

= Mahanoy Creek =

Mahanoy Creek is a 51 @. @ 6 @-@ mile @-@ long (83 @. @ 0 km) tributary of the Susquehanna River in Northumberland and Schuylkill counties , Pennsylvania . There are at least 35 sources of acid mine drainage in the creek 's watershed . Anthracite was mined in the upper part of the Mahanoy Creek watershed in the 19th and 20th centuries . Mahanoy Creek 's tributaries include Schwaben Creek , Zerbe Run , Little Mahanoy Creek , Shenandoah Creek , and North Mahanoy Creek . Little Mahanoy Creek and Schwaben Creek are two streams in the watershed that are unaffected by acid mine drainage . Schwaben Creek has a higher number and diversity of fish species than the main stem .

There are two passive treatment systems in the Mahanoy Creek watershed by the Mahanoy Creek Watershed Association . Coal mining has been done in the watershed since the 19th century and continues to some extent in the 21st century . The watershed is in the Western Middle Anthracite Coal Field .

= = Course = =

Mahanoy Creek 's source is in strip mines in the eastern part of Schuylkill County , near Buck Mountain . It heads west for a short distance before crossing under Pennsylvania Route 54 and entering Mahanoy City , where it picks up the tributary North Mahanoy Creek . Mahanoy Creek continues westward , heading into Mahanoy Township again , and goes through more strip mines . It begins paralleling Bear Ridge for several miles , passing the communities of St. Nicholas and Boston Run before entering Gilberton . In Gilberton , the creek passes under Pennsylvania Route 924 and goes through by the former Mahanoy Plane . Upon leaving Mahanoy Township , the creek enters Butler Township . Soon after entering this township , the creek passes through Girardville , picking up Shenandoah Creek . It parallels Pennsylvania Route 54 for some distance into Ashland . Upon leaving Ashland , the creek stops paralleling Pennsylvania Route 54 and turns south through a gap in Ashland Mountain , leaving behind the strip mines . At Gordon , it picks up Little Mahanoy Creek and then turns west again , meandering out of Butler Township . The creek then briefly meanders through Barry Township before passing into Eldred Township . It flows on the northern side of a mountain in Weiser State Forest . Upon leaving Eldred Township , the creek enters Northumberland County .

Mahanoy Creek enters Northumberland County in East Cameron Township . It flows westward for a number of miles through a valley with Line Mountain to the south and Mahanoy Mountain to the north . The creek passes under Pennsylvania Route 125 in this valley . The creek passes into West Cameron Township , flowing west and goes through the township for several miles . It then flows into Little Mahanoy Township . After a short distance , it leaves behind the Line Mountain / Mahanoy Mountain valley and picks up Zerbe Run . Mahanoy Creek then turns southwest and passes by Dornsife before cutting through a gap between Little Mountain and Line Mountain and exiting Little Mahanoy Township . At this point , the creek enters Jackson Township and picks up Schwaben Creek , its last tributary , after some distance . Mahanoy Creek then meanders west to its mouth on the Susquehanna River north of Herndon and ten miles south of Sunbury .

= = = Tributaries = = =

Mahanoy Creek 's tributaries include Little Mahanoy Creek , Schwaben Creek , Shenandoah Creek , Waste House Run , North Mahanoy Creek , and Zerbe Run . There are also several unofficially named tributaries with local names , such as " Big Run " and " Big Mine Run " . Only Schwaben Creek and Little Mahanoy Creek are unaffected by acid mine drainage .

North Mahanoy Creek starts in unpolluted springs on Locust Mountain and meets the main stem in Mahanoy City . There are strip mines in this tributary 's watershed . Shenandoah Creek , whose tributaries include Kehley Run and Lost Creek , also begins on Locust Mountain and its watershed has an area of 11 @. @ 6 square miles . Shenandoah Creek is contaminated by sewage and mine

drainage . The tributary Little Mahanoy Creek starts in Frackville and its watershed has an area of 11 @. @ 6 square miles . No mining has been done in this watershed .

= = Hydrology = =

There are large quantities of dissolved iron and aluminum in the waters of Mahanoy Creek . Additionally , there are trace amounts of various metals , including cobalt , nickel , copper , zinc , and lead , sulfates , manganese , and beryllium . There are traces of numerous other metals in the waters , but their concentrations conform to drinking water standards .

