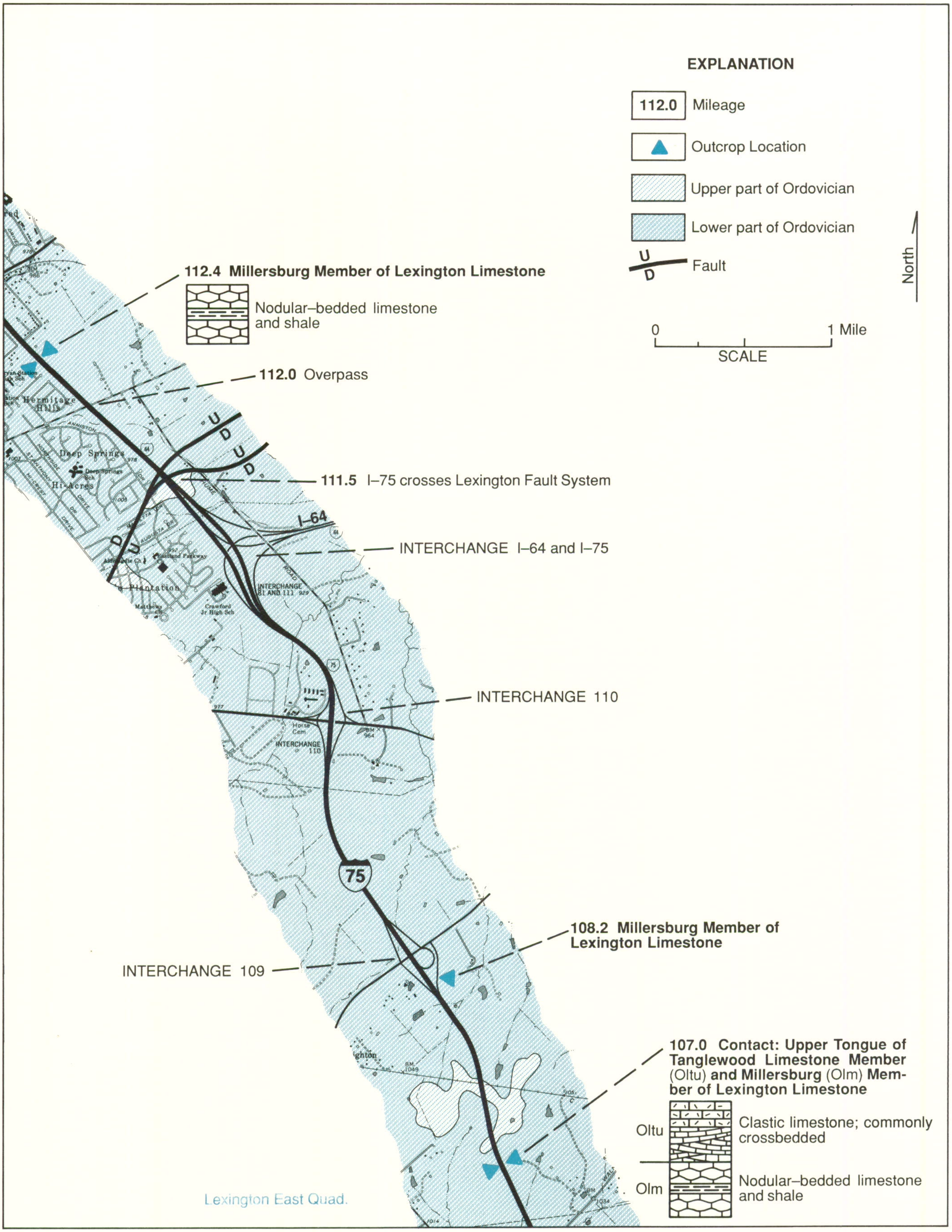
Delaplain Quad.
134.3 Underpass
EXPLANATION
131.0 Mileage
Outcrop Location
Upper part of Ordovician
Lower part of Ordovician
North
0
1 Mile
SCALE
Mileage 131 through 136: Dominantly grass–covered slopes of Clays Ferry Formation
75
131.5 Note the change in landscape from fairly steep ridges and rounded hills on the north to a gently rolling upland on the south. This change marks the boundary between the Eden Shale Belt and the Inner Blue Grass (see Figure 4).
131.0 Underpass
129.9 Clays Ferry Formation
128.7 and 128.9 Contact: Upper Tongue of Tanglewood Limestone (Oltu) and Millersburg (Olm) Members of Lexington Limestone
INTERCHANGE 129
Oltu
Clastic limestone; commonly crossbedded
Olm
Nodular–bedded limestone and shale; contains fossils
Delaplain
Delaplain Quad.

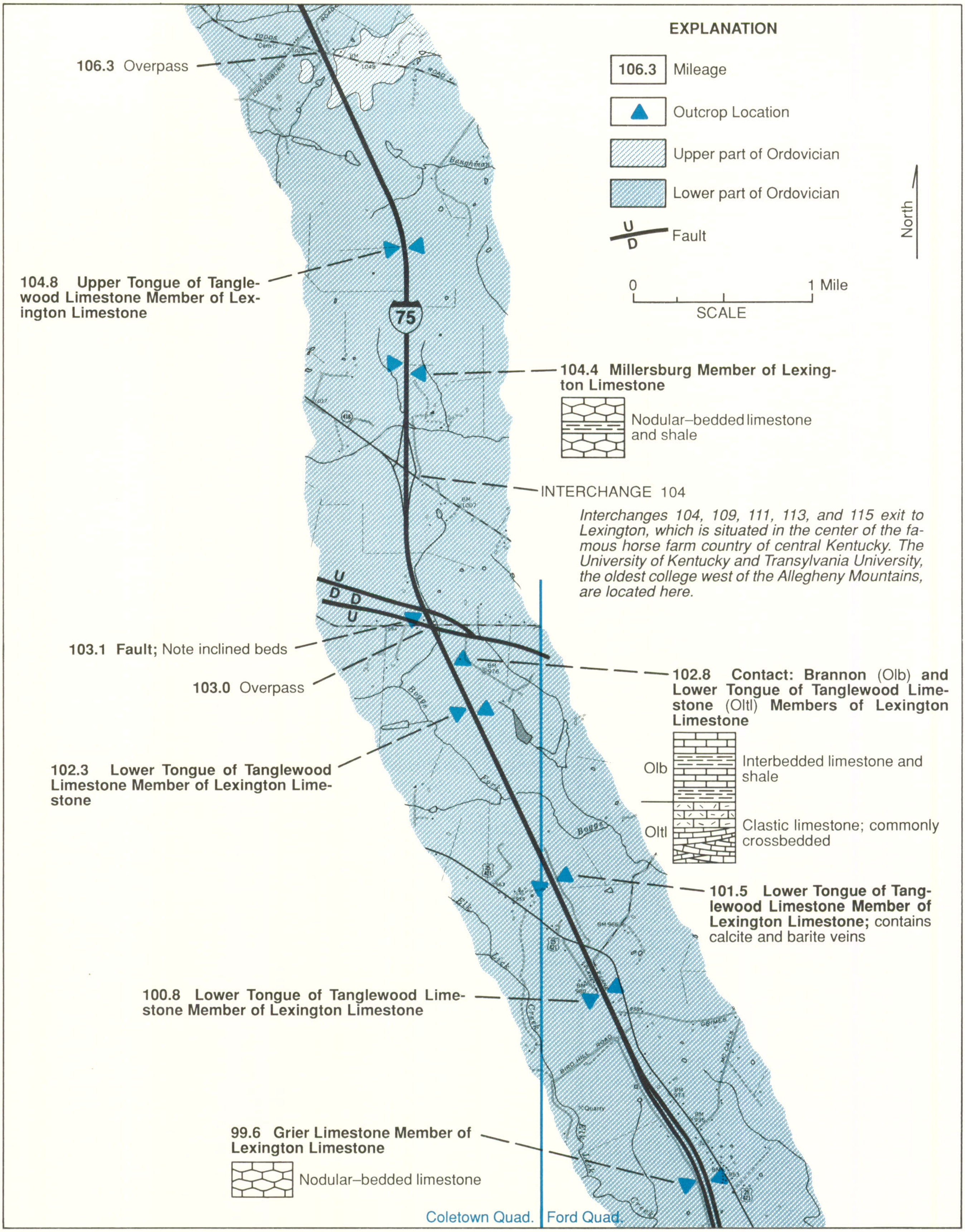


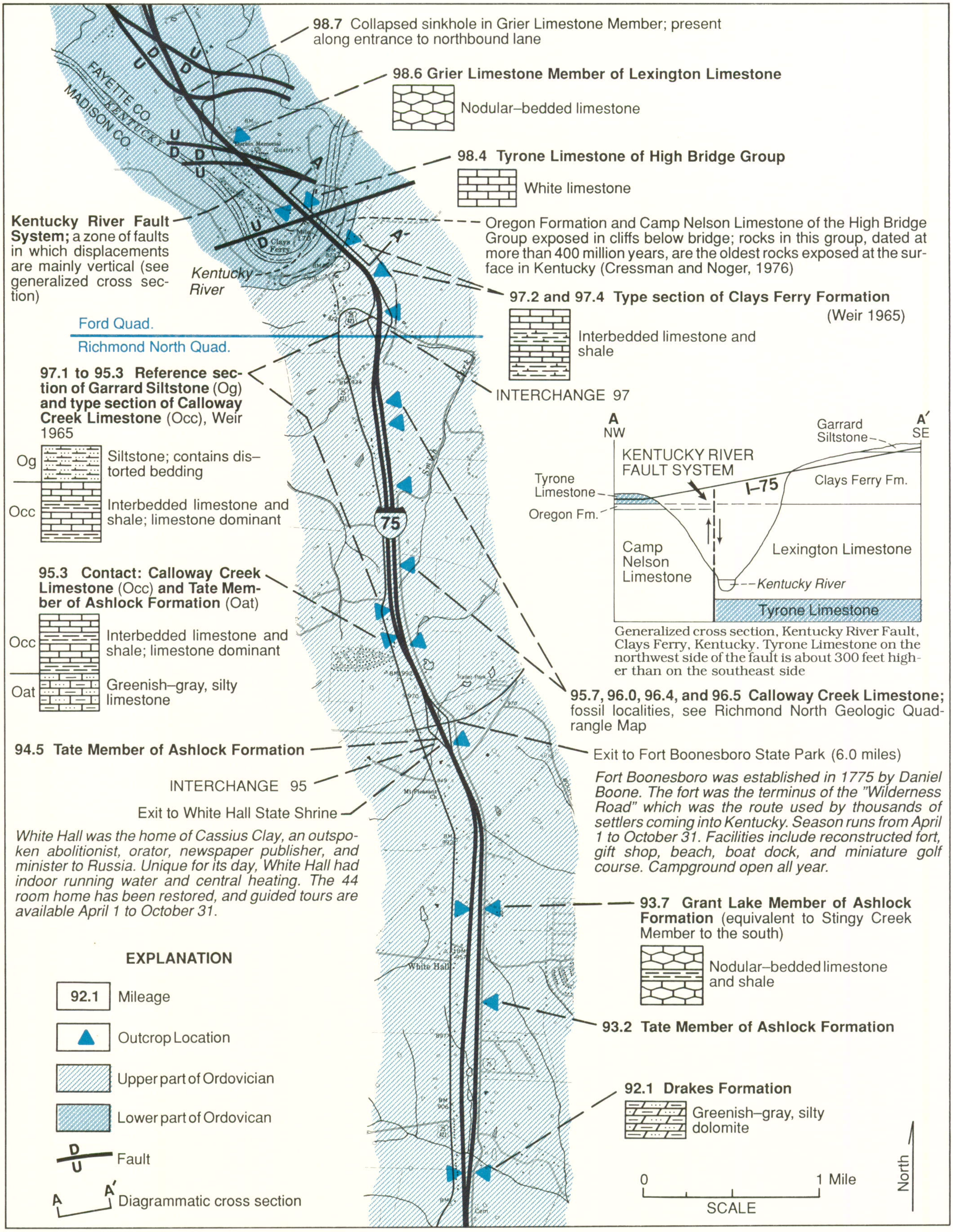
127.7 and 128.0 Contact: Upper Tongue of Tanglewood Limestone (Oltu) and Millersburg (Olm) Members of Lexington Limestone
Oltu
Clastic limestone; commonly crossbedded
Olm
Nodular–bedded limestone and shale; contains fossils
Delaplain Quad.
Georgetown Quad.
REST AREA
126.0 and 126.9 Millersburg Member of Lexington Limestone; fossil locality, see Georgetown Geologic Quadrangle Map
75
INTERCHANGE 126
125.2 Stamping Ground Member of Lexington Limestone
125.3 I–75 crosses fault
125.0 Stamping Ground Member of Lexington Limestone
EXPLANATION
122.6
Mileage
Outcrop Location
Lower part of Ordovician
Stromatoporoid
North
0
1 Mile
SCALE
124.1, 124.2, 124.5, and 124.6 Contact: Tanglewood Limestone and Grier Limestone
Quarry in Grier Limestone Member of Lexington Limestone; stone is used for road metal and concrete aggregate
123.4 and 123.8 Contacts: Stamping Ground (Olsg), Tanglewood Limestone (Olt), and Grier Limestone (Olg) Members of Lexington Limestone
Olsg
Nodular–bedded limestone and shale; contains stromatoporoids
Olt
Clastic limestone; commonly crossbedded
Olg
Nodular–bedded limestone
123.1 I–75 crosses fault
123.0 Tanglewood Limestone
123.2 Grier Limestone Member of Lexington Limestone; fossil locality, see Georgetown Geologic Quadrangle Map
122.6 Contact: Millersburg (Olm) and Tanglewood Limestone (Olt) Members of Lexington Limestone
Olm
Nodular–bedded limestone and shale
Olt
Clastic limestone; commonly crossbedded
75
121.3 Contact: Stamping Ground (Olsg) and Tanglewood Limestone (Olt) Members of Lexington Limestone
Olsg
Nodular–bedded limestone and shale; contains stromatoporoids
Olt
Clastic limestone; commonly crossbedded

