

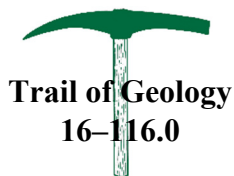


A guide for the geologic tourist to the

Northern Extension of the York County Heritage Rail Trail



Jeri L. Jones, York County Department of Parks & Recreation
Rose-Anna Behr, Bureau of Topographic and Geologic Survey



Material from this trail of geology booklet may be published if credit is given to the Pennsylvania Geological Survey

COMMONWEALTH OF PENNSYLVANIA
Tom Wolf, Governor
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
Cindy Adams Dunn, Secretary
OFFICE OF CONSERVATION AND TECHNICAL SERVICES
Nathan Flood, Deputy Secretary
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
Gale C. Blackmer, Director

This report and can be obtained through
the Bureau of Topographic and Geologic Survey website at
dcnr.state.pa.us/topogeo

Supersedes Open-File Report OFMI 16-03.0

Suggested citation: Jones, J. L., and Behr, Rose-Anna, 2016, A guide for the geologic tourist to the Northern Extension of the York County Heritage Rail Trail: Pennsylvania Geological Survey, 4th ser., Trail of Geology 16-116.0, 14 p.



Introduction

Constructed in 2015, the Northern Extension to the York County Heritage Rail Trail follows the Codorus Creek upstream, around the west end of the Hellam Hills to the York Valley. It is itself, not a rail trail, but will eventually be six miles long and connect with the former Northern Central Railroad bed, now the Heritage Rail Trail County Park, in downtown York. The current 4.4-mile trail is 10 feet wide, paved or ADA accessible crushed gravel, ideal for walkers, strollers, and bikers. The trail winds through woodlots, sports fields, industrial parks, and urban areas.

At the John Rudy County Park trailhead, you can look north to the ridge where Canine Meadows is located (Figure 1). This ridge is composed of resistant sandstone of the Antietam Formation. More easily eroded limestone and dolostone of the Vintage Formation underlies the valley in which you stand. To the south, you see the Hellam Hills, a ridge composed of an even harder rock known as quartzite of the Chickies Formation (Figure 2). The different rocks have shaped the landscape and land use along the trail.

Geology also affects the land use of an area. The type of rock underlying an area controls what type of soil forms, as well as how deep the soil will be. This in turn controls the land use options. Along your trip on the Northern Extension, you will pass through several different land use areas.

Limestone and dolostone underlie the floor of the valleys. These rocks produce deep soils that are good for agricultural and easy to build on. You will see farms and feed mills, homes, businesses, and industries.

Sandstone and quartzite are more durable than limestone and underlie the Hellam Hills. In places, bedrock is only inches from the surface. Elsewhere it produces a moderately thick sandy soil that is often rocky. This sandy soil does not hold moisture well. This land is not good for farming, and used to be difficult to build on, so is commonly forested. Modern techniques have allowed construction to move into these sandstone and quartzite areas.



Figure 1. View looking north at Canine Meadows ridge.



Figure 2. View looking south at Hellam Hills.

Part of the Northern Extension is on the floodplain of the Codorus Creek. Periodic flooding limits the land use. It may be used for agriculture, but the farmer realizes that occasionally the crops may be damaged due to high water. The Greg A. Crist Memorial Park sports fields are on the floodplain, too. They may occasionally be submerged, but after clean up, will be as good as new. Certainly, no homes or businesses should be built on a floodplain.

The types of rocks in the area obviously control what can be locally mined and quarried. Near the beginning of the trail, there is an inactive limestone quarry. York County is well known for its high quality limestone and dolostone used for aggregate, building materials, and pet food. Within a mile of the trail, at least three iron mines were active in 1875 (Frazer, 1875). The ore was extracted and taken to Marietta for smelting. Near Route 30, there are abandoned sand and phyllite quarries where materials were excavated to make glass and for fill, respectively.

The lay of the land influenced the creek. The fall of the creek was harnessed for waterpower, which ran sawmills, gristmills, flourmills, and feed mills. The creek itself was used for transportation from 1833-1850 following the Codorus Navigation Canal. Part of the trail follows the old tow path.

