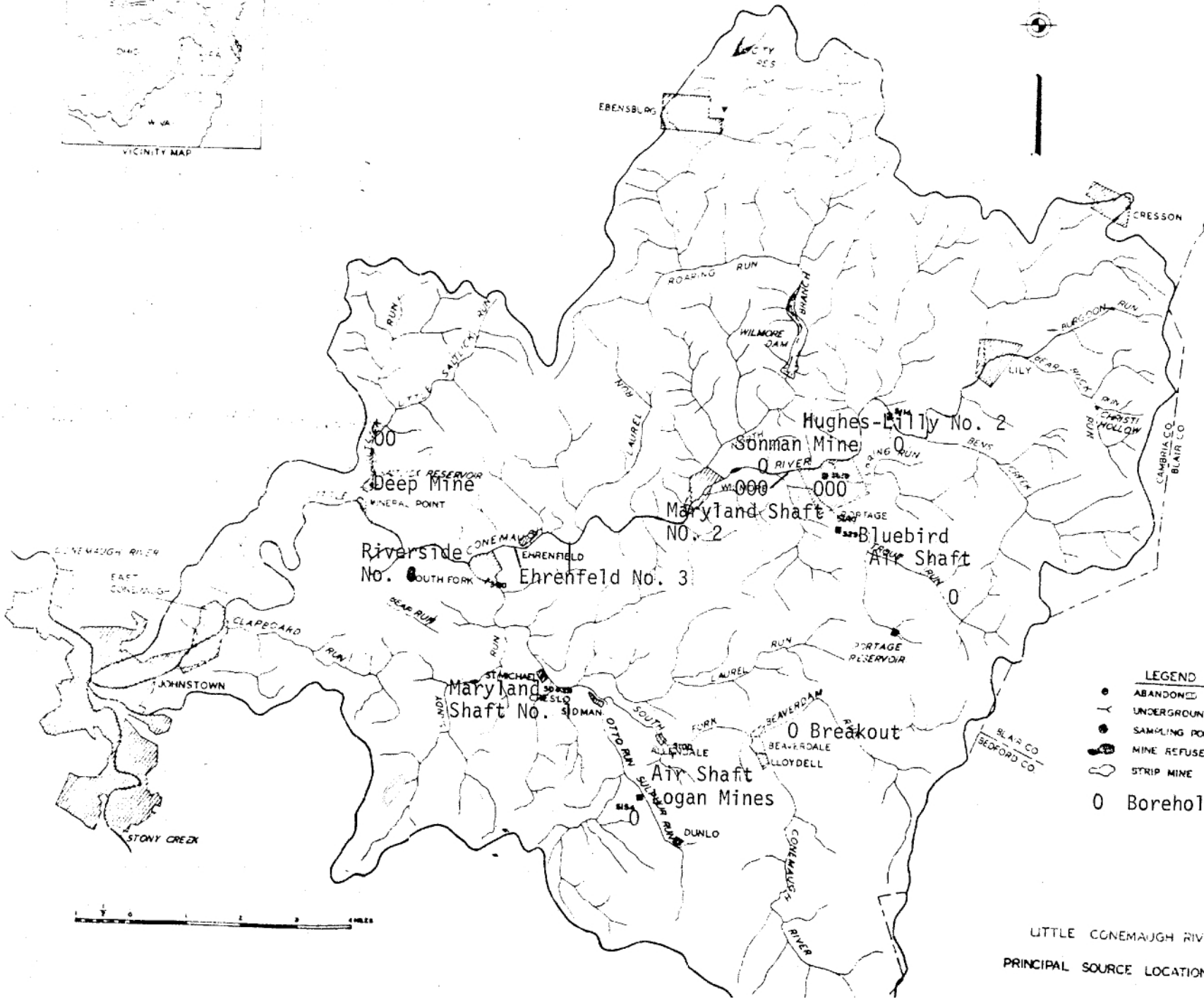


INTERIM REPORT FOR
LITTLE CONEMAUGH RIVER WATERSHED
SCARLIFT NO. 164-1
December 1974

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Somerset, Pennsylvania



- LEGEND**
- ABANDONED GAS WELL
 - UNDERGROUND MINE
 - SAMPLING POINT LOCATION
 - ⊖ MINE REFUSE
 - ⊖ STRIP MINE
 - Borehole



LITTLE CONEMAUGH RIVER
PRINCIPAL SOURCE LOCATION MAP

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SUMMARY AND CONCLUSIONS

The Little Conemaugh River drains an area of 188 square miles in Cambria County. The entire length of the main stem between the headwaters near Cresson and the city of Johnstown is polluted by Acid Mine Drainage (AMD) from bituminous coal mining related activities present and past.

