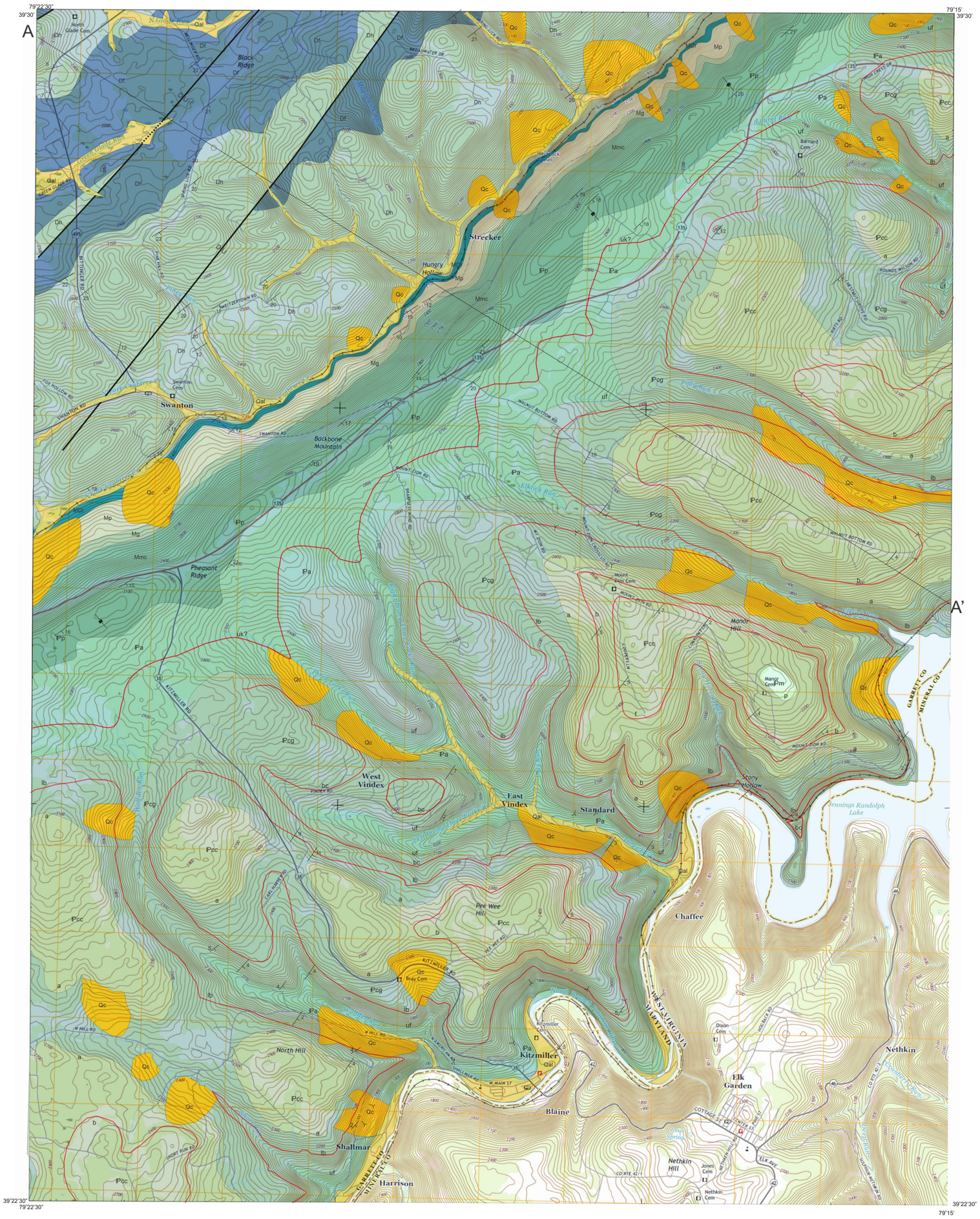
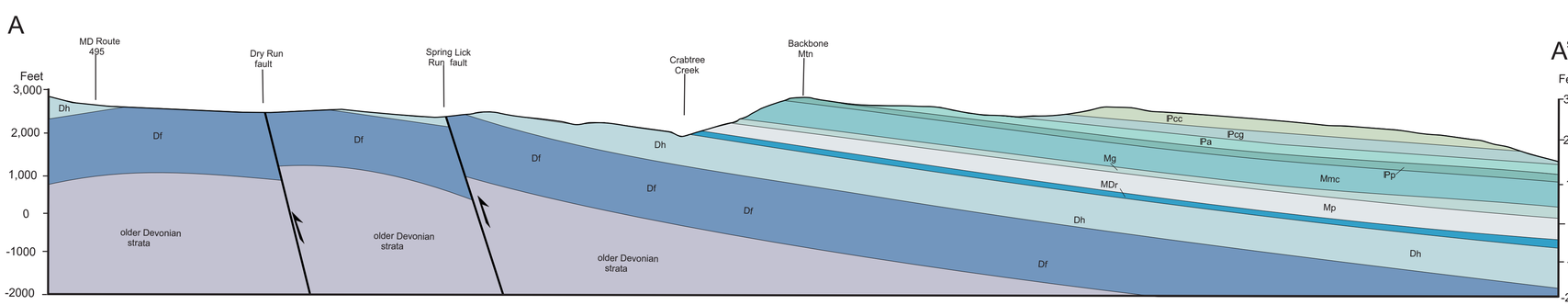