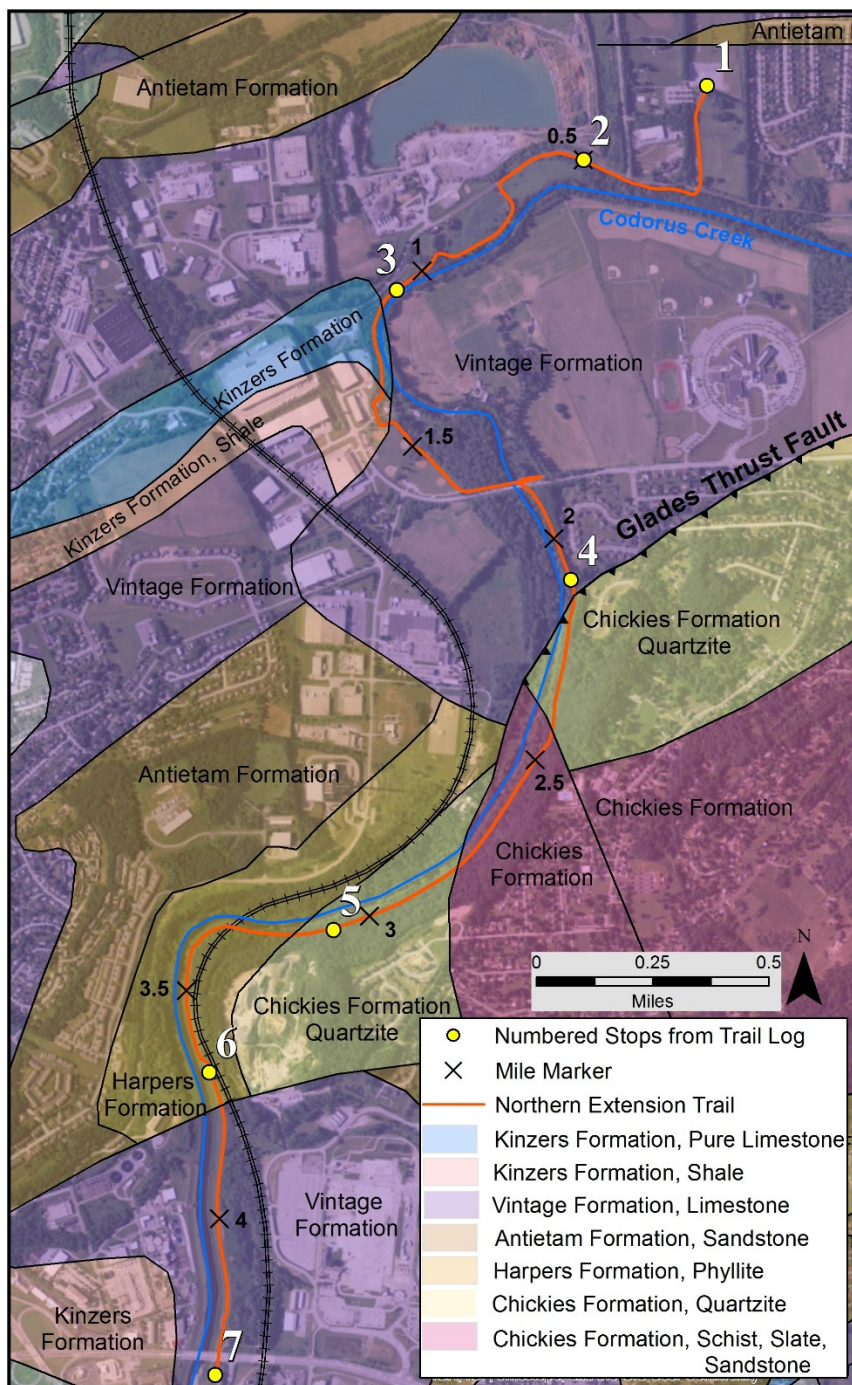


Figure 3. Map showing route of the Northern Extension Trail, numbered stops, Codorus Creek, and geologic formations (Stose and Jonas, 1939).