Out of the 35 or more acid mine drainage sources in the Mahanoy Creek watershed , the four most significant ones are the Locust Gap Tunnel , the Packer # 5 Breach , the Packer # 5 Borehole , and the Girard Mine seepage . The 15 most significant sources have discharges of between 29 @. @ 200 liters per minute and 680 liters per minute . The pHs of the sources range from 3 @. @ 9 to 6 @. @ 7 . The iron concentrations at these sites ranges from 2 @. @ 1 to 18 milligrams per liter . The concentrations of manganese ranges from 0 @. @ 95 to 6 @. @ 4 milligrams per liter .

The pH of the stream itself ranges from 3 @. @ 6 to 8 @. @ 4 , while the pH of the abandoned mine drainage ranges from 2 @. @ 9 to 7 @. @ 4 . The concentration of dissolved oxygen in Mahanoy Creek ranges from 2 @. @ 5 to 13 @. @ 1 milligrams per liter , while the concentration in the watershed 's abandoned mine drainage ranges from 0 @. @ 1 to 9 @. @ 7 milligrams per liter . The dissolved iron concentration in the stream ranges from under 0 @. @ 01 milligrams per liter to 6 @. @ 8 milligrams per liter . The dissolved iron concentration in the abandoned mine drainage ranges from 0 @. @ 01 to 33 milligrams per liter . The amount of dissolved aluminum in the creek ranges from 0 @. @ 01 to 8 @. @ 9 milligrams per liter and the concentration in the abandoned mine drainage ranges from under 0 @. @ 01 to 17 milligrams per liter . The dissolved manganese concentration in the stream water ranges from 0 @. @ 01 to 9 @. @ 2 milligrams per liter and in the abandoned mine drainage it ranges from under 0 @. @ 01 to 9 @. @ 7 milligrams per liter .

The concentration of dissolved sulfates in the waters of Mahanoy Creek ranges from 4 to 597 milligrams per liter . In the abandoned mine drainage in the creek 's watershed , it ranges from 18 to 787 milligrams per liter . The dissolved nitrates concentration in the stream waters ranges from less than 0 @. @ 01 to 6 milligrams per liter . The concentration in the abandoned mine drainage ranges from less than 0 @. @ 01 to 0 @. @ 4 milligrams per liter . In the stream water , the concentration of dissolved phosphorus ranges from less than 0 @. @ 01 to 0 @. @ 3 milligrams per liter . In the abandoned mine drainage , the range is 0 to 139 milligrams per liter .

The concentration of arsenic is above 0 @. @ 2 micrograms per liter at most sites in the Mahanoy Creek watershed . The maximum concentration is 7 micrograms per liter . The concentration of barium is above 10 micrograms per liter at all sites in the watershed , and the maximum concentration is 75 micrograms per liter . The beryllium concentration is above 0 @. @ 05 micrograms per liter at most sites in the watershed , and in some places is as high as 16 micrograms per liter . The cadmium concentration is above 0 @. @ 02 micrograms per liter in most sites and can be up to 4 micrograms per liter . The maximum chromium concentration is 9 micrograms per liter . Most sites have a concentration of at least 0 @. @ 02 micrograms per liter of cobalt , with a maximum concentration of 530 micrograms per liter . Most sites have a concentration of at least 0 @. @ 5 micrograms per liter of copper , with a maximum concentration of 150 micrograms per liter . The lead concentration is above 0 @. @ 05 micrograms per liter in most sites and can be up to 6 @. @ 4 micrograms per liter .

The maximum nickel concentration in Mahanoy Creek is 895 micrograms per liter and the maximum silver concentration is 0 @. @ 9 micrograms per liter . The concentration of thallium does not exceed 0 @. @ 02 micrograms per liter and the concentration of vanadium does not exceed 1 microgram per liter . The maximum concentration of zinc is 3 @. @ 2 milligrams per liter .

Some water from the Shamokin Creek watershed enters the Mahanoy Creek watershed via various mine tunnels , mainly the Douthettville , Helfenstein , the Locust Gap , and the Centralia Mine discharges . Water from Mahanoy Creek also flows through mine tunnels into Shamokin Creek . The discharge of the creek at various locations ranges from 0 to 320 cubic feet per second . The

discharge of acid mine drainage in the creek ranges from 0 to 17 @. @ 2 cubic feet per second . In 2001 , the discharge was typically found to be higher in March than in August .

