

**EXPLANATION**

**Floodplain deposits**  
Alluvial deposits in stream valleys; underlie present floodplains of associated streams. A mixture of fine sand, silt, and clay. Thickness variable, generally ranges from 3 to 8 feet.

**Terrace deposits**  
Alluvial deposits situated above present floodplains. Composed of silt and clay, but includes lenses and bands of sand and gravel 4 to 14 inches thick. Thickness variable, commonly 3 to 9 feet.

**Colluvial fan deposits**  
Mixed colluvial and alluvial debris consisting of large and small rounded boulders, pebbles, and sand derived from quartzite, and a clay matrix. From metabasalt and metachert. Tends to be derived by wind and silt mixed with fragments of boulders and pebbles. Maximum boulder thickness 150-200 feet. Commonly and transversely across the deposits. Maximum boulder thickness 150-200 feet.

**Unconformity**  
Discontinuity in the geologic record.

**Newark Group**  
(Gettysburg-New Oxford Formations Unconformities)  
These rock units have been mapped, each characterized by a dominant lithology: interbedded sandstone and shale, ls., limestone conglomerate, ss., quartz conglomerate, ls.

**LATE PRECAMBRIAN OR CAMBRIAN**

**Weyvert Formation**  
Three subdivisions are recognized and mapped based on lithologic criteria. The lower member, W, is characterized by grayish to greenish gray quartzite, metabasalt, and metachert. The middle member, M, is characterized by medium to dark gray quartzite, metabasalt, and metachert. The upper member, U, is characterized by medium to dark gray quartzite, metabasalt, and metachert. The thickness of the Weyvert Formation is estimated at 300-500 feet.

**LATE PRECAMBRIAN**

**Catoctin Formation**  
The Catoctin Formation consists of three main rock types: metabasalt, metachert, and phyllite. Varieties of metabasalt and metachert are characteristic of the formation, including metabasalt (P-1), porphyritic metabasalt (P-2), red porphyritic metabasalt (P-3), and blue metabasalt (P-4). Gray, blocky and non-blocky phyllite constitute another important unit, P-5. No stratigraphic relationship is implied by the descriptive order below.

**LATE PRECAMBRIAN**

**Loudoun Formation**  
Two lithologic subdivisions, a lower phyllite unit, L, and an upper conglomerate unit, C, are recognized. The lower unit is characterized by medium to dark gray phyllite, and the upper unit is characterized by medium to dark gray conglomerate. The thickness of the Loudoun Formation is estimated at 100-150 feet.