The following trail log begins at John Rudy County Park and proceeds south 4.4 miles to the Louck's Mill Road parking lot. Mileage is estimated based on aerial photos and half-mile markers posted along the trails. **Stop** refers to the numbered locations shown on Figure 3. **Inc.** refers to the incremental mileage between points of interest, whereas **Cum.** refers to the total mileage from the beginning of the trail in John Rudy County Park. Please stay on the trail, as property adjacent to the trail is privately owned!

Trail Log

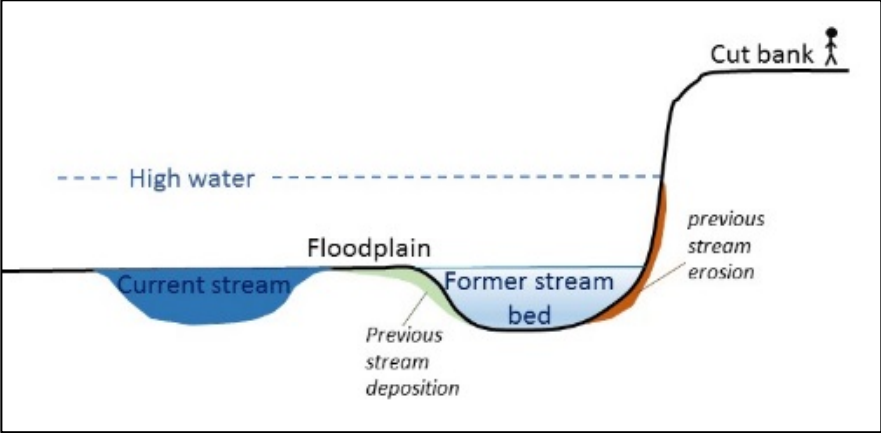
Inc	Cum	Things to See
0.0	0.0	<u>Stop 1. John Rudy County Park Trailhead</u> 40.0233/-76.7022 The park is underlain by limestone and dolostone of the Vintage Formation. A small fin of the pale blue gray rock can be seen between the trail and the Yellow Pine Pavilion.
0.3	0.3	Mundis Race Road crossing. Look back north, the copse of trees here hosts a few more fins of limestone. Please cross the road carefully!
0.1	0.4	On the left side of the trail is the old foundation for a smokehouse (Figure 4). It is made of blocks of quartzite and limestone. Some white vein quartz can be seen. The smokehouse belongs to the Michael and Magdealena Bixler Farmstead across the street (Figure 5). This registered historic house was built in 1799 of sandstone, quartzite, limestone, and dolostone, all relatively local building materials. The house serves as the York County Parks' Administrative Headquarters. The smokehouse and farmhouse are signs of the agricultural heritage of the valley. Limestone valleys make for great farming!



Figure 4. Foundation of smokehouse.



Figure 5. Bixler Farmstead, now the Parks' Administrative Headquarters.

0.2	0.6	<p>Stop 2. <u>Cut bank</u> and Mile Marker 0.5 40.0211/-76.7073</p> <p>To the north, you can see the waste rock piles from the Codorus Stone Company quarry. This quarry extracted limestone from the Vintage Formation for construction and road base use from 1954 to 2015.</p> <p>To the south, towards the creek, there is a near-vertical drop into the field below. You are standing on top of what geologists call a cut bank, once the bank of the Codorus Creek. The former creek eroded its way into the hillside. Since then, the Codorus Creek has moved south to its present-day channel. The field is called a floodplain and is covered with river water during heavy rains. Because much of the Northern Extension is located on the floodplain of the Codorus Creek, the trail was paved to lessen the damage during high waters.</p>  <p>Figure 6. Sketch of the former cut bank, floodplain, and current creek location.</p>
0.5	1.1	Join old road and cross unnamed stream on concrete bridge.
0.1	1.2	<p>Stop 3. <u>Trailside benches and an outcrop of Vintage Formation limestone</u> 40.0171/-76.7150</p> <p>Check out the large limestone boulder sitting near the bench. It was quarried at the nearby Codorus Stone Company quarry and placed here for landscaping purposes (Figure 7).</p>


The pale blue grey rock is limestone, and the tan areas are clay impurities. This rock was originally deposited in a warm shallow sea, like the Florida Keys. Intervals of stormy weather brought in clay. Creatures burrowed in the mud and lime, causing some mixing. As the sediment was buried, it solidified into rock. When brought back to the surface, water etched out the claystone and limestone differently. In the stream, stream water has eroded the surface smooth in places, but original animal burrows are evident.

