Department of the Interior
U.S. Geological Survey

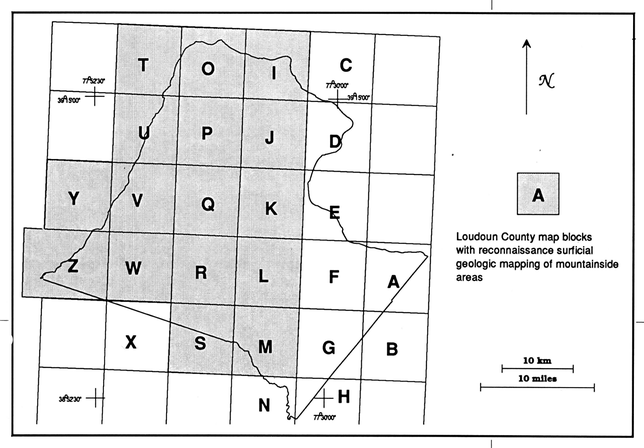
Prepared in cooperation with the Department of Natural Resources, Loudoun County, Virginia

OPEN-FILE REPORT 90-205
SHEET 1 OF 16

E 2,244,000 E 2,250,000 E 2,256,000 MATCH BLOCK E 2,262,000 E 2,268,000 E 2,274,000

N 610,000 N 606,000 N 602,000 N 598,000 N 594,000 N 590,000 N 586,000 N 582,000 N 578,000

MATCH BLOCK O MATCH BLOCK C MATCH BLOCK J



Explanation

Description of map units

Slope deposits - sediment deposited by diffusive processes such as small landslides, tree-throw, faunal turbation, seasonal creep, etc. Internal sedimentary structure is massive to poorly sorted diamicton. Colluvium has a mappable slope morphology when it attains approximately 1-2 m thickness. However, thickness of mapped units may be as little as 0.5 m. Maximum and average thicknesses are unknown.

- Qfc Fine colluvium. *Dark gray to light reddish-brown. Clay- to gravel -size particles; angular to sub-angular. Massive diamict, friable to compact. From source areas with gentle slopes on gneissic basement, schistose greenstone, and metasediments.*
- Qcc Coarse colluvium. *Dark gray to reddish brown. Clay- to boulder-size particles. dominated by boulders and cobbles; angular to sub-angular. Dominated by boulders, some without interstitial matrix. Varies from well-sorted block fields (or talus) to poorly sorted, massive diamicton. From source areas with steep slopes on Weverton Quartzite and Catoctin Formation (greenstone).*
- Qc Undifferentiated colluvium. *Dark gray to light reddish-brown. Intermediate particle-size distributions with clay- to cobble-size particles; angular to sub-angular. Massive diamict, friable to compact. Mapped in areas where source areas are mixed and have characteristics intermediate of those above.*

Debris deposits - sediment deposited by a combination of debris flow, fluvial transport, and, in places, periglacial processes. Internal sedimentary structure dominated by combinations of matrix-supported diamicton, poorly sorted framework-supported alluvium, and well-sorted alluvium. Unit may be as thin as approximately 50 cm. Maximum and average thicknesses are unknown. Older generations of debris terrace deposits are designated by successively higher arabic numbers, for example Qcd2.

- Qfd Fine debris. *Dark gray to light reddish-brown. Clay- to gravel -size particles, dominated by sand to gravel; sub-rounded to angular. Varies from massive diamict to well-sorted, friable to compact. From source areas with gentle slopes on gneissic basement, schistose greenstone, and metasediments.*
- Qcd Coarse debris. *Dark gray to light reddish-brown. Clay- to boulder-size particles,dominated by boulders, much of it without interstitial matrix; sub-rounded to angular. Varies from well-sorted block streams to poorly sorted diamicton with variable amounts of well-sorted alluvial sediment. From source areas with steep slopes on Weverton Quartzite and Catoctin Formation (greenstone).*
- Qd Undifferentiated debris. *Dark gray to light reddish-brown. Intermediate particle-size distributions, dominated by clay- to cobble-size particles; sub-rounded to angular. Varies from massive diamict to well-sorted, friable to compact. Mapped in areas where source areas are mixed and have characteristics intermediate of those above, and downslope of Qcd on low-angle fan slopes where debris has more interstitial matrix.*
- Qrb? Probable landslides. Composed of large, jumbled coherent rock blocks. Individual blocks are up to approximatley 1,000 m^3 volume; landslides are up to approximately 1,000,000 m^3 in volume.

Alluvial deposits - sediment deposited by fluvial processes. Identified by low gradient surface that laterally truncates debris fans and meandering stream pattern. Older generations of terrace deposits are designated by successively higher arabic numbers, for example Qal2.

- Qal Alluvium. *Dark gray to light reddish-brown. Generally fining upward from gravel- to boulder-size material to sand- to clay-size material. Bedding types include massive, planar, trough cross-bedded, and rippled. Particles are sub-rounded to rounded. Friable, moderate- to well-sorted.*

Man-made deposits - sediments and areas disturbed by excavation and filling.

- Dist *Areas disturbed by man, including scraped areas, artificially filled areas, and urbanized areas.*
- af *Areas of artificial fill, including impoundment dams.*
- w *Areas of impounded water not shown on base map.*

Thin colluvium over residuum - Areas with 0-2 m of colluvium overlying residual weathering profiles, saprolite, or unweathered bedrock. This unit is mapped from slope morphologies that reflect control by underlying bedrock. Denoted on map by bedrock geologic mapping symbol.