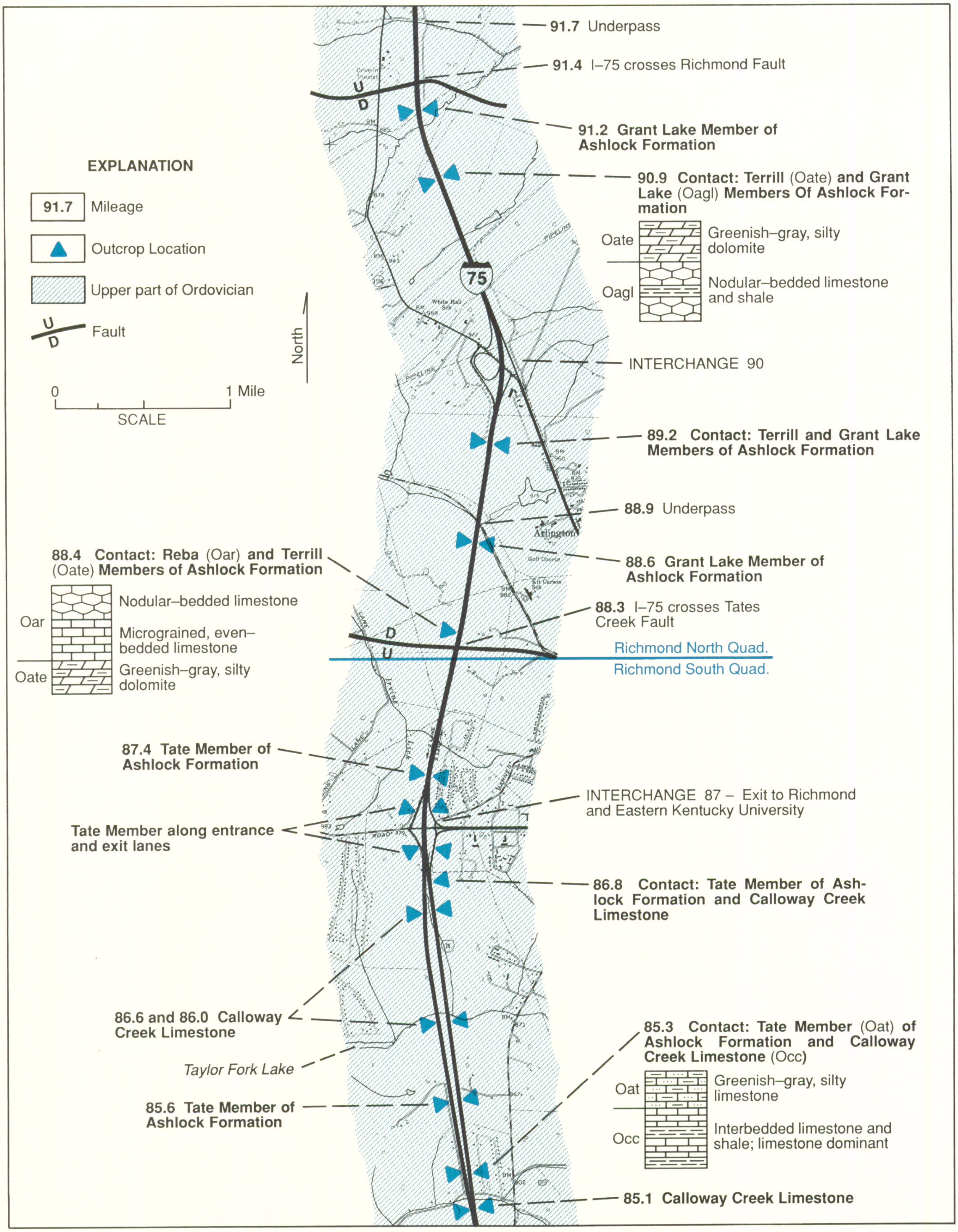


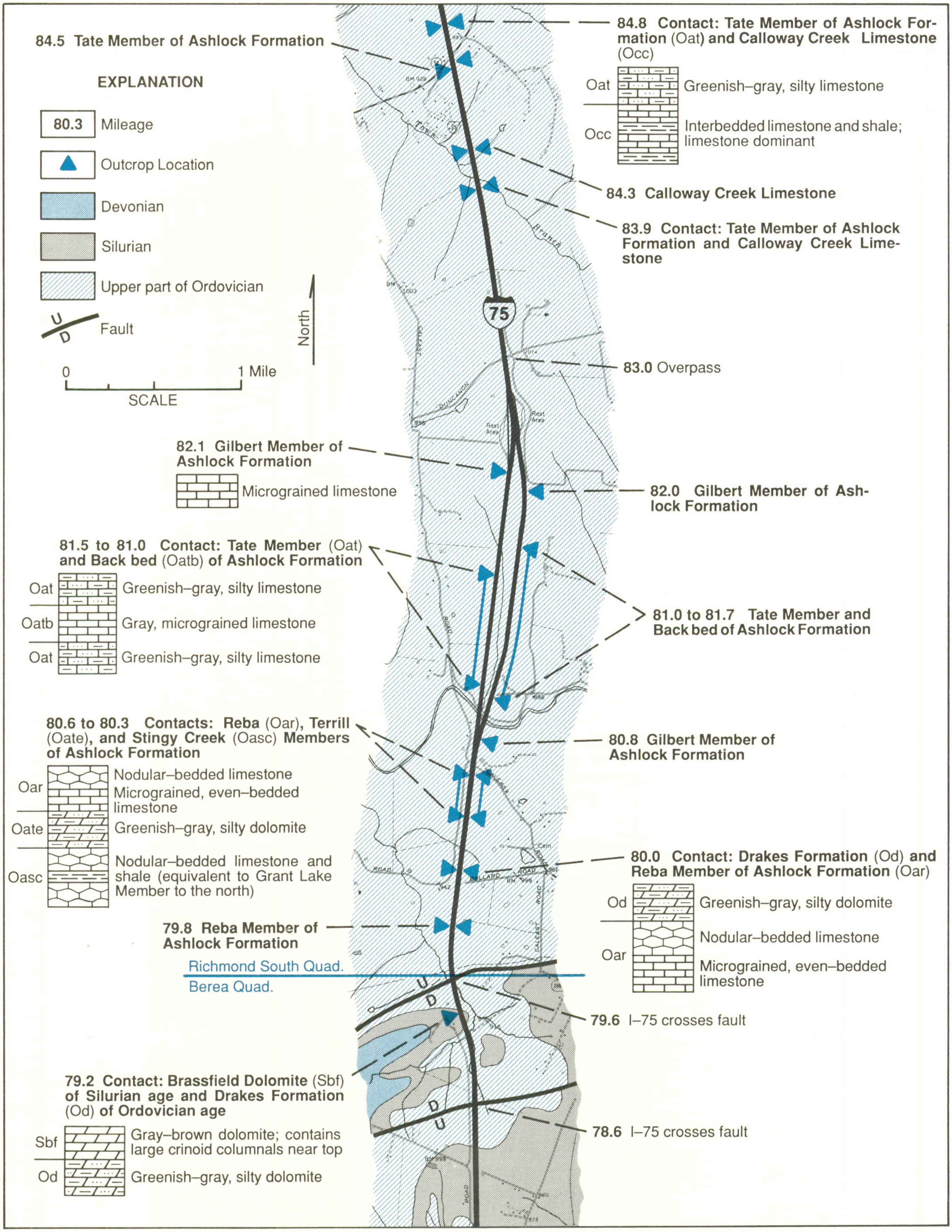
120.8 Stamping Ground Member of Lexington Limestone
120.4 Tanglewood Limestone Member of Lexington Limestone
120.1 Greendale Lentil of Lexington Limestone
INTERCHANGE 120
Exit to Kentucky Horse Park
The Kentucky Horse Park, the world's only park dedicated to man's relationship with the horse, is a working horse farm. Features include a campground, film presentations, walking farm tours, parade of breeds, carriage rides, International Museum of the Horse, and the American Saddle Horse Museum. The park is host to some of the finest championship equestrian events in the world.
118.8 and 119.2 Greendale Lentil of Lexington Limestone
Nodular–bedded limestone and shale; fossil locality, see Georgetown Geologic Quadrangle Map
118.1 and 118.6 Greendale Lentil of Lexington Limestone
Georgetown Quad.
Lexington West Quad.
Lexington East Quad.
116.2, 117.1, and 117.3 Stamping Ground Member of Lexington Limestone
Nodular–bedded limestone and shale; contains stromatoporoids
INTERCHANGE I–75 AND I–64
INTERCHANGE 115
Interchanges 115, 113, 111, 109, and 104 exit to Lexington, which is situated in the center of the famous horse farm country of central Kentucky. The University of Kentucky and Transylvania University, the oldest college west of the Allegheny Mountains, are located here.
114.4 Millersburg Member of Lexington Limestone
Nodular–bedded limestone and shale
113.9 Tanglewood Limestone Member of Lexington Limestone
Clastic limestone; commonly crossbedded
INTERCHANGE 113
EXPLANATION
113.9 Mileage
Outcrop Location
Lower part of Ordovician
Stromatoporoid
North
0
1 Mile
SCALE
SCOTT CO.
FAYETTE CO.
75
I-64
Donerail
Spindletop Estates

