HISTORY AND GEOLOGY OF THE PENNSYLVANIA MAIN-LINE CANAL (WESTERN DIVISION) IN SOUTHERN INDIANA COUNTY

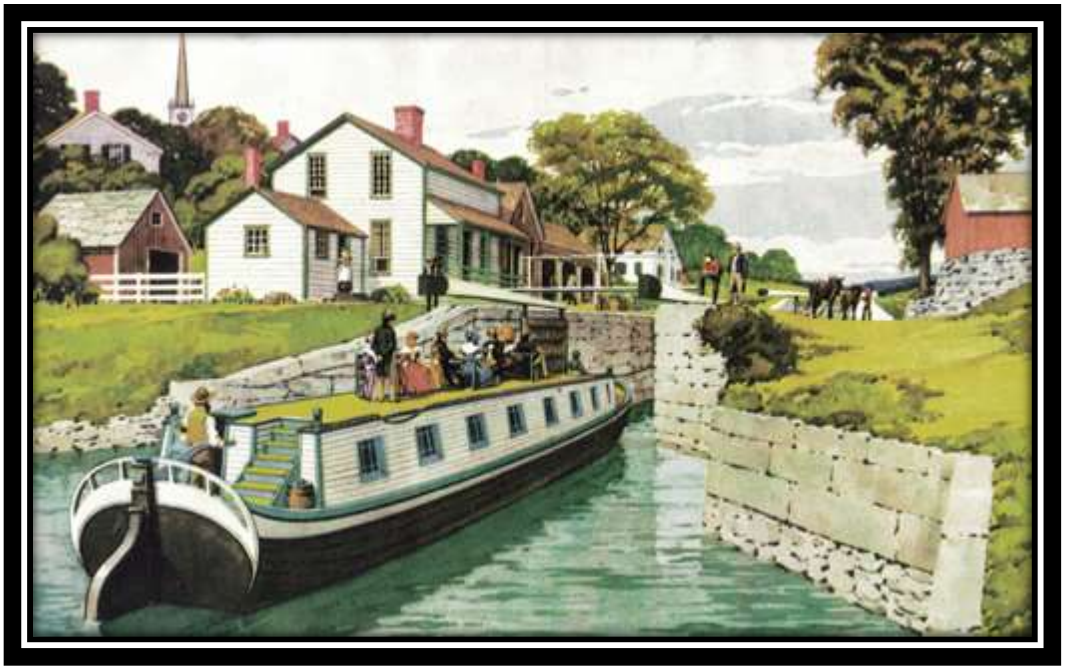


Illustration Courtesy of VisitSaltsburg.com

Guidebook Prepared for the

Pittsburgh Geological Society
Spring Field Trip

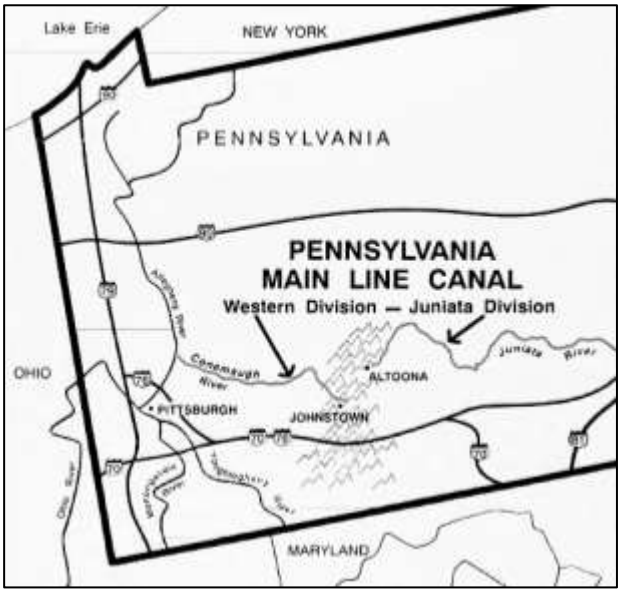
April 8, 2017

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

Thanks to the staff of The Kiski School for giving us access to their staircase to examine the Saltsburg sandstone; the volunteers at the Rebecca Haddon Stone House Museum for hosting our visit on a Saturday; the US Army Corps of Engineers for providing a tour of the Conemaugh River Lake Dam facility and Dr. David Dzombak of Carnegie-Mellon University for sharing a pre-publication copy of the monograph written by his late father William Dzombak, "Canal to Pittsburgh: A documentary history of the Western Division of the Pennsylvania Main Line of Public Works (1826-1864)." A special thanks to field trip participant James Hamel for sharing his memories of consulting work done at Bow Ridge and his archive of historical maps and stratigraphic sections for use in this guidebook.

HISTORICAL BACKGROUND

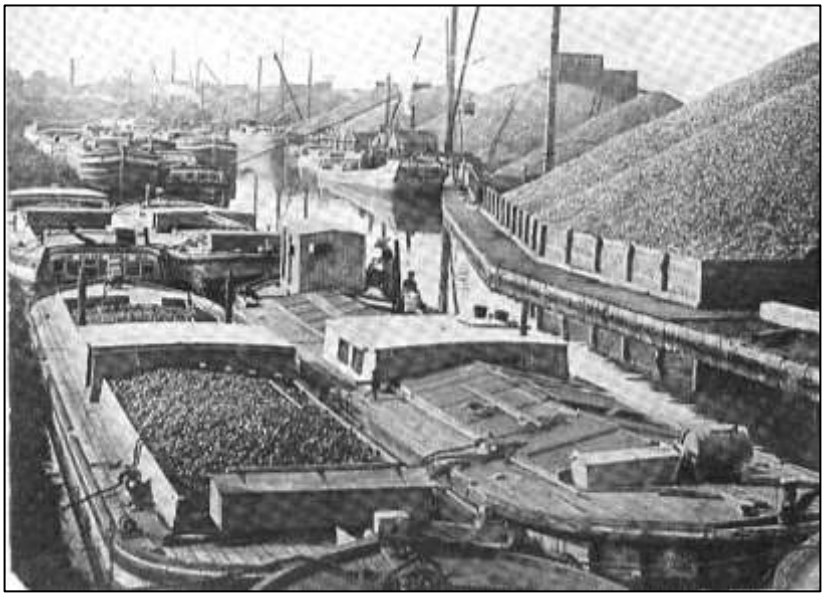


The Western Division of the Pennsylvania Main Line Canal System ran 105 miles between Johnstown and Pittsburgh. This portion of the canal was designed in 1825, approved by the state legislature in 1827 and completed by 1830. It provided a route for transport of natural resources and industrial goods, which had previously traveled by horse and wagon along toll roads.