While there are sewage @-@ treatment plants in the larger communities in the Mahanoy Creek watershed , there are also leaky sewage disposal systems that discharge sewage into the stream 's tributaries . The creek experiences atmospheric disposition , a type of runoff .

= = Geology and geography = =

The watershed of Mahanoy Creek is in the Ridge and Valley Appalachians . The lower part of the creek 's watershed is in the Northern Shale Valleys and Slopes Ecoregion . The Mahanoy Creek watershed is part of a synclinorium that runs from the northeast to the southwest , running between Hunter and Shenandoah . Rock formations in the watershed include the Pottsville Group and the Llewellyn Formation . These are found on the northern side of the creek 's valley .

There are 24 coal beds from the Pennsylvanian subperiod , which are part of the Llewellyn Formation and the Pottsville Formation . The coal beds are 0 @. @ 6 feet (0 @. @ 18 m) to 8 @. @ 3 feet (2 @. @ 5 m) thick . Mining of these coal beds has been done at depths of over 2 @, @ 500 feet (760 m) underground . There are significant silt deposits on the creek downstream of Ashland . In the watershed , there are a number of close @-@ to @-@ parallel ridges and valleys . These tend to be oriented in the same direction as the creek itself , east to west . The highest elevation in the Mahanoy Creek watershed is 2 @, @ 090 feet (640 m) above sea level in the eastern part of the watershed , not far from Delano . The lowest elevation in the watershed is 420 feet (130 m) at the mouth . The elevations of the ridges tend to be between 1 @, @ 400 feet (430 m) and 1 @, @ 800 feet (550 m) above sea level , while the valleys are between 600 feet (180 m) and 800 feet (240 m) lower .

The stream bed of Mahanoy Creek has an iron crust near Girardville , but some fish live in that area .

Minerals in the acid mine drainage areas of the Mahanoy Creek watershed include goethite , ferrihydrite , schwertmannite , amorphous aluminum @-@ hydroxysulfates , quartz , muscovite , kaolinite , and gypsum . Red shale of the Mauch Chunk Formation is found in a substantial part of the watershed . The main rock types in the watershed are interbedded sedimentary rock , which occupies 70 percent of the watershed , and sandstone , which occupies 30 percent .

A number of seeps , boreholes , and mine tunnels contribute water to Mahanoy Creek throughout large sections of the watershed . Mined areas in the upper part of the watershed have been said to " resemble a moonscape " . There are numerous large spoil piles in the upper one @-@ third of the watershed . Some buildings the Mahanoy Creek valley are damaged by subsidence due to underground mining .

= = Watershed = =

The area of Mahanoy Creek 's watershed is 157 square miles (407 square kilometers) . The watershed is in Schuylkill , Northumberland , and Columbia County . 42 square miles (109 square kilometers) are located in the Western Middle Anthracite Field . There are at least 35 sources of acid mine drainage in the watershed . The watershed has a population of close to 45 @, @ 000 people as of July 2009 . A tract of land in the Mahanoy Creek watershed has been converted by the Mahanoy Creek Watershed Association into a wetland known as " The Swamp " . It serves as a passive treatment system . This organization has also performed cleanups of the creek at Ashland , Girardville , and Helfenstein . The main stem of the creek is divided into several basins . One basin is the Upper Basin , which is drained by Mahanoy Creek and its tributaries upstream of Shenandoah Creek . It has an area of 21 @. @ 8 square miles . Another basin is the Ashland Basin , which is drained by Mahanoy Creek and its tributaries between Shenandoah Creek and Big Run , not including the Little Mahanoy Creek watershed . The Ashland basin has an area of 17 @. @ 7 square miles . The next basin downstream is the Middle Basin , which drains the area where the creek flows between Mahanoy Mountain and Line Mountain , ending at Zerbe Run . This basin has an area of

38 @. @ 7 square miles . The final basin of Mahanoy Creek is the Lower Basin , which is drained by Mahanoy Creek downstream of Zerbe Run . This basin has an area of 42 @. @ 7 square miles .

The Mahanoy Creek watershed is 66 percent forested land , 21 percent agricultural land , 9 percent barren mined land , and 4 percent developed land . However , the upper part of Mahanoy Creek is 50 percent forested land , 44 percent mined land , 5 percent developed land , and less than 1 percent agricultural land . There are six boroughs in the upper part of the watershed . There are a total of 28 municipalities in the watershed .