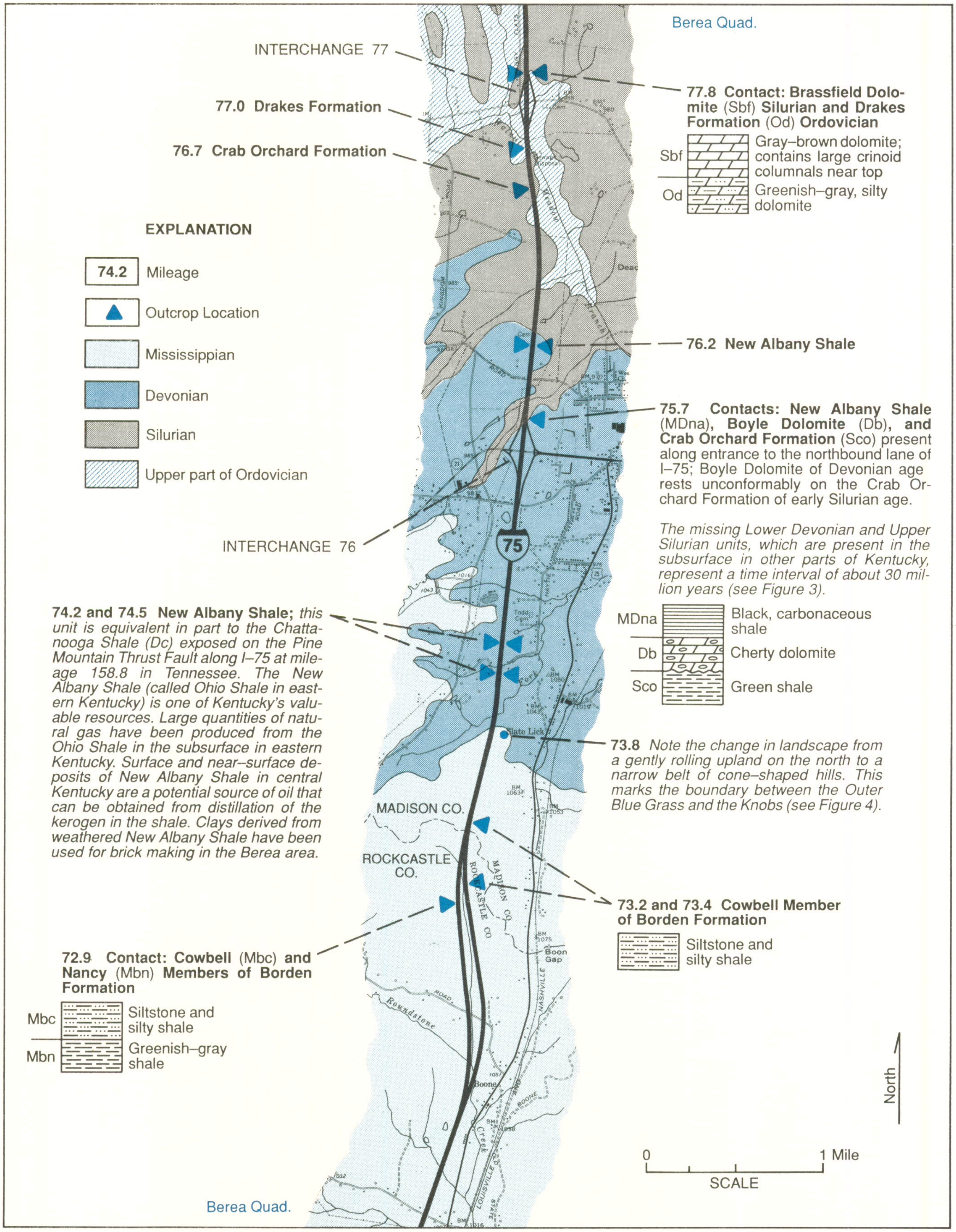

EXPLANATION
112.0 Mileage
Outcrop Location
Upper part of Ordovician
Lower part of Ordovician
U D Fault
North
0 1 Mile
SCALE
112.4 Millersburg Member of Lexington Limestone
Nodular–bedded limestone and shale
112.0 Overpass
111.5 I–75 crosses Lexington Fault System
I-64
INTERCHANGE I–64 and I–75
INTERCHANGE 110
75
108.2 Millersburg Member of Lexington Limestone
INTERCHANGE 109
107.0 Contact: Upper Tongue of Tanglewood Limestone Member (Oltu) and Millersburg (Olm) Member of Lexington Limestone
Oltu
Clastic limestone; commonly crossbedded
Olm
Nodular–bedded limestone and shale
Lexington East Quad.
Hermitage Hills
Deep Springs
Hi-Acres
Plantation

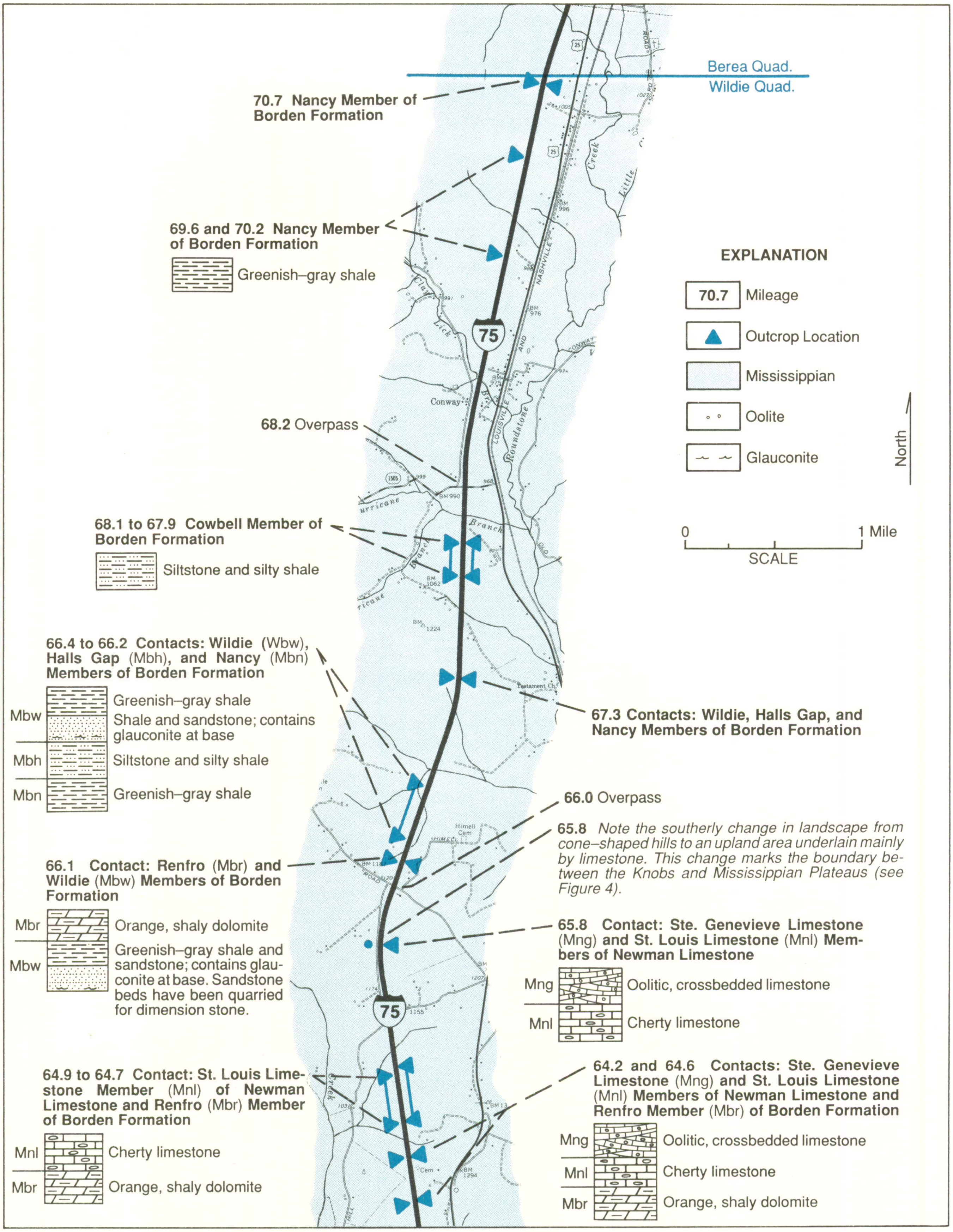

EXPLANATION
106.3 Mileage
Outcrop Location
Upper part of Ordovician
Lower part of Ordovician
U D Fault
North
0 1 Mile
SCALE
106.3 Overpass
104.8 Upper Tongue of Tanglewood Limestone Member of Lexington Limestone
75
104.4 Millersburg Member of Lexington Limestone
Nodular–bedded limestone and shale
INTERCHANGE 104
Interchanges 104, 109, 111, 113, and 115 exit to Lexington, which is situated in the center of the famous horse farm country of central Kentucky. The University of Kentucky and Transylvania University, the oldest college west of the Allegheny Mountains, are located here.
U
D
D
U
103.1 Fault; Note inclined beds
103.0 Overpass
102.8 Contact: Brannon (Olb) and Lower Tongue of Tanglewood Limestone (Oltl) Members of Lexington Limestone
Olb
Interbedded limestone and shale
Oltl
Clastic limestone; commonly crossbedded
102.3 Lower Tongue of Tanglewood Limestone Member of Lexington Limestone
101.5 Lower Tongue of Tanglewood Limestone Member of Lexington Limestone; contains calcite and barite veins
100.8 Lower Tongue of Tanglewood Limestone Member of Lexington Limestone
99.6 Grier Limestone Member of Lexington Limestone
Nodular–bedded limestone
Coletown Quad.
Ford Quad.


98.7 Collapsed sinkhole in Grier Limestone Member; present along entrance to northbound lane
98.6 Grier Limestone Member of Lexington Limestone
Nodular–bedded limestone
98.4 Tyrone Limestone of High Bridge Group
White limestone
Oregon Formation and Camp Nelson Limestone of the High Bridge Group exposed in cliffs below bridge; rocks in this group, dated at more than 400 million years, are the oldest rocks exposed at the surface in Kentucky (Cressman and Noger, 1976)
Kentucky River Fault System; a zone of faults in which displacements are mainly vertical (see generalized cross section)
FAYETTE CO
KENTUCKY
MADISON CO
Kentucky River
Clays Ferry
97.2 and 97.4 Type section of Clays Ferry Formation (Weir 1965)
Interbedded limestone and shale
Ford Quad.
Richmond North Quad.
INTERCHANGE 97
97.1 to 95.3 Reference section of Garrard Siltstone (Og) and type section of Calloway Creek Limestone (Occ), Weir 1965
Og
Siltstone; contains distorted bedding
Occ
Interbedded limestone and shale; limestone dominant
75
A
NW
A′
SE
Garrard Siltstone
KENTUCKY RIVER FAULT SYSTEM
I-75
Clays Ferry Fm.
Tyrone Limestone
Oregon Fm.
Camp Nelson Limestone
Lexington Limestone
Kentucky River
Tyrone Limestone
Generalized cross section, Kentucky River Fault, Clays Ferry, Kentucky. Tyrone Limestone on the northwest side of the fault is about 300 feet higher than on the southeast side
95.3 Contact: Calloway Creek Limestone (Occ) and Tate Member of Ashlock Formation (Oat)
Occ
Interbedded limestone and shale; limestone dominant
Oat
Greenish–gray, silty limestone
95.7, 96.0, 96.4, and 96.5 Calloway Creek Limestone; fossil localities, see Richmond North Geologic Quadrangle Map
94.5 Tate Member of Ashlock Formation
Exit to Fort Boonesboro State Park (6.0 miles)
INTERCHANGE 95
Fort Boonesboro was established in 1775 by Daniel Boone. The fort was the terminus of the "Wilderness Road" which was the route used by thousands of settlers coming into Kentucky. Season runs from April 1 to October 31. Facilities include reconstructed fort, gift shop, beach, boat dock, and miniature golf course. Campground open all year.
Exit to White Hall State Shrine
White Hall was the home of Cassius Clay, an outspoken abolitionist, orator, newspaper publisher, and minister to Russia. Unique for its day, White Hall had indoor running water and central heating. The 44 room home has been restored, and guided tours are available April 1 to October 31.
93.7 Grant Lake Member of Ashlock Formation (equivalent to Stingy Creek Member to the south)
Nodular–bedded limestone and shale
White Hall
93.2 Tate Member of Ashlock Formation
EXPLANATION
92.1 Mileage
Outcrop Location
Upper part of Ordovician
Lower part of Ordovican
D U Fault
A A′ Diagrammatic cross section
92.1 Drakes Formation
Greenish–gray, silty dolomite
0
1 Mile
SCALE
North