A total of 120 sampling and measuring stations were established to monitor the AMD discharges from approximately 1500 acres of surface mined areas that are the result of 35 strip mines.

Other mining-related operations include: 227 deep mines, 8 slopes, 15 drifts, 7 shafts, and 12 boreholes, according to official documentation. Discharges from the coal mine sources ranged from 1 to 3956 gallons per minute (gpm) and totaled more than 23 million gallons per day (mgd). The total net acid load discharged by 15 major sources was 49,700 pounds per day (ppd), and did not include several major flows from the St. Michael Shaft area (Maryland Shaft No. 1-Berwind White Co.). The total iron load from these 15 major sources was 11,200 ppd. Total acid load from all sources was 452,605 ppd, and total iron 70,965 ppd.

During this survey there are only two active discharging deep mines in the Little Conemaugh River Watershed. Both mines are operated by Bethlehem Mines Corporation. Brookdale No. 77 is a slope, and Mine No. 38 is a drift, which was formerly Ehrenfeld No. 8 operated by Pennsylvania Coal and Coke Corporation. Mine No. 38 is being mined toward Bethlehem's Mine No. 31 in Nanty Glo, and after both mines are connected the coal will be hauled out of the mines at Mine No. 31. All of these deep mines are treating their mine water and there are plans for a larger

and more efficient treatment plant to be constructed at Mine No. 38.

Abandoned deep mines were the major source of AMD being discharged to the Little Conemaugh River Watershed. This includes drifts, slopes, boreholes, airways, breakouts and seepage. Other mine-related operations, such as old strip mines --open or backfilled-- and coal refuse piles contributed AMD with high chemical content, but usually had low flows. The deep mines contributed over 95 percent of the acid load for the entire basin.

A total of 20 principal sources have been located in the study area. These sources include shafts, drifts, boreholes and break-outs. These sources contributed a total net acid load of 45,850 ppd. This represents about 10 percent of the total acid load discharged from all sources.

DESCRIPTION OF AREA

The Little Conemaugh River rises south and west of Cresson, Pennsylvania, in Cambria County. The river flows generally southwest through the communities of Lilly, Portage, Cassandra, Wilmore, Summerhill, Ehrenfeld, South Fork, Mineral Point, and East Conemaugh, and joins Stony Creek at the Point in the city of Johnstown to form the Conemaugh River. The principal tributaries to the Little Conemaugh River are the North Branch, South Fork, and Saltlick. The North Branch and all other streams in this area are clean. Saltlick and all other streams in this area are clean except for two boreholes at the head of Saltlick Reservoir, which were drilled to prevent AMD pollution to the reservoir from old Ehrenfeld Mine No. 3. The AMD from these boreholes bypasses the reservoir by way of a diversion ditch on the eastern side of the reservoir, and as the ditch approaches the terminus of the spillway it picks up an AMD from two old deep mines. These AMD discharges are all that were found on the Saltlick Branch.

Coal mining operations were extensive in all areas of the watershed southeast of and along the main stem. The "B" seam, or Lower Kittanning, coal has all been extracted and presently it appears there will be no further mining of

this coal except for that which is situated in the lowest part of the Wilmore Basin. This seems improbable because of the vast quantity of water that has inundated the area.

All of the major AMD discharges are concentrated along the South Fork Branch and main stem from mining operations located in Portage, Bens Creek, Martindale, Lilly, Beaverdale, Allendale, Dunlo, South Fork Borough, Ehrenfeld, Summerhill, Jamestown, St. Michael, and Sonman. The South Fork Branch drains 62 miles of the total square mile drainage area of the Little Conemaugh River Watershed.