Although canal transport was slow, and frequently interrupted by freezing conditions in the winter or flood damage in the spring and summer, many tons of goods were moved by canal boat and mule teams over the time period from 1830 to 1854, fueling the growth of local towns like Blairsville and Saltsburg. The main-line canal shut down in 1857, selling its remaining assets to the Pennsylvania Railroad that had put it out of business. In many parts of the state, the rails in turn have been converted to trails that follow the old canal path. The West Penn Trail through Saltsburg is part of the Pittsburgh to Harrisburg Main Line Canal Greenway, a linkage of hiking, biking and water trails that follows the historical canal route across the state.

CANAL ENGINEERING

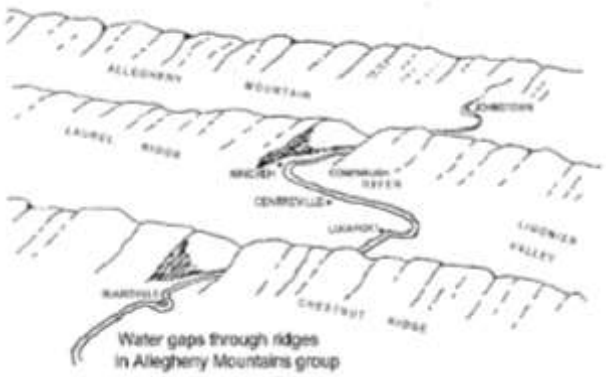
The Pennsylvania Main Line Canal was designed with a standard dimension: a width of forty feet at the top water line and twenty-eight feet width at the bottom, wide enough to allow two boats to pass, with a minimum depth of four feet. The towpath, which was generally built on the river side of the canal, had to be at least eleven feet wide, while the opposite or berm side had to be at least seven feet wide.

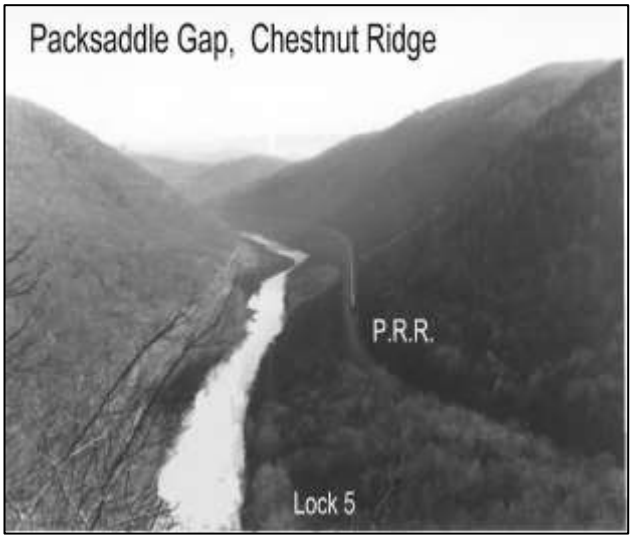


Postcard view of canal basin at Columbia, PA, looking north.

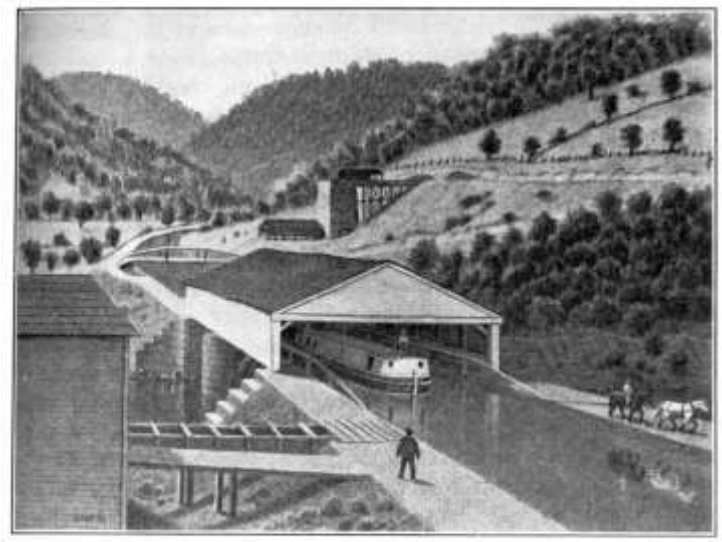
In some of the narrower reaches of the Conemaugh and Kiskiminitas where there was not enough room to install a full boat channel, river dams were installed to create slack-water pools, so that only a tow-path needed to be built alongside.

The Western Division of the Canal started in Johnstown, PA, where canal boats were offloaded from the Allegheny Portage Railroad. (The geology of this railroad was studied on a previous Pittsburgh Geological Society field trip in 2002; the field guide is available on the PGS website.) From Johnstown, the Canal followed the westward course of the Conemaugh River through two major water gaps: Laurel Hill and Chestnut Ridge.





Sketch of the canal path, Johnstown to Blairsville and photo of Packsaddle Gap by William Dzombak.



Aqueduct Across Little Conemaugh River, 1845.
George W. Storm, Artist.

From Blairsville to Pittsburgh, the canal descended a grade that fell approximately three feet per mile, which required construction of a lock to change the water level on an average of every two miles. Where it crossed tributary streams or the main river channel, the canal was carried over by aqueducts, which led to striking images of canal boats floating in mid-air above running water. These images often remain in use as historical symbols centuries after the canal itself ceased to exist.