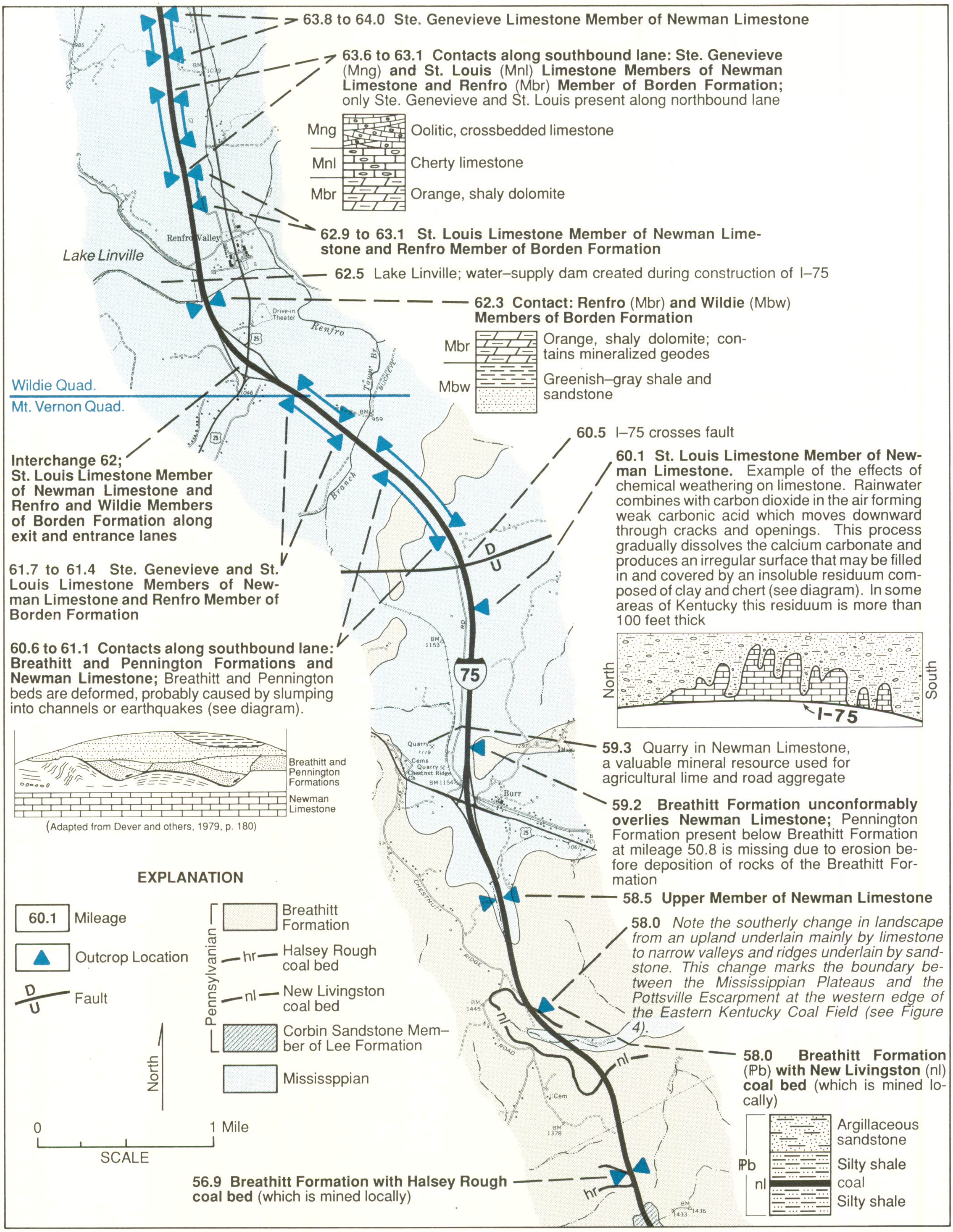

91.7 Underpass
91.4 I–75 crosses Richmond Fault
91.2 Grant Lake Member of Ashlock Formation
EXPLANATION
91.7 Mileage
Outcrop Location
Upper part of Ordovician
Fault
U
D
0
1 Mile
SCALE
North
90.9 Contact: Terrill (Oate) and Grant Lake (Oagl) Members Of Ashlock Formation
Oate
Greenish–gray, silty dolomite
Oagl
Nodular–bedded limestone and shale
75
INTERCHANGE 90
89.2 Contact: Terrill and Grant Lake Members of Ashlock Formation
88.9 Underpass
Arlington
88.4 Contact: Reba (Oar) and Terrill (Oate) Members of Ashlock Formation
Oar
Nodular–bedded limestone
Micrograined, even–bedded limestone
Oate
Greenish–gray, silty dolomite
88.6 Grant Lake Member of Ashlock Formation
88.3 I–75 crosses Tates Creek Fault
Richmond North Quad.
Richmond South Quad.
87.4 Tate Member of Ashlock Formation
INTERCHANGE 87 – Exit to Richmond and Eastern Kentucky University
Tate Member along entrance and exit lanes
86.8 Contact: Tate Member of Ashlock Formation and Calloway Creek Limestone
86.6 and 86.0 Calloway Creek Limestone
Taylor Fork Lake
85.3 Contact: Tate Member (Oat) of Ashlock Formation and Calloway Creek Limestone (Occ)
Oat
Greenish–gray, silty limestone
Occ
Interbedded limestone and shale; limestone dominant
85.6 Tate Member of Ashlock Formation
85.1 Calloway Creek Limestone


84.5 Tate Member of Ashlock Formation
EXPLANATION
80.3 Mileage
Outcrop Location
Devonian
Silurian
Upper part of Ordovician
U D Fault
0 1 Mile
SCALE
North
84.8 Contact: Tate Member of Ashlock Formation (Oat) and Calloway Creek Limestone (Occ)
Oat Greenish–gray, silty limestone
Occ Interbedded limestone and shale; limestone dominant
84.3 Calloway Creek Limestone
83.9 Contact: Tate Member of Ashlock Formation and Calloway Creek Limestone
75
83.0 Overpass
82.1 Gilbert Member of Ashlock Formation
Micrograined limestone
82.0 Gilbert Member of Ashlock Formation
81.5 to 81.0 Contact: Tate Member (Oat) and Back bed (Oatb) of Ashlock Formation
Oat Greenish–gray, silty limestone
Oatb Gray, micrograined limestone
Oat Greenish–gray, silty limestone
81.0 to 81.7 Tate Member and Back bed of Ashlock Formation
80.6 to 80.3 Contacts: Reba (Oar), Terrill (Oate), and Stingy Creek (Oasc) Members of Ashlock Formation
Oar Nodular–bedded limestone
Micrograined, even–bedded limestone
Oate Greenish–gray, silty dolomite
Oasc Nodular–bedded limestone and shale (equivalent to Grant Lake Member to the north)
80.8 Gilbert Member of Ashlock Formation
80.0 Contact: Drakes Formation (Od) and Reba Member of Ashlock Formation (Oar)
Od Greenish–gray, silty dolomite
Oar Nodular–bedded limestone
Micrograined, even–bedded limestone
79.8 Reba Member of Ashlock Formation
Richmond South Quad.
Berea Quad.
79.6 I–75 crosses fault
79.2 Contact: Brassfield Dolomite (Sbf) of Silurian age and Drakes Formation (Od) of Ordovician age
Sbf Gray–brown dolomite; contains large crinoid columnals near top
Od Greenish–gray, silty dolomite
78.6 I–75 crosses fault

