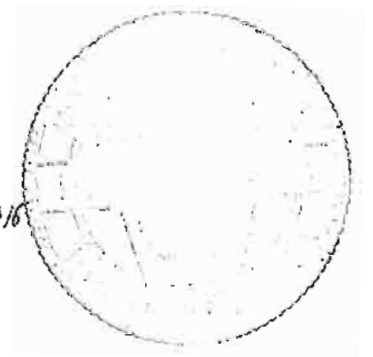
pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO Brian Bradley
Chief
Division of Mine Hazards
Bureau of Abandoned Mine Reclamation



FROM Michael Timcik, P.G.
Acid Mine Drainage Division
Bureau of Abandoned Mine Reclamation
MST 4/12/2016

THROUGH Dave Leiford
Environmental Group Manager 4/12/16
Acid Mine Drainage Division
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THROUGH Jeffrey Means JM 4/14/16
Environmental Program Manager
Acid Mine Drainage Division
Bureau of Abandoned Mine Reclamation

DATE April 12, 2016

RE Qualified Hydrologic Unit: Little Conemaugh River
AMD 11(0623,2473)101.1
Little Conemaugh River Project
Cambria County

MESSAGE:
Please find attached information documenting a Qualified Hydrologic Unit (QHU) on the Little Conemaugh River. Included is the complete QHU Determination Form with appendixes, as well as a CD containing a complete copy of the full document. The QHU Determination Form documents that the Little Conemaugh River meets the requirements of the Surface Mining Control Act Amendments of 2006, Section 402(g)(6)(A) and (B) for the expenditure of funds from the Acid Mine Drainage Abatement and Treatment Fund (AMD Set-Aside).

Please file as appropriate and add this QHU to the statewide Hydrologic Unit Map. In addition, please forward a copy of the revised map to me. Thank you.

Attachments

Qualified Hydrologic Unit Determination
Surface Mining Control and Reclamation Act Amendments of 2006

Hydrologic Unit: Little Conemaugh River

Description of Qualified Hydrologic Unit (unit boundaries, stream segment(s), tributaries included, etc.):

The area covered by this Hydrologic Unit consists of the entire Little Conemaugh River Watershed, including named and unnamed tributaries extending from the headwaters downstream to the confluence with the Stony Creek River in Johnstown, Cambria County. The Stony Creek River and the Little Conemaugh River join in the City of Johnstown, Cambria County, forming the Conemaugh River. The Stony Creek River Basin was previously designated as a separate Hydrologic Unit Plan (HUP). PA HUP 08. The Little Conemaugh River drains approximately 188 square miles within Cambria County. Out of this total approximately 62 square miles are drained by the South Fork of the Little Conemaugh. The Little Conemaugh River originates near the town of Cresson, Cresson Township, Cambria County and flows approximately 29.6 miles southwest to Johnstown. Please refer to Figure 1.

The headwater portions of both the main stem of the Little Conemaugh River and the South Fork of Little Conemaugh River are severely impaired by acid mine drainage, primarily resulting from abandoned pre- SMCRA underground mines. The area downstream of the confluence of the Little Conemaugh River and South Fork Little Conemaugh River signify an acid mine drainage (AMD) recovery zone, with no further significant impairments. Seven AMD discharges, all of which are located upstream of the confluence of the Little Conemaugh and the South Fork of the Little Conemaugh, contribute more than 89% of the AMD pollution load in the QHU. The St. Michael Shaft, Sulfur Creek Borehole discharge, Beaverdale area discharges and Logan/Allendale discharge, located in the South Fork of the Little Conemaugh basin contribute approximately 29.2%, 10.7%, 6.3% and 2.3% respectively, of the total AMD pollution load in the QHU. The Trout Run/Miller Shaft Discharges, Sonman Borehole Discharges, and the Hughes Borehole discharge all of which are located on the main stem of the Little Conemaugh River upstream of the junction with the South Fork contribute approximately 13.4%, 9.7% and 7.8% respectively of the total AMD pollution load within the QHU. The area downstream of the confluence of the Little Conemaugh River and the South Fork of the Little Conemaugh River is the recovery zone with only minor additional impairments between the upper reaches and the end of the QHU. Although this QHU extends only to Johnstown, it could in fact extend further downstream another 22.7 miles to Bolivar. Within this section there are only minor additional impairments. Furthermore, based on relative loading calculations, the Department expects this portion of the Conemaugh River to also experience water quality improvements due to the treatment projects within the Little Conemaugh Watershed. At this time, the portion of the Conemaugh between Johnstown and Bolivar is also not part of this QHU. However, it could be added if needed at a later date. Downstream of Bolivar, the river is impacted again by additional AMD discharges and impaired tributaries. These tributaries and other sources of AMD further downstream are outside the scope of this Hydrologic Unit.

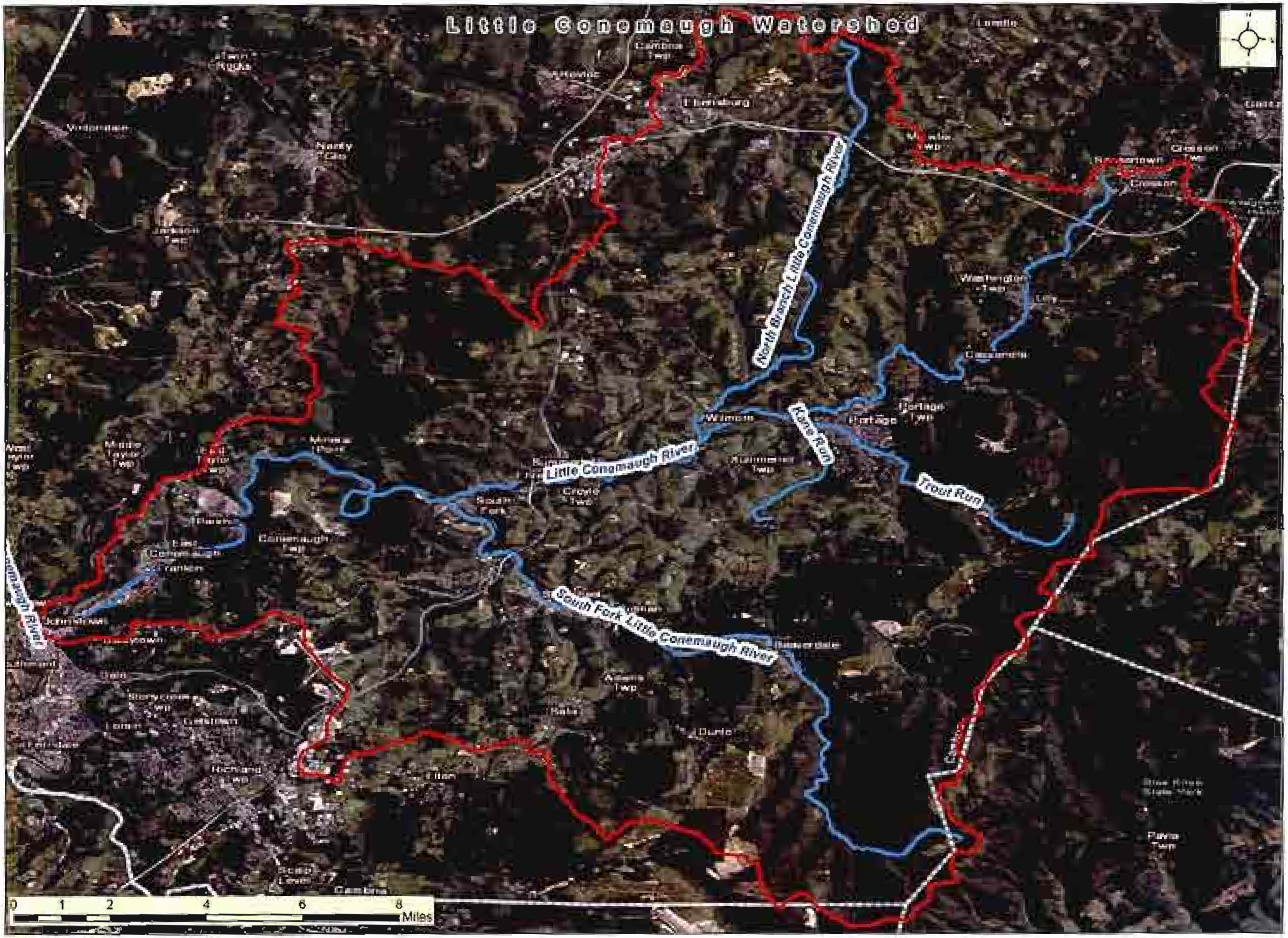
Little Conemaugh Watershed
North Branch Little Conemaugh River
Little Conemaugh River
South Fork Little Conemaugh River
Trout Run
Ebensburg
Cambria Twp
Washington Twp
Portage
Portage Twp
Cassandra
Cresson
Croyle Twp
South Fork
Conemaugh Twp
Johnstown
Richland Twp
Adams Twp
Beaverdale
Summerhill Twp
Wilmore
0 1 2 4 6 8 Miles

Figure 1

The Little Conemaugh River main stem is classified as a CWF above the confluence with the North Branch and as a WWF from the North Branch to its mouth. The South Fork of the Little Conemaugh River is classified as EV from its source to the Beaverdale Reservoir, HQ-CWF from this point downstream to state route SR 0869 and as a CWF from SR 0869 to its mouth. Tributaries associated with both the Little Conemaugh main stem and South Fork Main Stem are all designated CWF with a number of them also receiving the further protective designation of HQ or EV.

The main stem Little Conemaugh River, including the South Fork is listed as impaired by abandoned mine drainage by PA DEP ("2012 and 2014 Pennsylvania Integrated Water Quality Monitoring and Assessment Report").

Section 402(g)(6)(A):

The above Hydrologic Unit is covered under a restoration plan that addresses the abatement of the causes and treatment of the effects of AMD in a comprehensive manner?

Yes X * No ___

(* with the additional information provided in this document)

Five (5) comprehensive assessments with and without associated restoration plans have been completed with the Little Conemaugh River as the focus or at least as a significant part of the document. These reports address the water quality problems and sources of impairment in the watershed. The plans are as follows:

1.) Cooperative Mine Drainage Survey – Kiskiminetas River Basin, 1972, U.S. Environmental Protection Agency.

2.) Interim Report for Little Conemaugh River Watershed: Scarlift Report No. 164-1, 2 December 1974, The Neilan Engineers, Inc.

3.) Report on the Water Quality and Acid Mine Drainage in the Little Conemaugh River Watershed Cambria County (SCRIP Report), Pennsylvania, June 1995 (William Gleason Barbin, Director, Cambria County Conservation District).

4.) Little Conemaugh River Watershed Restoration Plan, GAI Project Number C020500.10 (GAI Consultants, September 2004), Prepared for Cambria County Conservation and Recreation Authority

5.) TMDLs for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed, Pennsylvania. EPA, Region III, January 29, 2010.

In addition, the Department of Environmental Protection, Bureau of Abandoned Mine Reclamation (DEP BAMR) and Bureau of Conservation and Restoration (BCR) have done extensive sampling and monitoring in conjunction with project development and

the development of this Hydrologic Unit that documents and prioritizes the AMD pollution in the watershed.

Although not comprehensive relative to the entire watershed and all discharges therein, additional reports were completed which include information about the discharges in the Little Conemaugh Basin. These would include the following:

1.) Little Conemaugh River (818E) Management Report, Sections 01-04, Pennsylvania Fish and Boat Commission, Bureau of Fisheries, Fisheries Management Division, Fisheries Management Area 8, Gary Smith and Rick Lorson, March 2000.

2.) Watershed Restoration Action Strategy (WRAS), State Water Plan Subbasin 18E, Stonycreek and Little Conemaugh River Watersheds, Somerset and Cambria Counties, PA Department of Environmental Protection, Updated September 2003.

3.) Hydrologic Investigation of the Berwind Mine Pool and the St. Michael Discharge (Paul C. Rizzo Associates, Inc., December 2004), Prepared for the Southern Allegheny Conservancy
This report includes information on the various discharges in the Little Conemaugh Basin but focuses on the St. Michael Discharge, the largest single source of pollution load.

4.) Phase I SRB Low Flow Mine Storage and Treatment Project Evaluation, Selection Summary Report (July 2006) and Final Report (May 2007)
This investigation was commissioned by the Susquehanna River Basin Commission (SRBC). The focus of these reports is to identify additional sources of water that could be directed to the Susquehanna River during drought or low-flow conditions.

Restoration plans should include the following:

- **Assessment of the problem/sources of impairment**
- **Identification and Prioritization of AML/AMD sites that are adversely affecting water quality**
- **Realistic and Measurable Treatment Goals for discharges proposed for treatment**
- **A scientific analysis of the pollution load and the known source contribution**
- **Realistic and Measurable Restoration Goals**

Yes X No ___

For the past several decades significant interest in restoring this QHU has been generated by a wide range of stakeholders. Interested parties include community organizations (local sportsmen's and watershed groups), local government, state and federal agencies. In addition and more recently interest has arisen from underground mining companies who have proposed partnership arrangements in treating both the Hughes and St. Michael mine discharges so as to provide for extraction of coal reserves located higher in the stratigraphic column, but which are

hydrologically connected to coal seams on which are located abandoned and flooded deep mines. Listed below are the identified stakeholders;

Community Organizations;

FPW - Foundation for PA Watersheds
SCRIP – Stony Creek Conemaugh River Improvement Project
SAC – Southern Alleghenies Conservancy
GJWA – Greater Johnstown Watershed Association
Kiski Conemaugh Stream Team
LCWA – Little Conemaugh River Watershed Association

Local Government;

Cambria County Conservation District
Somerset Conservation District
Indiana County Conservation District
City of Johnstown
Cambria County Conservation and Recreation Authority

State and Federal Agencies;

PADEP BCR – PA Department of Environmental Protection Bureau of Conservation and Restoration
PADEP BAMR - PA Department of Environmental Protection Bureau of Abandoned Mine Reclamation
PADEP DMO - Bureau of District Mining Operations
PA F&BC - PA Fish and Boat Commission
USEPA - US Environmental Protection Agency
USDA NRCS - US Department of Agriculture National Resources Conservation Services
USDOI OSM - US Department of the Interior - Office of Surface Mining and Reclamation
USACOE - US Army Corps of Engineers

Mining Companies;

Rosebud Mining Company
Amfire Mining Company LLC.*

*Please note that Amfire was purchased by Rosebud Mining Company in 2014.

Since the 1970's many of the above listed organizations have completed evaluations and assessments of the AMD problems within this QHU. As referenced earlier, numerous documents, reports and recommendations have been published throughout the years. Listed below is a summary of available information;

U.S.EPA, 1972, 'Study of the Kiskiminetas River Basin' –Seven principal AMD sources that were impacting the Kiskiminetas River were documented. The report concluded that the discharges located in the Little Conemaugh and South Fork Little Conemaugh River watershed were the principle discharges affecting the Kiskiminetas Basin. The report concluded that the St. Michael Discharge was the most significant discharge in the watershed.

PA DER, 1974, Operation Scarlift Interim Report No. 164-1, Little Conemaugh River - This report concluded that the entire main stem of the Little Conemaugh River was impacted by numerous surface and underground mine areas. Fifteen major AMD source areas were reported to have a combined acid and iron load of 462,605 lbs./day and 70,965 lbs./day respectively. Conceptual plans and cost estimates for active lime treatment facilities were provided.

Late 1980's and 1990's SCRIP Stony Creek Conemaugh River Improvement Project – With the assistance of Congressmen Murtha's office, local community groups and government agencies within Cambria and Somerset Counties formed a partnership to address AMD issues in the Stony Creek and Conemaugh River Watersheds. Individual watershed assessments were conducted and restoration projects were implemented in various subwatersheds, especially within the Stony Creek Basin where many of the AMD problems were more amenable to treatment by passive systems. The larger more acidic discharges endemic to the Little Conemaugh remained un-addressed as sources of funding for conventional active mine drainage treatment facilities were not available. The Little Conemaugh assessment was published by SCRIP in 1995 and is entitled **"Report on the Water Quality and Acid Mine Drainage in the Little Conemaugh River Watershed Cambria County, Pennsylvania".** This study was the first comprehensive study of the Little Conemaugh River watershed and it led to the understanding that seven (7) large underground mine discharges were responsible for 80% of the AMD pollution load and that meaningful watershed restoration would need to focus upon conventional treatment of these large discharges.