The final feat of engineering needed to complete the Western Division of the canal was a 'short-cut' through Bow Ridge, a sandstone-armored meander bend on the Conemaugh River between Blairsville and Saltsburg. To accomplish this, canal engineer Alonzo Livermore drove a tunnel through the narrow ridge. This was one of the earliest transportation tunnels ever built in the United States, and it inspired the name of the nearby town, Tunnelton PA.

STOP ONE: THE SALTSBURG SANDSTONE AT THE KISKI SCHOOL WATERFALL OUTCROP

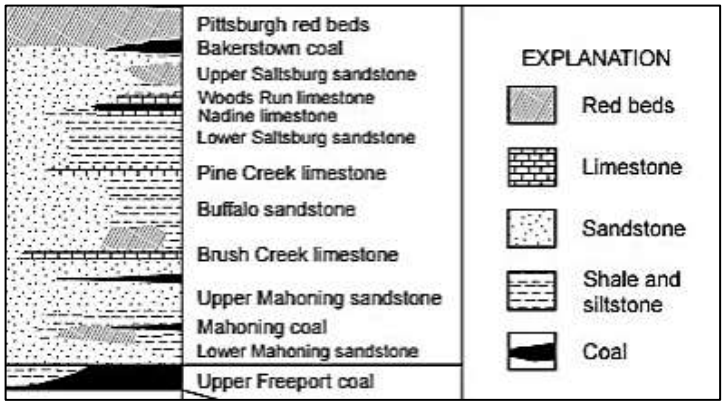
Logistics: Field trip participants may choose to disembark here and examine the type locality of the Saltsburg sandstone as they descend a three-story metal staircase along the school's waterfall. Those with limited physical mobility can stay on the bus and disembark at Canal Park.

Historical photo of Saltsburg Bluff. Note covered bridge in the background right.

In 1878, a geologist working for the 2nd Geological Survey of Pennsylvania (J. J. Stevenson) designated the cliff across the river from Saltsburg as the "type locality" for Saltsburg sandstone, based on the fact that this member of the Glenshaw Formation (Conemaugh Group) was first seen and studied here. Early photos (right) show a steep cliff immediately adjacent to the river.

In his USGS folio on the Mineral Resources of the Elder's Ridge Quadrangle (1905), Ralph Stone described this interval as follows: "The succeeding 40 feet comprise a mass of sandy shales which in the Conemaugh region are overlain by a heavy sandstone ... It is known as the Saltsburg sandstone and can be seen to the best advantage in the bluff opposite the village of that name. The top of this member is generally about 150 feet above the Upper Freeport coal. In the hills on both sides of Kiskiminitas River at Salina this member has a massive character and outcrops conspicuously in the roads and ravines ... The Saltsburg sandstone is thin bedded and shaly in the northern part of the quadrangle and could not be traced continuously. In Plum Creek Valley the Mahoning sandstone seems to be but a few feet thick and the Saltsburg horizon is occupied by shales."

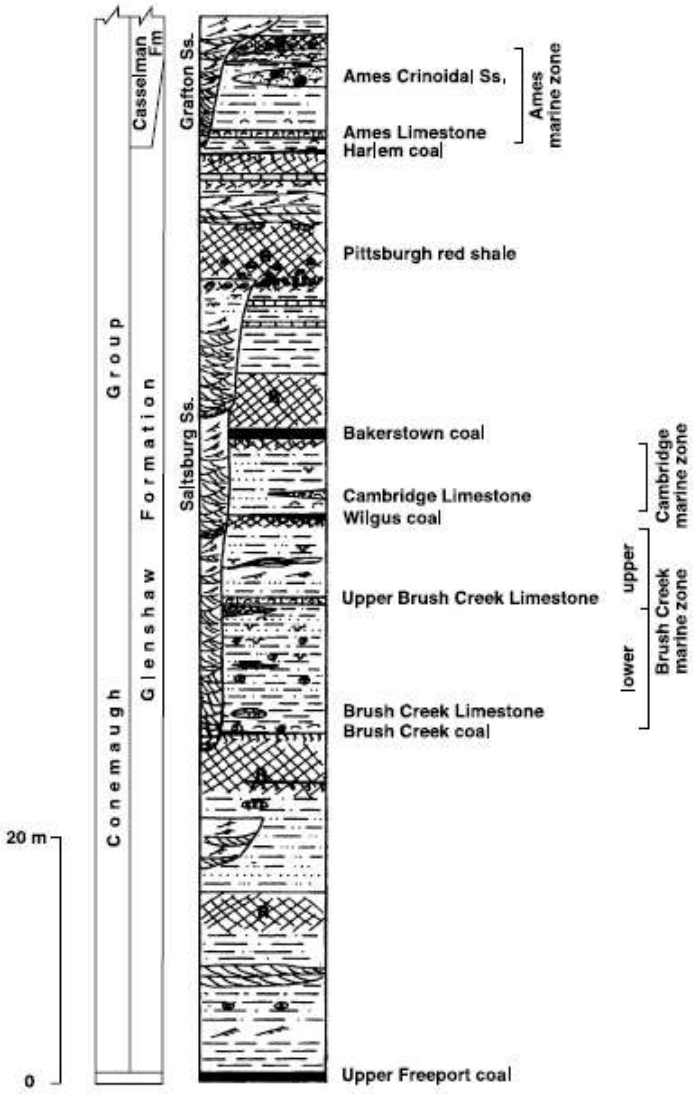
The limited extent of the Saltsburg sandstone noted in this early field description was later confirmed by drilling for coal mines in this area. Despite its massive appearance, the Saltsburg sandstone has limited lateral extent and is replaced by sandy shales within a short distance of its type locality (JF Taylor, personal communication). There are also two or three Saltsburg sandstones. The Upper Saltsburg lies between the Woods Run and Bakerstown marine units and the Lower Saltsburg occurs between the Pine Creek and Woods Run marine units (JA Harper, personal communication).



A simplified stratigraphic diagram of the Glenshaw Group in western Pennsylvania (Shultz & Harper, 2000).