STREAM WATER QUALITY

The headwaters area of the Little Conemaugh River appear to be little affected by AMD downstream to the community of Lilly. This is probably due to the discharge from the Cresson Sewage Treatment Plant located on one of the headwaters' tributaries. Although there are several AMD discharges upstream from Lilly, the acidity and alkalinity are in close balance. This condition persists along the main stem to a point between Jamestown downstream and Cassandra upstream, where a borehole from Hughes No. 2 mine discharges .936 mgd of AMD and 4687 ppd of acidity, and it appears that Bear Rock Run and Burgoon Run have little pollutional effect on the main stem up to this point. Downstream from this borehole, Trout Run and the numerous discharges from the Sonman Mine degrade and pollute the main stem more than at any other point in the entire study area. The Sonman Mine is completely inundated to the extent that there were 7 artesian flows and an additional borehole drilled to relieve the hydraulic pressure and drain super-saturated areas, especially in the area of Pennsylvania Route 53 near the low end of Portage, where many places of business are located. AMD can be seen flowing by gravity and also being pumped from these business places most of the time.

Below the community of South Fork the water quality does not improve because of the conditions that exist near the Saltlick Reservoir and downstream opposite Brookdale No. 77 where there are numerous country bank mines that discharge large volumes of AMD.

SOURCES OF MINE DRAINAGE

Officially there are approximately 290 mining-related sites that include about 1500 acres of surface-mined areas which have been explored to date. Samples have been collected for 205 sources, of which 80 have been tentatively eliminated because initial analysis indicate a good or borderline quality of water. Many of the sources sampled have had intermittent flows, but require further investigation. It is anticipated that because of the erratic nature of the study area there will be additional AMD discharges located as the study progresses. The total net acid load discharged to the Little Conemaugh River was found to be over 226 tons, and 36 total tons of iron.

LITTLE CONEMAUGH RIVER, ABOVE SOUTH FORK

Headwaters Area

Several old coal mining operations were located along the short reach of the main stem Little Conemaugh River between the headwater community of Cresson and the downstream community of Lilly.

The acid load produced in this area averaged 150 ppd.

Burgoon Run, Bear Rock Run

There were no AMD discharges located in the Burgoon Run area, although there are many small mines and mine openings situated in this area.

The most significant source of abandoned AMD discharge in the Bear Rock Drainage area resulted from a strip mine. At this surface mine, which was partially backfilled, some water had accumulated and was flowing to Bear Rock Run. The acid load in this water amounted to about 40 ppd. Analysis of Bear Rock Run at Lilly indicates an excess of alkalinity over acidity.

Little Conemaugh River

Several AMD discharges from abandoned deep mines were located along this main stem of Little Conemaugh River below the community of Lilly, near what is known as Plane Bank. Acidity contributed by these sources amounted to about 150 ppd.

A number of borehole discharges were located discharging AMD to the main stem in the general vicinity of Portage. The first of these was upstream of Portage, near the village of Jamestown, and was discharging 4687 ppd of acid and 906 ppd of iron. This discharge was from the W. H. Hughes and Co. - Lilly No. 2 Mine.

Two boreholes and an air shaft were discharging AMD from the Sonman Mine "D" and "E" seams (lower and upper Freeport seams). These discharges were located at the Portage Cleaners property. The acid load from these sources was 1420 ppd and 175 ppd total iron.

A borehole that had an intermittent discharge was located near a scrapyard on the North side of Pennsylvania Route 53. When flowing this produced an acid load of 132 ppd.

Almost directly across Pennsylvania Route 53 from the intermittent borehole discharge were two additional borehole discharges located along the North bank of the river near the Portage Sewage Treatment Plant. The AMD comes to the surface from the Sonman Mine upper and lower Freeport seams of coal by way of a cased 8-inch power hole and a 12-inch borehole at an elevation of 1600 msl. The 12-inch borehole was originally used to dewater the mine when it was operating. The acid load from these boreholes was 23,770 ppd with 3,700 ppd of total iron. A new 36-inch borehole was drilled near these two boreholes by The Pennsylvania Department of Environmental Resources (DER) to relieve the super-saturated condition affecting homes and business places about one mile upstream. The new 36-inch borehole was to be cased to 24 inches and was drilled to a depth of 489 feet, but some difficulties have developed and it appears that this hole is partially blocked. At this point the coal dips toward the Wilmore basin at 8%.