Mid 1990's – to present – Previous assessment, identification and prioritization efforts lead Stakeholders to the consensus that, in order to address sustained treatment of the aforementioned large volume discharges, an approach that identified both capital funds and a revenue mechanism for continued operation and maintenance was necessary. To that end potential public private partnerships alliances were created. One such alliance resulted in a report dated September 2004 and entitled Little Conemaugh River Restoration Plan prepared by GAI Consultants for the Cambria County Conservation and Recreation Authority. This report included a detailed review of the sources mine related pollution to the Little Conemaugh River, recommendations for addressing the various sources of pollution and estimated costs associated with the treatment options. Finally, the report included a detailed implementation plan and suggested sources of funding.

Another initial partnership was formed between the Cambria County Recreation Authority and Paul C. Rizzo and Associates involving the St. Michael Discharge. The feasibility of a Pumped Storage Hydroelectric (PSH) project was evaluated. In this scenario treated mine water from the mine pool would be pumped during off-peak hours to a storage facility where hydroelectric power would be generated and sold to the grid at peak periods. A portion of the proceeds could then be used to fund the mine water treatment costs. While the project did not move forward, significant and useful data concerning the St. Michael Discharge and Berwind Mine pool complex was generated. In 2004 Rizzo completed a detailed Hydrologic Investigation Report for the Southern Allegheny Conservancy entitled **"Hydrologic Investigation of the Berwind Mine Pool and St. Michael Discharge".** The information compiled lead to a much more complete understanding of the mine complex hydrogeology and the discharge's impact upon the watershed. This data continues to be relied upon in assessing and developing restoration strategies.

Subsequent to the PSH project, additional innovative technology pilot projects that targeted treatment of the St. Michael Discharge were executed. Resource recovery grants, made available through Congressman Murtha's office, were used to evaluate treatment technologies that would result in a recoverable commercial iron precipitate product. An innovative technology grant from the DEP Growing Greener program was awarded to determine the feasibility of treatment by Ion Exchange Liquid – Liquid Extraction which was envisioned to produce commercial quantities of commodity chemicals such as potassium sulfate and ferrous sulfate and potentially saleable industrial water. To date, none of these approaches have resulted in favorable economic conditions for development.

In June of 2005, Rosebud Mining Company (RMC) approached the Department offering a proposal for a public private partnership arrangement for perpetual active chemical treatment of the St. Michael mine pool discharge. RMC is currently mining, by underground mining methods, the Upper Kittanning coal seam within areas overlying the St. Michael mine pool. This mine is known as Mine 78 (CMAP # 56841328). The geologic structure in the area is such that a substantial portion of Upper Kittanning coal reserves are situated below the elevation of the St. Michael mine pool. Consequently, in order for RMC to access these reserves, the St. Michael pool would need to be lowered by continuous pumping and subsequent treatment of the discharge. RMC proposed construction of a 10,000 gallon per minute lime treatment plant ("facility") at the location of the St. Michael shaft discharge. Over a proposed 25 to 40 year timeframe, RMC would continuously pump and treat the mine pool, lowering the pool elevation by as much as 670 feet. In December 2012 RMC and the Department signed a Consent Order and Agreement (CO&A) addressing the construction and long term operation and maintenance of the facility. Under the agreement, RMC assumes all costs associated with the construction and operation/maintenance (O&M) of the facility for the life of their mining operation. In addition, RMC will finance a perpetual trust to fund post closure operation and maintenance of the facility. The trust fund contribution from RMC will not exceed 15 million dollars with contributions beginning with the commencement of mining activities and taking the form of fifteen annual 1 million dollar contributions. This 15 million dollar facility went on-line in the spring of 2013, pumping down the mine pool thereby eliminating the discharge. The treated discharge meets the effluent requirements of the associated NPDES Permit.

In March of 2007, Amfire Mining Company LLC approached the Department with a partnership proposal concerning treatment of the Hughes Mine Pool Discharge. Amfire's Cresson underground mine (CMAP No. 1051301), issued in December 2006, is projected to mine the Upper Freeport Coal seam which overlies the Lower Kittanning coal seam and the abandoned Hughes mine pool complex. During the permitting process, Amfire was precluded from mining approximately 1200 acres of their Upper Freeport reserves in the Cresson Mine. The precluded areas directly overly the Hughes mine pool, consequently a potential hydrologic connection may exist or be created post closure of the Cresson Mine. In November 2012 Amfire and the Department entered into a Consent Order and Agreement (CO&A) which provides for a financial contribution from Amfire for treatment of either the Hughes Discharge or other AML discharges that the Department considers appropriate within this proposed qualified hydrologic unit. Unlike the Rosebud – St. Michael agreement, treatment of the Hughes discharge will not require dewatering or otherwise modifying the flow rate of the discharge or the mine pool elevation. Under the terms of the CO&A, one year following the commencement of mining operations within the formerly precluded area and determination that mining can be completed in a safe and

economically feasible manner, Amfire is required to contribute a total of $5,666,164.31 into the trust fund in accordance with the schedule set forth in Exhibit C as referenced in the CO&A. This agreement would facilitate Amfire mining the Upper Freeport reserves in the precluded area without assuming liability for the Hughes mine pool discharge. *Please note that Amfire was purchased by Rosebud Mining Company in 2014.

TMDLs for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River
Watershed, Pennsylvania:
In 2009, the Environmental Protection Agency (EPA), Region III approved a TMDL for the entire Kiski-
Conemaugh Watershed. All portions of the watershed included within this QHU were included within this TMDL Report. The TMDL Report found the entire watershed to not be attaining use and therefore no further loading beyond the base concentrations (Chapter 93 In-Stream Limits) established in the TMDL are allowed unless loading is effectively reduced elsewhere in the watershed.

BAMR Modeling, Assessment and Proposed Projects/Restoration Plan:
BAMR and subsequently BCR made the decision to supplement the work already completed. As part of this effort, additional assessment work was completed on the watershed and a restoration plan proposed herein for the Hydrologic Unit in accordance with the criteria of Section 402 (g)(6)(A).

ASSESSMENT OF THE PROBLEM/SOURCES OF IMPAIRMENT:
Various investigations, including those listed above, have assessed the discharges to his hydrologic unit and ranked them based on the percentage of pollutant load contributed to the Little Conemaugh River.
The top ten discharges in terms of loading are as follows:
(from the headwaters through the main stem, including the South Fork, downstream to the junction with the Stony Creek River at Johnstown):

1.) Berwind Mine at St. Michael, 29.2 %, high aluminum
2.) Trout Run, 13.41%
3.) Sulphur Creek, 10.7%
4.) Ehrenfeld, 11.9%
5.) Portage Sewage Treatment Plant (Sonman Discharges), 9.72%
6.) Hughes Borehole, 7.8%
7.) Beaverdale, 6.33%
8.) South Fork Borough / Stineman, 2.37%
9.) Allendale (Logan) 2.34%
10.) Kokomo, 1.4%

Collectively, these top 10 discharges account for over 95% of the pollution load.

The text below discusses these discharges in more detail. The discharges are not addressed in order.

When taken collectively, the first discharge that had to be addressed in the larger watershed was the St. Michael Discharge. This discharge is located in the town of St. Michael. The discharge emanated from the abandoned Berwind and White Maryland #1 Mine Complex and discharged to Topper Run from an old vertical mine shaft. Topper Run then flows to the South Fork of the Little Conemaugh River. Contributing more than 29% of the total mining related pollution to the Little Conemaugh River, until this discharge was addressed, work on other discharges would not be cost effective. As noted earlier, this discharge has been addressed by the treatment plant constructed and operated by Rosebud Mining. This hydrated lime plant, complete with pre-aeration Maelstrom Oxidizer, went into operation in the spring of 2013. The effluent meets the established NPDES Permit Limits (Chapter 93 In-stream Limits). More details about the history of this plant were discussed earlier. Please refer to Figure 2 below.

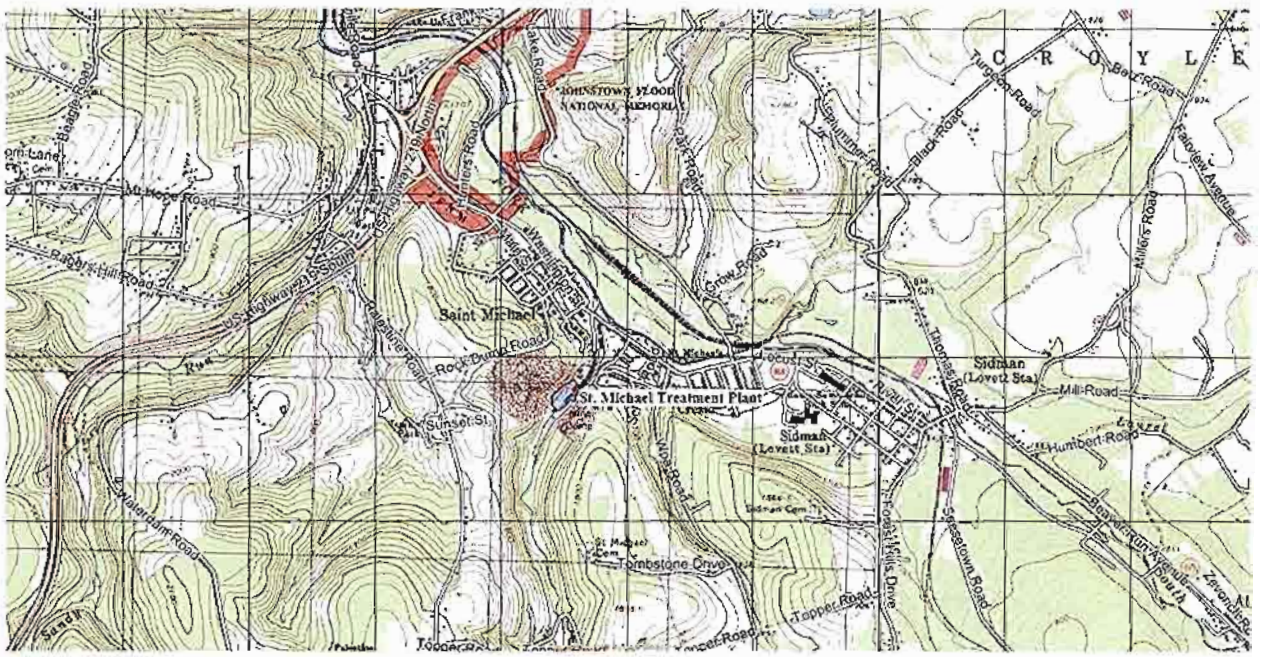

Figure 2

The Hughes Discharge is located near Jamestown and discharges directly to the Little Conemaugh River. This discharge contributes 7.8% of the mining related pollution load to the Little Conemaugh River. The Portage Sewage Treatment Plant Discharges are in fact the discharges from the abandoned Sonman Deep Mine Complex, located directly across the Little Conemaugh River from the sewage treatment plant in Portage. These discharges flow directly to the Little Conemaugh River and combined they contribute 9.72% of the mining related pollution load to the Little Conemaugh River. The Trout Run Discharges are comprised of multiple discharges along Trout Run, the most significant of which is the Miller Shaft Discharge. Upstream of the Miller Shaft Discharge a passive system is currently in-place to address the Puritan Deep Mine Discharge. This system is set to be upgraded to successfully treat all of the Puritan Discharge and will be funded by a Growing Greener Grant. Trout Run joins Kane Run approximately 1,500' upstream of Kane Run's junction with the Little Conemaugh River. Kane

Run is not impacted by mining. These discharges contribute 13.41% of the mining related pollution to the Little Conemaugh River. The current project is intended to address the Hughes, Sonman and Miller Shaft Discharge. The intent is to the route the Hughes and Miller Shaft Discharges to the Sonman Deep Mine Complex and treat the combined mine pool via the construction of a new hydrated lime treatment plant located somewhere between the towns of Portage and Wilmore. Please refer to Figure 3 below.

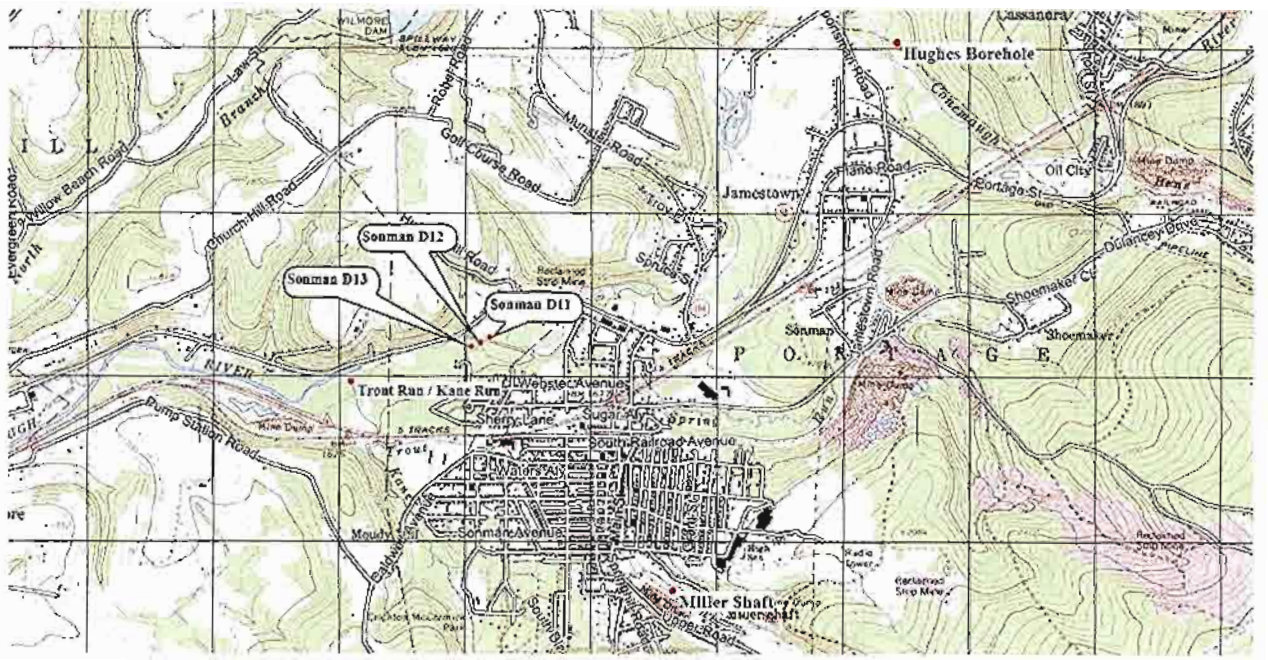

Figure 3

The Ehrenfeld Discharges are comprised of discharges from the mining refuse and deep mines in the hillside above the town of Ehrenfeld as well and the Beth Energy Mine 33 water which is routed to the existing Pristine Resources Treatment Plant also located in Ehrenfeld. This plant successfully treats the Mine 33 water as well as some of the other mining discharges in Ehrenfeld. Please refer to Figure 4 below.

The South Fork Discharges are comprised of the Stineman Deep Mine Discharge located on the north side of the South Fork within the Norfolk-Southern Rail Yard and by multiple discharges from the hillside and refuse area along the south side of the South Fork. These discharges contribute 2.37% of the mining related pollution load to the Little Conemaugh river and are not currently treated. The potential exists for the South Fork (Stineman) Discharge to also be impacted by the drawdown of the Maryland #1 Mine Pool. Remining has been completed on the hillside along the south side of the South Fork of the river. However, there is currently no plan to address the combined Stineman Discharges. Please refer to Figure 4 below.