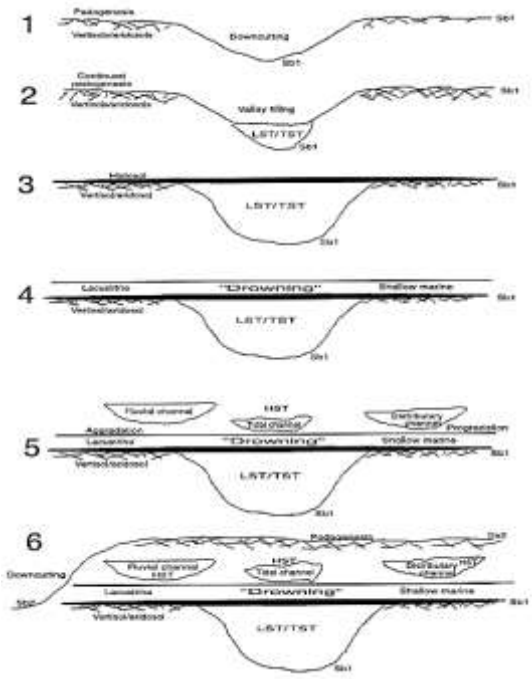
According to a recent analysis by Martino (2004), the Saltsburg sandstone and other similar sand bodies represent stacked fluvial-estuarine filling of erosional valleys formed during middle-late Pennsylvanian glacial cycles. These major river valleys were eroded as deeply as 65-100 feet during sea-level fall, when large coastal rivers cut through previously deposited alluvial and fluvial strata between the Pine Creek and Upper Bakerstown intervals of the Glenshaw Formation, Conemaugh Group, while paleosols developed on intervening regions of exposed sediment.

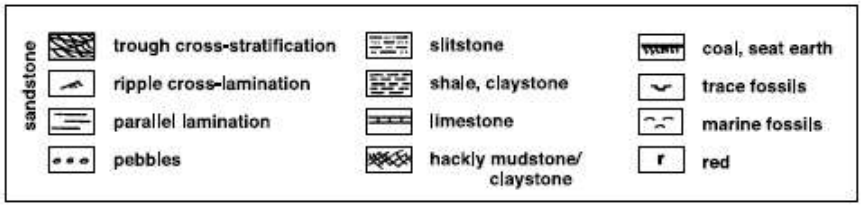
This new stratigraphic interpretation accords quite well with the notes of a much older generation of field geologists. After mapping the New Kensington quadrangle in 1932, G.B. Richardson observed, "Some confusion in nomenclature of sandstones in the lower half of the Conemaugh formation has been caused by the fact that at the type localities of the Buffalo and Saltsburg sandstones those members are unusually well developed and occupy a stratigraphic interval to parts of which other names are given in other localities. Thus the Buffalo and Mahoning and the Saltsburg and Buffalo in the type localities of the Buffalo and Saltsburg sandstones respectively merge into each other and replace the Brush Creek and 'Pine Creek' limestones. In most places, however, these sandstones are not nearly so thick as at the type localities, and in general they are distinct units."



Generalized stratigraphy of the Glenshaw Formation near Huntingdon, West Virginia (left) showing the multistory nature of the Saltsburg sandstone (Martino, 2004).

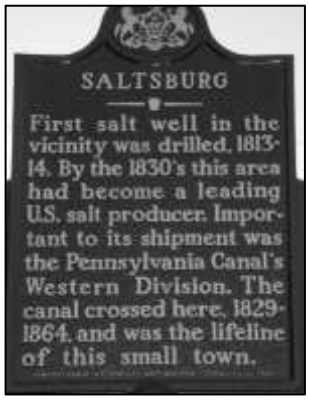
Below, cartoons showing a sequence stratigraphic interpretation of these deposits and paleosols from the same paper.





STOP TWO: MAINLINE CANAL PARK AND REBECCA HADDON STONE HOUSE MUSEUM, SALTSBURG

Saltsburg's Canal Park traces the original path of the canal through the center of town. Mules were led along the canal path to pull the boats through the waterway. Lock #8, a canal boat basin, and a warehouse fronting the basin were located on the northern end of town.



The area around Saltsburg, PA, was one of the leading U.S. salt producers during and after the canal's active years (1829-1863). Sometime between 1795 and 1798, a perhaps-apocryphal woman named Mrs. Deemer was said to be boiling water from a spring near what is now Saltsburg. As the water evaporated, she noticed a formation of salt crystals in the bottom of her kettle. Mrs. Deemer's discovery led to the birth of an industry that over the next few decades made the Conemaugh-Kiskiminetas Valley one of the leading salt producers in the nation.

Salt wells were drilled using spring-pole technology. The brines were then boiled down over fires burning coal from local pits. According to historian William Dzombak, the Conemaugh Salt Works, the third-largest salt producer in America at the time, produced 500,000 barrels of salt annually between 1820 and 1830. Other sources of salt such as the Kanawha Valley in West Virginia became cheaper, but a few salt well were still in use in Indiana and Westmoreland Counties in the 1870's.