Basemap Kitzmiller 1:24,000 series. North American Datum of 1983 (NAD83) World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 17S. Produced by the United States Geological Survey. This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. Magnetic declination 9.38 degrees.

Geologic Map of the Kitzmiller Quadrangle, Garrett County, Maryland

By
David K. Brezinski
2021



Adjoining 7.5-minute quadrangles
(Kitzmiller quadrangle shaded)

1	2	3	1 McHenry 2 Bittinger 3 Barton 4 Deer Park 5 Westernport 6 Gorman 7 Mt Storm 8 Antioch
4		5	
6	7	8	

Quadrangle Location

Scale 1:24 000
1 ½ 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0.5 0 1 KILOMETERS

Explanation of Map Symbols

Contacts
Geologic contacts; definite, approximate, and concealed location

Planar Features
Inclined bedding strike and degree of dip shown
Horizontal bedding
Inclined joint strike and degree of dip shown
Vertical joint strike shown

Transportation
Primary route, class 1 (divided lanes)
Primary route, class 1 (undivided)
Secondary route, class 2
Light duty road or street, class 3

Faults
Fault; approximately located. D refers to down thrown side, U to the up thrown side.

Coal Beds
Projected outcrop trace of coal bed
Quarry/mine
Prospect pit

Topography
Topographic index contour (100- ft interval)
Topographic intermediate contour (20-ft interval)

Hydrography
Stream
Spring
Water body (eg. lakes, ponds, rivers)

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Governor

Boyd K. Rutherford
Lieutenant Governor

DEPARTMENT OF NATURAL RESOURCES
Jeannie Haddaway-Riccio
Secretary

MARYLAND GEOLOGICAL SURVEY
Richard Ortt
Director

DESCRIPTION OF MAP UNITS

Quaternary

Alluvium (Qal)
Pebbles and cobbles in a sandy matrix. Clasts are subrounded to rounded, weathering to a yellowish orange, and orange-brown patina. These deposits are present along both modern and ancient stream channels, and may have a thick humic component near the top. The thickness of alluvium varies from a thin veneer to more than 30 feet. These thicker accumulations tend to be concentrated where colluvium at the edge of valleys overlaps the alluvium.

Colluvium/Landslide (Qc)
Colluvium (Qc) is an unsorted mass of boulders and cobbles that form on present on steep slopes overlying and below massive sandstone intervals. These deposits are largely the result of frost wedging or mass movement. Topographically, these accumulations exhibit an irregular upper surface, thin upslope, and rarely have soil cover. Thickness ranges from several feet on steep slopes to more than 50 feet. Landslides (Ql) consist of coherent masses of bedrock that have been detached and have moved downhill under the influence of gravity. Many of these features are only visible on LiDAR imagery.

Pennsylvanian

Monongahela Formation (Pm)
Interbedded shale, siltstone, and coal. The Monongahela Formation is present on Manor Hill in the Kitzmiller Quadrangle. That location consists of a reclaimed surface mine of the Pittsburgh Coal [p]. The Monongahela formation is generally 250 feet thick in Maryland (Brezinski, 1988), but only about 30 feet are preserved in the Kitzmiller Quadrangle.

Conemaugh Group
Interbedded sandstone, shale, siltstone, and nonmarine limestone. The Conemaugh Group is divided into the Casselman and Glenshaw formations (Flint, 1965), and has an aggregate thickness of between 700 to 800 feet in the Upper Potomac Basin.

Casselman Formation (Pcc)
Interbedded, tan, medium- to coarse-grained, locally conglomeratic, cross-bedded sandstone, gray to reddish gray mudstone, medium gray, silty shale, siltstone, and light gray to grayish brown, buff-weathering non-marine limestone. Coal beds of the Casselman Formation that are mined in the Kitzmiller Quadrangle consist of the Barton [b] and Franklin [f]. The Casselman Formation is approximately 400 feet thick in the Kitzmiller Quadrangle.