All of the borehole discharges mentioned above are draining from the abandoned Sonman Mine. The W. H. Hughes and Co.- Lilly No. 2 Mine and the Shoemaker Coal Mining Co.-Wilmore No. 3 Mine, in the upper Freeport seam, are cut into the Sonman Mine. There was no discharge from Sonman slope because it is located at the highest

elevation of the mine.

Bens Creek

Five AMD discharges were located on this large tributary that joins main stem at Cassandra. Four of the discharges are from strip mines and one from an old slumped drift opening. Most of the AMD discharges are intermittent. The flow from the drift mine, about 14,000 gpd, produces about 75 ppd of acid. Flow from the strip mine, about 7,000 gpd, produces about 1 ppd of acid.

Bens Creek, above the confluence with main stem, contains about 502 ppd of acid, and shows no iron.

Spring Run

This small tributary drains an area northeast of the community of Portage. The three AMD discharges located are intermittent.

The deep mine, with a flow of 155,520 gpd, produces about 400 ppd of acid, and 0.3 ppd of iron. Spring Run, above the confluence with main stem at Portage, with flows of 12.7 to 38 mgd, contains 16,300 to 73,000 ppd of acidity. The main stem of Little Conemaugh River, upstream from the community of Portage, and Spring Run with flows of 20.6 to 60.5 mgd, contains as much as 43,845 ppd of acidity, as little as 6,051 ppd of iron, and 33,026 ppd of alkalinity.

Trout Run

This stream rises in an area northeast of the community of Portage, and feeds the Portage Reservoir at the headwaters. Below the Portage Reservoir the stream drains a 10 square mile drainage area that has been extensively mined. This area has active strip mines and there are plans for new deep mines in the area by the Harmony Mining Company.

There are several strip mine discharges near the community of Martindale, and although the chemical loading is high the flows are low, producing from 220 to 435 ppd of acidity. There is a drift mine and a borehole at Puritan downstream from Martindale. The flow from the borehole is intermittent and produces about 5 ppd of acidity. The drift mine flow fluctuates between 28,800 and 86,400 gpd.

Downstream and below Miller Shaft there is a flow of 9.8 mgd from Bluebird Air Shaft that contains 4,000 to 16,200 ppd of acidity. There were no discharges located issuing from the old oxidized coal refuse dumps.

North Branch

North Branch, and all the tributaries to North Branch, are clean streams. The Wilmore Dam Reservoir is situated on this stream and is used as an industrial water and, to a small extent, as domestic water at Bethlehem Mines Slope No. 33. This stream is clean until it enters the main stem Little Conemaugh River at Wilmore.

Little Conemaugh River

One of the most extensive coal mine complexes in the entire study area is the Maryland Mines-Shaft No. 1 at St. Michael, and Shaft No. 2 at Wilmore, that were operated by the Berwind-White Corporation. Records indicate that the Lower Freeport and the Lower Kittanning seams of coal were mined out of this complex. Both shafts have been sealed, but the water level has risen to a point where the concrete shaft lining was punctured and a discharge pipe placed about 20 feet below the shaft coping in Maryland Shaft No. 1 at St. Michael. This is a 36-inch corrugated pipe which discharges about 1 mgd. There are several other discharges from this side of the Maryland complex. A 4-inch power hole has an intermittent discharge, and an 8-inch drain pipe of undetermined origin discharges about 0.5 mgd. The flow measured as a total contribution from the Maryland No. 1 complex is 1.9 mgd. Each individual discharge has not been measured to determine flow volume. A coal refuse area has been contributing 5,600 ppm of acidity, the 8-inch drain pipe has 860 ppm of acidity, the power hole has 800 ppm, and the 36-inch drain pipe from the shaft 820 ppm of acidity.