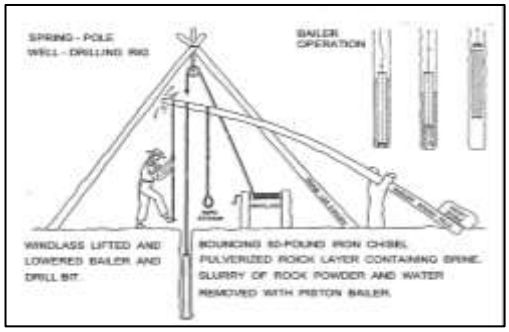
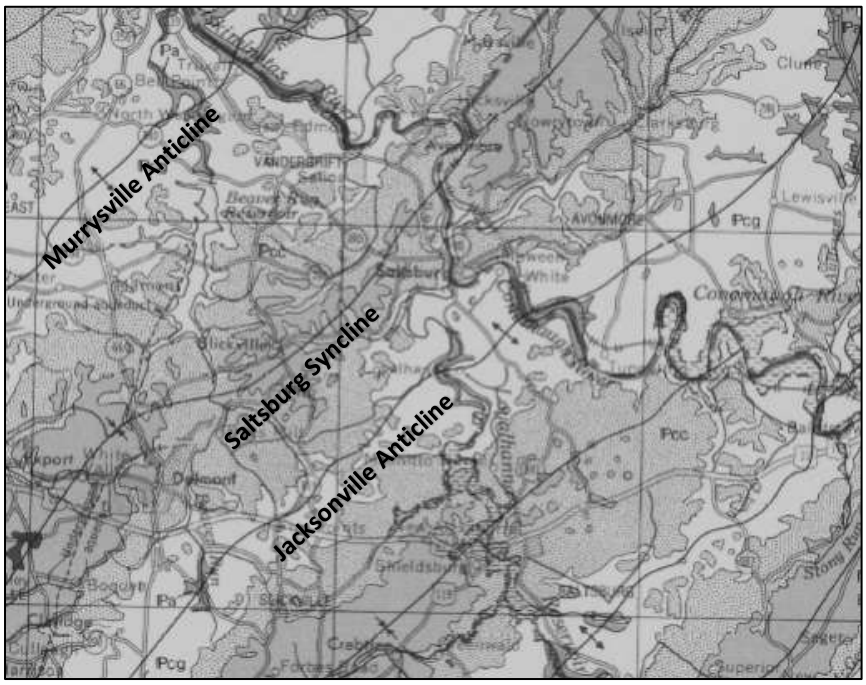


Image courtesy of Conemaugh Valley Conservancy (http://www.conemaughvalleyconservancy.org/)

The source of the brine produced by the salt works was the Pennsylvanian-age Pottsville sandstone.



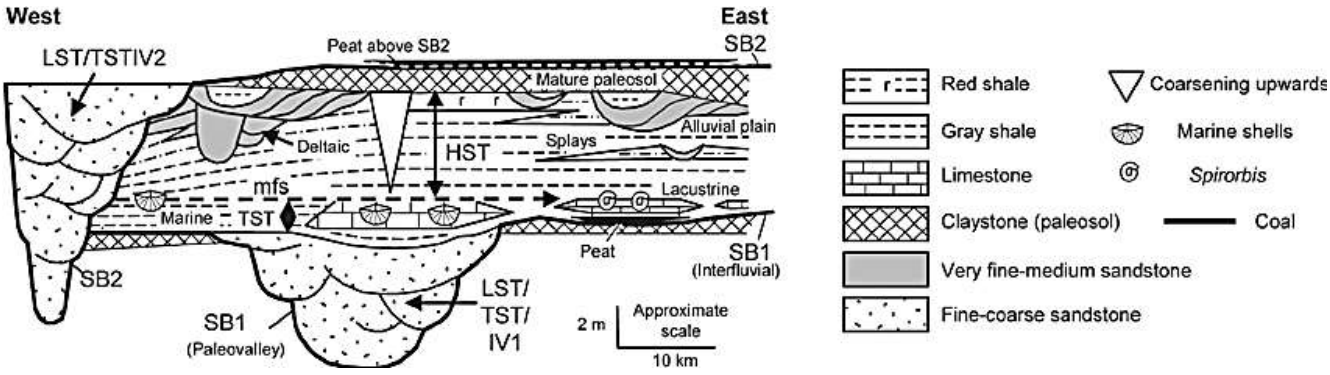
This unit does not crop out here, but it is brought closer than usual to the ground surface where the Conemaugh River cuts through the core of the Murrysville and Jacksonville anticlines to expose the Allegheny Group below the Conemaugh Group. Ironically, Saltsburg itself did not produce as much salt brine because it was situated in the syncline between these two anticlines. The main Conemaugh Salt Works were actually downstream near Salina and upstream near White's Station.

STOP THREE: GLENSHAW FORMATION ALONG THE WEST PENN TRAIL

The West Penn Trail follows the route of the Pennsylvania Canal upstream along the Conemaugh River from Saltsburg toward Blairsville. Just east of the Saltsburg Water Treatment Plant, excellent exposures of crossbeds and channel scour surfaces can be seen in deposits of the Glenshaw Formation along the trail. Futher upstream, more massive sandstone exposures above the trail level resemble the type locality of the Saltsburg sandstone and may be part of its narrow, estuary-filling lens shape. This sand body is what gives the town of Saltsburg its pronounced upward slope above the river; it is noticeably absent on the southern bank of the Conemaugh.

Looking vertically upward as you walk the trail, a second terrace can be viewed parallel to the path of the canal. This man-made feature, often buttressed with stone walls, marks where an earlier railroad line was placed in order to stay out of the canal's path. This elevated route led to the former railroad hub in Saltsburg (currently the site of the village municipal building) and then onward to the bridge whose stone piers can still be seen in the Kiskiminitas River downstream of the current automobile bridge. The elevated route was abandoned when the Pennsylvania Canal right of way was sold off to the railroads. The railroad line that replaced the canal along the Conemaugh River was eventually itself replaced by the 'rails-to-trails' movement spearheaded by the Conemaugh Valley Conservancy, one of whose dedicated members was local canal historian, William Dzombak.

The Glenshaw deposits seen here may represent some of the normal 'high-stand' sediments created by laterally migrating streams and deltas during warmer intervals of the Pennsylvanian glaciations. Alternatively, these lower sandstones could represent infill of a smaller paleo-valley eroded at a lower level than the main Saltsburg sandstone as shown below. Note that while paleo-valleys are cut downward and then filled, adjacent high-stand sediments on exposed plateaus develop extensive soil horizons. These soils later become flooding surfaces when sea level rose during inter-glacials, and often developed peat layers that later became coal seams. We will see a possible example of such a surface in the exposures at Stop Five (Bow Ridge).



Sequence stratigraphic interpretation of Appalachian sedimentary cycles resulting from tectonic and glacial interactions. Note paleosol development on exposed sediments between channels (Greb et al., 2008).