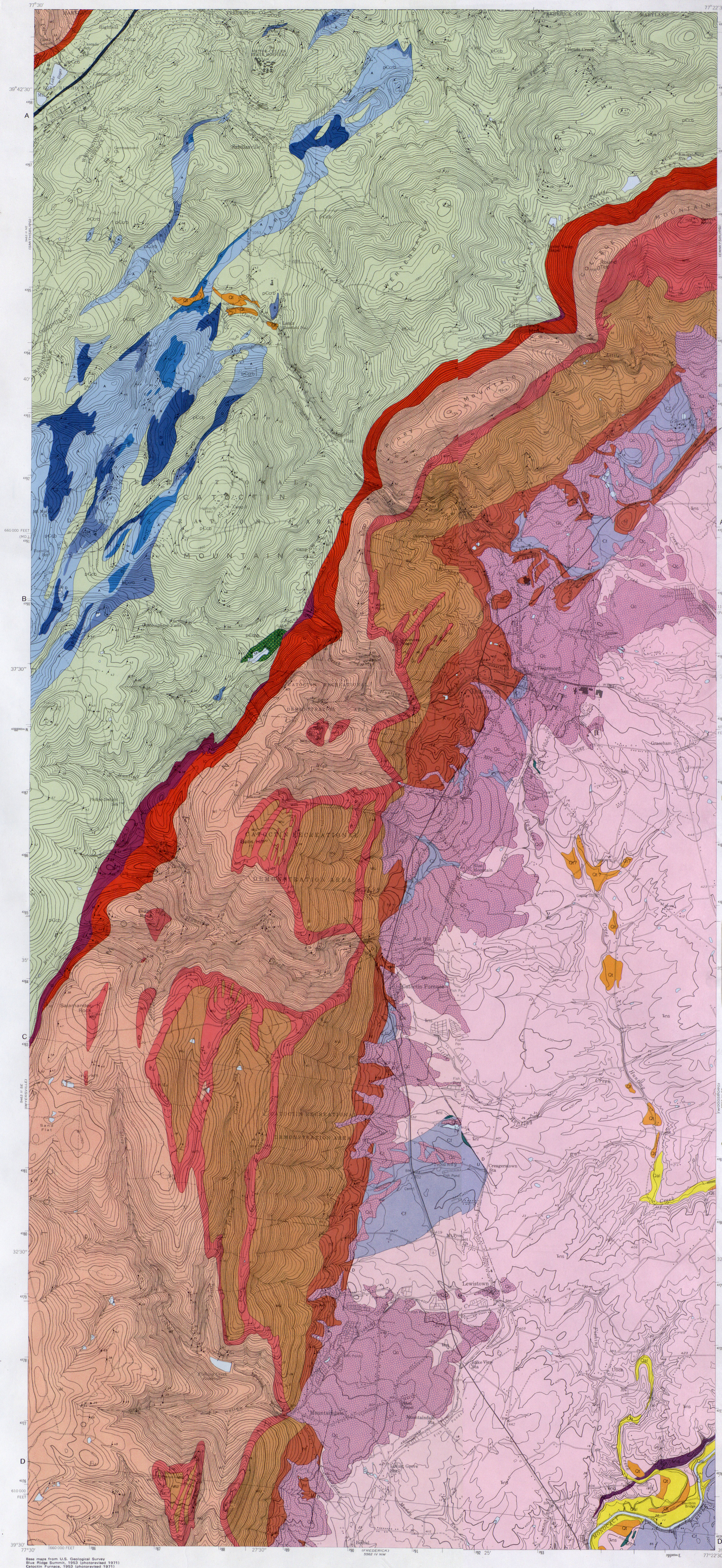
**LATE PRECAMBRIAN**

**Frederick Formation**  
Includes limited outcrop areas of the three members of the Frederick Formation proposed by Hamilton (1974) and not individually mapped in this report.

**Linear Elements**  
(bearing and plunge)  
- - - intersection of bedding (hanging) and regional flow cleavage  
- - - intersection of bedding (hanging) and slip cleavage  