There are a number of discharges in the vicinity of Maryland Shaft No. 2 at Wilmore. The water in this shaft is reported to be 18 feet from the top of the coping. Analysis of the water in this shaft on November 14, 1974, showed a pH of 7.8, acidity 0, alkalinity 175, iron (total) 1.5, and sulfates 79 (all but pH total values in parts per million). An AMD discharge from this area with a flow

of 28,800 gpd contains 300 ppd of acidity. Other discharges from this area, also with flows about 30,000 gpd, contain 300 ppd of acidity.

A series of abandoned drift mines and refuse disposal areas located along the North Bank of the Little Conemaugh River, in the vicinity of Ehrenfeld, have not been completely evaluated because of the intermittent nature of the discharges and because of destruction and vandalism of measuring stations in this area.

The active Ehrenfeld No. 8 Mine, in the Lower Freeport Seam, which is presently being operated by Bethlehem Mines Corporation as Mine No. 38, and previously operated by Pennsylvania Coal and Coke Co., is located in this area and the mine water is being treated.

The old Ehrenfeld No. 3 Mine has been worked out and is now inactive. This mine was in the Lower Kittanning Seam and there are two major discharges from this mine in the area of Ehrenfeld. One of these discharges appears to be a breakout or "break through" mine opening along the railroad tracks with a flow of 475,200 gpd that produces as much as 400 ppd of acidity. The other discharge, located along the railroad tracks below the Mine No. 38 Office, has a flow of 340,000 gpd and produces as much as 2,300 ppd of acidity.

AMD from a deep mine in the Lower Freeport Seam pours off the hillside near the bridge between South Fork and Ehrenfeld Boroughs. This flow varies from 40 to 4,000 gpm, and produces from 106 to 400 ppd of acidity.

A sealed deep mine, which has been tentatively identified as the Riverside Mine, operated by Joe Leonard, has a flow of 576,000 to 864,000 gpd and produces as much as 4,100 ppd of acidity.

SOUTH FORK LITTLE CONEMAUGH RIVER

Headwaters Area

The Lloydell Reservoir is located near the headwaters of the South Fork Little Conemaugh River. Coal mine operations are totally absent in the headwaters area and in the downstream area to the community of Lloydell.

Several deep and strip mines were located on tributaries which drain to the South Fork downstream from the reservoir.

South Fork Little Conemaugh River, Beaverdale to Sidman

A borehole discharge of 432,000 gpd flows to the South Fork in the community of Beaverdale. This produces 4,400 ppd of acidity.

An AMD discharge, which flows out of the base of a coal refuse pile near the borehole discharge originates in a deep mine with a discharge of about 300,000 gpd and produces 1,753 ppd of acidity. This flow appears to be an old deep mine "break out". Information from a registered engineer regarding the borehole discharge indicates this drilled hole was placed to relieve hydraulic pressure and wet basements in this general area.

All evidence of the slope entry has been destroyed. Considerable coal refuse is scattered about this general area.

A discharge was found that had not been previously reported. It was located near the ball field in Beaverdale with a flow from a constructed cement overflow. This could be a sealed mine, although there are no sealed mines indicated for this area. The flow was measured at 360,000 gpd with 600 to 1,000 ppd of acidity. There were at least 5 major flows located that had not been previously reported.

The air shaft discharge at Allendale with a flow of 1,008,000 gpd, produces 2,300 ppd of acidity. This water has been flowing out of an old drift opening which caved in. This discharge is coming from the Logan Mines, of which Nos. 3, 4, 6, 6-1/2, and 8 were located in this area. Seepage from a refuse pile in this area has a flow of 115,200 gpd and produces 387 ppd of acidity.

Otto Run

Otto Run and its principal tributary, Sulphur Creek, flows into the South Fork at Sidman (Lovett Station). All AMD sources were located on Sulphur Creek. Because of the highly polluttional load in Sulphur Creek, Otto Run is also affected by the pollution carry-over from Sulphur Creek.

This flow was measured to be 1.1 mgd and was producing 5,240 ppd of acidity. Elevation of the discharge point is 1900 msl. This flow includes water from Logan Coal Co. - Logan No. 1 - east of Yellow Creek in the Lower Freeport seam of coal; The Mountain Coal Co. - Yellow Creek Mine in the Lower Freeport seam; and the Henrietta Coal Mining Co. - Henrietta No. 2, also in the Lower Freeport seam of coal.