STOP FOUR: CONEMAUGH RIVER LAKE DAM

Conemaugh River Lake is one of sixteen flood control projects maintained in western Pennsylvania by the US Army Corps of Engineers Pittsburgh District. The lake is held back by a concrete gravity dam 144 feet high and 1266 feet long, completed in 1952. The dam was placed just downstream of the 'Great Bend' in the Conemaugh River, the incised meander also known as Bow Ridge, taking advantage of the storage capacity created by its steep slopes and exaggerated curvature. The lake's total storage capacity is estimated at 355,000 acre feet but it is usually kept at a much lower level of 5,140 acre feet in order to mitigate flash floods.

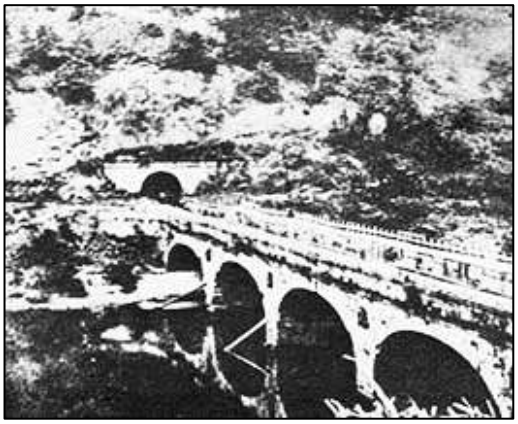
The Flood Control Act of 1936 authorized the building of this and other dams after the catastrophic St. Patrick's Day floods of that year hit communities throughout the northeast United States. After a sudden spring melt, rivers in Pittsburgh reached flood stage of 25 feet on March 17, 1936. Heavy rains caused the rivers to rise overnight, with all local watersheds pouring unrestricted flows into the Allegheny, Monongahela and Ohio. The next day, floodwaters peaked in Pittsburgh at 46 feet, an incredible 21 feet above flood stage. Over 100,000 buildings were destroyed and total flood damage was estimated at $250 million ($4.3 billion in today's dollars).

Downtown Pittsburgh, March 18, 1936. Photo by the Pittsburgh Post-Gazette.

Along with a similar dam on Loyalhanna Creek, the Conemaugh Dam provides flood protection to the Kiskiminetas River, minimizing risks to downstream communities such as Saltsburg, Apollo and Leechburg. By holding back high flows in this watershed, flooding can also be controlled in the Allegheny River Valley and the city of Pittsburgh itself. Since its completion in 1952, it has been estimated that the Conemaugh River Lake Dam has prevented more than $2.2 billion in flood damage. For example, when Hurricane Ivan struck the area in September 2004, the Conemaugh Dam reduced flood levels at the Point in Pittsburgh by as much as four feet.

Construction of the reservoir required plugging of all the historic tunnels through Bow Ridge, both those of the Pennsylvania Canal and the former railroad lines whose bridges and bridge supports can still be seen at the Tunnelview Historic Site. These tunnels would have allowed the reservoir to drain through the ridge, bypassing the dam. In 1987, a small hydroelectric plant was constructed near Conemaugh River Lake Dam to take advantage of the gradient created from the reservoir to the dam tailrace. A fourth tunnel was excavated through Bow Ridge, this time to allow flowing water to power the hydroelectric generators. This 15-megawatt plant, operated by Pennsylvania Renewable Resources Associates, currently provides energy to 10,000 Southwestern Pennsylvania families through a long term agreement with PENELEC.

STOP FIVE: GLENSHAW FORMATION AT BOW RIDGE



Only surviving photograph of the canal tunnel through Bow Ridge and the adjacent aqueduct

Near this site, the Pennsylvania canal once passed through an 817-foot-long tunnel, emerging onto a stone aqueduct to allow it to cross the Conemaugh River. This unusual arrangement was created in order to shorten the canal's length around the pronounced incised meander bend known as Bow Ridge, a narrow finger of high land cradled within a long river-bend.

The tunnel, built in 1830, was just the third tunnel to open in the United States. A transportation tunnel was such an unusual feat of engineering at that time that the Pennsylvania Canal Commissioners had to explain to people that "A tunnel is a passage like a large well, dug horizontally through a hill or mountain" (House Journal, 1824-1825, Vol. II, p.328.) Canal engineer Alonzo Livermore explained his rationale for it in his 1827 report to the Pennsylvania Legislature: (quoted from William Dzombak, ***Canal to Pittsburgh*** preprint)

"From this point, the north [west] side of the river presents but a continued series of difficulties to canal navigation. The lofty mountains on either side of the river are, literally, walls of solid rock. The river winds its way as if at a loss which course to pursue, being interrupted in its meandering by those stupendous and almost impassible barriers.

"Happily, however, I discovered a passage, where by crossing the river to the south side and making a tunnel of 750 feet in length, through a hill of about 300 feet elevation, I could cut off in distance 2¼ miles of the most unfavorable navigation, and by keeping the south side of the river, to a point 'at or near Blairsville', should save the State to the amount of $83,000."

Plan showing canal tunnel and two railroad tunnels through Bow Ridge, Portion of Pittsburgh District, Corps of Engineers, Conemaugh Dam Project Plan, 1945 (courtesy of James Hamel)

The canal tunnel's eastern entrance is below the level of Conemaugh River Lake and its western entrance is hidden below rock spoil on the lower slope of Bow Ridge. The canal tunnel is located between two later railroad tunnels as shown here on a portion of a Corps of Engineers plan drawing for the Conemaugh Dam project. A fourth tunnel for low head hydropower was constructed through Bow Ridge in 1987. This power tunnel is located just right (north) of the three older tunnels on the portion of the plan drawing included here. Bulkheads were constructed in the canal tunnel and two railroad tunnels to prevent water flow from the reservoir as part of the Conemaugh Dam project.

Excellent exposures of the Glenshaw Formation (probable Upper Bakerstown interval) can be viewed along the West Penn Trail where it follows a Disabled Hunters' Access Road across a former railroad bridge at the Tunnelview Historic Site and then up to the top of Bow Ridge. According to the interpretations of Martino (2004) and Greb and others (2008), these sediments represent high-stand deposits that were subsequently exposed to soil-forming processes during glacial lowstands, at the same time that major river valleys were being eroded elsewhere. Coal-forming wetlands were created both by rapid sea-level rise following glacial periods and by lateral facies migration during high-stands.