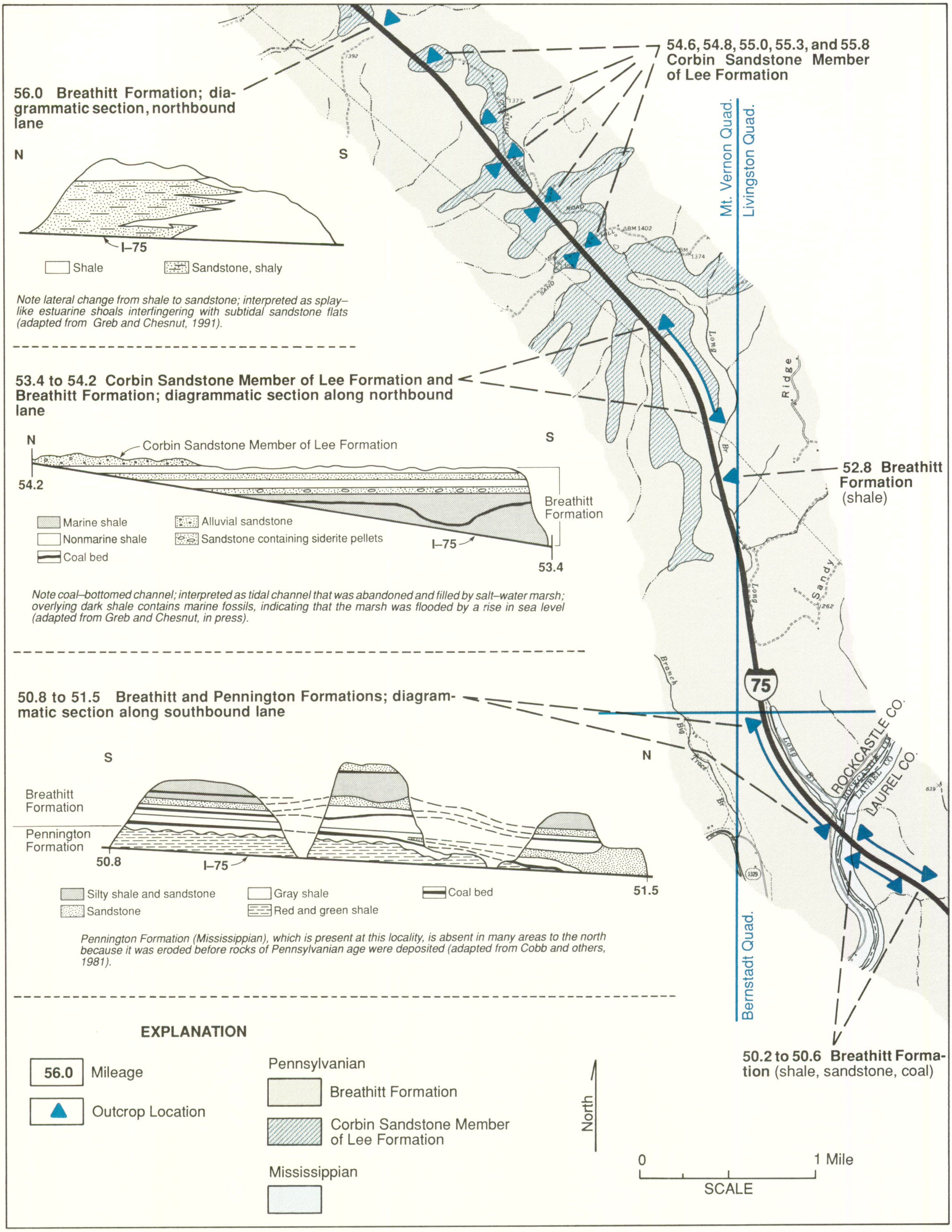

Berea Quad.
INTERCHANGE 77
77.0 Drakes Formation
76.7 Crab Orchard Formation
77.8 Contact: Brassfield Dolomite (Sbf) Silurian and Drakes Formation (Od) Ordovician
Sbf
Gray–brown dolomite; contains large crinoid columnals near top
Od
Greenish–gray, silty dolomite
EXPLANATION
74.2
Mileage
Outcrop Location
Mississippian
Devonian
Silurian
Upper part of Ordovician
76.2 New Albany Shale
75.7 Contacts: New Albany Shale (MDna), Boyle Dolomite (Db), and Crab Orchard Formation (Sco) present along entrance to the northbound lane of I–75; Boyle Dolomite of Devonian age rests unconformably on the Crab Orchard Formation of early Silurian age.
The missing Lower Devonian and Upper Silurian units, which are present in the subsurface in other parts of Kentucky, represent a time interval of about 30 million years (see Figure 3).
INTERCHANGE 76
75
MDna
Black, carbonaceous shale
Db
Cherty dolomite
Sco
Green shale
74.2 and 74.5 New Albany Shale; this unit is equivalent in part to the Chattanooga Shale (Dc) exposed on the Pine Mountain Thrust Fault along I–75 at mileage 158.8 in Tennessee. The New Albany Shale (called Ohio Shale in eastern Kentucky) is one of Kentucky's valuable resources. Large quantities of natural gas have been produced from the Ohio Shale in the subsurface in eastern Kentucky. Surface and near–surface deposits of New Albany Shale in central Kentucky are a potential source of oil that can be obtained from distillation of the kerogen in the shale. Clays derived from weathered New Albany Shale have been used for brick making in the Berea area.
Slate Lick
73.8 Note the change in landscape from a gently rolling upland on the north to a narrow belt of cone–shaped hills. This marks the boundary between the Outer Blue Grass and the Knobs (see Figure 4).
MADISON CO.
ROCKCASTLE CO.
73.2 and 73.4 Cowbell Member of Borden Formation
Siltstone and silty shale
72.9 Contact: Cowbell (Mbc) and Nancy (Mbn) Members of Borden Formation
Mbc
Siltstone and silty shale
Mbn
Greenish–gray shale
Boon Gap
Roundstone
Boone
Creek
North
0
1 Mile
SCALE
Berea Quad.

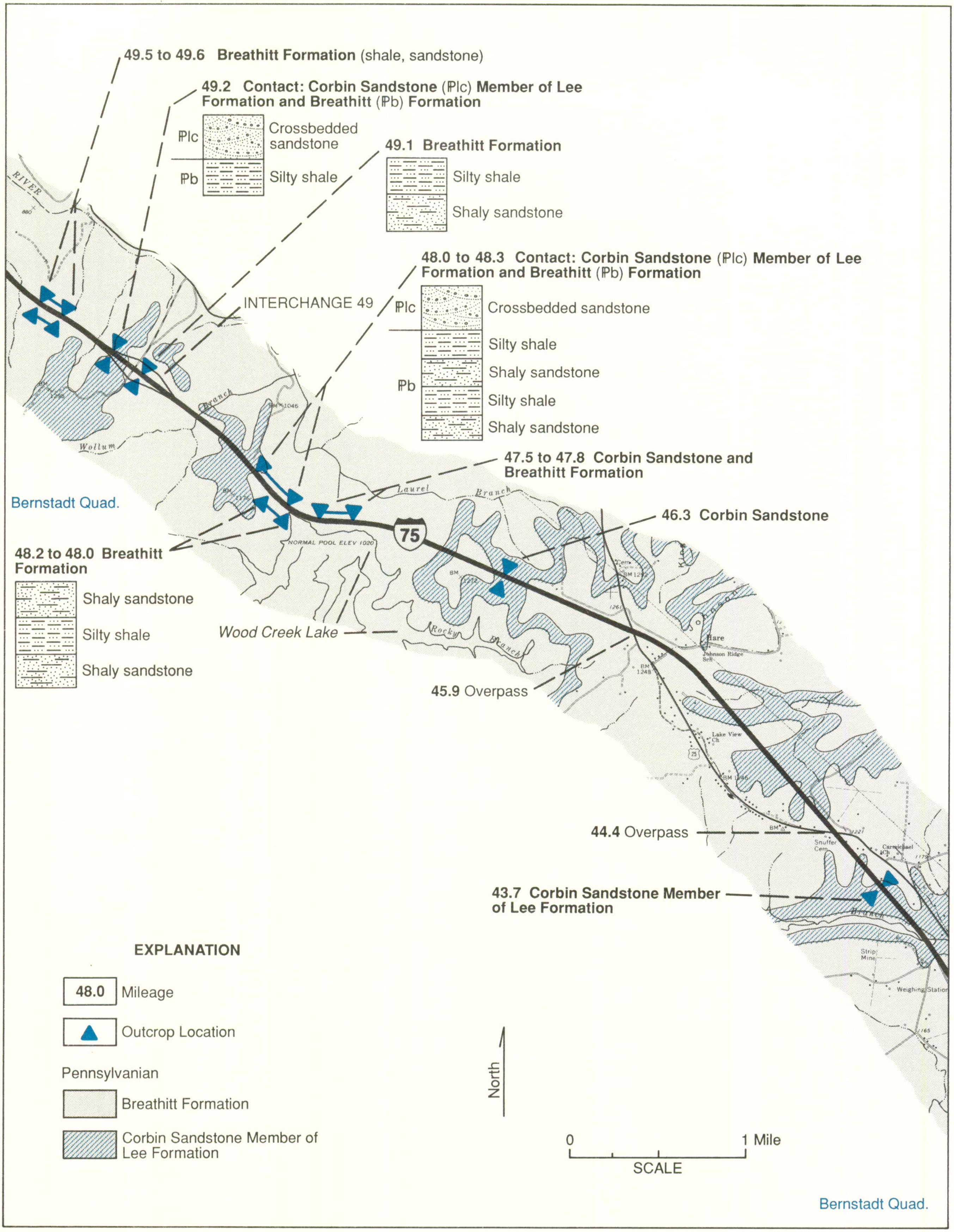


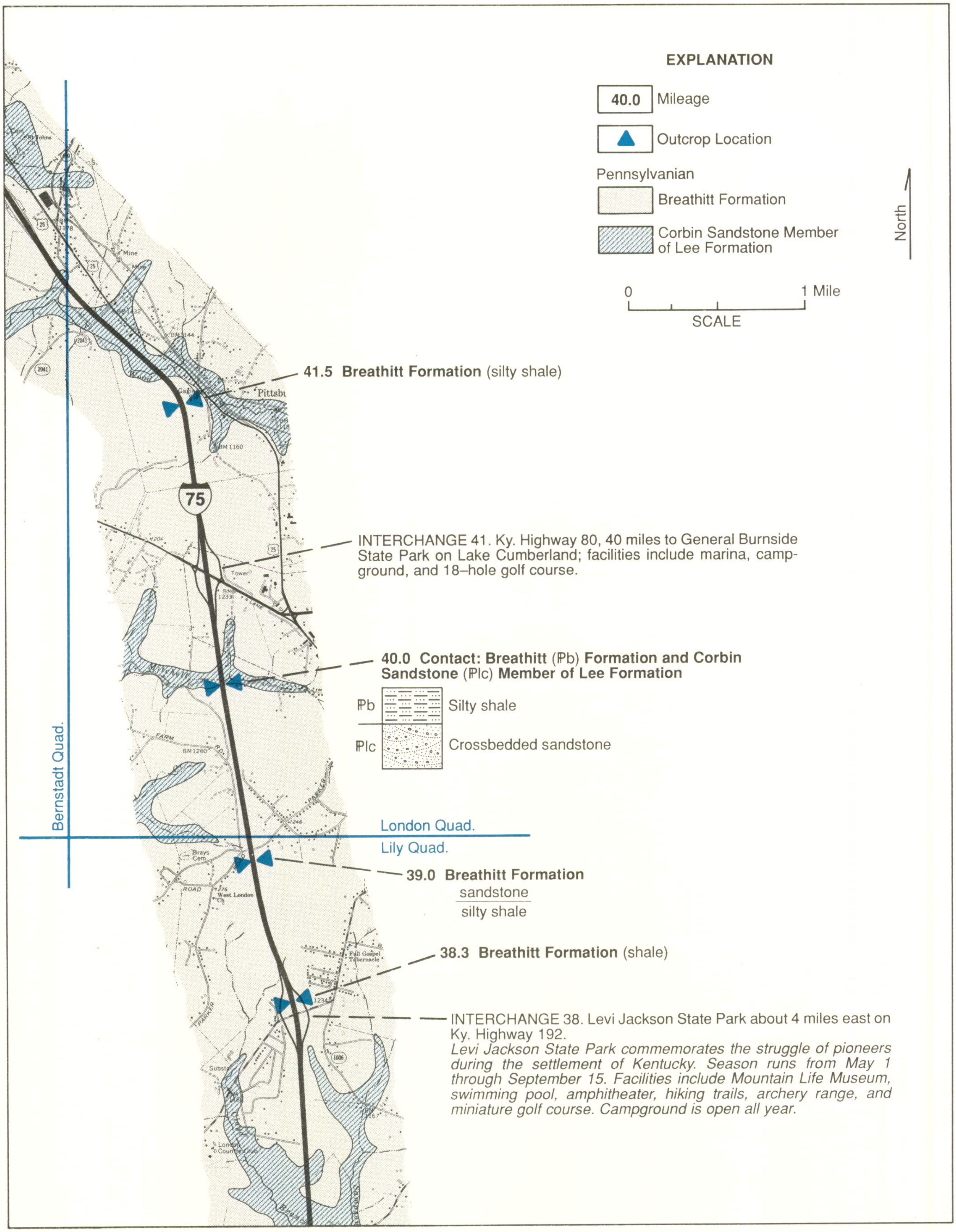
Berea Quad.
Wildie Quad.
70.7 Nancy Member of Borden Formation
69.6 and 70.2 Nancy Member of Borden Formation
Greenish–gray shale
EXPLANATION
70.7 Mileage
Outcrop Location
Mississippian
Oolite
Glaucomite
North
0
1 Mile
SCALE
68.2 Overpass
Conway
68.1 to 67.9 Cowbell Member of Borden Formation
Siltstone and silty shale
66.4 to 66.2 Contacts: Wildie (Wbw), Halls Gap (Mbh), and Nancy (Mbn) Members of Borden Formation
Mbw
Greenish–gray shale
Shale and sandstone; contains glauconite at base
Mbh
Siltstone and silty shale
Mbn
Greenish–gray shale
67.3 Contacts: Wildie, Halls Gap, and Nancy Members of Borden Formation
66.0 Overpass
65.8 Note the southerly change in landscape from cone–shaped hills to an upland area underlain mainly by limestone. This change marks the boundary between the Knobs and Mississippian Plateaus (see Figure 4).
66.1 Contact: Renfro (Mbr) and Wildie (Mbw) Members of Borden Formation
Mbr
Orange, shaly dolomite
Mbw
Greenish–gray shale and sandstone; contains glauconite at base. Sandstone beds have been quarried for dimension stone.
65.8 Contact: Ste. Genevieve Limestone (Mng) and St. Louis Limestone (Mnl) Members of Newman Limestone
Mng
Oolitic, crossbedded limestone
Mnl
Cherty limestone
75
64.9 to 64.7 Contact: St. Louis Limestone Member (Mnl) of Newman Limestone and Renfro (Mbr) Member of Borden Formation
Mnl
Cherty limestone
Mbr
Orange, shaly dolomite
64.2 and 64.6 Contacts: Ste. Genevieve Limestone (Mng) and St. Louis Limestone (Mnl) Members of Newman Limestone and Renfro Member (Mbr) of Borden Formation
Mng
Oolitic, crossbedded limestone
Mnl
Cherty limestone
Mbr
Orange, shaly dolomite