On the top of the boulder near the trail, look for small smooth lines on the surface. These are slickensides, which indicated movement between this rock and another adjoining rock, like a mini-fault.



Figure 7. Boulder of Vintage Limestone. Keys for scale.

Next, check out the outcrop at the edge of the Codorus Creek. Can you see the fractures passing through the rock? These fractures are called joints. A joint is a fracture in the rock that has relatively no or very small movement. A fault is a fracture where movement can be observed. We will cross one later in our trip! Do you recognize a

		pattern to these fractures? There are three joint patterns or sets here: 1) northwest-to-southeast; 2) northeast-to-southwest and; 3) north-to-south.
0.3	1.5	<p>Myers-Mundis Mill, Inc. #1</p>  <p>Figure 8. Mundis Mill, formerly known as Myer’s Mill, made use of the fall in the creek to power the mill.</p> <p>As you cross Locust Lane, look to the left to see the mill (Figure 8). A mill was first built here in 1799 (MillPictures.com). Samuel Myers and his wife built the present mill in 1841. Roy Mundis used it as a feed mill as recently at 1977. The drop along this stretch of creek provided an excellent location for the mill. Geology shaped the land, the land shaped the way people used it.</p> <p>Pennsylvania Railroad Caboose: Admire it from afar- it is on private land.</p> <p>The trail skirts the sports fields of the Greg A. Crist Memorial Park.</p>
0.1	1.6	<p>Mile Marker 1.5 Cross green bridge.</p>
0.2	1.9	Cross Codorus Creek on silver bridge, go under Mundis Mill Road.


0.2	2.0	Mile Marker 2
0.1	2.1	<p>Stop 4. <u>Glades Thrust Fault</u> 40.0080/-76.7081</p> <p>Stop at the wooden railing, concrete box culvert, and tiny creek (Figure 9). It does not seem like much, but important stuff happened here! This is the Glades Thrust Fault. If we were able to dig down to bedrock here, we would see a fault where rocks forming the ridge have been pushed up and over the rocks forming the valley you are leaving. The Glades Thrust Fault is a low-angle fault that put the Chickies Formation over the Vintage Formation. The fault is evidence of the collision of North America and Africa that formed supercontinent Pangaea about 350 million years ago. Just imagine the great forces it took to achieve this feature! The Chickies Formation resists erosion better than the limestone we saw in the Vintage Formation, so it stands tall as a hill we must now climb.</p>  <p>Figure 9. Glades Thrust Fault runs across the trail along the small drainage channel.</p>
0.1	2.2	Small hillside outcrop of very fine grained, pale olive brown sandstone of the Chickies Formation, dipping gently towards the creek.

0.3	2.5	Mile Marker 2.5
0.1	2.6	Boulder field of Chickies Formation quartzite. These resistant rocks hold up the hill, and refuse to give in to erosion. The boulder-strewn nature of the hillside made it better suited for a woodlot than for farming or grazing.
0.3	2.9	Five foot tall outcrop of Chickies Formation. We will get a better look at the next stop. Sometimes geologists have to piece together the entire puzzle from little pieces like these.
0.1	3.0	Mile Marker 3
0.1	3.1	<p>Stop 5. <u>Chickies Formation Outcrop</u> 39.9971/-76.7179</p> <p>This exposure of the Chickies Formation reveals resistant quartzite (Figure 10). The sand was originally deposited at a beach or in the sea. As it was buried, it solidified into sandstone. Additional heat and pressure changed its shape (metamorphosed it) into quartzite. Quartzite is very resistant to erosion. Over time, erosion wore away the softer valley rock, but left the quartzite standing as today's hills. Notice how blocky the rock is! Do you remember the joints we saw by the Codorus Creek? These rocks are much thicker and more evenly jointed. When it breaks apart, it forms these large rectangular pieces.</p> <p>On the hilltop above this stop is an abandoned quarry in the Chickies Formation. Neuman Sand Bank operated from the 1910's to the 1940's extracting silica sand. Later it was operated by York Stone and Supply Company as the Silica Rock Quarry (Wilshusen, 1979). In the early 1990's, Kinsley Construction opened it up as York Silica Sand but closed after a few years.</p>