Outcrop A: Fluvio-deltaic Sediments

Shales, siltstones and sandstones exposed near the mouth of the 1907 railroad tunnel at the end of the bridge contain coaly plant fossils (mainly *Calamites*).

Outcrop B: Cut and fill channels (pictured right)

Numerous small down-cutting channels can be seen around the entrance of the older 1864 tunnel, infilled with a mixture of sandstone and shale.

Outcrop C: Shale dewatering structures (pictured left)

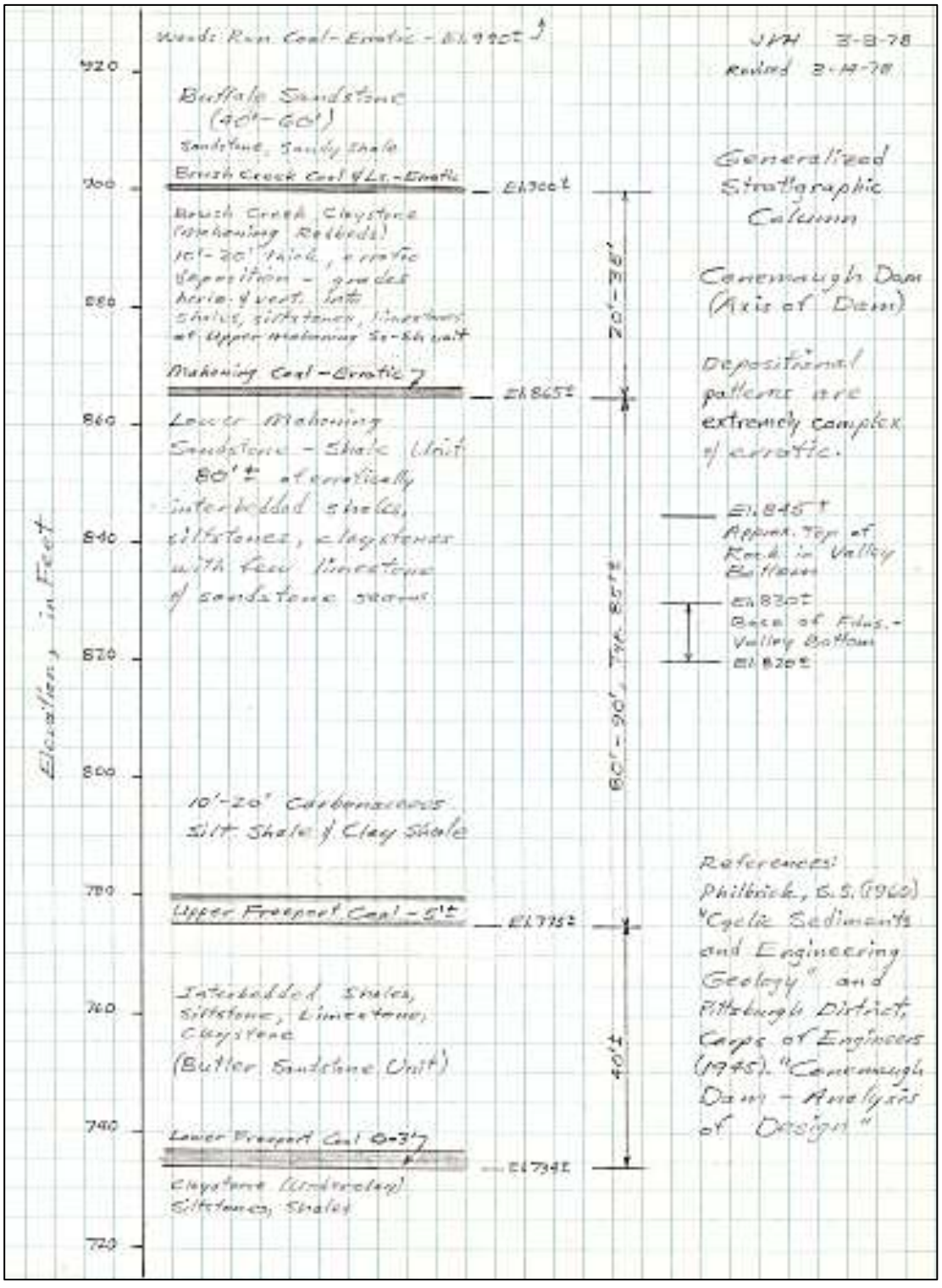
A thick section of shale along the mid-slope of Bow Ridge displays round structures in the clay that may have formed from sudden dewatering events. This unit contains very few interlayered sandstones and therefore may have trapped more interstitial water during burial than adjacent shales.

Outcrop D: Paleosol and coaly layers

Farther up-section, a distinctly reddish horizon may represent the exposure of high-stand sediments during a subsequent glacial low-stand, causing soil horizons to form while river valleys were cutting down through adjacent regions like Saltsburg. These soils were subsequently flooded during post-glacial sea-level rise, creating the dark coaly seam seen above it.

Outcrop E: Capping Sandstone

A massive sandstone layer (probably the upper Saltsburg) caps Bow Ridge, explaining why this exaggerated meander curve stayed elevated as erosion lowered the land around it. The sandstone can be seen behind trees where the West Penn Trail zig-zags near the top. An excellent bedding surface with sedimentary bed marks exposed on it can be seen at the top of the ridge, where the West Penn Trail leaves the Disabled Hunter's Access Road.



Stratigraphy of the lower Glenshaw Formation deposits below Conemaugh Dam and Bow Ridge (1978) provided courtesy of James Hamel. The stratigraphic interpretation shown here was based on work done in the 1930's and 1940's by Shailer Philbrick, one of the founders of the Pittsburgh Geological Society.

REFERENCES

Greb, S.F., Pashin, J.C., Martino, R.L., and Eble, C.F., 2008, Appalachian sedimentary cycles during the Pennsylvanian: Changing influences of sea level, climate, and tectonics, in Fielding, C.R., Frank, T.D., and Isbell, J.L., eds., Resolving the Late Paleozoic Ice Age in Time and Space: Geological Society of America Special Paper 441, p. 235–248, doi: 10.1130/2008.2441(16).