There are no Lower Freeport coal reserves remaining in this area.

At the mouth of Otto Run at Sidman, which is the combined flows of the headwaters of Otto Run and Sulphur Creek, there is a flow of 2.5 mgd and 2,000 ppd of acidity.

South Fork Little Conemaugh River, Sidman to South Fork

Only two other areas of coal mining activity were located on the South Fork between the community of Sidman and the downstream community of South Fork.

The Maryland Shaft No. 1 at St. Michael has a 4-inch concrete cap and discharges to a small unnamed tributary which enters the South Fork near the communities of St. Michael and Creslo. A 36-inch discharge pipe has been connected to a hole cut into the concrete shaft liner and allows the shaft water to discharge to the unnamed tributary. Discharge of AMD from the shaft is about 1 mgd and carries an acid load of 7,176 ppd.

Several discharges were located in the general area of Maryland Shaft No. 2 at Wilmore. Two discharges are suspected to be coming from a deep mine, but the sources have not been located. The first of these has a flow of 15,840 gpd and carries an acid load of 300 ppd. The second AMD has a flow of 26,640 and carries an acid load of 55 ppd. There is a discharge of AMD from a coal refuse area with a flow of 3,250 gpd and carries an acid load of 15 ppd.

There are a number of deep mine and coal refuse disposal areas that are discharging from areas along the south bank of South Fork. These flows vary from 2,500 to 21,600 gpd, with acid loads from 8 ppd to 150 ppd.

Main stem of Little Conemaugh at the Bethlehem Steel river intake and water treatment plant has a flow of 456 mgd and carries an acid load of one million ppd.

No AMD discharges were found in the Bear Run Area. Bear Run flows into, through, and out of an old strip mine cut and the analysis of the water into and out of the strip mine does not show AMD pollution.

Saltlick Run

Saltlick Run drains an area of 11.4 square miles and enters the Little Conemaugh River in the small community of Mineral Point. Two boreholes and two old deep mines discharge AMD to a diversion ditch which bypasses the reservoir on the eastern side and drops the AMD below the reservoir spillway. Flow from the two boreholes is 100,000 gpd, with an acid load of 350 ppd.

Flow from the deep mines varies from 230,900 to 600,000 gpd, and carries an acid load of from 270 to 650 ppd.

Saltlick Reservoir is used as an industrial water for Bethlehem Steel Corporation in Johnstown. This reservoir is located at the lower end of the tributary.

Little Conemaugh River, Mineral Point to Johnstown

An old abandoned deep mine located in the vicinity of Brookdale No. 77 had an AMD flow of 2,000 gpd, and produced about 45 ppd of acidity.

The active Brookdale No. 77 Mine of the Bethlehem Mines Corporation is situated on the north bank of the river just west of the Saltlick Reservoir near the community of Mineral Point. The mine water from this active deep mine (slope) is being treated.

Ten AMD discharges were located across from the Brookdale Mine on the opposite bank of the river. These discharges drain areas that have been deep and strip mined. These flows vary from intermittent flows to 51,120 gpd, with acid loads of 21 to 350 ppd.

Clapboard Run

Clapboard Run joins the Little Conemaugh River approximately 0.3 miles upstream

of the U. S. Stream Gaging Station at East Conemaugh. There are two old deep mines that had been sealed, but are discharging AMD. Flow from one of these mines is 85,000 gpd with an acid load of 13 to 1,120 ppd. The second deep mine has a flow of 26,350 gpd with an acid load of 450 ppd.

Of the total 188 square miles in the study area it is estimated that 120 square miles are affected by AMD pollution.

POLLUTION ABATEMENT

Abandoned deep mines are the principal sources of AMD pollution to the Little Conemaugh River and produced 454,300 ppd of acidity and 70,900 ppd of iron from 18 of the major discharges.

Initial consideration of a mine drainage abatement program in the Little Conemaugh River Study Area would preclude the elimination of those discharges that have been created to relieve hydraulic pressure and super-saturated areas where dwellings or business places are located.

There are about 50 refuse areas, old strip mines, small country bank mines, boreholes and breakouts where the flow of AMD may be controlled or abated.