The eastern edge of the Mahanoy Creek watershed is marked by Locust Mountain and Vulcan Hill . The southern edge is formed by Broad Mountain , Fisher Ridge , and Line Mountain . The northern edge is formed by Little Mountain , Locust Mountain , and Mahanoy Mountain . The drainage system of the watershed is a trellis pattern , a dendritic pattern , or an angular drainage pattern .

The streams in the Mahanoy Creek watershed tend to meander relatively little , but the main creek meanders somewhat between Gordon and Lavelle and near its mouth .

Mahanoy Creek 's headwaters are close to the edge of the Susquehanna River watershed , near the Schuylkill River watershed .

= = History = =

= = = Early history and naming = = =

Mahanoy Creek 's name comes from a corruption of the Delaware Indian word " mahoni " or " maghonioy " . The former word means " lick " . The area was owned by the Iroquois before European settlers arrived . The community of Mahanoy City is named after Mahanoy Creek .

= = = Modern history = = =

Nathan Beach and several other people filed an application for 34 lots at the headwaters of Mahanoy Creek in 1794 .

The Danville and Pottsville Railroad had a terminus in Girardville , a community of Mahanoy Creek , by 1834 . The Mahanoy Creek Navigation Company formed on March 22 , 1827 . The Mahanoy Creek Canal ran from the Susquehanna River to the coal mines in the upper part of Mahanoy Creek . A canal running from Chester County and Lancaster County to Pittsburgh with a course going through Mahanoy Creek was planned by 1832 .

In the late 19th century , a company piped waste from the production of illuminating gas (for gas lighting) into Mahanoy Creek . In Gilberton , Mahanoy Creek used to be underground , but surfaced before 1940 .

Anthracite was mined in the upper part of the Mahanoy Creek watershed from 1840 until 1950 . However , farming was also done in the western part of the watershed in the early 20th century . Most of the deep mines ceased operation by 1960 . Surface mines instead continued mining operations in the watershed . A total of 12 million short tons of anthracite were mined in the creek 's watershed in 1917 . This was 12 % of the anthracite yield of the state of Pennsylvania in that year . In the 1910s , there were 40 washeries and collieries that drained into the creek . Large amounts of culm also flowed into it during this time . The layer of coal silt on the banks of the creek was 40 feet (12 m) by 1940 . Several mines remain active in the 21st century , but they mostly reprocess coal waste .

At least one covered bridge crosses Mahanoy Creek . It is called the Mahanoy Creek Bridge . It was built in 1940 in Northumberland County and is 152 @. @ 9 feet (46 @. @ 6 m) in length . Two passive treatment systems have been installed in the creek 's watershed by the Mahanoy Creek Watershed Association . They are the Mahanoy Creek Aerobic Wetlands , which were created in 2000 ; and the Bolich Property Wetlands , which were created in 2006 .

= = Biology = =

In the fall of 2000 , twelve species of fish were observed during electrofishing . They included black @-@ nosed dace , northern hog-nosed suckers , shiners , small @-@ mouthed bass , and rock bass .

An October 2001 survey of Mahanoy Creek identified two species of fish each at Ashland and Girardville . There were 20 individuals at the latter location and 22 at the former . There were also 13 species and 134 individuals at Gowen City , and 14 species and 545 individuals at the creek 's mouth . Additionally , 1003 individuals and 20 species of fish were observed at the mouth of the tributary Schwaben Creek . White Suckers were found at each of the aforementioned sites . Other fish species found on Mahanoy Creek and Schwaben Creek include the swallowtail shiner , the rosyface shiner , the river chub , the banded darter , and the shield darter . Brown trout , longnose dace , and blacknose dace have also been observed in the watershed . Historically , deer came to the creek to consume salt .

There are second @-@ growth forests near Kehly Run , a tributary of Mahanoy Creek .

= = Recreation = =

The Pennsylvania State Game Land Number 84 is located immediately south of Mahanoy Creek between Helfenstein and Dornsife . The Sen. James J. Rhoades Nature Trail is a walking trail along the creek in Barry Township . It was dedicated to James J. Rhoades on May 8 , 2010 . Catch and release fishing of smallmouth bass and largemouth bass is permitted on the creek .