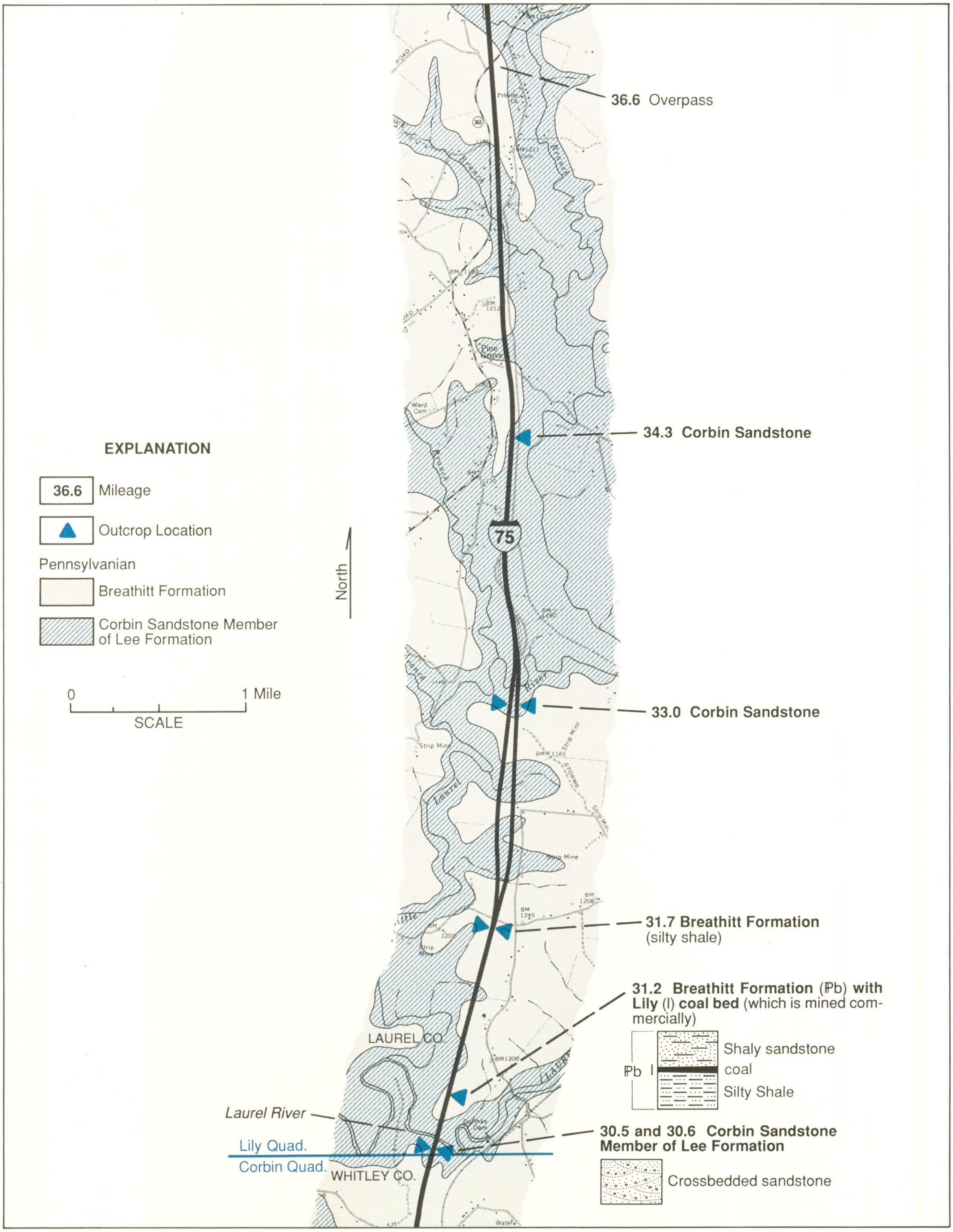


63.8 to 64.0 Ste. Genevieve Limestone Member of Newman Limestone
63.6 to 63.1 Contacts along southbound lane: Ste. Genevieve (Mng) and St. Louis (Mnl) Limestone Members of Newman Limestone and Renfro (Mbr) Member of Borden Formation; only Ste. Genevieve and St. Louis present along northbound lane
Mng
Oolitic, crossbedded limestone
Mnl
Cherty limestone
Mbr
Orange, shaly dolomite
62.9 to 63.1 St. Louis Limestone Member of Newman Limestone and Renfro Member of Borden Formation
Lake Linville
Renfro Valley
62.5 Lake Linville; water–supply dam created during construction of I–75
62.3 Contact: Renfro (Mbr) and Wildie (Mbw) Members of Borden Formation
Mbr
Orange, shaly dolomite; contains mineralized geodes
Mbw
Greenish–gray shale and sandstone
Drive-in Theater
Renfro
Wildie Quad.
Mt. Vernon Quad.
60.5 I–75 crosses fault
Interchange 62; St. Louis Limestone Member of Newman Limestone and Renfro and Wildie Members of Borden Formation along exit and entrance lanes
60.1 St. Louis Limestone Member of Newman Limestone. Example of the effects of chemical weathering on limestone. Rainwater combines with carbon dioxide in the air forming weak carbonic acid which moves downward through cracks and openings. This process gradually dissolves the calcium carbonate and produces an irregular surface that may be filled in and covered by an insoluble residuum composed of clay and chert (see diagram). In some areas of Kentucky this residuum is more than 100 feet thick
D
U
61.7 to 61.4 Ste. Genevieve and St. Louis Limestone Members of Newman Limestone and Renfro Member of Borden Formation
60.6 to 61.1 Contacts along southbound lane: Breathitt and Pennington Formations and Newman Limestone; Breathitt and Pennington beds are deformed, probably caused by slumping into channels or earthquakes (see diagram).
75
North
South
I-75
Breathitt and Pennington Formations
Newman Limestone
(Adapted from Dever and others, 1979, p. 180)
59.3 Quarry in Newman Limestone, a valuable mineral resource used for agricultural lime and road aggregate
Burr
59.2 Breathitt Formation unconformably overlies Newman Limestone; Pennington Formation present below Breathitt Formation at mileage 50.8 is missing due to erosion before deposition of rocks of the Breathitt Formation
EXPLANATION
60.1 Mileage
Outcrop Location
D U Fault
Pennsylvanian
Breathitt Formation
—hr— Halsey Rough coal bed
—nl— New Livingston coal bed
Corbin Sandstone Member of Lee Formation
Mississppian
North
0 1 Mile
SCALE
58.5 Upper Member of Newman Limestone
58.0 Note the southerly change in landscape from an upland underlain mainly by limestone to narrow valleys and ridges underlain by sandstone. This change marks the boundary between the Mississippian Plateaus and the Pottsville Escarpment at the western edge of the Eastern Kentucky Coal Field (see Figure 4).
nl
58.0 Breathitt Formation (Pb) with New Livingston (nl) coal bed (which is mined locally)
Argillaceous sandstone
Pb
Silty shale
nl
coal
Silty shale
hr
56.9 Breathitt Formation with Halsey Rough coal bed (which is mined locally)


54.6, 54.8, 55.0, 55.3, and 55.8 Corbin Sandstone Member of Lee Formation
56.0 Breathitt Formation; diagrammatic section, northbound lane
N
S
I–75
Shale
Sandstone, shaly
Note lateral change from shale to sandstone; interpreted as splay–like estuarine shoals interfingering with subtidal sandstone flats (adapted from Greb and Chesnut, 1991).
Mt. Vernon Quad.
Livingston Quad.
53.4 to 54.2 Corbin Sandstone Member of Lee Formation and Breathitt Formation; diagrammatic section along northbound lane
N
S
Corbin Sandstone Member of Lee Formation
54.2
Breathitt Formation
Marine shale
Nonmarine shale
Coal bed
Alluvial sandstone
Sandstone containing siderite pellets
I–75
53.4
Note coal–bottomed channel; interpreted as tidal channel that was abandoned and filled by salt–water marsh; overlying dark shale contains marine fossils, indicating that the marsh was flooded by a rise in sea level (adapted from Greb and Chesnut, in press).
52.8 Breathitt Formation (shale)
Long
Ridge
Sandy
Branch
Big
Trace
75
ROCKCASTLE CO.
LAUREL CO.
50.8 to 51.5 Breathitt and Pennington Formations; diagrammatic section along southbound lane
S
N
Breathitt Formation
Pennington Formation
50.8
I–75
51.5
Silty shale and sandstone
Sandstone
Gray shale
Red and green shale
Coal bed
Pennington Formation (Mississippian), which is present at this locality, is absent in many areas to the north because it was eroded before rocks of Pennsylvanian age were deposited (adapted from Cobb and others, 1981).
Bernstadt Quad.
50.2 to 50.6 Breathitt Formation (shale, sandstone, coal)
EXPLANATION
56.0 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
Corbin Sandstone Member of Lee Formation
Mississippian
North
0
1 Mile
SCALE

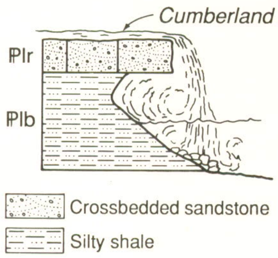

49.5 to 49.6 Breathitt Formation (shale, sandstone)
49.2 Contact: Corbin Sandstone (Plc) Member of Lee Formation and Breathitt (Pb) Formation
Plc
Crossbedded sandstone
Pb
Silty shale
49.1 Breathitt Formation
Silty shale
Shaly sandstone
48.0 to 48.3 Contact: Corbin Sandstone (Plc) Member of Lee Formation and Breathitt (Pb) Formation
Plc
Crossbedded sandstone
Pb
Silty shale
Shaly sandstone
Silty shale
Shaly sandstone
INTERCHANGE 49
47.5 to 47.8 Corbin Sandstone and Breathitt Formation
46.3 Corbin Sandstone
Bernstadt Quad.
48.2 to 48.0 Breathitt Formation
Shaly sandstone
Silty shale
Shaly sandstone
Wood Creek Lake
45.9 Overpass
44.4 Overpass
43.7 Corbin Sandstone Member of Lee Formation
75
RIVER
Wollum
Branch
Laurel Branch
NORMAL POOL ELEV 1020
Rocky Branch
EXPLANATION
48.0 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
Corbin Sandstone Member of Lee Formation
North
0
1 Mile
SCALE
Bernstadt Quad.


EXPLANATION
40.0 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
Corbin Sandstone Member of Lee Formation
0
1 Mile
SCALE
North
41.5 Breathitt Formation (silty shale)
75
INTERCHANGE 41. Ky. Highway 80, 40 miles to General Burnside State Park on Lake Cumberland; facilities include marina, campground, and 18–hole golf course.
40.0 Contact: Breathitt (₱b) Formation and Corbin Sandstone (₱lc) Member of Lee Formation
₱b
Silty shale
₱lc
Crossbedded sandstone
Bernstadt Quad.
London Quad.
Lily Quad.
39.0 Breathitt Formation
sandstone
silty shale
38.3 Breathitt Formation (shale)
INTERCHANGE 38. Levi Jackson State Park about 4 miles east on Ky. Highway 192.
Levi Jackson State Park commemorates the struggle of pioneers during the settlement of Kentucky. Season runs from May 1 through September 15. Facilities include Mountain Life Museum, swimming pool, amphitheater, hiking trails, archery range, and miniature golf course. Campground is open all year.