The 15 major, or 20 principal, sources located during the initial portion of this survey provide an indication as to where the most serious pollutional problems are. Control or abatement of these sources appears to be improbable at this time because plugging or sealing the discharge points would create further inundation of the worked-out deep mines, increase hydraulic pressures with the possibility of disastrous "break-outs", and cause further property damage by flooding in super-saturated surface areas. This had been demonstrated in May, 1973, when the Logan Drift caved in and the 10-inch concrete seal on top of an air shaft was lifted off by the hydraulic pressure of the AMD.

Following is a description of major and principal sources mentioned above:

PRINCIPAL AND MAJOR SOURCES

Maryland Shaft No. 1 at St. Michael

Previous reports show 24 tons of acidity being discharged from this complex per day. Because of the difficulty in placing flow-measuring devices in the discharge points, and vandalism, flows for each of the discharge points have not been established. Instead a stream cross-section had been established on the unnamed run and a flow of 4.7 million gpd carries the combined chemical loading from this complex.

Allendale Air Shaft Discharge from Logan Mines

This discharge is located adjacent to Route 869 near the small community of Allendale. The flow was over one mgd, and carried an acid load of 2,350 ppd. The drift where the AMD was flowing is caved in, and the AMD is now flowing out of an old concrete air shaft into which a drain pipe has been placed several feet from the top.

