

Description of Map Units

- Quaternary**
 - Qal** **Alluvium**
Reddish brown, poorly sorted mixture of rounded pebbles, cobbles, boulders, sand, silt and clay, interbedded with layers of moderately well sorted, rounded cobbles or sandstone pebbles. Present along flood plains of streams. Thickness estimated at 1 foot to more than 15 feet especially along the Monocacy River.
 - Qc** **Colluvium**
Unsorted, light gray to reddish gray, angular boulders to cobbles of quartzite and vein quartz with a silty, clayey reddish matrix. Present near the foot of Catechin Mountain and formed by the slow down-slope movement of weathered material from the Weverton Formation. Thickness ranges from a thin veneer to more than 100 feet.
 - Or** **Weathering residuum**
Mixture of moderate reddish brown soil and pebbles to blocks of grayish pink to white, angular, locally euhedral quartz. Thickness ranges from a thin veneer to 10 feet.
 - Cr** **Terrace deposits**
Reddish brown to brown, sandy and clayey mixture of rounded pebbles to cobbles of sandstone, vein quartz and quartzite. Present along elevated low relief areas above the current Monocacy and Potomac Rivers' flood plains. At least two and perhaps three separate elevated levels, can be discerned, but are not separated here. Thickness ranges from a thin veneer to more than 10 feet.
- Jurassic**
 - Di** **Diabase dikes**
Medium to dark gray, fine- to medium-grained, locally porphyritic diabase. Weathers to rounded boulders with reddish brown rinds.
- Triassic**
 - Lf** **Leesburg Formation**
Light gray to light reddish gray, very thickly bedded to massive, cobble to boulder conglomerate. Clasts are dominantly subangular to subrounded limestone and dolomite of Cambrian and Ordovician age, but locally Triassic age siltstone and sandstone are prevalent. Thickness ranges from 100 to 3,000 feet (Lee, 1979).
 - Lb** **Balls Bluff Siltstone**
Brownish red to reddish brown, argillaceous, massive siltstone with thin fine-grained sandstone interbeds. Thickness estimated at 200 to 4,500 feet (Lee, 1979).
 - Temp** **Manassas Formation**
Poolesville Member
Reddish brown to reddish gray, locally greenish gray, medium-grained sandstone and reddish, variegated claystone. Claystone intervals are thoroughly root mottled and contain light gray calcareous nodules. Thickness estimated at 500 to 3,000 feet (Lee, 1979). Sandstone bed **Temp** exhibits sharp curved-down bases, shale pebble lag conglomerates, and fining-up-section character.
 - Tent** **Tuscarora Creek Member**
Light gray to light reddish gray, sub-angular to subrounded limestone conglomerate. Clasts are predominately limestone and dolomite, but locally reddish siltstone and sandstone are common. Matrix is a reddish brown calcareous mudstone to reddish clay carbonate. Thickness ranges from a feather edge to 100 feet.
- Ordovician**
 - Ogr** **Grove Formation**
Fountain Rock Member
Thickly interbedded, medium light gray, locally sandy, thrombotic and stromatolitic algal limestone and medium gray, laminated dolomitic limestone and olive gray dolomite. Thickness probably greater than 450 feet.
 - Ogr** **Ceresville Member**
Medium light gray, to medium gray, thick-bedded and crossbedded, arenaceous limestone and sandy dolomitic limestone with thin interbeds of medium light gray, sandy dolomite. Thickness is approximately 150 to 200 feet.
- Cambrian**
 - Ch** **Frederick Formation**
Line Kilm Member
Interbedded, thinly laminated to thinly bedded, dark gray, fine-grained limestone, calcareous shale, and medium bedded fine-grained limestone near the base, becoming more thickly interbedded toward the top with medium dark gray, fine-grained limestone with wavy bedding, and locally stromatolitic algal beds. Near the top, the member becomes interbedded with crossbedded, sandy, medium light gray limestone. Thickness is 600 feet.
 - Chs** **Adamstown Member**
Thinly interbedded, medium dark gray to dark gray, argillaceous, fine-grained limestone and dusky yellow to medium dark gray, silty dolomitic limestone. Limestone beds range from 0.2 to 4 cm in thickness. Several thin (6 to 15 feet), dark greenish gray to greenish black, light olive brown weathering, silty calcareous shale intervals are present throughout the member. The top of the member is mapped at the base of the lowest medium to thick bed of sandy or algal limestone. Thickness is approximated at 1,000 feet.
 - Chb** **Rocks Springs Station Member**
Interbedded, flaggy-bedded, dark gray limestone with dusky yellow to light olive gray, silty dolomitic partings and laminations, with intervals 1 to 30 feet thick of medium dark gray, polytomic breccia (**Chb**) that grades upward into planar bedded, arenaceous, medium gray limestone. Clast sizes range from sand size to 1 foot on the western flank of the Frederick Valley synclinorium and diminish to less than 1 to 2 inches in diameter on the eastern flank. Top of the member is mapped at the top of the stratigraphically highest polytomic breccia interval. Thickness is approximated at 1,200 feet.
 - Chm** **Monocacy Member**
Interbedded, nodular to lumpy bedded, dark gray, argillaceous dolomitic limestone and black to dark grayish brown calcareous shale. Thickness ranges from 100 to 150 feet. Mappable interval of grayish black, platy shale 45 to 60 feet thick present near the top of the member (**Chms**).
 - Chn** **Tomstown Formation**
Medium light gray to medium gray, sugary dolomite with thin layers of mica. Not exposed at the surface in the Buckeystown Quadrangle. Thickness measured at 150 feet by Hoy and Schumacher (1956).
 - Car** **Araby Formation**
Thickly bedded, greenish black to grayish black, very fine grained to fine-grained, burrow-mottled, silty sandstone, interbedded with medium gray to grayish black, phyllitic shales 3 to 9 feet thick. Top of the formation consists of grayish black phyllitic shale 45 to 60 feet thick. The Araby Formation is present on the eastern side of the Frederick Valley synclinorium. Thickness of the Araby Formation is estimated at 300 feet.
 - Ca** **Antietan Formation**
Interbedded, light olive gray to olive gray, medium- to coarse-grained, medium-bedded, locally ferruginous, micaceous, silty sandstone and very fine grained, silty sandstone to sandy siltstone. Thickness is estimated at 300 feet.
 - Ch** **Harpers Formation**
Brownish gray to dark greenish gray, silty phyllitic shale to highly sheared phyllitic siltstone with intervals of brownish gray, medium-grained, silty sandstone. Thickness is estimated at greater than 900 feet.
 - CSq** **Sugarloaf Mountain Quartzite**
Pinkish-gray to white, fine- to medium-grained granular quartzite. Medium-bedded to massive, well-sorted, graded, crossbedded and ripple marked. Quartzite, interbedded with siltstone-exposed moderate-brown quartzite metasilstone and dusky blue laminated metasilstone similar to that of the conformably overlying Urbana Formation, underlies topographic swales. Lower, middle, and upper members (informal) are not separately mapped based on topographic expression of ridge-forming units since the quartzites are virtually identical; total thickness is approximately 2,000 feet.
 - CU** **Urbana Formation**
Predominately, moderate olive brown to light olive gray, calcareous metagraywacke and metasilstone. Poorly sorted, graded, crossbedded, and ripple marked. Contains light olive gray and light brownish gray very calcareous metasilstone and quartzite. Fine- to coarse-grained, thin- to medium-bedded, crossbedded, pitted, friable, lenticular and discontinuous. Interbedded with light brown laminated metasilstone. Also contains light gray to greenish gray thin-bedded crystalline marble. Laminated beds of indeterminate thickness marked by seams of sericite and chlorite. Poorly exposed; produces distinctive reddish orange soil.
 - CSi** **Hjansville Phyllite**
Dusky blue, grayish blue, very dusky red-purple, greenish gray to pale olive phyllitic, phyllonitic and minor slate. Phyllite contains mostly muscovite and chlorite. Lustrous sheen from mica and dark color results from abundant hematite dust.