Figure 10. Thick beds of Chickies Formation quartzite form large blocks as joints weather.

0.2	3.3	Pass under the Norfolk Southern Railroad trestle.
0.2	3.5	<p>Mile Marker 3.5</p> <p>You are on the floodplain. You do not want to be here during a flood!</p>
0.2	3.7	<p>Stop 6. <u>Codorus Creek Levee</u> 39.9930/-76.7230</p> <p>This short, steep climb puts you on top of the levee (Figure 11). The U.S. Army Corp of Engineers built this structure as part of the York Flood Plan following the great Northeast Flood of 1936. Heavy rain, concurrent with melting of the snow, caused severe flooding. The levee was constructed about three feet higher than the height of the floodwater in 1936 to protect the city from future damage. The rock used to build the levee is phyllite from the Harpers Formation. Phyllite started out as mud. The mud turned into mudstone, but heat and pressure further changed it into the smooth, slightly shiny rock called phyllite. The rock was quarried on the opposite side of the Codorus</p>

		<p>Creek near the railroad bridge. You can see the quarry highwall in the fall and winter when leaves are off the trees. You can see and feel the smooth phyllite in a few places along the top of the levee.</p>  <p>Figure 11. The levee built after the floods of 1933 and 1936 to protect the City of York from further flooding.</p>
0.2	3.9	Note monitoring wells on top of the levee. Geoscientists are monitoring the groundwater to be sure contaminants are not leaking from the nearby former military arsenal.
0.1	4.0	<p>Mile Marker 4</p> <p>Across the creek is the City of York's sewage treatment plant.</p>
0.4	4.4	<p>Stop 7. <u>Louck's Mill Parking Area</u> 39.9833/-76.7230</p> <p>As you approach the southern end of the trail, you pass under Route 30 and will notice a few large boulders. They are conglomeratic limestone from the Kinzers Formation. This rock has exceptionally high calcium and has been quarried for agricultural lime. Notice the fist-size chunks of limestone within the large block. These chunks make it a conglomerate.</p>

We hope you have enjoyed your geology and history tour!



References

- Frazer, Persifor, Jr., 1876, Report of Progress in the district of York and Adams Counties: Pennsylvania Geological Survey, 2nd ser., Report C, 198 p.
- MillPictures.com, <http://www.millpictures.com/mills.php?millid=238> Accessed 2/12/2016.
- Stose, G. W., and Jonas, A. I., 1939, Geology and mineral resources of York County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., County Report 67, 199 p.
- Wilshusen, J. P., 1979, Environmental geology of the greater York area, York County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 6, 3 plates.
- Wikipedia, https://en.wikipedia.org/wiki/National_Register_of_Historic_Places_listings_in_York_County,_Pennsylvania Accessed 1/12/2016.

York County Heritage Rail Trail Regulations

- The park is open year round, dawn until dusk, and is patrolled by York County Park Rangers.
- Users must stay on the trail, as property adjacent to the trail is privately owned.
- Motorized vehicles are prohibited on the trail except for the use of emergency and maintenance vehicles.
- Pets are permitted on the trail, but must be kept on a leash. Owners must clean up after their pets.
- All riders are encouraged to wear approved helmets.
- Horses are prohibited from the Northern Extension.
- For trail conditions, contact park headquarters at 717-840-7440 or follow on Twitter “@yorkcountyparks”.

From Route 30, follow Sherman Street north three miles to Mundis Race Road. Turn left, park is 0.6 miles on right.