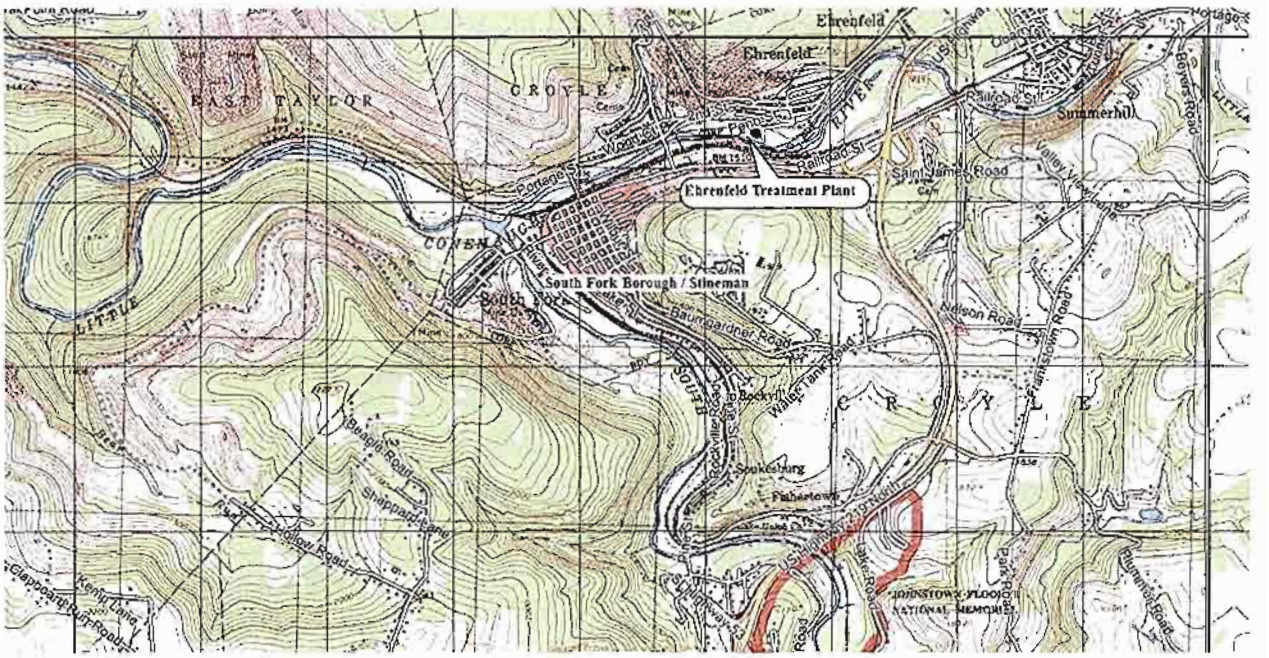

Figure 4

Please note that with the successful treatment of the Hughes, Miller Shaft and Sonman Discharges, combined with the ongoing treatment at the St. Michael Plant and the Pristine Resources Plant in Ehrenfeld the Department estimates that more than 70% of the mining related pollution load in the Little Conemaugh River will be addressed. The Department expects this improvement to be further enhanced by additional reduction in pollution load due to the elimination of the Ehrenfeld Refuse Pile and the existing discharges associated with it. This project is being completed by the Department's Bureau of Abandoned Mine Reclamation.

The Sulfur Creek Borehole Discharge is located along Sulphur Creek about 4,600' south-southwest of Allendale. This discharge contributes 10.7% of the mining related pollution load to the Little Conemaugh River and is not currently being treated. As part of the development of the NPDES discharge permit limits for this plant and the Consent Order and Agreement between Rosebud and the Department, there is potential that the draw-down of the Maryland #1 Mine Pool might impact the Yellow Run Deep Mine Complex, which is the source for the Sulfur Creek Borehole Discharge. If this impact does not occur there is potential to address the Sulfur Creek Discharge by routing the water to the Maryland #1 Mine Pool and treating it at the existing St. Michael Treatment Plant. Please refer to Figure 5 below.

The Allendale (Logan) Discharge emanates from the Logan #4 Mine and discharges directly to the South Fork of the Little Conemaugh River along SR869 near Allendale. This discharge contributes 2.34% of the mining related pollution load to the Little Conemaugh River and is not currently treated. There is potential for this discharge to be treated in the future by routing it into the Maryland #1 Mine Pool and treating it at the existing St. Michael Treatment Plant. Please refer to Figure 5 below.

The Beaverdale Discharges are comprised of three deep mine discharges, one of which is also impacted by a large refuse pile. These discharges flow directly to the South Fork of the river and

contribute 6.33% of the mining related pollution load to the Little Conemaugh River. These discharges represent the first significant mining related pollution to the South Fork of the river. Reprocessing of the large refuse pile and reclamation of said site was completed by Robindale Energy in 2015. There is currently no plan to address these discharges. However, the potential exists to treat some of the discharges by passive systems, or a combination of same with routing the water to the Maryland #1 Mine Complex and treating the water at the existing St. Michael Treatment Plant. Please refer to Figure 5 below.

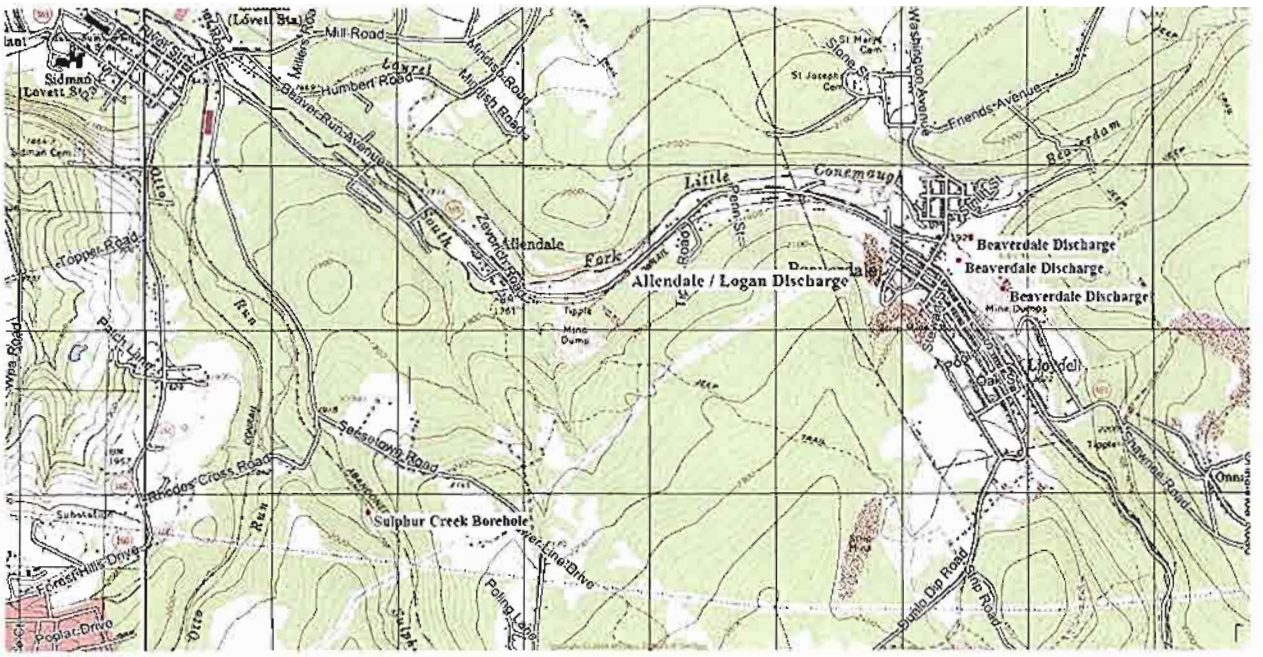

Figure 5

Kokomo Run is the northern most tributary to the Little Conemaugh River. Eight drift mine discharges flow to the stream which contributes 1.4% of the mining related pollution load to the Little Conemaugh River. There exists potential for passive treatment of some of these discharges. However, the river assimilates these discharges with no significant impact. Please refer to Figure 6 below.

While the various assessments noted earlier have documented the primary sources of contamination and their locations, based on these previous assessments, in October 2009, BAMR sampled a subset of these discharges consisting of all the most relevant, as well as every major tributary flow into the Hydrologic Unit. Subsequently BAMR and then BCR continued to monitor and characterize these major sources of pollution in the Hydrologic Unit. This work simply served to further document the quality and quantity of the flows and the impact to the watershed. Please note that in December 2015 BCR was climinated, with the various parts absorbed by other programs. The mine drainage section was renamed the Division of Acid Mine Drainage and reabsorbed by BAMR.

A scientific approach was then taken to analyze the pollution load and further prioritize AMD sites contributing to the problem. Geochemist Workbench software by Rockware was used to

model and predict the water quality changes to be achieved by addressing certain sources of impairment. Please see the detailed discussion below.

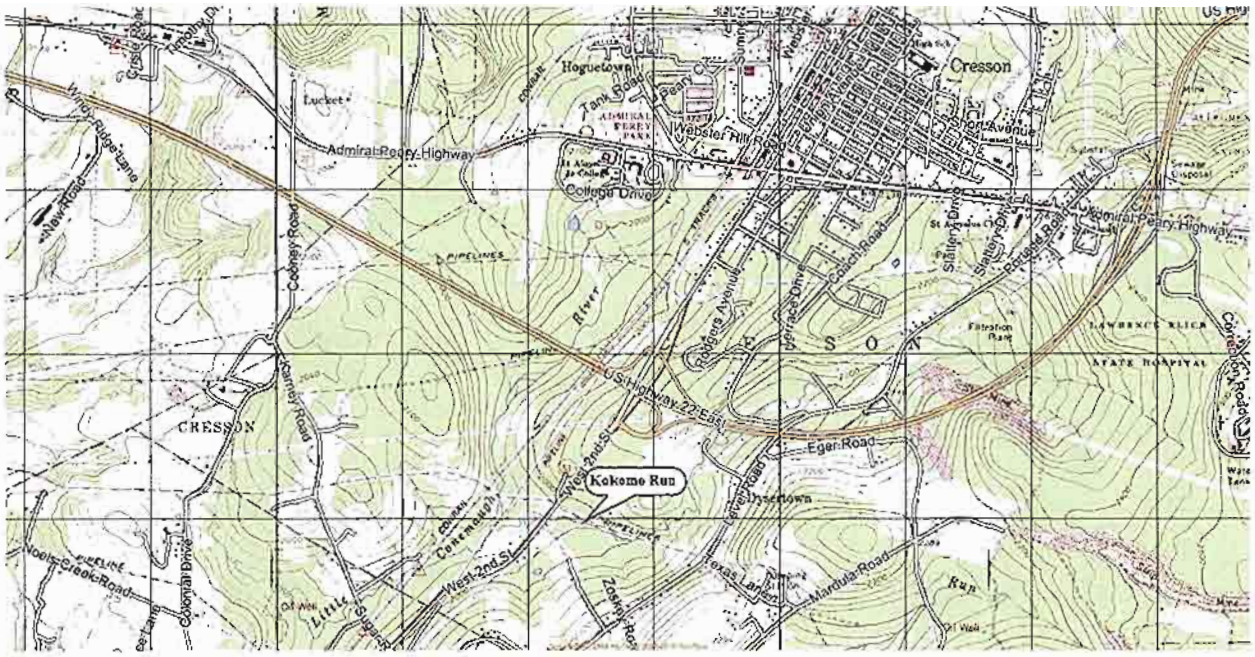

Figure 6

A SCIENTIFIC ANALYSIS OF THE POLLUTION LOAD AND THE KNOWN SOURCE CONTRIBUTION:

Geochemical modeling software by Rockware's Geochemist Workbench, was used to model and predict the changes with in-stream water quality in this Hydrologic Unit. This modeling was then used to determine realistic restoration goals for the unit. Data for the modeling were collected on October 21 and 22, 2009. This timeframe represented the calculated Q(7,10) Low-Flow conditions. The Q(7,10) is the 7-day, 10-year low-flow characteristic representing the minimum average flow for 7 consecutive days, expected to occur once every 10 years, or the flow which has a 10 percent chance of occurring each year. Q(7,10) was chosen as the sample period for the modelling because it is during such low flow periods, when the baseflow to the stream, comprised of runoff and tributary flows, is expected to be the lowest. Therefore, the portion of the total stream flow comprised of the mine discharges will be greater and less dilution of that pollution load will occur. As a result the stream would be expected to exhibit its worst water quality for the year during this timeframe. The Hughes Discharge is the first major mining related discharge to the upper reaches of the main stem of the Little Conemaugh River. Although previous assessments did identify sources of pollution upstream of the Hughes Discharge, they are assimilated by the river and are not large enough to cause significant/measureable impairment to the river. Based on the good water quality of the Little Conemaugh, upstream of the Hughes Discharge, it was decided that this would be the most upstream sampling point on the Main Stem. From this point, sampling continued downstream to Johnstown. In order to attempt to adequately model the Hydrologic Unit, significant flows of surface waters or mine drainage were sampled over the two (2) day period. Flows were measured at each sample point using in place weirs or Marsh McBirney staff and velocity meters. Because

the South Fork of the Little Conemaugh is also severely impact by mine drainage the same sampling protocol was also used within the South Fork of the river. The North Fork of the river is not impacted by mine drainage and therefore was addressed simply by its downstream sample. The samples were then analyzed at the state laboratory for every major cation and anion expected to be in the solution. The Geochemist Workbench program then models the chemical reactions proportionally on a molar basis. The waters were "reacted" in the Geochemist Workbench program starting from the most upstream points and working downstream, just as the waters would flow together in the watershed. Minerals and oxides were allowed to precipitate and become part of the bed load, as they would be in the natural system. The Geochemist Workbench software was made available through the Office of Surface Mining's TIPS Program. Brent Means, Hydrologist at OSM, and expert in using this software was consulted during development of the various models presented below. A complete discussion of the modeling procedures are beyond the scope of this document.

BAMR (Rich Beam) originally completed models based on treating only the St. Michael Discharge and then again, with only the Hughes Borehole treated. These revised tables are presented below as Tables 1 and 2. More recent modeling was completed and is discussed later. The results in these tables are presented here primarily for the purpose of supporting the veracity of future modeling, all of which is based on the same water quality and flow data set, as well as illustrating potential problems with elevated levels of Total Dissolved Solids (TDS). Please refer to Table 1 and Figure 7 below. This table presents Rich Beam's modeling results for treating only the St. Michael Discharge. The first two columns represent respectively the actual lab results for a sample collected in Franklin/East Conemaugh and the modeled results for that same location with no treatment. These results match each other well, supporting the veracity of modeling efforts. The third column represents a potential worst case scenario for TDS levels with the treatment of the St. Michael Discharge. There is concern that when mine pools are drawn down the quality of the water may worsen, increasing among other things, the levels of sulfate and TDS. At the time this modeling was completed, the St. Michael Plant had not yet gone on-line, so older water quality was used from the 60's and 70's. This modeling simulates the potential effect of increased sulfate and TDS concentrations in the treated effluent that may result from the mine pool dewatering. A theoretical raw water quality, similar to samples of the discharge from the late 1960's and early 1970's, was used in the run. The quality of the mine pool water is expected to worsen (based on previous experience with mine pool drawdown projects – Melcroft #1, McDonald and others). The extent to which this occurs could not be predicted. The 60's and 70's data were used as they represent a period shortly after the mine pool filled completely and thus may be representative of future water quality as the pool is drawn down. The predicted TDS concentrations downstream at the gage in Franklin/East Conemaugh under these conditions did reveal cause for concern as the modeled TDS levels approach levels which may be unfavorable for aquatic life. Clearly, precautions and careful planning are warranted so as to avoid a situation where sulfate and TDS levels in the effluent approach or exceed the theoretical values used in this early model. Please refer to Table 1 and Figure 7 below.