References

Brezinski, D.K., 2004, Stratigraphy of Frederick Valley and its relationship to karst development. Maryland Geological Survey Report of Investigations 75, 101 p.

Brezinski, D.K., and Southworth, S., 2004, Geologic Map of the Buckeystown Quadrangle, Frederick and Montgomery Counties, Maryland. Maryland Geological Survey Geologic Map scale 1:24,000 (Version BUCKEGE02001).

Hoy, R.B., and Schumacher, R.L., 1956, Fault in Paleozoic rocks near Frederick, Maryland. Geological Society of America Bulletin, v. 67, no. 11, p. 1521-1528.

Lee, K.Y., 1979, Triassic-Jurassic Geology of the Northern Part of the Culpeper Basin, Virginia and Maryland. United States Geological Survey Open File Report 79-157; 102 p.

Supplemental Information

Use Constraints: These data represent the results of data collection/processing for a specific Department of Natural Resources, Maryland Geological Survey activity and indicate general existing conditions. As such, they are only valid for the intended use, content, time, and accuracy specifications. The user is responsible for the results of any application of the data for other than their intended purpose. The Maryland Geological Survey makes no warranty, expressed or implied, as to the use or appropriateness of the data, and there are no warranties of merchantability or fitness for a particular purpose of use. The Maryland Geological Survey makes no representation to the accuracy or completeness of the data and may not be held liable for human error or defect. Data are only valid at 1:24,000 scale. Data should not be used at a scale greater than that.