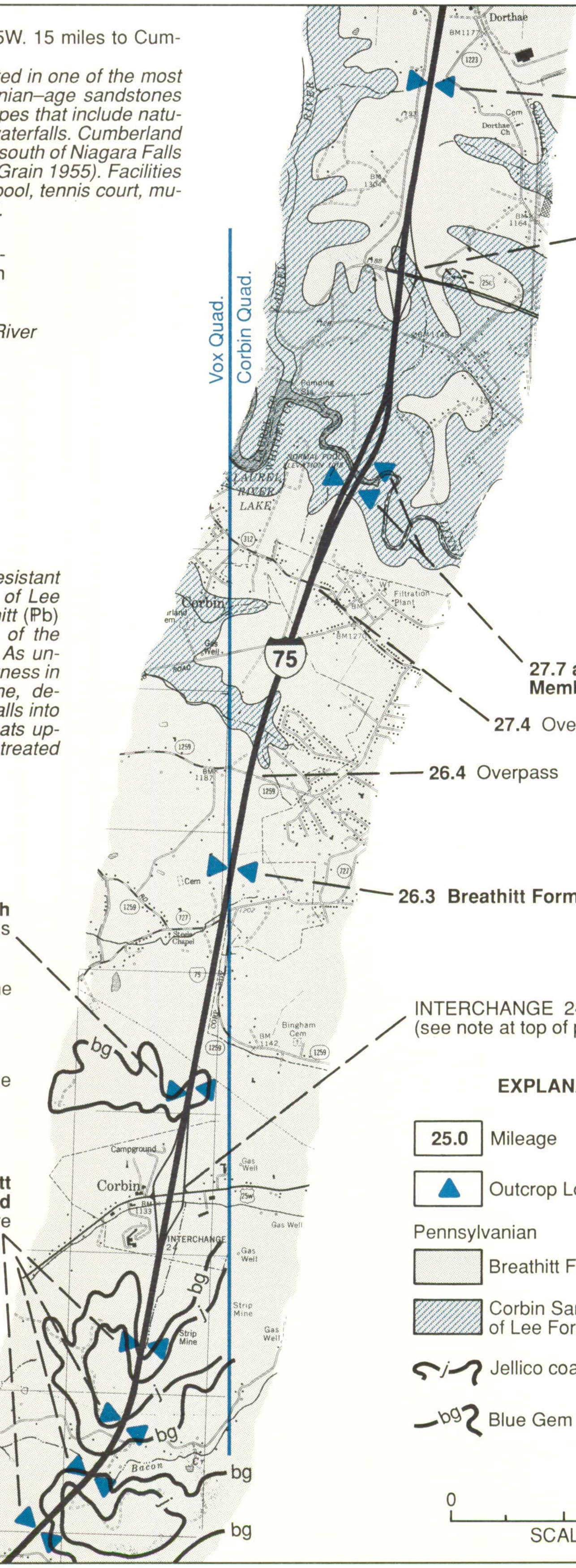

36.6 Overpass
34.3 Corbin Sandstone
33.0 Corbin Sandstone
31.7 Breathitt Formation
(silty shale)
31.2 Breathitt Formation (₱b) with Lily (l) coal bed (which is mined commercially)
₱b l
Shaly sandstone
coal
Silty Shale
30.5 and 30.6 Corbin Sandstone Member of Lee Formation
Crossbedded sandstone
EXPLANATION
36.6 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
Corbin Sandstone Member of Lee Formation
0
1 Mile
SCALE
North
75
Pine Grove
LAUREL CO.
WHITLEY CO.
Laurel River
Lily Quad.
Corbin Quad.

INTERCHANGE 24. U.S. Highway 25W. 15 miles to Cumberland Falls State Park.
Cumberland Falls State Park is situated in one of the most scenic parts of Kentucky. Pennsylvanian–age sandstones form rugged and picturesque landscapes that include natural bridges, cliffs, rocky gorges, and waterfalls. Cumberland Falls is reported to be the largest falls south of Niagara Falls and east of the Rocky Mountains (McGrain 1955). Facilities include lodge and cabins, swimming pool, tennis court, museum, riding stable, and campground.

Diagrammatic Section of Cumberland Falls (adapted from McGrain, 1955, Fig. 17)



Cumberland River passes from the resistant Rockcastle Sandstone Member (ℙlr) of Lee Formation to soft shale of the Breathitt (ℙb) Formation. With more rapid erosion of the shale, the sandstone is undermined. As undermining proceeds to a zone of weakness in the sandstone, a block of sandstone, deprived of its support, breaks out and falls into the gorge below. Thus, the falls retreats upstream. Cumberland Falls has retreated about 45 miles.



29.5 Breathitt Formation (sandstone and shale)

INTERCHANGE 29. U.S. Highway 25E, 34 miles to Pine Mountain State Park.
The park is located on the Pine Mountain Overthrust Fault near Pineville. Pine Mountain is one of Kentucky's most outstanding landscape features. Majestic cliffs, wooded coves, and diverse rock formations are prominent along the ridge extending northeast about 125 miles from near Jellico, Tennessee, to Elkhorn City, Kentucky (McGrain, 1975, 1983). Park facilities include lodge and cabins, swimming pool, nine–hole and miniature golf courses, gift shop, nature trails, and campground.

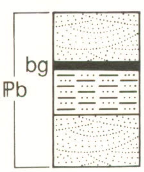
27.7 and 28.1 Corbin Sandstone Member of Lee Formation

27.4 Overpass

26.4 Overpass

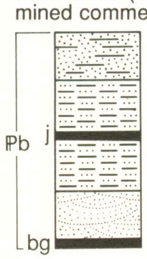
26.3 Breathitt Formation (shale)

25.0 Breathitt Formation (ℙb) **with Blue Gem** (bg) **coal bed** which is mined commercially



INTERCHANGE 24
(see note at top of page)

24.0, 23.8, 23.2, and 23.0 Breathitt Formation (ℙb) **with Jellico** (j) **and Blue Gem** (bg) **coal beds** which are mined commercially