- - - intersection of regional flow cleavage and slip cleavage  
- - - mineral elongation  
- - - axis of minor bedding fold

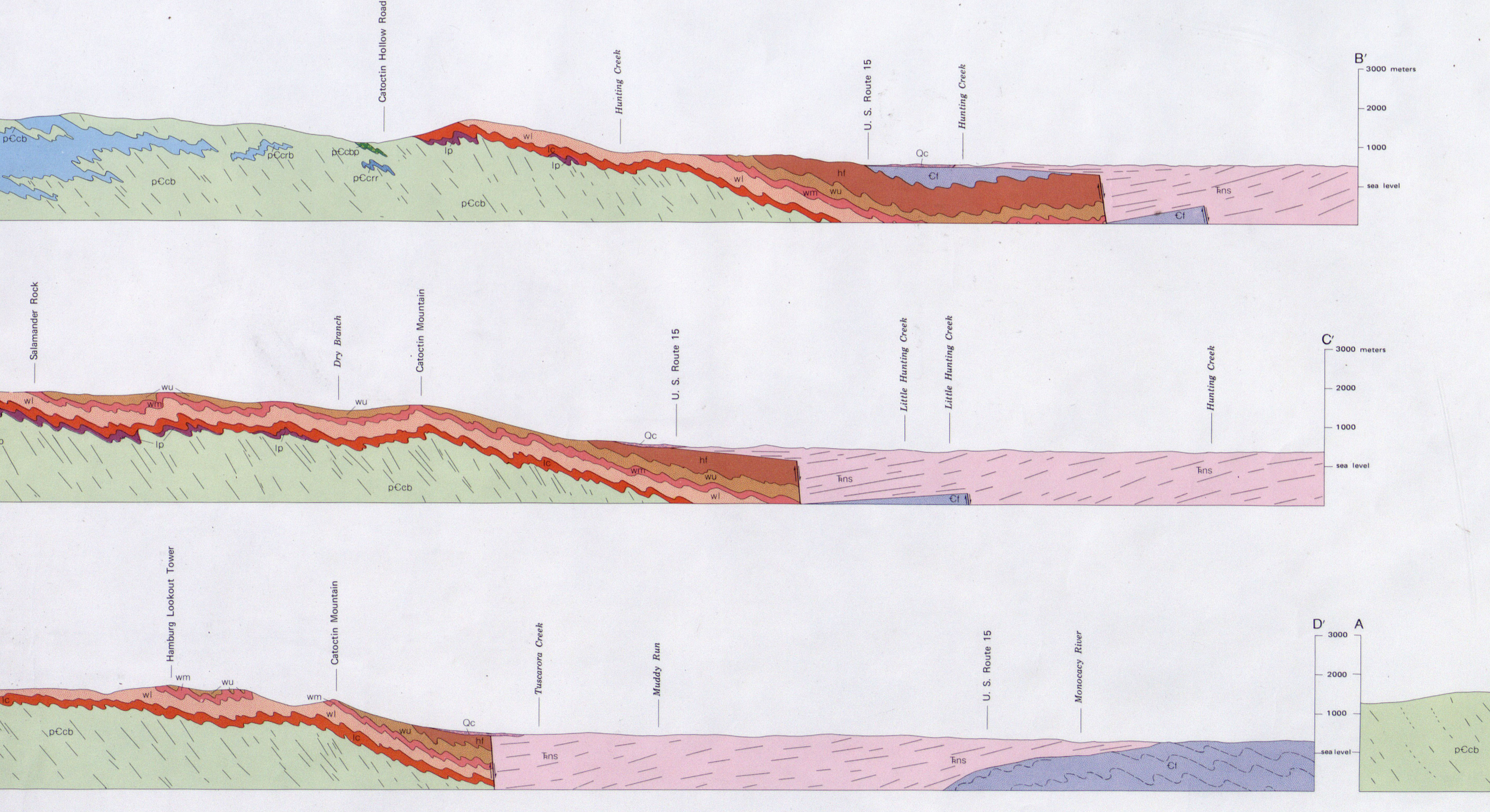
**contact between geologic units**  
- - - normal fault  
- - - unknown side  
- - - downthrown side  
- - - distribution of structural trends provides an approximate measure of the reliability of the contact between adjacent mapped units  
- - - fault trace concealed by overburden