Acknowledgements: This map was funded in part by the Maryland State Highway Administration.

Field mapping of karst features was conducted in 1999 and updated in 2001 and 2002 by David K. Brezinski. Geologic field mapping was completed in 1991 and 1995 (Brezinski and Southworth, 2001). Geologic mapping was conducted in conjunction with the United States Geological Survey (USGS). For the 2001 release of the karst map, digital compilation was completed by Liana Dume of the Maryland Geological Survey. For the 2004 version, digital revision and compilation were completed by Heather Quinn of the Maryland Geological Survey and Catherine Lachkhat of Towson University, Center for Geographic Information Sciences.

The facilities and services of the Maryland Department of Natural Resources are available to all without regard to race, color, religion, sex, sexual orientation, age, national origin or physical or mental disability.

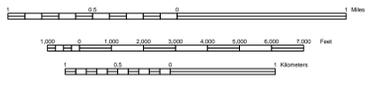
Version: BUCKEKST001.2
Version 1 released: December 2001; version 2 released: June 2004

Karst Features of the Buckeystown Quadrangle, Frederick and Montgomery Counties, Maryland

By
David K. Brezinski
2001

Revised 2004

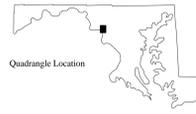
Scale 1:24,000



Contour Interval 20 Feet
National Geodetic Vertical Datum of 1929
(To convert elevations to the North American Vertical Datum of 1988, subtract 1 foot)
(To convert from feet to meters, multiply by 0.3048)

Base layers derived from U.S. Geological Survey (USGS)
7.5-minute Series (Topographic)
Buckeystown Quadrangle 1952 (photorevised 1971)
Digital line graphs for hydrography, topography, transportation and boundaries (1:24,000)
Cultural features shown from USGS Geographic Names Information System database
(To determine current magnetic declination see: <http://www.ngdc.noaa.gov/cgi-bin/seg/imag/150ath1.pl>)

Current map projection:
Maryland State Plane Coordinate System 1987
(Projection: Lambert Conformal Conic, 1980 geodetic reference system)
(Horizontal Datum: North American Datum 1983)
State Plane 2000-meter grid ties and coordinates shown in black
Geographic coordinates (latitude-longitude) shown at 2.5' intervals in black



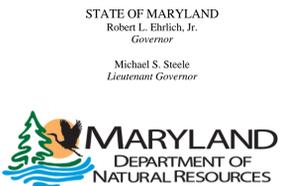
Adjoining 7.5' Quadrangle Names
Buckeystown Quadrangle, shaded

1	2	3
4	5	6
7	8	

1. Middlebrook
2. Frederick
3. Walkersville
4. Point of Rocks
5. Urbana
6. Warford
7. Poolesville
8. Germantown

Explanation of Map Symbols

- Geologic Symbols**
- Contacts**
Geologic contact; approximately located
dotted where concealed
 - Karst Features**
Active Sinkhole
Depression
Spring
 - Faults**
U Upthrown side
D Downthrown side
Thrust fault
sawtooth on upthrown block
Overturned Thrust Fault
base of sawtooth on upper plate;
sawtooth in direction of dip
Fault; concealed
- Base Map Symbols**
- Transportation**
Primary route, class 1 (divided, lanes separated)
Primary route, class 1 (undivided)
Secondary route, class 2
Light duty road or street, class 3
Unimproved road or street, class 4
Trail
Railroad, railroad siding or spur
Substation
 - Topography**
Topographic index contour
(100-ft interval)
Topographic intermediate contour
(20-ft interval)
Hydrography
Stream
Water body
(eg. lakes, ponds, rivers)
 - Culture**
State boundary
County boundary
Park or reservation boundary
Cemetery
Church
School



STATE OF MARYLAND
Robert L. Ehrlich, Jr.
Governor
Michael S. Steele
Lieutenant Governor
DEPARTMENT OF NATURAL RESOURCES
C. Ronald Franks
Secretary
W. P. Jensen
Deputy Secretary
MARYLAND GEOLOGICAL SURVEY
Emery T. Cleaves
Director

Copies of this map are available
in hard copy (paper) and digital form from:
MARYLAND GEOLOGICAL SURVEY
2500 Saint Paul Street
Baltimore, MD 21218
Ph: 410-554-5500
Fax: 410-554-5502
<http://www.ngs.maryland.gov/>