Table 1: Geochemical Model Summary Results- St. Michael Discharge:

	1	2	3
	Little Conemaugh @ Franklin Street U.S.G.S. Gage Collected 10/22/09 Sample #7485938	GWB model Existing cond. (St. Michael Dsg. Not Treated)	GWB model Elevated TDS conditions (St. Michael Dsg. Treated))
pH	6.75	6.20	7.01
Total Iron (mg/l)	4.803	5.23	1.29
Dissolved Iron (mg/l)	0.10	0.01	.005
Manganese (mg/l)	1.23	1.22	1.21
Aluminum (mg/l)	0.63	0.74	0.58
Sulfate (mg/l)	238	243	532
Total Dissolved Solids (mg/l)	458	465	935
Flow (gpm)	40,392	40,397	48,597

1 – Existing conditions as sampled
2 – Modeled existing conditions (for model calibration and confirmation)
3 – Modeled conditions with treatment of the St. Michael Discharge and elevated TDS

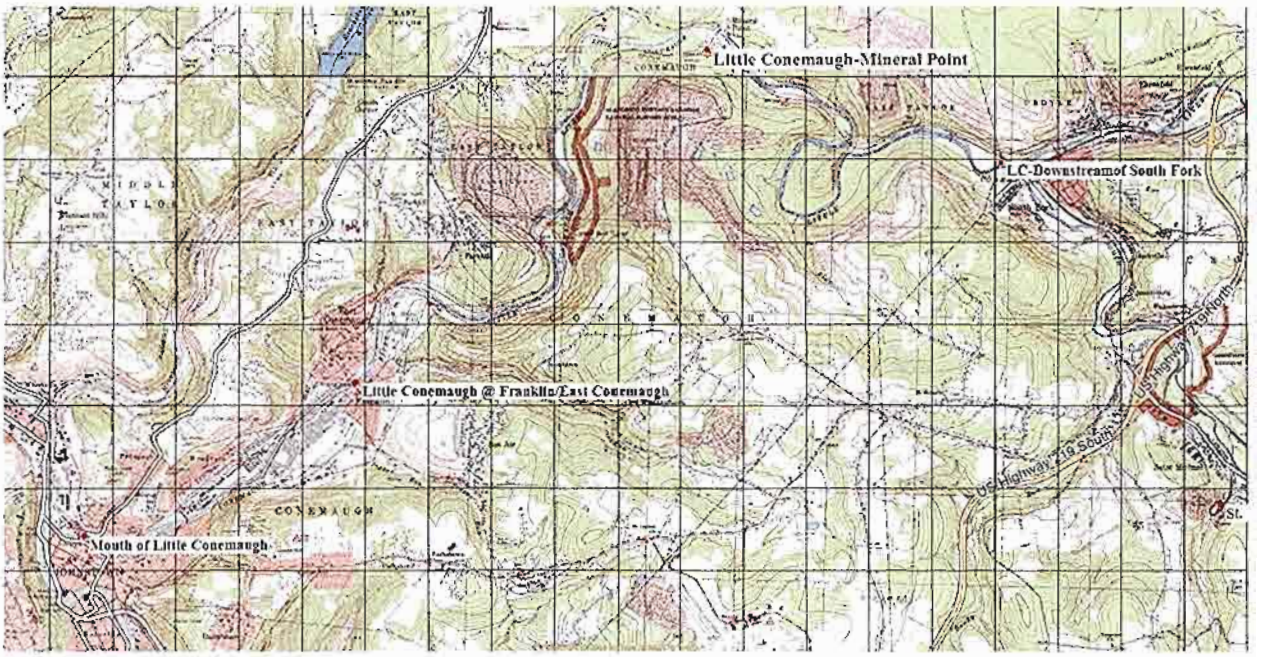

Figure 7

Please refer to Table 2 and Figure 8 below. The table provides Rich Beam's modeling results for a comparison of the existing conditions and modeled results of the existing conditions within the segment of the Main Stem of the Little Conemaugh from Summerhill to a point prior to the junction with the South Fork. Again, the lab results and modeled conditions match well and serve to support the veracity of modeling efforts.

Table 2: Geochemical Model Summary Results- Little Conemaugh above confluence with the South Fork Little Conemaugh

	1	2
	Segment #2 sample Collected 10/22/09 Sample #7485936	**GWB mixing model Existing conditions**
pH	6.86	6.64
Total Iron (mg/l)	2.65	2.92
Dissolved Iron (mg/l)	0.10	0.01
Manganese (mg/l)	0.616	0.638

Aluminum (mg/l)	<0.2	<0.2
Sulfate (mg/l)	220.2	227
Total Dissolved Solids (mg/l)	**450**	**491**
Flow (gpm)	**23,989***	**20,665**

1 – Existing conditions as sampled
2 – Modeled existing conditions
*** This flow measurement was obtained 24 hours after collection of the model data. The difference in flow is likely the result of variable discharge rates at upstream sewage treatment facilities and the Mine 33 treatment facility.**

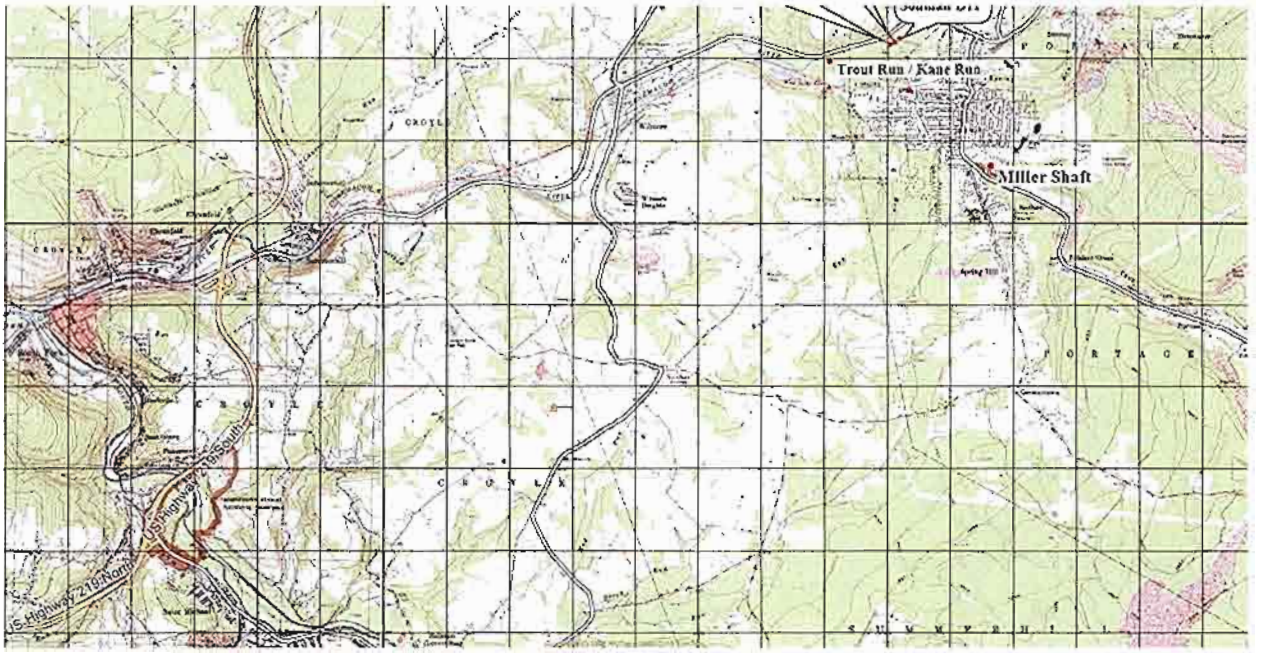

Figure 8

Please refer to Tables 3 and 4 and Figure 9 below. Brent Means completed in March 2013, modeling on the Main Stem of the Little Conemaugh River from a point upstream of the Hughes Discharge, near Jamestown, then downstream to the junction with the South Fork of the Little Conemaugh. This effort as presented in Table 3 modeled the condition of this segment of the Little Conemaugh, with the Hughes, Sonman and Miller Shaft Discharges removed and the combined waters treated at a hydrated lime plant and then reintroduced into the river between Portage and Wilmore. Table 4 shows the results for the same segment if the Hughes and Sonman Discharges are treated, but the Miller Shaft Discharge is left untreated.

Table 3: Geochemical Model Summary Results - Modelled Little Conemaugh River Between Jamestown and South Fork – Hughes, Sonman and Miller Shaft Discharges Treated.

	pH	Alkalinity (mg/L)	TDS (mg/L)	Suspended Fe (mg/L)	Suspended Al (mg/L)	Diss. Fe (mg/L)	Diss. Al (mg/L)	Diss. Mn (mg/L)
LC Upstream Confluence Kane	7.5	44	208	<.2	<.2	<.2	<.2	0.1
LC Downstream Confluence Kane	7.3	36	226	<.2	<.2	<.2	<.2	0.1
LC @ Wilmore after Treated Effluent	6.6	54	542	<1.0	<.2	<.2	<.2	1.1
LC @ Confluence with North Fork	6.7	55	491	<.5	<.2	<.2	<.2	0.9
LC @ Confluence with Rt 160 Trib.	6.7	55	490	<.2	<.2	<.2	<.2	0.9
LC @ Confluence with Laurel Run in Summerhill	6.8	53	461	<.2	<.2	<.2	<.2	0.8
LC Downstream of Mine 38 (Ehrenfeld) Effluent	7.0	83	535	<.2	<.2	<.2	<.2	0.7
LC @ Confluence with Ehrenfled Trib.	6.9	83	534	<.2	<.2	<.2	<.2	0.7

Little Conemaugh (LC)

Table 4: Geochemical Model Summary Results - Modeled Little Conemaugh River Between Jamestown and South Fork - Hughes & Sonman Treated / Miller Shaft Discharge Untreated

	pH	Alkalinity (mg/L)	TDS (mg/L)	Suspended Fe (mg/L)	Suspended Al (mg/L)	Diss. Fe (mg/L)	Diss. Al (mg/L)	Diss. Mn (mg/L)
LC Upstream Confluence Kane	7.5	44	208	<.2	<.2	.11	<.2	0.1
LC Downstream Confluence Kane	7.0	32	275	2.9	1.1	.53	<.5	0.4
LC @ Wilmore after Treated Effluent	6.6	43	528	1.3	<1.0	<.2	<.5	1.1
LC @ Confluence with North Fork	6.7	46	478	<1.0	<.5	<.2	<.5	1.0
LC @ Confluence with Rt. 160 Trib.	6.6	46	483	<.5	<.5	<.2	<.2	1.0
LC @ Confluence with Laurel Run in Summerhill	6.7	45	450	<.2	<.2	<.2	<.2	0.9
LC Downstream of Mine 38 (Ehrenfeld) Effluent	6.9	76	526	<.2	<.2	<.2	<.2	0.7
LC @ Confluence with Ehrenfled Trib.	7.0	75	525	<.2	<.2	<.2	<.2	0.7

Little Conemaugh (LC)

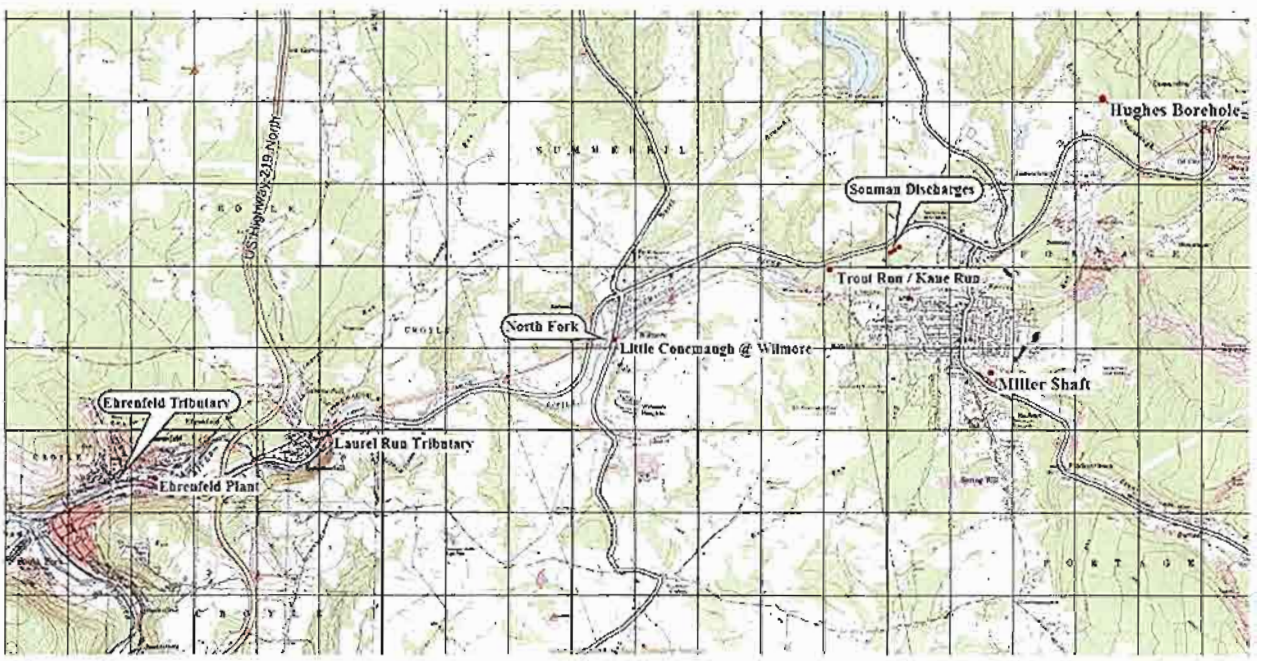

Figure 9

As expected, the modeled results from Tables 3 show that treating the Miller Shaft Discharge will create water quality conditions within the stretch of the Main Stem between Portage and Wilmore, as well as the stretch downstream to the South Fork that are consistent with the cleanup goals set. The entire portion of this same stretch downstream to Wilmore, without the Miller Shaft Treated, would not attain those goals, but instead would constitute an ongoing mixing zone in the Little Conemaugh River for the polluted water from Kane Run.

Please refer to Table 5 below as well as Figure 7 above. The modeled results for the Main Stem of the river, with the Hughes, Miller Shaft and Sonman Discharges treated and reintroduced into the river between Wilmore and Portage were combined with the actual water quality from recent (late 2013 through first half of 2014) downstream samples of the South Fork, coupled with the flow from the 2009 sampling event. The modeling on the Main Stem is based on the proposed plant discharging at approximately 5,000 gallons per minute (gpm). This reflects the anticipated/typical discharge rate from the proposed new plant. The water quality used in the model for the South Fork reflects the actual condition of the South Fork with the St. Michael Treatment Plant discharging at approximately 4,000 gpm. Based on conversations with Rosebud Mining, this is the anticipated discharge rate for the St. Michael Plant well into the future and also reflects the anticipated discharge rate from the plant after it is turned over to the state for perpetual treatment and the associated necessary pumping rate anticipated for the St. Michael Plant to prevent an untreated discharge and maintaining a 30-day buffer on the mine pool level.

Table 5: Geochemical Model Summary Results - Modeled Little Conemaugh River Just Downstream of South Fork to East Conemaugh and the Point in Johnstown – Hughes, Sonman and Miller Shaft Discharges Treated / St. Michael Discharge Treated

	pH	Alkalinity (mg/L)	TDS (mg/L)	Suspended Fe (mg/L)	Suspended Al (mg/L)	Diss. Fe (mg/L)	Diss. Al (mg/L)	Diss. Mn (mg/L)
SFLC with SM @ 4K Combined with Modeled main Stem above South Fork (1)	7.02	52.34	460	.05	.05	.004	.0005	.39
(1) Combined with Saltlick Run (2)	6.96	51.61	438	.003	.008	.004	.0005	.357
(2) Combined with Clapboard Run (East Conemaugh)	6.86	50.61	442	.05	.07	.004	.0004	.365

Little Conemaugh (LC)
South Fork of Little Conemaugh (SFLC)
St. Michael Discharge (SM)

One weakness in the model is the difficulty in accounting for base flow groundwater into the system due to the inherent difficulty in accurately measuring this flow. However, with respect to this modelling on the Little Conemaugh, it is important to note that the originally modelled flows downstream matched well the actual recorded flows at the downstream U.S.G.S. Gauging Stations. This fact helps to support the modeling results with respect to flows as well as suggesting that the deep mines throughout the area firmly control the groundwater flow. There are also inherent weaknesses associated with combining the measured 2009 flow with later water quality results. However, the typical discharge rate from the St. Michael Plant used for the modeling, as noted above, is somewhat higher than would be reflected by the flow used in the model for the South Fork of the river. Therefore, the model anticipates less treated water in the system than is expected. One final weakness is the fact that the model is based on low-flow conditions when the mines are not discharging as much water. However, as noted earlier, these conditions also reflect lower surface flows and therefore are anticipated to reflect the highest contaminant concentrations in the river system.