**Planar Elements**  
bedding in sedimentary rocks  
- - - horizontal  
- - - inclined  
- - - overturned  
bedding in volcanic rocks  
- - - horizontal  
- - - inclined  
- - - overturned  
regional flow cleavage  
- - - slip cleavage



**Geologic Factors Affecting Land Use**

LITHOLOGIC CHARACTERISTICS	HYDROLOGIC CHARACTERISTICS	WEATHERING CHARACTERISTICS	CONSTRUCTION AND MINERAL RESOURCES	LAND USE SUITABILITIES
<b>COLLUVIAL FAN DEPOSITS</b> Heterogeneous mixture of quartzite and locally abundant phyllite and basal blocks consisting of 100-200 feet in place.	Generally above water table and well-drained. In places contains enough clay and silt to make water from these deposits discharge at rates of 1 to 1.5 gallons per minute. Fair to poor aquifer. Quality fair to poor because of high turbidity in some wells; water usually slightly to moderately acidic.	Slightly to moderately resistant; moderate and thin weathering; mostly to red, fairly shallow to moderately deep soil; overlying mantle composed of clay, silt, and sand. National slope moderately steep; stable.	Good to fair source of rock material and fill; possibly source of interest aggregate, rock, and floor tile material. Substrata generally have reasonable to good stability. Fair to good source of aggregate material. Some aggregate material has limited use as decorative stone.	Well-suited to most any use. Steep slopes may be limiting factor locally. Includes areas of prime farmland.
<b>NEWARK GROUP</b> Reddish sandstone, shale, siltstone, and fine-grained sandstone some light-colored sandstone and quartz pebbles conglomerate. Pebbles contain 10-20% sandstone and limestone. Thickness: 1100-1200 feet.	Moderately good surface drainage. Joint and bedding planes provide secondary porosity to moderate degree. Generally moderate to good permeability. In places and well-sorted sandstone and siltstone. In places and well-sorted sandstone and siltstone. In places and well-sorted sandstone and siltstone. In places and well-sorted sandstone and siltstone.	Moderately resistant; weathering to shallow depth. Soils well-drained, deep, with moderate to good stability. Underlies stable, moderate to steep slopes. National slope gentle and stable.	Good material for road material, riprap, and fill. Good source of interest aggregate, rock, and floor tile material. Substrata generally have reasonable to good stability. Fair to good source of aggregate material. Some aggregate material has limited use as decorative stone.	Generally shallow overburden (50-100 inches), bedrock drainage, and the high susceptibility of slopes to erosion are moderate to severe limiting factors for intensive development. In some areas and some localities, moderate to severe erosion may be expected. In some areas and some localities, moderate to severe erosion may be expected.
<b>FREDERICK FORMATION</b> Light-colored, fine-grained crystalline limestone; some massive granular limestone in lower part. Limestone composition is upper part locally. Thickness: 2500 feet.	Good surface drainage. Fracture, partings, and solution openings provide secondary porosity to moderate degree. Generally moderate to good permeability. In places and well-sorted sandstone and siltstone. In places and well-sorted sandstone and siltstone. In places and well-sorted sandstone and siltstone.	Moderately resistant; weathering to shallow depth. Soils well-drained, deep, with moderate to good stability. Underlies stable, moderate to steep slopes. National slope gentle and stable.	Good material for road material, riprap, and fill. Good source of interest aggregate, rock, and floor tile material. Substrata generally have reasonable to good stability. Fair to good source of aggregate material. Some aggregate material has limited use as decorative stone.	Suitability good for all purposes; includes areas of prime farmland.
<b>HARBERS FORMATION</b> Gray and brown, fine-grained graywacke and gray phyllite. Thickness: 400 feet.	Good surface drainage. Joint and storage provide very low magnitude, secondary porosity. Fair water-bearing unit; adequate supply for domestic use and small commercial or public water supply. Average yield of wells is 1 to 2 gpm with about half yielding 2 gpm or more. Fracture zones are most favorable sites for wells and should produce small yield. Fracture zones are most favorable sites for wells and should produce small yield. Fracture zones are most favorable sites for wells and should produce small yield.	Moderately resistant; phyllite commonly highly and deeply weathered. Depth to bedrock variable; moderate to steep. National slope moderate to steep.	Generally good for road material and fill; substratum may be used in impervious cores and blankets.	In general suitability for most uses is moderated by excessive slopes (8-15 per cent or greater) and, locally, by moderate to severe erosion. In some areas and some localities, moderate to severe erosion may be expected. In some areas and some localities, moderate to severe erosion may be expected.
<b>WEYVERT FORMATION</b> Greenish gray, cross-bedded and laminated quartzite with prominent light gray quartzite in beds of wavy. This green and red quartzite phyllite interbeds in lower and upper parts of formation. Thickness: 500 feet.	Good surface drainage. Joint and storage provide very low magnitude, secondary porosity. Fair water-bearing unit; adequate supply for domestic use and small commercial or public water supply. Average yield of wells is 1 to 2 gpm with about half yielding 2 gpm or more. Fracture zones are most favorable sites for wells and should produce small yield. Fracture zones are most favorable sites for wells and should produce small yield.	Highly resistant; moderately to highly weathered to moderate depth. Overlying mantle thin to moderate. Underlies stable, moderate to steep slopes. National slope moderate to steep.	Good for fill.	Mainly suited to open space and passive recreation; complementary aesthetic value in some areas. Modest potential variable.
<b>LOUDOUN FORMATION</b> Gray and blue, coarse conglomerate; quartzite interbed of dark-colored phyllite locally. Thickness: 150 feet.	Good surface drainage. Secondary porosity of very low magnitude; permeability low to moderate. Fracture zones are most favorable sites for wells and should produce small yield. Fracture zones are most favorable sites for wells and should produce small yield.	Moderately resistant; phyllite commonly highly and deeply weathered. Depth to bedrock variable; moderate to steep. National slope moderate to steep.	Good for fill; siltstone may be used in impervious cores and blankets.	Generally suitable for open space and passive recreation. Wooded suitability variable.
<b>CATOCTIN FORMATION</b> Blue, red, and gray metachert; commonly porphyritic and flow banded.	Good surface drainage. Secondary porosity of very low magnitude; permeability low to moderate. Fracture zones are most favorable sites for wells and should produce small yield. Fracture zones are most favorable sites for wells and should produce small yield.	Highly resistant; typically moderate weathering to shallow depth; overlying mantle thin, bedrock generally smooth to irregular. Underlies stable, moderate to steep slopes.	Good source of road material, riprap, fill.	Areas at lower elevations and low to moderate slopes, mostly in the western part of the Catoctin belt, are readily adapted to agriculture and farm use. Includes some areas of prime farmland. Slight to moderate erosion limiting factor to slope for residential development. In remainder of area and some localities, moderate to severe erosion may be expected. In some areas and some localities, moderate to severe erosion may be expected.



**GEOLOGIC MAP OF THE CATOCTIN FURNACE AND BLUE RIDGE SUMMIT QUADRANGLES, MARYLAND**  
By  
**John L. Fauth**  
1977

STATE OF MARYLAND  
DEPARTMENT OF NATURAL RESOURCES  
MARYLAND GEOLOGICAL SURVEY  
Kenneth N. Weaver, Director  
Office of Maps available from  
Maryland Geological Survey  
Johns Hopkins University  
Baltimore, Maryland 21218

Scale: 1:24,000  
CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

Map written by Margaret P. Ketchum