- Mdz Mesozoic diabase dike. *Clayey residuum, 0-1 m thick.*
- Mu Mesozoic sedimentary rocks, undifferentiated. *Clayey residuum, 0-1 m thick.*
- Ca Antietam Quartzite. *Sandy, micaceous residuum, 0 to greater than 10 m thick.*
- Ch Harpers Formation, phyllite and siltstone. *Micaceous,silty residuum, 0 to greater than several m thick.*
- Cw-Ch Weverton Quartzite and Harpers Formation undifferentiated, phyllite and phyllitic quartzite, mapped south of Leesburg along Catoctin Ridge. *Micaceous, silty and sandy residuum. 0-1 m thick on quartzite, 0 to greater than 3 m on phyllite.*
- Cw Weverton Quartzite, undifferentiated. *Sandy residuum. 0-0.5 m thick.*
  - Cwp locally mappable phyllite to metasiltstone beds. *Micaceous, silty residuum, 0 to greater than several m thick.*
  - Cwq quartzite mapped south of Leesburg along Catoctin Ridge. *Sandy residuum. 0-0.5 m thick.*
- Cl Loudoun Formation, undifferentiated, phyllite and conglomerate. *Sandy to gravelly residuum on conglomerate (0 to 0.5 m thick) and micaceous, silty residuum (0 to greater than 3 m thick) on phyllite.*
  - Clp Phyllite unit. *Sandy to gravelly residuum, 0 to 0.5 m thick.*
  - Clc Conglomerate unit. *Silty residuum, 0 to greater than 3 m thick.*
- CpCc Catoctin Formation, metabasalt, phyllite, and tuffaceous sediments. Locally contains some phylittic unitsof the Swift Run Formation. *Clayey, stoney residuum on massive metavolcanic units, 0 - 2 m thick. Clayey to silty, stoney residuum on phyllitic units, 0 to greater than 5 m thick.*
  - CpCct Tuffaceous unit differentiated on block Z after Gathright and Nystrom (1974). *Clayey to silty, stoney residuum, 0 to greater than 5 m thick.*
- CpCs Swift Run Formation, undifferentiated. *Clayey to sandy, micaceous residuum with areas of sandy, stoney residuum where underlain by quartzites, 0 to greater than 3 m thick.*
  - CpCsp Phyllite unit, locally may contain some phyllitic units of the Catoctin Formation.*Clayey to silty, stoney residuum, 0 to greater than 5 m thick.*
  - CpCs-ls Limestone lenses mapped by Parker (1968).*Clayey residuum, 0-1 m thick.*
- pCg Middle Proterozoic granitic/gneissic rocks, locally intruded with Catoctin Formation dikes and sills. *Sandy, micaceous, to clayey residuum, 0 to greater than 10 m thick.*

Explanation of map symbols

Areas of continuous rock outcrop and areas of high denisty of rock outcrop, mappable from aerial photographs.

Springs — Springs and seeps conspicous on April 1986 color aerial photographs. Usually at heads of alluvial channels and debris accumulations.

Landslide scar

Surficial unit contact

Bedrock contact

Edge of mapped area

Mapping methods

These maps were produced under a cooperative funding agreement with the Department of Natural Resources, Loudoun County, Virginia. Surficial geologic mapping was based on aerial photographic interpretation and limited field mapping. Mapping at field sites helped to establish general landscape models showing correspondences between slope morphologies and underlying surficial units. Small numbers of exposures, lack of subsurface exploration data, and lack of sedimentological and mineralogical analyses limit our ability to define these units.

The final map was prepared using color aerial photographs of Loudoun County (April, 1986, 1:12,000 approximate scale) on a Kern PG-2 stereoplotter. Units were plotted with a pantograph onto mylar topographic bases at 1:12000 scale and 5 foot contour interval.

Bedrock geology was compiled from unpublished, ongoing USGS mapping by the authors and maps by Gathright and Nystrom (1974), Lee (1979a, b), Nickelson (1956), and Parker (1968).

References cited

Gathright, T. M., II, and Nystrom, P. G., Jr., 1974, Geology of the Ashby Gap Quadrangle, Virginia: Virginia Division of Mineral Resources Report of Investigations 36, 1:24,000 scale

Lee, K.Y., 1979, Geology of the Culpeper Basin in Middleburg Quadrangle, Prince William and Loudoun Counties, Va.: U.S. Geological Survey Open-file Report 79-1557, 1:24,000 scale.

Lee, K.Y., 1979, Geology of the Culpeper Basin in Lincoln Quadrangle, Loudoun County, Va.: U.S. Geological Survey Open-file Report,79-1557, 1:24,000 scale.

Nickelson, R.P., 1956, Geology of the Blue Ridge near Harpers Ferry, West Virginia - Geologic map of the Blue Ridge from Harpers Ferry West Virginia to Purcellvile, Virginia (Plate 1, 1:25,000 scale): Geol. Soc. America Bull., v. 67, p. 239-270.

Parker, P. E., 1968, Geologic investigation of Lincoln and Bluemont quadrangles, Virginia: Virginia Division of Mineral Resources, Report of Investigations 14, 1:24,000 scale

Base map
Prepared by

AIR SURVEY & DESIGN INC.,
HERNDON, VIRGINIA.

THIS MAP PREPARED FROM PHOTO COMPILATION OF 5X SCALE REDUCTIONS OF LOUDOUN COUNTY PHOTOGRAMMETRIC BASE

Base map copyright 1979,1983, County of Loudoun, Virginia. Used with permission.

NORTH

SCALE 1 12.000

1 INCH 1000 FEET
1000 500 0 1000 2000 3000 4000 FEET

1 INCH 304 5 METERS
500 375 250 125 0 500 1000 METERS

CONTOUR INTERVAL 5 FEET

Disclaimer: Quality of basemap is variable, resulting in areas of poor reproduction.

Reconnaissance Surficial Geologic Map of the Mountainous Parts of Loudoun County, Virginia

Block I

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1990

LOUDOUN COUNTY

VIRGINIA

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