Currently the Main Stem of the river already exhibits a pH that is typically greater than 6.0 and net alkaline conditions from its headwaters all the way downstream to Johnstown. However, with respect to metals content, Geochemist Workbench predicts that once the current Hughes, Sonman and Miller Shaft Discharges are eliminated and the treated water reintroduced to the

system, combined with the existing treatment of the St. Michael Discharge as it impacts the Main Stem downstream of the town of South Fork, the entire 22.6 mile stretch of the Main Stem from Johnstown to Jamestown (location of the current Hughes Discharge) will achieve during normal flow conditions water quality with total Iron levels less than 1.5 mg/L, total Al levels less than .5 mg/L and Total Dissolved Solids (TDS) levels less than 1,500 mg/L. In addition, the levels of Total Suspended Iron and Aluminum were also predicted to be less than the levels noted above.

The upstream sample of Trout Run, above the current Miller Shaft Discharge already exhibits water quality that often approximates the goals noted above. As noted earlier, there currently exists a small passive treatment system in-place on the Puritan discharge upstream of Miller Shaft. This system has received a Growing Greener Grant in the latest round, to upgrade the system such that it will address the entire discharge year round. While modeling has not been completed on Trout Run, the Department is confident that once this system is upgraded, combined with the elimination of the Miller Shaft Discharge, Trout Run and Kane Run below their junction will achieve more consistently the water quality goals noted above. Kane Run upstream of Trout Run is not impacted by mine drainage and exhibits exceptional water quality.

REALISTIC, SPECIFIC AND MEASURABLE RESTORATION GOALS

A lower tier restoration goal of biological recovery with a recreational fishery and water quality goals of pH between 6.0 – 9.0, alkalinity greater than acidity, total iron less than 1.5 mg/l, total Al less than 0.5 mg/l and TDS less than 1,500 mg/l during normal stream flow, as described in the BAMR AMD Set-Aside Program Implementation Guidelines, has been set for the main stem of the Hydrologic Unit, from Jamestown downstream to Johnstown, as well as Trout Run/Kane Run downstream of the Miller Shaft. It is intended that the restoration goals of this Hydrologic Unit plan are met when the above described lower tier restoration goals are met at all points within stretches of stream described above. It is not the intention of this Hydrologic Unit Plan that the lower tier restoration goals be met at every point in every tributary in the defined Hydrologic Unit.

After construction of the Little Conemaugh Treatment Plant, the most significant of the remaining untreated AMD sources are the Sulfur Creek Borehole and Beaverdale / Allendale area discharges which enter the South Fork upstream of St. Michael. There exists potential for these discharges to be treated in the future, in whole or in part, by conveying this water to the existing St. Michael Treatment Plant. It is also possible that certain of these discharges could be treated with a passive system.

The additional AMD discharges within the QHU will preclude attainment of upper tier goals and will likely prevent delisting these or other segments from the impaired waters list.

IDENTIFICATION AND PRIORITIZATION OF AML/AMD SITES THAT ARE ADVERSELY AFFECTING WATER QUALITY

As noted earlier, this project would not be economically feasible without the treatment of the St. Michael Discharge. The combined effect of the treatment at St. Michael and the proposed treatment plant on the Main Stem of the Little Conemaugh, downstream of the South Fork,

provides much additional benefit for this project. Combined with a capital infusion of approximately $2,225,000 dollars from the Foundation for PA Watersheds (GenOn Settlement) make this project economically feasible.

The project is proposed to occur in three phases:

Little Conemaugh Phase I – This phase will involve the design and construction of the AMD treatment plant between Portage and Wilmore and will include the installation of new extraction wells and sludge injection wells into the Sonman Deep Mine Complexes on both the "E" (Upper Freeport) Seam Mine and the "B" (Lower Kittanning) Seam Mine. This design may be completed as a separate contract. Upon completion the plant will operate to eliminate the existing Sonman Discharges and pull-down the mine pool sufficiently to facilitate the addition of the Hughes Discharge into the Sonman Deep Mine Complex.

Little Conemaugh Phase II – This phase will involve the combination of the Hughes and Sonman Mine Pools via drill holes and pipelines. This phase will involve progressive adjustments to plant operations as impacts from the Hughes Mine Pool become apparent. These adjustments include additional pumping to facilitate the addition of the Miller Shaft Discharge.

Little Conemaugh Phase III – Combine the Miller Shaft discharge with the Sonman Mine Pool. This phase may involve horizontal drilling and as such may be more complicated. Therefore, the plant will be designed to handle this discharge, but the progress of the project will be maintained by allowing this phase to occur separately from the overall project.

Please refer Figures 10-15 below. Figures 10-12 provide a visual representation of the extent of the various mining complexes and the coal seams wherein they are located. Figures 13-15 provide a visual representation of the condition of the Sonman B and E Seam Mines in the general location where the treatment plant and associated extraction and sludge injection wells are expected to be located.

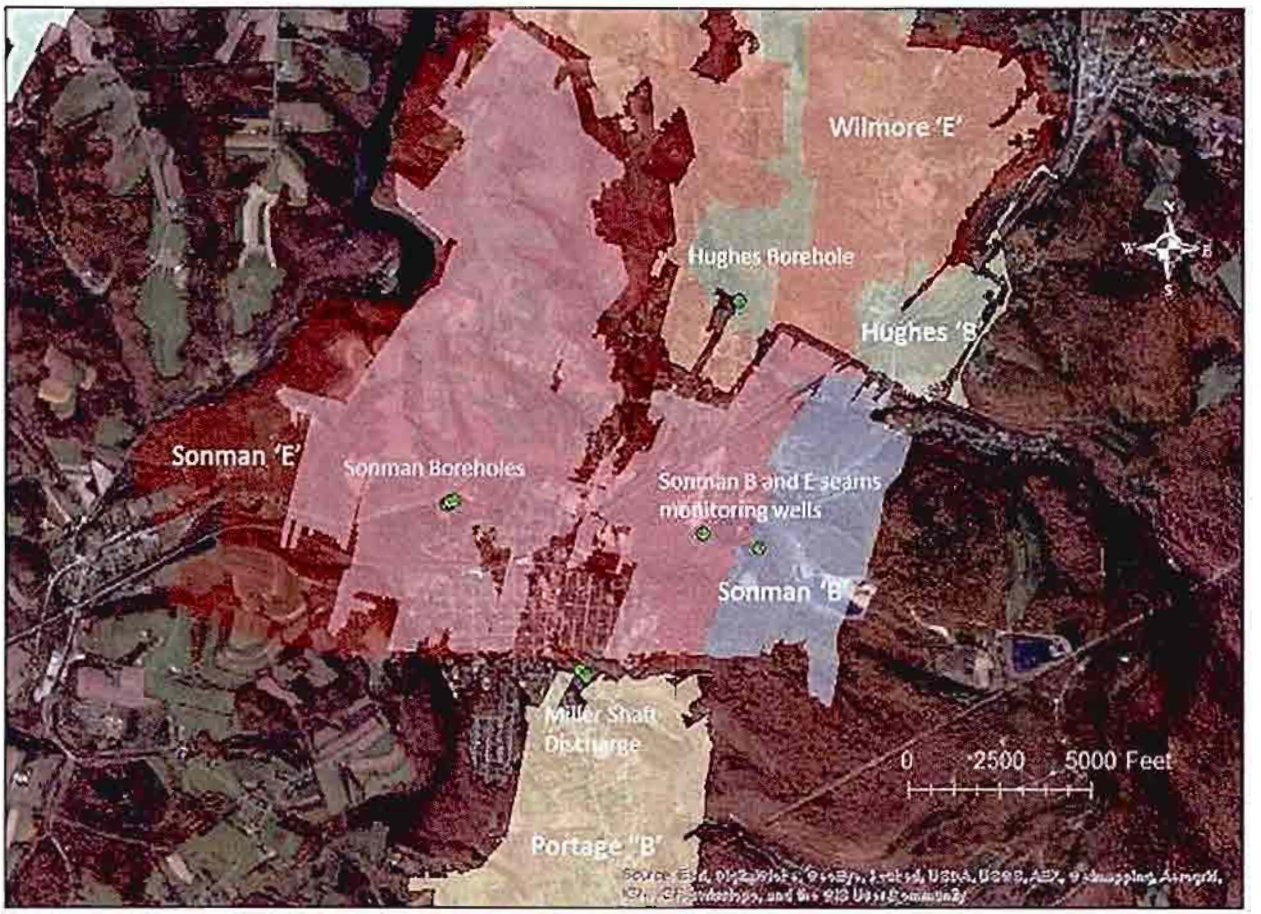

Figure 10. Location of Sonman, Hughes and Miller Shaft Discharges. Extent of Sonman, Portage and Hughes mines in the lowest coal seam, 'B' seam, shown in shaded tan, gray and green areas. Extent of mine-works in the uppermost 'E' coal seam is shown in red shading, and includes Sonman and Wilmore 3 mines. Locations of two monitoring wells in the Sonman B and E seam mine-works are also shown. Most of the town of Portage is underlain by workings in both the B and E seams.

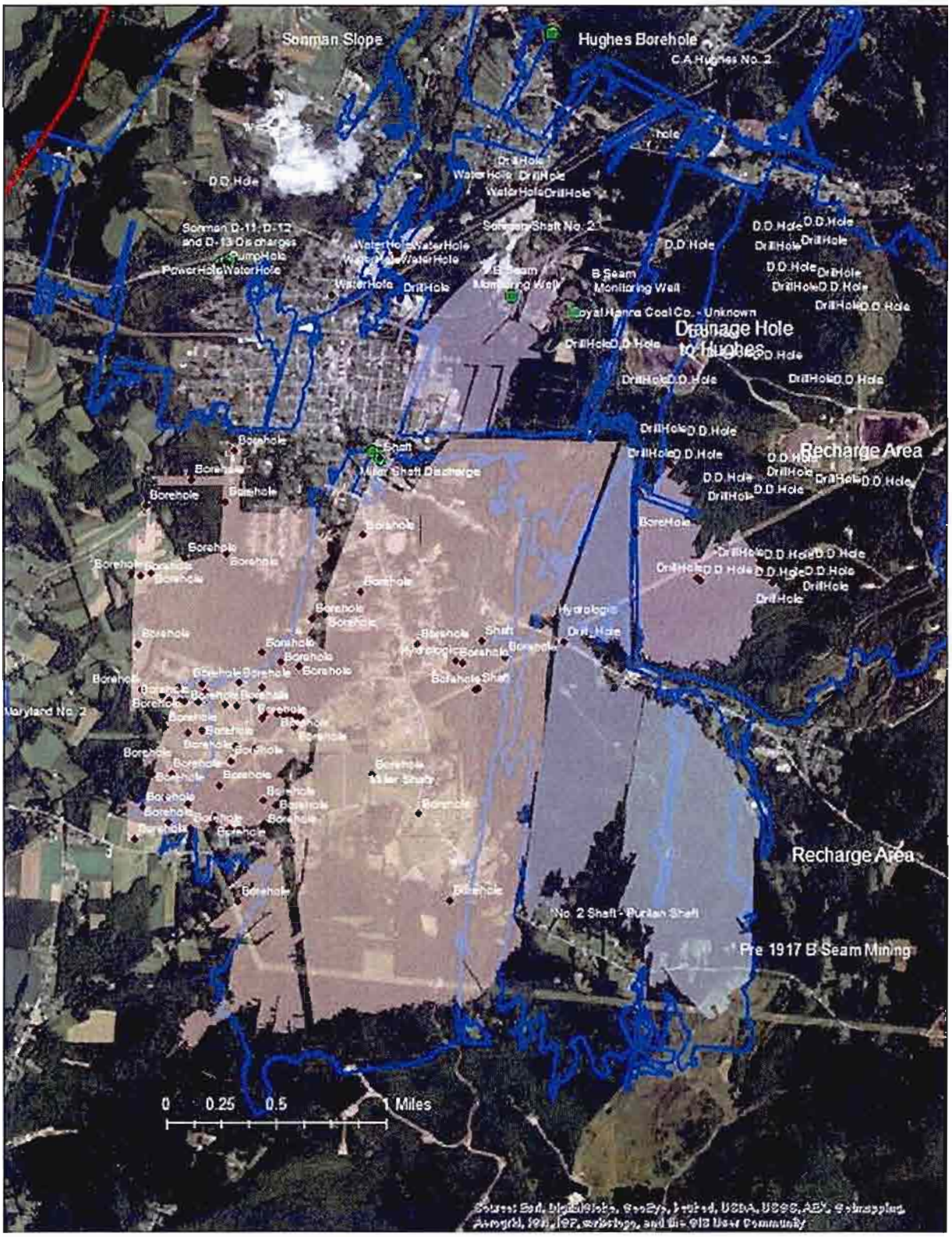

Figure 11. Extent of Mines in the Upper Kittanning C' Seam and Miscellaneous Features of Hydrologic Significance. Most of the features are boreholes with additional description given in the Attributes table for Points of Interest (POI). Blue outline is underlying Lower Kittanning B seam mines.

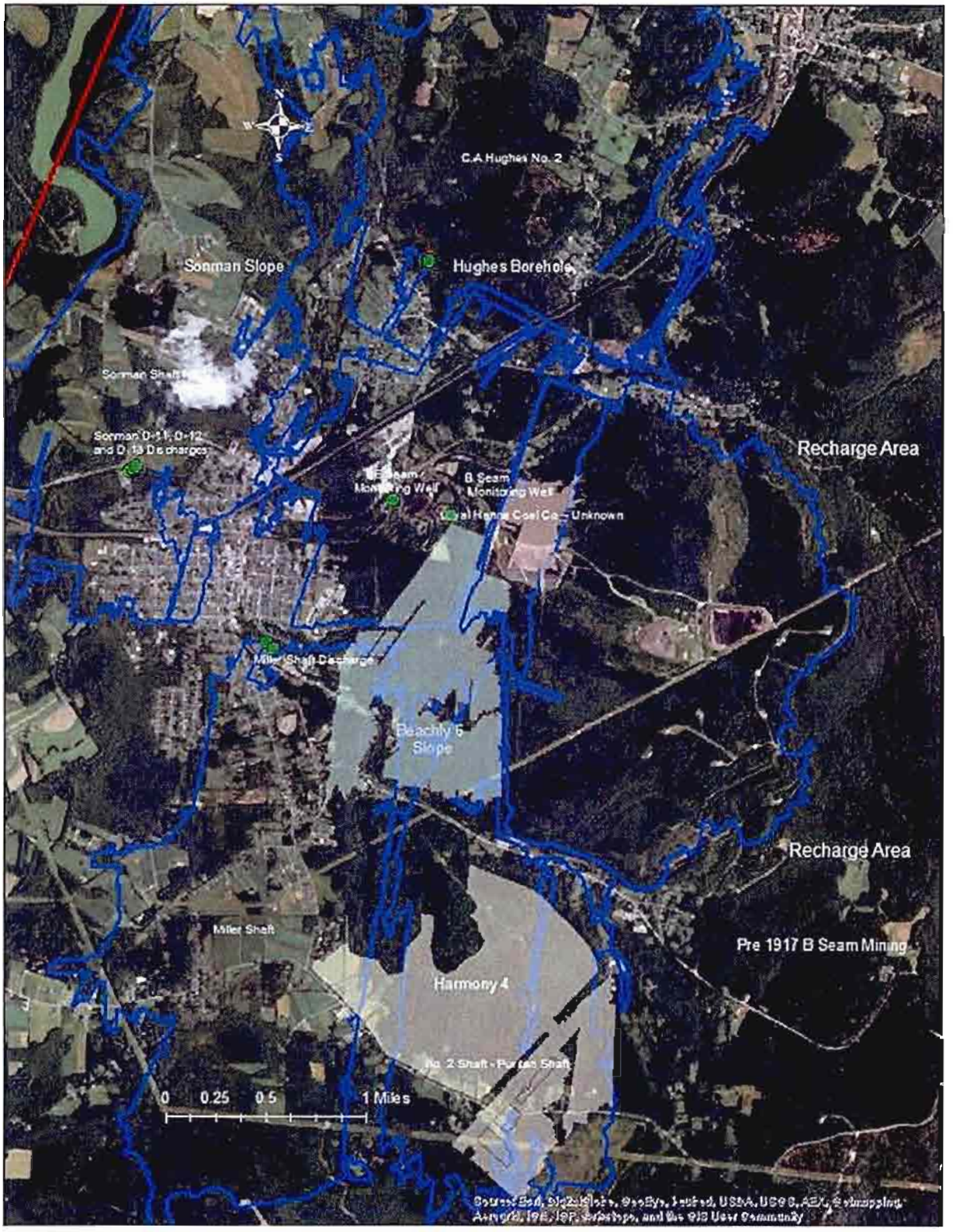

Figure 12. Extent of Lower Freeport D Seam Mines. Blue outline is underlying Lower Kittanning B seam mines.