Martino, R. L., 2004, Sequence stratigraphy of the Glenshaw Formation (middle– late Pennsylvanian) in the central Appalachian basin, in J. C. Pashin and R. A. Gastaldo, eds., Sequence stratigraphy, paleoclimate, and tectonics of coal-bearing strata: AAPG Studies in Geology 51, p. 1–28.

Richardson, G.B., 1932, Geology and Coal, Oil, and Gas Resources of the New Kensington Quadrangle, Pennsylvania. USGS Bulletin No. 829, 102 pp.

Shultz, Charles and Harper, John A., 2000, Stop 8, Bakerstown Station railroad cut, in Harper, J. A., ed., Pittsburgh at the millennium—the impact of geoscience on a changing metropolitan area: Annual Field Conference of Pennsylvania Geologists, 65th, Pittsburgh, Pa., Guidebook, p. 125–130.

Stone, Ralph, 1905, Mineral Resources of the Elder's Ridge Quadrangle, Pennsylvania. USGS Bulletin No. 256, 112 pp.

NOTES

ROAD LOG

Mile	Stop Location or Travel Directions
0.0	Depart from Shop and Save Plaza, Murrysville PA, heading east on Route 22 toward Delmont
5.5	Take right exit ramp for Route 66 North. Continue north on Route 66 for five miles.
10.9	Exit right from Route 66 onto Mamont Drive, opposite Donal Plaza.
11.8	Turn right from Mamont Drive onto Route 286 East.
13.8	Cross over Beaver Run Reservoir.
18.0	Merge with Route 380 just west of Saltsburg. Continue east on Route 286.
19.5	Turn right into the entrance of The Kiski School. Continue on the main school road past the baseball field to an access road on the left, where the bus will leave Passenger Group One. Remaining passengers will go directly to the Rebecca Haddon Museum.
Stop One: Type Locality of the Saltsburg Sandstone Participants will examine the lithology and bedding of this unit at its type locality by descending the metal staircase along the waterfall that occurs at this cliff exposure. *Note: permission must be obtained from The Kiski School to enter the school grounds and descend the waterfall stairs.*	
19.9	From the Kiski School, turn right and continue on Route 286 east to the bottom of the hill. Turn left onto the Saltsburg Bridge / Washington Street (note – opposing traffic has a stop sign).
20.0	At the end of the bridge, turn right onto Water Street before the Fueland BP gas station. Continue one block to Point Street. Turn right and park near the old mill building. Passenger Group Two will disembark here to visit the Rebecca Haddon Stone House Museum before Canal Park.
Stop Two: Rebecca Haddon Stone House Museum and Saltsburg Canal Park After walking down the waterfall stairs, Passenger Group One will walk across the Saltsburg Bridge/ Washington Street and turn left on Old Canal Way to examine the remains of the Pennsylvania Canal and Lock while Passenger Group Two visits the museum**. COFFEE BREAK.** Later, the groups will alternate activities – Passenger Group One will visit the museum exhibits while Passenger Group Two walks down the Canal Park to the lock. (Our bus will use this time to turn around.)	
20.1	Turn left on Water Street and continue until it ends near the Saltsburg Water Treatment Plant. All passengers will disembark here to walk to the outcrop. (Our bus will use this time to turn around.)
Stop Three: Glenshaw Formation along the West Penn Trail Excellent exposures of channel sandstones, cut-and-fill structures and numerous cross-beds can be seen along the former path of the Pennsylvania Canal west of Saltsburg. At a higher level along the trail, stone walls show where the rail line was once elevated to fit along the slope when the canal was in use. The canal right-of-way was later converted to a rail line, which has since been converted to the West Penn Trail.	
20.6	Return down Water Street to Washington Street.
21.0	Turn left onto Washington Street/Saltsburg Bridge.
21.1	Turn left onto Route 981 South
21.2	The erosional basal contact of the Saltsburg sandstone can be seen exposed along the Loyalhanna Creek to the right of Route 981. Continue south on Route 981 for another three miles.
24.2	Turn left at Marshall's Market onto Tunnelton Road. Continue for two miles.
26.1	Turn left onto the Tunnelton Bridge and continue north on Tunnelton Road

27.0	Turn right on Auen Road
27.7	Entrance to the US Army Corps of Engineers Conemaugh River Lake Dam on the right.
28.1	Bear right into parking lot to the Social Hall park pavilion. **LUNCH BREAK**
Stop Four: Tour of Conemaugh River Lake Dam USACE Park Ranger Mark Keppler will guide those with clearances on a tour of the flood-control dam facility while those who chose not to apply for clearance will hear a presentation on the history and geology of the Pennsylvania Canal in Southern Indiana County by KR Cercone. All participants will have access to the park's Visitor Center exhibits following these parallel activities.	
28.2	Continue on park access road to Tunnelview Historic Site.
28.6	A preserved section of the canal has been maintained near the Tunnelview Historic Site by the Indiana County Parks and Recreation Commission. This is also an access point for boaters.
28.8	Disabled Hunters Parking Area. All passengers will disembark here to walk up this trail, while our bus returns to the Tunneview Historic Site to wait for us.
Stop Five: Upper Bakerstown Deposits Along Bow Ridge Participants will view fluvial channels, coaly intervals with plant fossils, paleosols, dewatering structures and sedimentary bedmarks as they walk upward through the deposits of the Upper Bakerstown Interval. (Note: Those who wish may return to the bus and the rest facilities at Tunnelview Historic Site at any point.)	
29.9	Return to the park exit, turn left onto Auen Road
30.6	Turn left on Tunnelton Road. Continue across bridge.
31.5	Bear left after bridge onto Pump Station Road. Continue on Pump Station Road for two miles.
33.7	Turn left onto Route 981 South. Continue on Route 981 for four miles to New Alexandria.
36.8	Turn right onto Route 22 West. Continue West on Route 22 to Murrysville Shop and Save lot.