Glenshaw Formation (Pcg)
Gray, tan-weathering, micaceous, medium- to coarse-grained, cross-bedded sandstone containing abundant coaly plant fragments; interbedded with gray, reddish gray, and locally reddish brown, silty shale, siltstone, light gray, bioturbated, non-marine limestone, and brittle, dark gray, fossiliferous, marine shale. The base of the Glenshaw Formation is placed at the top of the Upper Freeport coal bed; and the top of the formation is considered to be at the top of the Ames marine shale and coal [a]. Marginal marine intervals are underlain by mined coal beds at the Brush Creek [bc], Lower Bakerstown [lb], and Ames [a] coals. The Glenshaw Formation is approximately 350 feet thick.

Allegheny Formation (Pa)
Interbedded, medium to dark gray shale and siltstone, and tan to light gray, coarse-grained, cross-bedded sandstone, with thin, light gray claystones. The top of the formation is at the top of the Upper Freeport [uf] coal bed, and the base of the formation is the top of the white, massive, conglomeratic, Homewood Member of the underlying Pottsville Formation. The Upper Kittanning [uk] coal bed is locally mined. The Allegheny Formation is between 200 to 250 feet thick.

Pottsville Formation (Pp)
Dominantly tan to light grayish brown, medium- to coarse-grained, cross-bedded sandstone and conglomeratic sandstone with abundant coaly plant fragments and thin intervals of dark gray, coaly shale, siltstone, or coal beds. The massive, pebbly to granular, light gray, highly cross-bedded Homewood Sandstone constitutes a resistant, mappable sandstone layer at the top of the formation. Total thickness for the unit is 200 to 250 feet.

Mississippian

Mauch Chunk Formation (Mmc)
Interbedded, reddish brown shale, variegated mudstone and siltstone, and reddish brown to greenish gray, medium-grained, micaceous sandstone. Sandstone intervals are lenticular, cross-bedded, exhibit sharp bases, and fine upsection. Several thin, greenish gray, marine calcareous shale to argillaceous limestone units are present near the base of the formation. The Mauch Chunk Formation is approximated at 400 feet in thickness in the Kitzmiller Quadrangle.

Greenbrier Formation (Mg)
Interbedded, gray to reddish brown, calcareous sandstone, fossiliferous and variegated shale, and fossiliferous limestone. The Greenbrier Formation is subdivided into four members in Maryland (Brezinski, 1989), but are not mapped separately. The basal unit is a light gray, highly cross-bedded, sandy limestone known as the Loyalhanna Member. The Loyalhanna Member is overlain by a thin, medium-bedded, greenish gray limestone known as the Deer Valley Member. Above the Deer Valley Member the Greenbrier Formation consists of interbedded, reddish, fossiliferous mudstone, and white to tan and reddish brown, fine-grained sandstone, and reddish brown siltstone and variegated shale. This part of the formation is known as the Savage Dam Member. The Savage Dam Member is overlain by thin- to medium-bedded, light to medium gray, argillaceous, fossiliferous limestone known as the Wymps Gap Member. The Greenbrier Formation is 150 to 200 feet thick in Garrett County, Maryland.

Purslane Formation (Mp)
Tan to light gray, cross-bedded, coarse-grained sandstone to pebbly conglomerate near the base and reddish brown, argillaceous, cross-bedded sandstone at the top of the formation. Thin beds of gray shale and coaly shale are locally interbedded with the sandstone intervals. The Purslane Formation is 250 to 350 feet thick in southern Garrett County.

Rockwell Formation (MDr)
Interbedded, greenish gray, tan-weathering, argillaceous, bioturbated sandstone, and reddish gray to gray, coaly siltstone and shale. The greenish gray bioturbated sandstones at the base of the formation (Oswayo Member) are locally interbedded with the reddish strata of the upper Hampshire Formation. These basal marine strata are overlain by light gray to tan, thin- to medium- bedded, cross-bedded, lenticular sandstone, and rooted, gray mudstone. The top of the formation consists of well-sorted, burrowed, locally fossiliferous, buff sandstone of the Riddlesburg Member. The Rockwell Formation is 150 to 200 feet thick in the Kitzmiller Quadrangle.

Devonian

Hampshire Formation (Dh)
Interbedded, reddish brown to reddish gray, and brownish red, locally greenish gray, cross-bedded, upward-fining, lenticular sandstone; reddish brown micaceous siltstone, shale, and red-brown rooted claystone. The Hampshire Formation ranges from approximately 1,600 to 2,000 feet thick in Garrett County.

Foreknobs Formation (Df)
Interbedded, olive gray, tan-weathering, medium- to coarse-grained, cross-bedded, bioturbated sandstone; greenish gray to dusky red, fossiliferous shale and siltstone. Top of the formation is mapped at the top of the medium- to thick-bedded, cross-bedded, light gray to white (>30 feet) sandstone considered equivalent to the Pound Sandstone Member of the Valley and Ridge Province. The Foreknobs Formation is approximately 1,500 feet thick in Garrett County.

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Geologic field mapping conducted in 2019-2021.

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