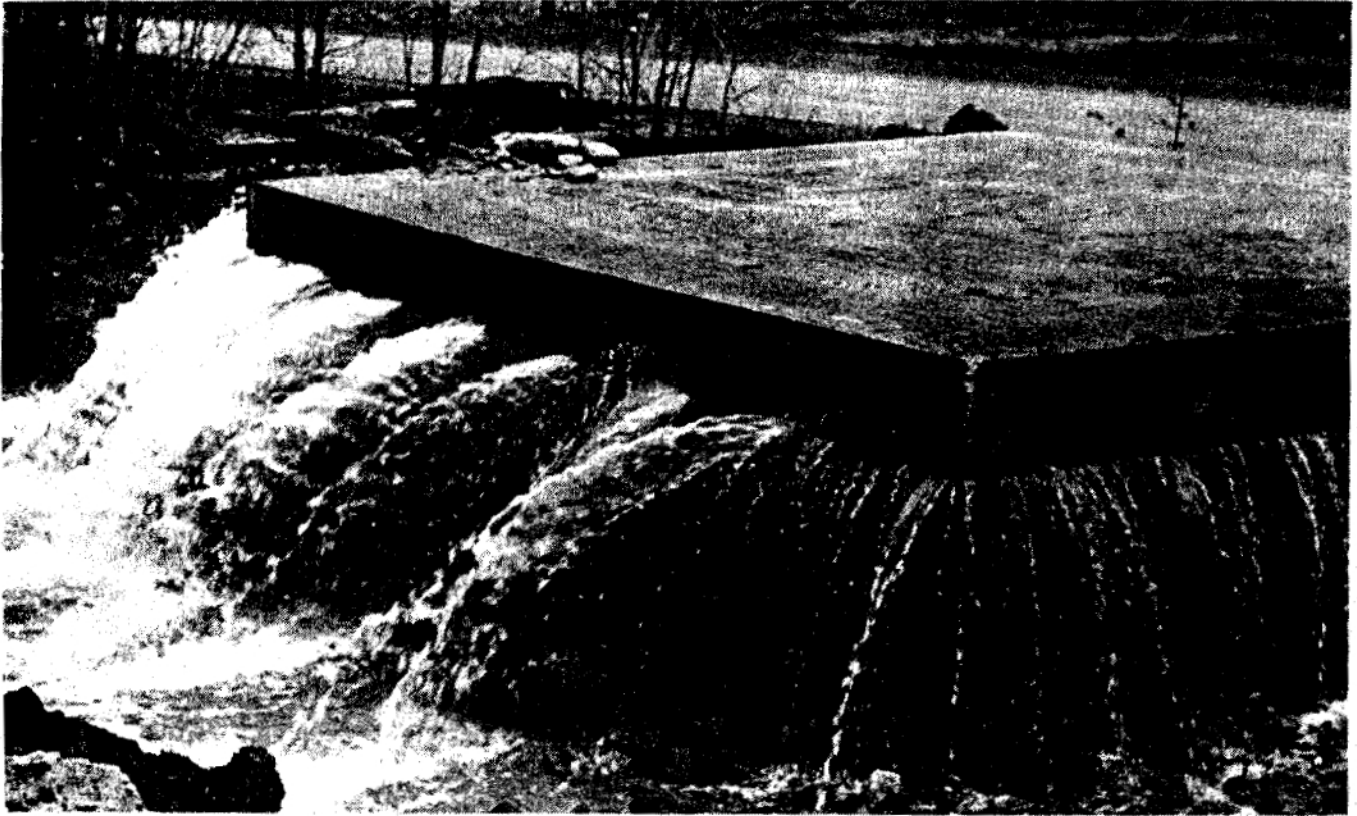
Borehole from Hughes - Lilly No. 2 Mine

The flow from this borehole was over 0.9 mgd and produced 4,687 ppd of acid. This mine is supposed to be connected to the Shoemaker-Wilmore No. 3, and the Sonman Mine Complex.

Two Boreholes From the Sonman Mine Complex

There are two boreholes at this location, one of which is a 12-inch horizontal discharge, the other an 8-inch power hole. An additional borehole was drilled last month because it was felt that the first two were not dewatering problem areas. This borehole was a 36-inch hole to be cased to 24 inches. It appears that this hole has plugged and is producing about 1,500 gpm. Flow from the first two boreholes are 5.7 mgd, and produced as much as 23,800 ppd of acidity.

These boreholes act as a common discharge point for the Sonman Mine, Hughes-Lilly No. 2, and the Shoemaker-Wilmore No. 3 Mine. All three flows are artesian.



Gusher at Old Air Shaft

Water has been gushing from this capped air shaft of an abandoned coal mine of the Johnstown Coal & Coke Co. along Route 869, between Beavertown and Sidman. A joint project has been planned by the Bureau of Mines of the state Department of Environmental Resources (DER) and the Pennsylvania Department of Transportation to alleviate the problem. The project is to be started within a few days. The mine water previously had flowed from a drift farther down the road, but subsidence apparently blocked that route and caused the water to

come up the old shaft. Plans call for tapping the shaft several feet underground and providing a course for the shaft to flow to a culvert and then into the Little Conemaugh River. Ground around the shaft is stained a deep orange, and a DER spokesman said the water was acid drainage. The immediate problem, he said, was to keep the water from causing road damage and also to carry out a planned road improvement in the area. He said the mine-acid problem would have to await the start of a pollution-abatement project being planned for the Little Conemaugh.

Sealed Drift Mine Near Foundry in South Fork.

This drift mine was developed along the bank of the South Fork near the railroad tracks and several feet above the water level of the river. There is no direct access to the discharge point because it appears to be a sealed mine. It produced 812,160 gpd and carried an acid load of over 4,100 ppd.

This mine has been tentatively identified as the Riverside Mine, and was operated by Mr. Joe Leonard.

Borehole on Sulphur Creek

This borehole was primarily responsible for degrading the headwaters of Otto Run, which forms a confluence with Sulphur Creek and is a tributary to the South Fork, Conemaugh River. This borehole is located on the east bank of Sulphur Creek which is, in turn, a tributary to Otto Run. Flow from this borehole was over 1.1 mgd, and produced an acid load of over 5,200 ppd.

This discharge includes AMD from Logan Mine No. 1, Yellow Creek Mine, and Henrietta Mine No. 2, all in the "B", or Lower Freeport, seam of coal.

The Abandoned Miller Shaft

The abandoned Miller shaft is located on the lower portion of Trout Run. There is no discharge from this shaft. The discharge was found at Bluebird Air Shaft of the Johnstown Coal and Coke Company Mine. Elevation of this discharge point is 1735 msl. Flow from this shaft was over 2.3 mgd, and produced an acid load of 16,200 ppd.

The discharge from Bluebird Shaft discharges AMD from the "B, C, D and E" seams of coal. These are the Lower Kittanning, Upper Kittanning, and Lower and Upper Freeport Seams.