22.9 Overpass

EXPLANATION

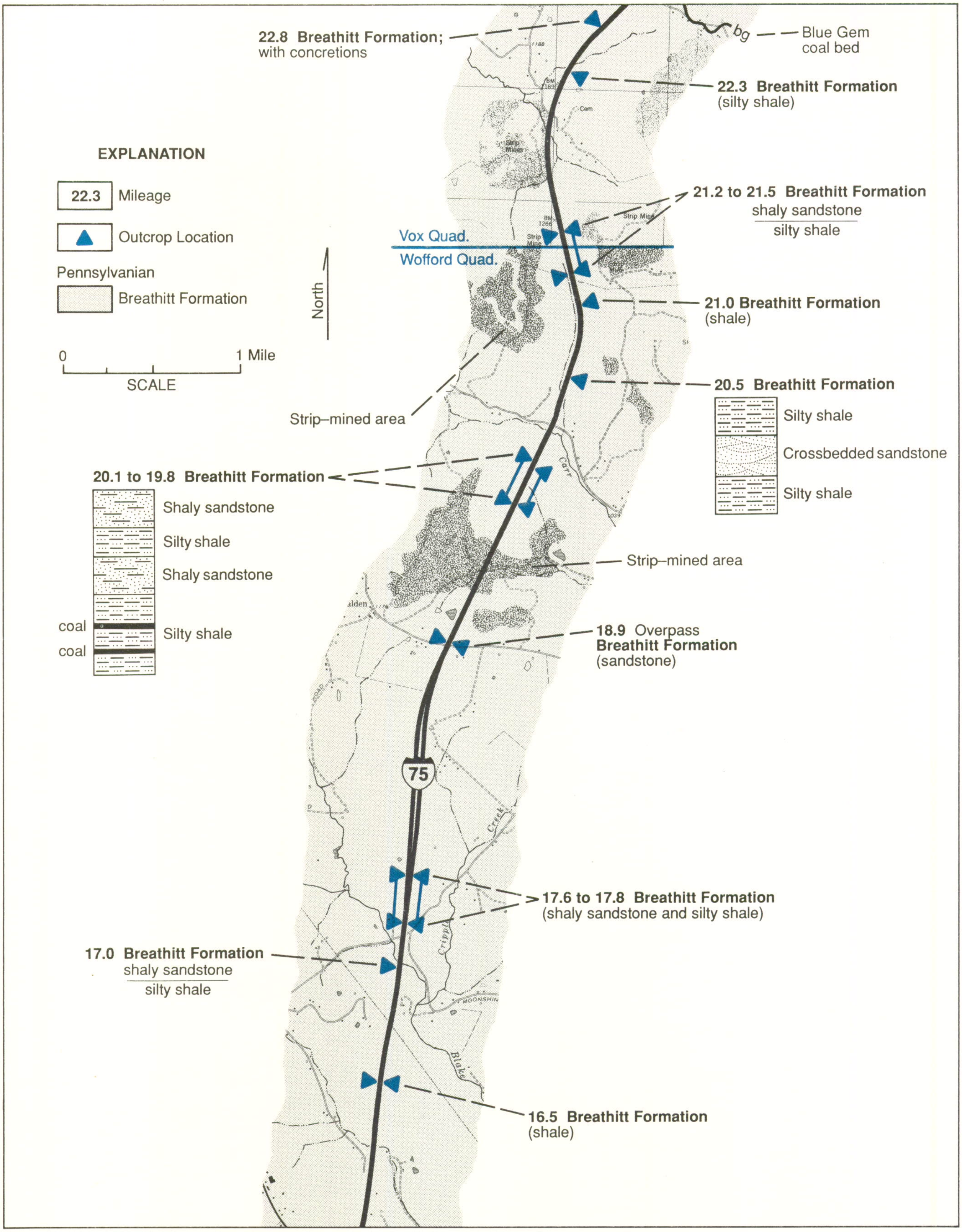
25.0	Mileage
▲	Outcrop Location

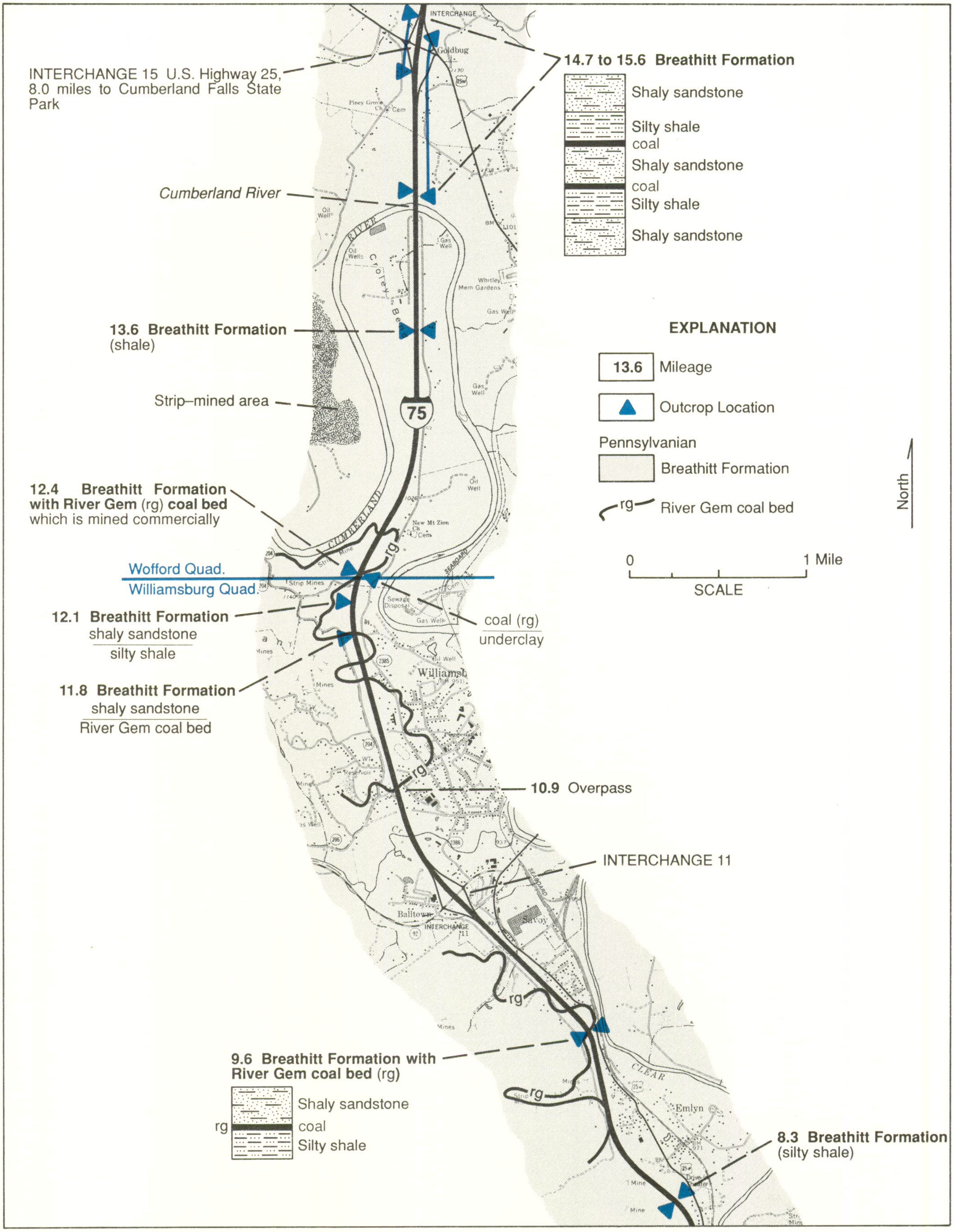
Pennsylvanian

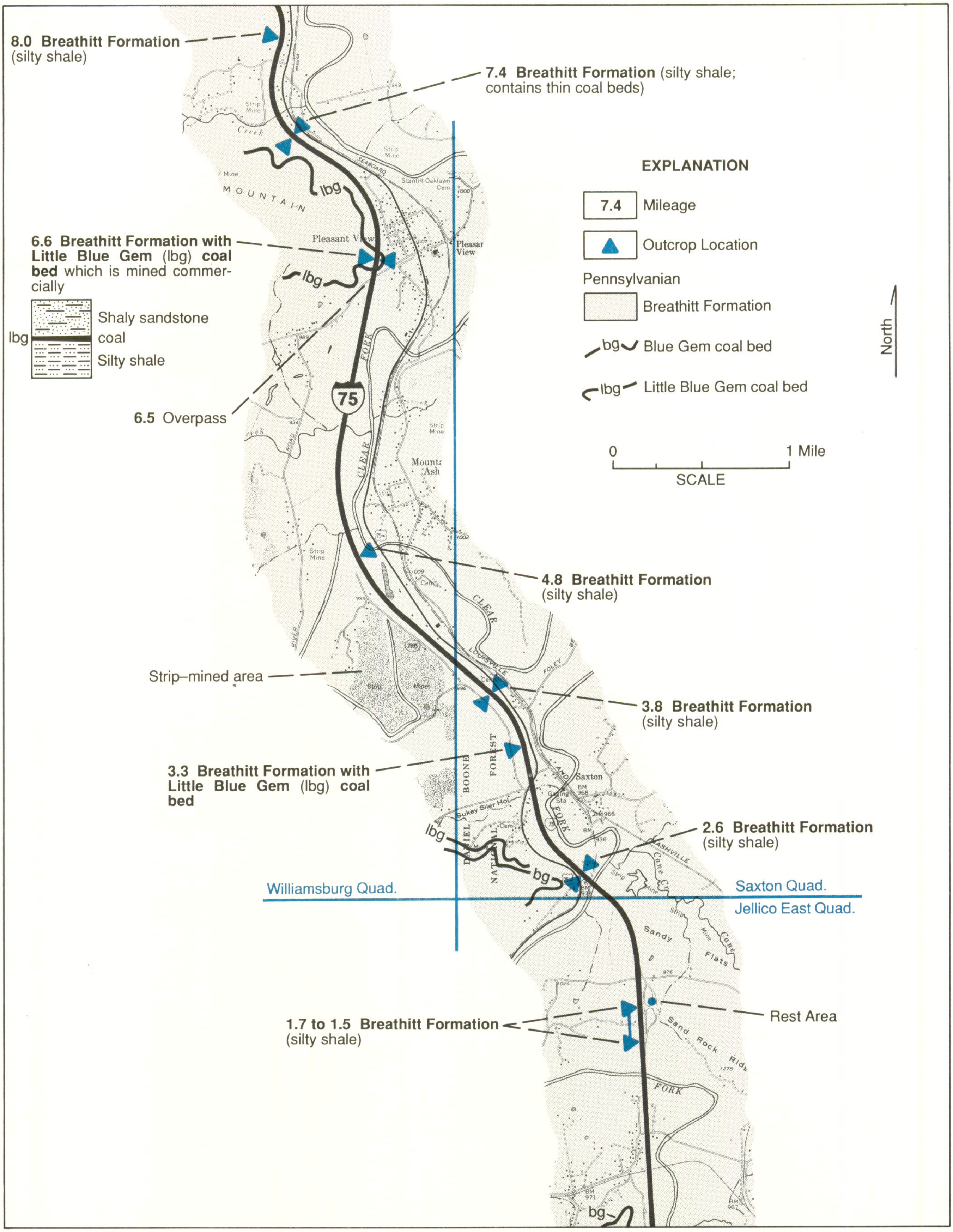
- Breathitt Formation
- Corbin Sandstone Member of Lee Formation
- Jellico coal bed (j)
- Blue Gem coal bed (bg)

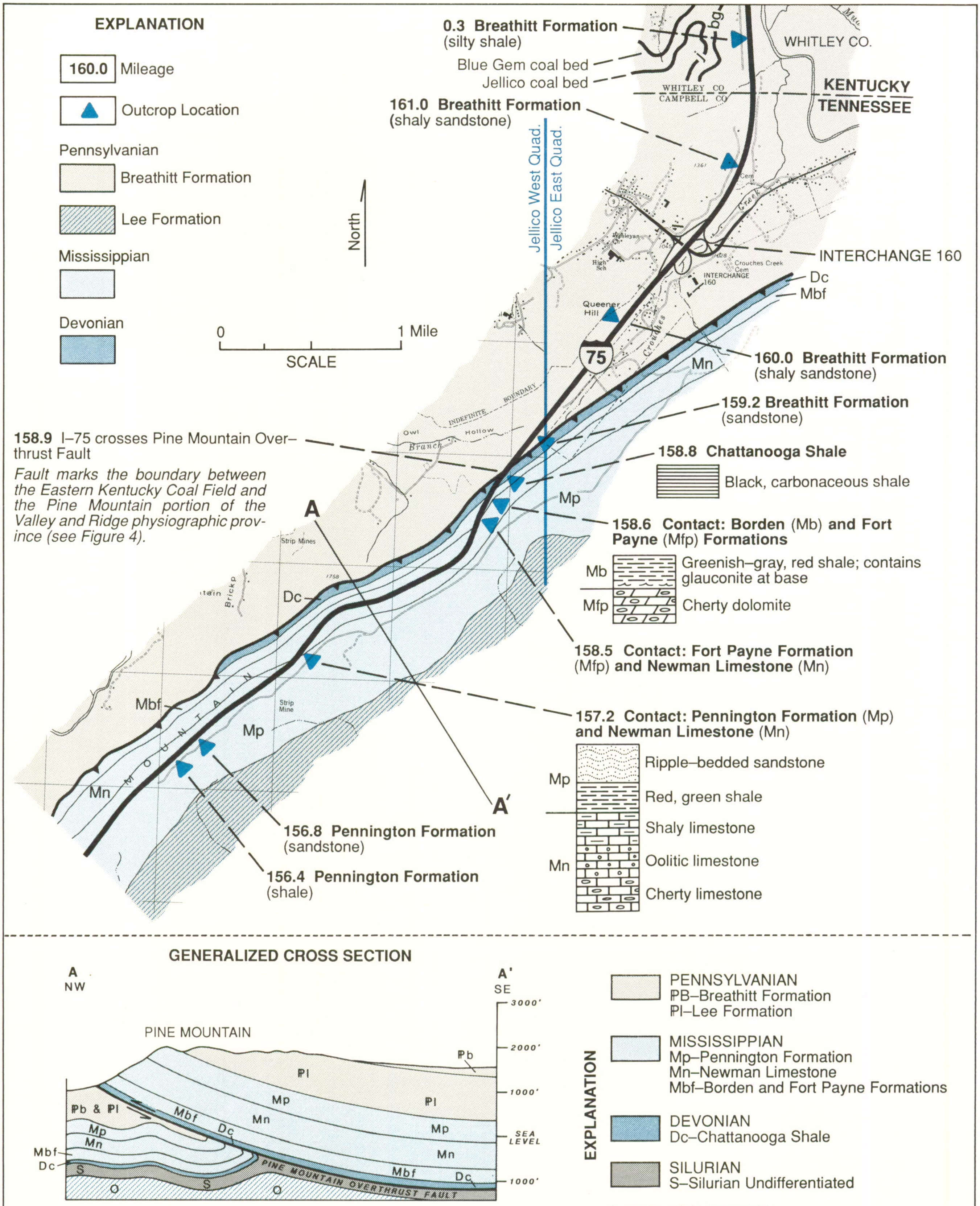
North

0 — 1 Mile
SCALE


22.8 Breathitt Formation; with concretions
bg
Blue Gem coal bed
22.3 Breathitt Formation (silty shale)
EXPLANATION
22.3 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
0
1 Mile
SCALE
North
Vox Quad.
Wofford Quad.
21.2 to 21.5 Breathitt Formation shaly sandstone / silty shale
21.0 Breathitt Formation (shale)
Strip–mined area
20.5 Breathitt Formation
Silty shale
Crossbedded sandstone
Silty shale
20.1 to 19.8 Breathitt Formation
Shaly sandstone
Silty shale
Shaly sandstone
coal
coal
Silty shale
Strip–mined area
18.9 Overpass Breathitt Formation (sandstone)
75
17.6 to 17.8 Breathitt Formation (shaly sandstone and silty shale)
17.0 Breathitt Formation shaly sandstone / silty shale
16.5 Breathitt Formation (shale)


INTERCHANGE 15 U.S. Highway 25, 8.0 miles to Cumberland Falls State Park
14.7 to 15.6 Breathitt Formation
Shaly sandstone
Silty shale
coal
Shaly sandstone
coal
Silty shale
Shaly sandstone
Cumberland River
13.6 Breathitt Formation (shale)
Strip–mined area
EXPLANATION
13.6 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
rg River Gem coal bed
North
0 1 Mile
SCALE
75
12.4 Breathitt Formation with River Gem (rg) coal bed which is mined commercially
Wofford Quad.
Williamsburg Quad.
12.1 Breathitt Formation shaly sandstone / silty shale
coal (rg) / underclay
11.8 Breathitt Formation shaly sandstone / River Gem coal bed
10.9 Overpass
INTERCHANGE 11
9.6 Breathitt Formation with River Gem coal bed (rg)
rg
Shaly sandstone
coal
Silty shale
8.3 Breathitt Formation (silty shale)


8.0 Breathitt Formation (silty shale)
7.4 Breathitt Formation (silty shale; contains thin coal beds)
6.6 Breathitt Formation with Little Blue Gem (lbg) coal bed which is mined commercially
lbg
Shaly sandstone
coal
Silty shale
6.5 Overpass
EXPLANATION
7.4 Mileage
Outcrop Location
Pennsylvanian
Breathitt Formation
bg Blue Gem coal bed
lbg Little Blue Gem coal bed
0
1 Mile
SCALE
North
75
4.8 Breathitt Formation (silty shale)
Strip–mined area
3.8 Breathitt Formation (silty shale)
3.3 Breathitt Formation with Little Blue Gem (lbg) coal bed
2.6 Breathitt Formation (silty shale)
Williamsburg Quad.
Saxton Quad.
Jellico East Quad.
1.7 to 1.5 Breathitt Formation (silty shale)
Rest Area
Pleasant View
Mountain Ash
Saxton
CLEAR FORK
MOUNTAIN
Sandy Flats
Sand Rock Ridge



An overthrust fault involves dominantly horizontal movement that may place older rocks over younger rocks. Strata in the Pine Mountain Overthrust have been displaced about 10 miles from the southeast.

Sandstone–filled channel in the Breathitt Formation (mileage 50.6).

Sandstone containing large concretions in the Breathitt Formation (mileage 22.8).