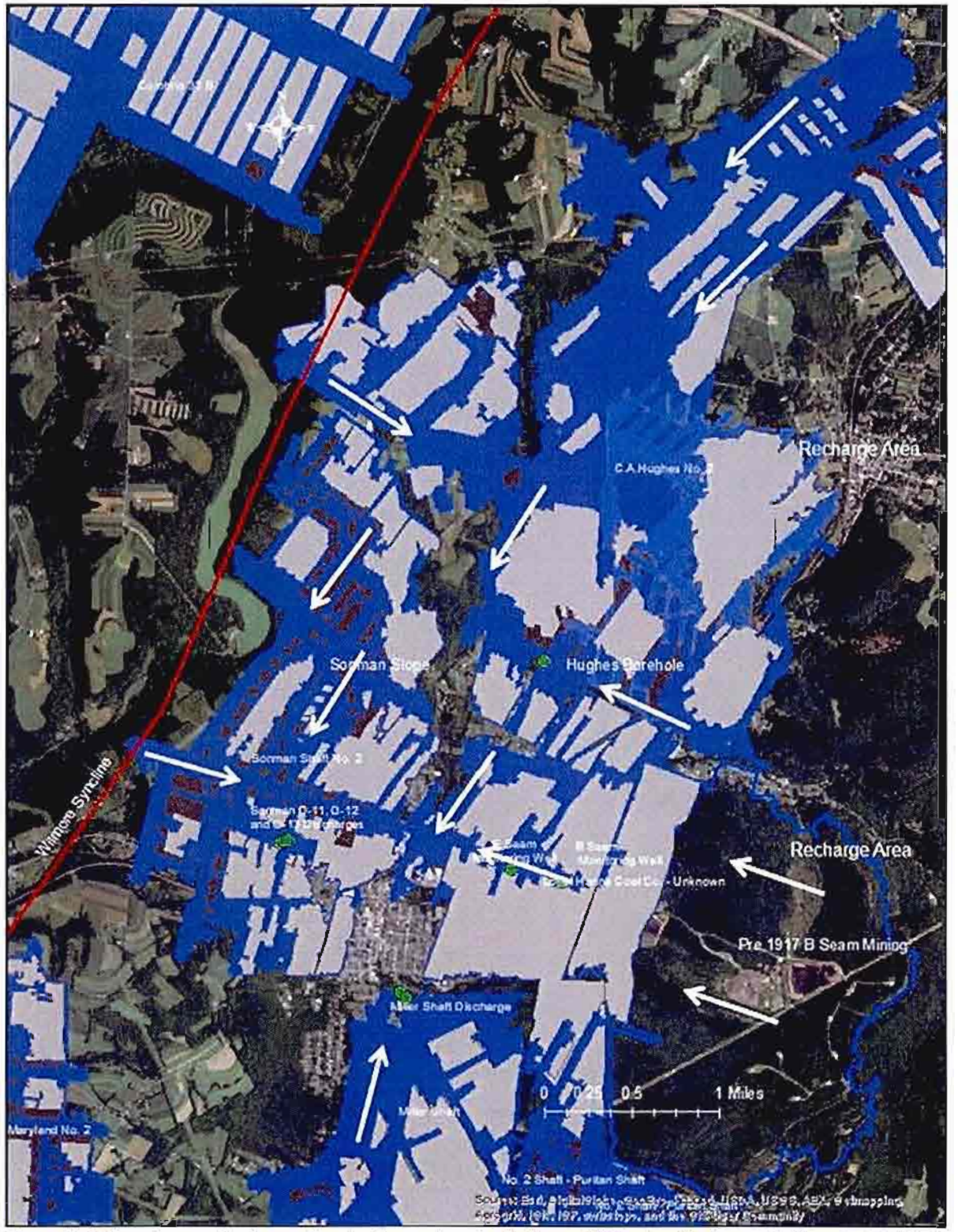

Figure 13. Inferred generalized ground water flow pattern in the Lower Kittanning B mine-pool. Open supported areas shown in solid blue likely have the most rapid flow rates. Flow lines converge toward the principal discharge points at the Hughes borehole, Miller shaft and Sonman boreholes. Light gray indicates collapsed zones and dark gray are solid blocks.

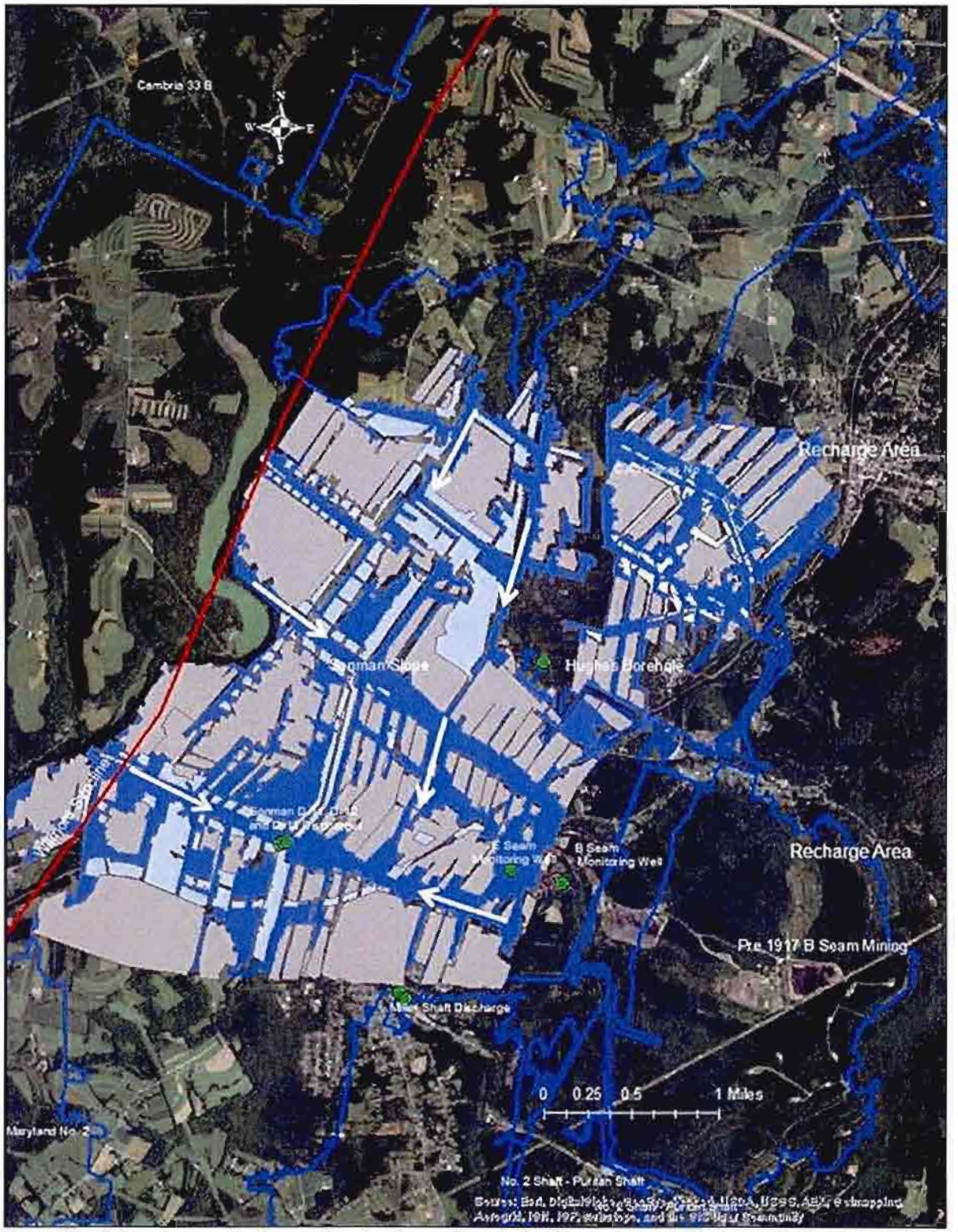

Figure 14. . Inferred generalized ground water flow pattern in the Upper Freeport E mine-pool. Open supported areas shown in solid blue likely have the most rapid flow rates. Flow lines converge toward the principal discharge points at the Sonman boreholes. Light gray indicates collapsed zones and dark gray are solid blocks.

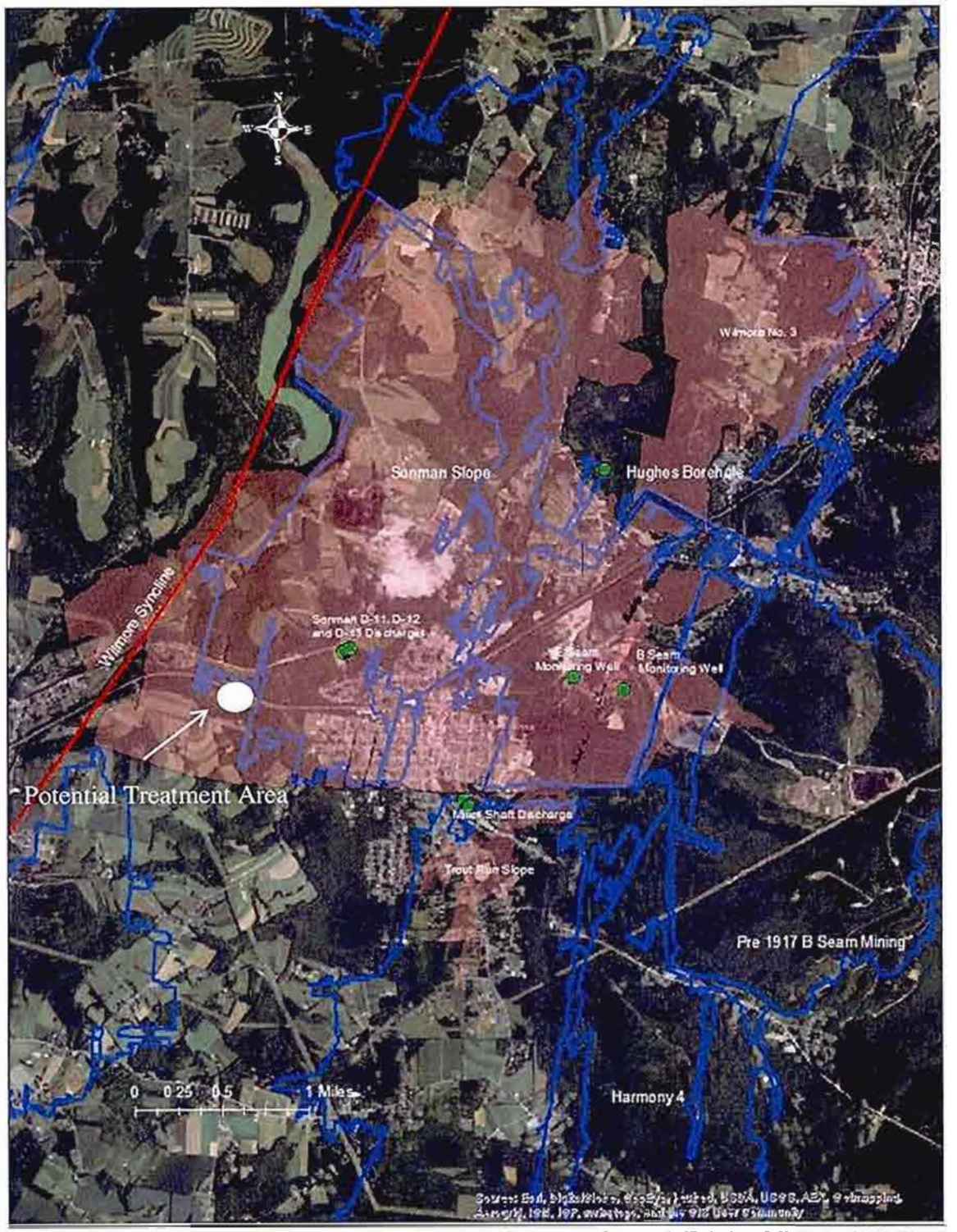

Figure 15. General Location of Possible Mine Water Treatment Site and Existing Mine Pool Discharges. Lower Kittanning B Mines outlined in blue. Upper Freeport E mines as semitransparent overlay.

In addition, BAMR is currently working to complete a project to remove the refuse pile above Ehrenfeld. When complete this is expected to have a positive impact on the pollution load emanating from the hill above Ehrenfeld.

The modeling supports the conclusion that addressing the Hughes, Sonman and Miller Shaft discharges, combined with the existing treatment plant at St. Michael, will achieve Lower Tier restoration goals for the Main Stem of the Little Conemaugh down to Johnstown. However, with this success of this project, further projects to address smaller discharges in tributaries using passive systems may become economically feasible. In addition, as noted earlier, other projects within the South Fork of the river (Allendale/Logan, Beaverdale and Sulfur Creek) could be addressed economically through a combination of passive treatment where feasible and by connecting these discharges to the Maryland #1 Mine Pool and treating them at the existing St. Michael Treatment Plant.

REALISTIC AND MEASURABLE TREATMENT GOALS FOR DISCHARGES PROPOSED FOR TREATMENT OR ABATEMENT

The goal established for treatment of the discharges described earlier, are Best Available Technology (BAT) limits as described in Chapter 87.102 of the Surface Mining of Coal state regulations. These limits would establish the following monthly average discharge limitations upon discharges from treatment facilities:

Total iron less than 3.0 mg/L and pH greater than 6.0 and less than 9.0 at all times. In reality, the pH of the discharge will likely be slightly above 7.0 in order to achieve the iron concentration goals. If these treatment goals are met, then the established restoration goals are expected to be achieved.

Cost-Benefit Analysis of Meeting the Proposed Goals

A cost-benefit analysis of meeting the proposed goals of the described Hydrologic Unit was performed. The analysis is attached as Appendix A. The total benefit to cost ratio of restoring the Main Stem of the Little Conemaugh River as part of the Little Conemaugh River Qualified Hydrologic Unit is 1.004 to 1.0. This includes a cash infusion of approximately $2.25 million from the Foundation for Pennsylvania Watersheds, as part of the GenOn Settlement.

It is important to note that this benefit value does not include significant additional benefit that may occur to the stretch of the Conemaugh River between Johnstown and Bolivar. Based on loading calculations and since no additional significant sources of AMD enter the Department believes that improvements in water quality will also be realized in this segment of the Little Conemaugh River. Please also note that the cost benefit ratio does not include more than $5.6 million dollars of cash infusion into the project from the Cresson Deep Mine. Although this money will not be provided until such time as the mining proceeds, Rosebud has affirmed that they plan to renew this permit and that they have no plans to cancel the permit. In fact, they noted that they have completed additional drilling to affirm the coal quality within the permit. With the Little Conemaugh Project constituting long-term / perpetual treatment and assuming this permit is activated at some point in the future, this Little Conemaugh Project will be in-place

to receive that monetary benefit. Inclusion of either one of these aforementioned additions greatly improves the cost to benefit ratio.

Furthermore, it is important to note that the benefit value is obtained solely from lost recreational use as estimated by the PA Fish and Boat Commission. It does not consider other intrinsic values such as the additional economic benefits of the infrastructure and expansion that is probable to support the opportunities that will arise with an improved Little Conemaugh River. The improved river condition creates the high probability of increased tourism due to other recreational activities such as kayaking. The benefit calculation also does not include economic benefit to industries currently operating in the unit or industries that may locate in the unit once they are no longer deterred by poor water quality. Restoration of the Hydrologic Unit may make industrial use of the stream water possible. It may also afford a lower cost of business to some industries due to a higher pollution attenuation potential which may allow for more relaxed discharge limitations. Finally, the cost-benefit analysis does not consider the economic benefits of the construction and operation of the plant itself. The construction of the plant will invariably create jobs and will pour additional moneys into the local and regional economy. The operation of the plant may create additional job opportunities. The benefit to cost ratio performed in order to evaluate the restoration of the Qualified Hydrologic Unit does not truly consider the complex economic network and the stimulus that such a large addition in local infrastructure will present. Modeling such effects is beyond the ability of this program and is excessive for the scope of this document. However, the costs to benefits ratio of meeting the lower tier restoration goals for the Main Stem of this Hydrologic Unit, supports this project as a worthwhile environmental and economic decision.

Section 402(g)(6)(B)(i):
The above Hydrologic Unit has been significantly affected by acid mine drainage from coal mining practices in a manner that adversely impacts biological resources?

Yes X No ___

Describe and provide references (may include references to TMDL, 303(d) list, watershed assessments or remediation plans, or BAMR water and biological sampling):

The water quality and biologic impacts of AMD within the Little Conemaugh Hydrologic Unit and more specifically within the Main Stem of the Little Conemaugh River have been assessed and documented through several efforts throughout the last 40 years. These sources include:

1.) Cooperative Mine Drainage Survey – Kiskiminetas River Basin, 1972, U.S. Environmental Protection Agency.

2.) Interim Report for Little Conemaugh River Watershed: Scarlift Report No. 164-1, 2 December 1974, The Neilan Engineers, Inc.

3.) Report on the Water Quality and Acid Mine Drainage in the Little Conemaugh River Watershed Cambria County (SCRIP Report), Pennsylvania, June 1995 (William Gleason Barbin, Director, Cambria County Conservation District).

4.) Little Conemaugh River Watershed Restoration Plan, GAI Project Number C020500.10 (GAI Consultants, September 2004), Prepared for Cambria County Conservation and Recreation Authority

5.) TMDLs for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed, Pennsylvania. EPA, Region III, January 29, 2010.

6.) Little Conemaugh River (818E) Management Report, Sections 01-04, Pennsylvania Fish and Boat Commission, Bureau of Fisheries, Fisheries Management Division, Fisheries Management Area 8, Gary Smith and Rick Lorson, March 2000.

7.) Watershed Restoration Action Strategy (WRAS), State Water Plan Subbasin 18E, Stonycreek and Little Conemaugh River Watersheds, Somerset and Cambria Counties, PA Department of Environmental Protection, Updated September 2003.

8.) Hydrologic Investigation of the Berwind Mine Pool and the St. Michael Discharge (Paul C. Rizzo Associates, Inc., December 2004), Prepared for the Southern Allegheny Conservancy
This report includes information on the various discharges in the Little Conemaugh Basin but focuses on the St. Michael Discharge, the largest single source of pollution load.
9.) Phase I SRB Low Flow Mine Storage and Treatment Project Evaluation, Selection Summary Report (July 2006) and Final Report (May 2007)
This investigation was commissioned by the Susquehanna River Basin Commission (SRBC). The focus of these reports is to identify additional sources of water that could be directed to the Susquehanna River during drought or low-flow conditions.

The results of the biological survey completed to-date are included in Appendix B.

Section 402(g)(6)(B)(ii):

(I) The above Hydrologic Unit contains land and water that are eligible (Section 404: Lands and water eligible for reclamation or drainage abatement expenditures under this title are those which were mined for coal or which were affected by such mining, wastebanks, coal processing, or other coal mining processes, except as provided for under Section 411, and abandoned or left in an inadequate reclamation status prior to the date of enactment of this Act [*August 3, 1977*], and for which there is no continuing reclamation responsibility under state or other federal laws).

Yes X_ No ____

Provide references and documentation of eligible lands and water (attach applicable signed Eligibility Determinations).

Appendix C contains the Signed Eligibility Determinations for the discharges intended to be addressed by this project, including the Hughes, Miller Shaft and Sonman Discharges, all located within this Hydrologic Unit. These discharges are located on lands and waters affected by

mining prior to August 3, 1977. In addition, there are more eligible sites in this Hydrologic Unit for which no project has yet been proposed.

(II) The above Hydrologic Unit contains land and water that are the subject of expenditures by the State from the forfeiture of bonds required under Section 509 or from other state sources to abate and treat abandoned mine drainage.

Yes X_ No ____

Provide references and documentation of State expenditures to abate and treat AMD.

A list of state funded Growing Greener AMD watershed restoration projects completed in this Hydrologic Unit can be found below:

$46,080 (FY2002) to Cambria County Conservation and Recreation Authority for Phase II restoration of the Little Conemaugh River.

$15,000 (End Date 6/30/2009) to CCD for Trout Run AMD.

$27,678 (End Date 6/30/2010) to Dunlo R&G for Shanks Creek AMD in South Fork of Little Conemaugh River.

$105,000 (End Date 6/30/2010) to CCD for South Fork AMD.

$172,180 (End Date 6/30/2010) to CCD for Trout Run AMD

Other sources of expenditure are as follows:

U.S. EPA Clean Water Act Section 319 Grants:
$142,430 (1994) to Cambria County Recreation Authority for passive treatment of a surface and a deep mine discharge and regrading and planting of a coal refuse pile on Bear Rocks Run, a tributary of Little Conemaugh River.

Pennsylvania Watershed Restoration Assistance Program (WRAP):
$30,500 (1998) to Cambria County Recreation Authority for an assessment and restoration plan for AMD pollution in South Fork Little Conemaugh River

U.S EPA Clean Water Act 104b3 through DEP Bureau of Mining and Reclamation (BMR):
$53,682 to Cambria County Conservation and Recreation Authority in FY97 for a demonstration treatment system on the Sulphur Creek Borehole. SAPS and Pyrolucite passive treatment system.

DCNR Rivers Conservation Grant
$188,00 (1996) to the Conemaugh Valley Conservancy to develop a rivers conservation plan for the Kiski-Conemaugh River system. The report contains a ten-year action plan for restoration

and protection of the Kiski-Conemaugh River basin. The final report is available at http://www.surfshop.net/users/mccombie.

Appendix A-Cost Benefit Analysis of Completing the Little Conemaugh River Qualified Hydrologic Unit

Benefit-Cost Analysis for the Little Conemaugh Project
(Little Conemaugh River Watershed)

To determine the value of the benefits of restoring this portion of the watershed, the following information was obtained from the Department's *AMD Set-Aside Program Implementation Guidelines, Revised Final Draft – February 21, 2015* Appendix D, Recreational Use Loss Estimates for PA Streams Degraded by AMD for base year 1989 adjusted to 2015 and Chapter 93, Water Quality Standards of the DEP's regulations. As required by the Implementation Guidelines, the dollar values listed in Appendix D from 1989 have been converted to 2015 US dollars, based on the reference date of December 2015, using the Bureau of Labor Statistics, Consumer Price Index (CPI) Inflation Calculator found online at http://www.bls.gov/data/inflation_calculator.htm.

The Hughes and Miller Shaft Discharges are proposed to be combined with the mine pool associated with the Sonman Discharges. This combined mine pool will be accessed by new extraction wells drilled into the uppermost "E" (Upper Freeport) Seam Sonman Deep Mine Complex. The water will be treated at a single hydrate lime treatment plant to be located between Portage and Wilmore. Sludge injection is anticipated into the lowermost "B" (Lower Kittanning) Seam Sonman Deep Mine Complex.

Little Conemaugh River
State Water Plan: 18E
Impaired miles potentially restored: - 22.5

Given the lack of significant additional sources of mining related contamination in the Conemaugh River between Johnstown and Bolivar in Westmoreland County, if the data obtained from modeling is projected further downstream by use of mass balance calculations involving U.S.G.S. gage data near the confluence with the Stonycreek River in Johnstown and the gage on the Conemaugh River at Seward, the Department anticipates water quality improvements in the aforementioned 22.7 mile stretch of the Conemaugh River. However, these stream miles are not included in the benefit analysis.

Stream Segment #1
Little Conemaugh River from Hughes Discharge to Sonman Discharges – 2.6 miles
Chapter 93 Designation: Cold Water Fishery (CWF)
Projected Use: Trout Stocked Fishery (TSF/WT)
Use Rate: 800 trips per year
Valuation: $89.63
Lost Value: 2.6 miles (X) 800 trips/year/mile (X) $89.63 trip = $186,430.40

Stream Segment #2
Trout Run from JCT with Miller Shaft Discharge to JCT with Kane Run – 1.25 miles
Chapter 93 Designation: Cold Water Fishery (CWF)
Projected Use: Trout Stocked Fishery (TSF/WT)
Use Rate: 800 trips per year
Valuation: $89.63
Lost Value: 1.25 miles (X) 800 trips/year/mile (X) $89.63 trip = $89,630.00

Stream Segment #3
Kane Run from JCT with Trout Run to JCT with Little Conemaugh - .28 miles
Chapter 93 Designation: Cold Water Fishery (CWF)
Projected Use: Trout Stocked Fishery (TSF/WT)
Use Rate: 800 trips per year

Valuation: $89.63
Lost Value: .28 miles (X) 800 trips/year/mile (X) $89.63 trip = $20,077.12

Stream Segment #4
Little Conemaugh River from Sonman Discharges to JCT with North Fork – 2.4 miles
Chapter 93 Designation: Cold Water Fishery (CWF)
Projected Use: Trout Stocked Fishery (TSF/WT)
Use Rate: 800 trips per year
Valuation: $89.63
Lost Value: 2.4 miles (X) 800 trips/year/mile (X) $89.63 trip = $172,089.6

Stream Segment #5
Little Conemaugh River from JCT with North Fork to Point near 5th Street in Ehrenfeld – 4.2 miles
Chapter 93 Designation: Warm Water Fishery (WWF)
Projected Use: Trout Stocked Fishery (TSF/WT)
Use Rate: 800 trips per year
Valuation: $89.63
Lost Value: 4.2 miles (X) 800 trips/year/mile (X) $89.63 trip = $301,156.8

Stream Segment #6
Note: CH 93 designates the L.C. in this area as WWF. I defined this segment this way since the L.C. picks up a LF deep mine discharge in this location and a little further downstream the Pristine Resources Plant discharges to the river. Finally, the South Fork of the Little Conemaugh joins the main stem at South Fork and adds the treated St. Michael water, but also the untreated South Fork discharges, including the Beaverdale and Logan Discharges and the Sulfur Creek Borehole Discharge, as well as the marginally treated discharges off the Cooney Brothers Dunlo and Janosky Permits in the upper reaches of Sulfur Creek.

Little Conemaugh River from 5th Street in Ehrenfeld to Johnstown – 13.3 miles
Chapter 93 Designation: Warm Water Fishery (WWF)
Projected Use: Trout Stocked Fishery (TSF/WT)
Use Rate: 800 trips per year
Valuation: $89.63
Lost Value: 13.3 miles (X) 800 trips/year/mile (X) $89.63 trip = $953,663.20
Although the Little Conemaugh River from East Conemaugh to the Point in Johnstown includes river walls, there is still limited access to this stretch of the river. With the concurrence of the PA Fish and Boat Commission this section was included with a projected use of TSF/WT.

Analysis of Benefits;

The net present value (NPV) of the benefits can be calculated using the uniform series, present worth equation or values extracted from the uniform series present worth value table.

The annual economic lost values of the portions of the Little Conemaugh River identified above are the basis of the project's NPV benefit evaluation. The lost value is $1,723,047.12 per year. The following parameters are applied to the NPV equation:

N = 50 years
i = 5%
USPWF = 18.25593

Net Present Benefit Value=
$1,723,047.12 (X) 18.25593 = $31,455,827.61

Analysis of Cost:
The capital costs for treating the discharge with an active lime treatment facility utilizing clarifier Technology and a Maelstrom Oxidizer for Pre-Aeration were estimated based on the actual cost of the St. Michael Treatment Plant constructed by Rosebud Mining as it exists in 2015.

Capital Costs for Treatment Plant = $17,500,000.00
Estimated Costs to Connect Miller Shaft and Hughes Mine Pools to Sonman Mine Pool: $1,000,000.00

Total Capital Costs = $18,500,000.00

The O&M costs for the Little Conemaugh Treatment Plant were estimated based on the actual 2012 O&M costs from the Barnes & Tucker Lancashire No. 15 Plant. 2012 was the last year that the Lancashire Plant used hydrated lime. This plant is pumping water at a rate comparable to the estimated rate expected during normal times of the year at the Little Conemaugh Plant (~4,500 - 5,000 gpm). The costs for 2012 were increased by 3% for every year through 2016 and rounded off.

The estimated O&M costs for the Little Conemaugh Treatment Plant = $830,000.00

Note: The following parameters are applied to the NPV equation:

n = 50 years
i = 5 %
USPWF = 18.25593

Total NPV O&M Costs = $830,000 (X) 18.25593 = $15,152,421.90

The NPV of the costs is determined by adding the capital cost of the treatment system and the net present value of the annual O&M costs over the 50 year life of the facility, then subtract the capital infusion from the Foundation for PA Watersheds/GenOn Settlement ($2,225,000).

Note: Total capital cost = NPV capital cost

Therefore, the project's NPV cost = NPV capital cost + NPV of the O&M - GenOn
= $18,500,000 + $15,152,421.90 - $2,225,000
= $31,427,421.9

Benefit-Cost Ratio:

Benefit-Cost Ratio = Total Benefit Value / Total Cost Value
= $31,455,827.61 / $31,427,421.9
=1.001
1.001 : 1.0

Methods and assumptions used in this analysis:

1. The portions of watershed defined above are designated and to be restored to a Trout

Stock Fishery and that the value lost as defined for similar streams are justifiable and applicable.

2. Any costs associated with real estate acquisition are not included.

3. The capital construction costs are based upon the assumption that the Department will design and construct the facility using its established contracting procedures. The capital cost may be less if a third party designs and constructs the facility.

4. The impaired portion of the Main Stem of the Little Conemaugh River, Kane Run and Trout Run Watersheds named above, having the potential to be restored to their intended uses, were derived by analysis of all available water quality and biological assessment data. However, additional biological sampling needs to be performed in order to determine the specific degree of impairment and potential for recovery. In addition to existing data sources, during low flow conditions on October 21 and 22, 2009, a comprehensive water quality and flow assessment was conducted that included the portion of the Little Conemaugh just upstream of the Hughes Discharge and extended downstream to the confluence with the Stony Creek River in Johnstown. The total distance of this portion of the stream is 22.6 miles. All major inflows within the stream section, including tributaries, treated and untreated discharges were sampled for a complete suite of total and dissolved constituents and measured flows were obtained. The objective of this survey was to gather sufficient data so as to develop a geochemical model in order to simulate the impact of the treated effluent upon the stream and to predict the extent of stream recovery given the fact that untreated AMD sources will remain.

5. The financial contribution of Rosebud Mining (Previously Amfire Mining Inc.) for their Cresson Mine Operation, if/when operations begin, as set by the CO&A will is $5,666,164.31. This money has not been utilized as capital infusion into the project. If this money were utilized considerable additional capital and O&M costs could be absorbed within an acceptable cost benefit ratio.

6. Although this QHU extends only to Johnstown, it could in fact extend further downstream another 22.7 miles to Bolivar. Within this section there are only minor additional impairments. Furthermore, based on relative loading calculations, the Department expects this portion of the Conemaugh River to also experience water quality improvements due to the treatment projects within the Little Conemaugh Watershed. At this time, the portion of the Conemaugh between Johnstown and Bolivar is also not part of this QHU. However, it could be added if needed at a later date. Downstream of Bolivar, the river is impacted again by additional AMD discharges and impaired tributaries. These tributaries and other sources of AMD further downstream are outside the scope of this Hydrologic Unit. If this additional stream improvement were added to the projected benefits, considerable additional capital and O&M costs could be absorbed within an acceptable cost benefit ratio.

7. In addition to the standard analysis of probable hydrologic consequences to surface and groundwater resources resulting from Rosebud's proposed mining activities, appropriate monitoring and planning are warranted so as to avoid a situation where sulfate and TDS levels in the effluent approach or exceed the theoretical values used in the early model.

Alternative Treatment Variant

ArcelorMittal USA Pristine Resources (Pristine) owns the various mines in Cambria County associated with the previous mining operations of BethEnergy, Inc. Pristine manages the mine pools associated with these deep mines and operates and maintains the associated treatment plants. This includes a treatment plant located in Ehrenfeld. The former Mine 33 complex is located north and east of Portage. Pristine pumps the water from this complex and discharges it to the abandoned PA Coal and Coke Mine, which gravity drains down to Ehrenfeld and into the treatment plant. Due to the manipulation of this mine pool, the water quality is already

net alkaline, with more than 400 mg/L of excess alkalinity. Therefore, the alternative considered was adding to the combined Sonman, Hughes and Miller Shaft Mine Pool, a portion of the pumped Mine 33 water adequate to make the mine pool net alkaline, thereby eliminating the need for hydrated lime. Please note the table below, wherein rough approximations of the variables associated with this option are presented.

	Flow (gpm)	Chemical Cost/yr.	Electrical Cost ($/yr.)	Net Cost
No Decarbonation/Lime Treatment*	4,556	$296,638	NA	$296,638
Decarbonation/Lime Treatment*	4,556	$122,802	$47,139	$169,941
Mine 33/Peroxide Treatment**	5,656	$74,000 (peroxide)	$84,000	$158,000
*Assumes Fe = 46 mg/L **Assumes Fe = 18.5 mg/L ***Estimated $1.9 million in additional capital costs to add mine 33 water				

Based on these numbers the annual O&M savings to be realized is less than $12,000. Therefore, it would take more years than the life of the plant to recoup the capital costs involved. The recommendation was to not pursue this option.

Appendix B-Biological Assessment of Little Conemaugh River

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 1:10:32 PM

Assessment ID:	61482
Station ID:	20101027-1750-kspyker (Latitude: 40.4080, Longitude: -78.6551)
Method:	6-Dframe Composite, 200 subsample
Location:	KLCON6A - Little Conemaugh upstream of Hughes discharge, Sportsman Road. 7485 - 812.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 203

Code	Standardized ID Level	Number	Tolerance
1020600702	Maccaffertium	8	3
1020800400	Eurylophella	9	4
1060100100	Sialis	1	6
1060200400	Nigronia	5	2
1080300500	Polycentropus	1	6
1080400500	Ceratopsyche	80	4
1080400600	Cheumatopsyche	37	6
1080500100	Rhyacophila	2	1
1101300600	Optioservus	2	4
1120900100	Atherix	8	2
1121900700	Antocha	3	3
1122200000	Chironomidae	47	6

Metrics:

Metric Name	Raw Metric Values	Standardized Metric Values						
		Freestone Riffle-Run						
		6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	12	36.4	38.7	34.3		38.7	64.9	66.7
Ephemeroptera Richness	2					33.3		
Trichoptera Richness	4					36.4		
EPT Richness	6			26.1	39.2	35.3	75.0	75.0
Trichoptera Richness (PTV 0-4)	2				55.6			
EPT Richness (PTV 0-4)	4	21.1	25.0					
Becks Index (version 3)	4	10.5	18.2	10.3				
Becks Index (version 4)	9				45.2	40.9		75.0
FC + PR + SH Richness	7				60.3			

Hilsenhoff Biotic Index	4.64	66.1	77.1	65.2	79.5		85.2	87.0
% Intolerant Individuals (PTV 0-3)	12.8	15.1	19.2				48.7	
% Intolerant Individuals (PTV 0-5)	57.6			62.3				
% Tolerant Individuals (PTV 7-10)	0.0						101.0	101.5
Shannon Diversity	1.71	59.6	59.6	58.8		70.2	88.8	80.1
	IBI Score	34.8	39.6	42.8	56.0	42.5	77.1	80.6

% Ephemeroptera:	8.37	% Plecoptera:	0	% Trichoptera:	59.11
% Ephemeroptera (PTV 0-4):	8.37	% Dominant Taxon:	39.41		

Habitat:

1 Instream Cover:	18	2 Epifaunal Substrate:	19		
3 Embeddedness:	16	4 Velocity/Depth Regimes:	19		
5 Channel Alterations:	19	6 Sediment Deposition:	16		
7 Frequency of Riffles:	18	8 Channel Flow Status:	15		
9 Condition of Banks:	12	10 Bank Vegetation:	16	**Total**	
11 Grazing or Disruptive:	17	12 Riparian Vegetation:	16	201	

Impairment:

Insufficient?	Y	Impaired?	N/A	Biology Impaired?	N/A
Habitat Impaired?	N/A	Rock picks influenced?	N	Impact Localized?	N

Designated Use needs reevaluation? N

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 1:06:05 PM

Assessment ID:	61480
Station ID:	20101027-1520-kspyker (Latitude: 40.3845, Longitude: -78.7187)
Method:	6-Dframe Composite, 200 subsample
Location:	KLCON4 - Little Conemaugh River upstream of North Fork at Rt. 160 bridge. 7485-811. Iron precipitation.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 6

Code	Standardized ID Level	Number	Tolerance
1080300500	Polycentropus	1	6
1080400500	Ceratopsyche	1	4
1122200000	Chironomidae	2	6
11000000000	Oligochaeta	1	10
13030000000	Amphipoda	1	6

Metrics:

Metric Name	Raw Metric Values	Standardized Metric Values						
		Freestone Riffle-Run						
		6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	5	15.2	16.1	14.3		16.1	27.0	27.8
Ephemeroptera Richness	0					0.0		
Trichoptera Richness	2					18.2		
EPT Richness	2			8.7	13.1	11.8	25.0	25.0
Trichoptera Richness (PTV 0-4)	1				27.8			
EPT Richness (PTV 0-4)	1	5.3	6.3					
Becks Index (version 3)	0	0.0	0.0	0.0				
Becks Index (version 4)	1				5.0	4.5		8.3
FC + PR + SH Richness	2				17.2			
Hilsenhoff Biotic Index	6.33	45.3	52.8	44.6	54.5		58.3	59.6
% Intolerant Individuals (PTV 0-3)	0.0	0.0	0.0				0.0	

% Intolerant Individuals (PTV 0-5)	16.7			18.1				
% Tolerant Individuals (PTV 7-10)	16.7						84.1	84.6
Shannon Diversity	1.56	54.6	54.6	53.8		64.2	81.3	73.3
IBI Score	20.0	21.6	23.2	23.5		19.1	46.0	46.4

% Ephemeroptera: 0 % Plecoptera: 0 % Trichoptera: 33.33
% Ephemeroptera (PTV 0-4): 0 % Dominant Taxon: 33.33

Habitat:

1 Instream Cover:	16	2 Epifaunal Substrate:	14	
3 Embeddedness:	10	4 Velocity/Depth Regimes:	12	
5 Channel Alterations:	15	6 Sediment Deposition:	10	
7 Frequency of Riffles:	11	8 Channel Flow Status:	16	
9 Condition of Banks:	13	10 Bank Vegetation:	13	**Total**
11 Grazing or Disruptive:	16	12 Riparian Vegetation:	10	156

Impairment:

Insufficient? Y | Impaired? N/A Biology Impaired? N/A
Habitat Impaired? N/A | Rock picks influenced? N Impact Localized? N
Designated Use needs reevaluation? N

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 1:03:23 PM

Assessment ID: 62549
Station ID: 20091221-1246-mlookenbil (Latitude: 40.3774, Longitude: -78.7542)
Method: 6-Dframe Composite, 200 subsample
Location: Little Conemaugh River, @ Old Rt. 53 between the rail overpasses.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 98

Code	Standardized ID Level	Number	Tolerance
1020800400	Eurylophella	1	4
1021000200	Caenis	1	7
1040300100	Taeniopteryx	1	2
1040500200	Leuctra	1	0
1060200400	Nigronia	1	2
1080200100	Lype	1	2
1080400500	Ceratopsyche	36	4
1080400600	Cheumatopsyche	2	6
1080400700	Hydropsyche	3	6
1101300200	Dubiraphia	2	6
1101301000	Stenelmis	3	5
1121900400	Tipula	2	4
1121901100	Dicranota	3	3
1121901600	Limnophila	1	3
1122100400	Prosimulium	1	2
1122200000	Chironomidae	38	6
15000000000	Hydracarina	1	7

Metrics:

Metric Name	Raw Metric Values	Standardized Metric Values						
		Freestone Riffle-Run						
		6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	17	51.5	54.8	48.6		54.8	91.9	94.4
Ephemeroptera Richness	2					33.3		
Trichoptera Richness	4					36.4		
EPT Richness	8			34.8	52.3	47.1	100.0	100.0
Trichoptera Richness (PTV 0-4)	2				55.6			
EPT Richness (PTV 0-4)	5	26.3	31.3					
Becks Index (version 3)	7	18.4	31.8	17.9				

Becks Index (version 4)	11				55.3	50.0		91.7
FC + PR + SH Richness	11				94.8			
Hilsenhoff Biotic Index	4.85	63.5	74.1	62.7	76.4		81.9	83.6
% Intolerant Individuals (PTV 0-3)	9.2	10.9	13.8				35.0	
% Intolerant Individuals (PTV 0-5)	52.0			56.2				
% Tolerant Individuals (PTV 7-10)	2.0						99.0	99.5
Shannon Diversity	1.71	60.0	60.0	59.1		70.6	89.3	80.5
IBI Score	38.4	44.3	46.5	66.9	48.7	82.8	91.6	

% Ephemeroptera: 2.04 % Plecoptera: 2.04 % Trichoptera: 42.86
% Ephemeroptera (PTV 0-4): 1.02 % Dominant Taxon: 38.78

Habitat:

1 Instream Cover:	10	2 Epifaunal Substrate:	15	
3 Embeddedness:	9	4 Velocity/Depth Regimes:	13	
5 Channel Alterations:	15	6 Sediment Deposition:	10	
7 Frequency of Riffles:	8	8 Channel Flow Status:	17	
9 Condition of Banks:	9	10 Bank Vegetation:	9	**Total**
11 Grazing or Disruptive:	12	12 Riparian Vegetation:	13	140

Impairment:

Insufficient? N Impaired? Y Biology Impaired? Y
Habitat Impaired? Y Rock picks influenced? N Impact Localized? N
Designated Use needs reevaluation? N

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 1:02:36 PM

Assessment ID:	62877
Station ID:	20090819-0730-mlookenbil (Latitude: 40.3774, Longitude: -78.7543)
Method:	6-Dframe Composite, 200 subsample
Location:	Little Conemaugh River, along old RT. 53 and just upstream of first stone bridge.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 223

Code	Standardized ID Level	Number	Tolerance
1021000200	Caenis	1	7
1080100200	Dolophilodes	1	0
1080400300	Diplectrona	1	0
1080400500	Ceratopsyche	12	4
1080400600	Cheumatopsyche	1	6
1080400700	Hydropsyche	60	6
1101300600	Optioservus	2	4
1101300800	Oulimnius	5	5
1101301000	Stenelmis	6	5
1120200000	Ceratopogonidae	1	6
1121200500	Hemerodromia	2	6
1121200700	Neoplasta	4	6
1121901100	Dicranota	1	3
1122100500	Simulium	8	6
1122200000	Chironomidae	107	6
4999999999	Nemertea	3	6
11000000000	Oligochaeta	5	10
13030100100	Crangonyx	1	4
15000000000	Hydracarina	2	7

Metrics:

Metric Name	Raw Metric Values	Standardized Metric Values						
		Freestone Riffle-Run						
		6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	19	57.6	61.3	54.3		61.3	102.7	105.6
Ephemeroptera Richness	1					16.7		
Trichoptera Richness	5					45.5		
EPT Richness	6			26.1	39.2	35.3	75.0	75.0
Trichoptera Richness (PTV 0-4)	3				83.3			

EPT Richness (PTV 0-4)	3	15.8	18.8					
Becks Index (version 3)	6	15.8	27.3	15.4				
Becks Index (version 4)	8				40.2	36.4		66.7
FC + PR + SH Richness	12				103.4			
Hilsenhoff Biotic Index	5.85	51.2	59.7	50.5	61.6		66.0	67.4
% Intolerant Individuals (PTV 0-3)	1.3	1.5	1.9				4.9	
% Intolerant Individuals (PTV 0-5)	13.0			14.1				
% Tolerant Individuals (PTV 7-10)	3.6						97.4	97.9
Shannon Diversity	1.68	58.6	58.6	57.8		69.0	87.3	78.7
IBI Score	33.4	37.9	36.4	64.9	44.0	71.8	80.9	

% Ephemeroptera:	0.45	% Plecoptera:	0	% Trichoptera:	33.63
% Ephemeroptera (PTV 0-4):	0	% Dominant Taxon:	47.98		

Habitat:

1 Instream Cover:	10	2 Epifaunal Substrate:	16	
3 Embeddedness:	14	4 Velocity/Depth Regimes:	14	
5 Channel Alterations:	15	6 Sediment Deposition:	14	
7 Frequency of Riffles:	12	8 Channel Flow Status:	15	
9 Condition of Banks:	13	10 Bank Vegetation:	10	**Total**
11 Grazing or Disruptive:	10	12 Riparian Vegetation:	14	157

Impairment:

Insufficient?	Y	Impaired?	N/A	Biology Impaired?	N/A
Habitat Impaired?	N/A	Rock picks influenced?	N	Impact Localized?	N

Designated Use needs reevaluation? N

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 1:00:49 PM

Assessment ID:	61481
Station ID:	20101027-1641-kspyker (Latitude: 40.3716, Longitude: -78.7650)
Method:	6-Dframe Composite, 200 subsample
Location:	KLCSUMHL - Little Conemaugh River upstream of mouth near Summerhill, Rt. 53 and 219. 7485-810. Iron precipitation.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 174

Code	Standardized ID Level	Number	Tolerance
1020600702	Maccaffertium	1	3
1020800300	Ephemerella	1	1
1040300100	Taeniopteryx	2	2
1060200400	Nigronia	1	2
1080400500	Ceratopsyche	139	4
1080400600	Cheumatopsyche	14	6
1101300600	Optioservus	2	4
1121901500	Hexatoma	1	2
1122200000	Chironomidae	1	6
13030200100	Gammarus	11	4
13040100300	Orconectes	1	6

Metrics:

		Standardized Metric Values						
		Freestone Riffle-Run						
Metric Name	Raw Metric Values	6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	11	33.3	35.5	31.4		35.5	59.5	61.1
Ephemeroptera Richness	2					33.3		
Trichoptera Richness	2					18.2		
EPT Richness	5			21.7	32.7	29.4	62.5	62.5
Trichoptera Richness (PTV 0-4)	1				27.8			
EPT Richness (PTV 0-4)	4	21.1	25.0					
Becks Index (version 3)	5	13.2	22.7	12.8				
Becks Index (version 4)	9				45.2	40.9		75.0
FC + PR + SH Richness	5				43.1			

Hilsenhoff Biotic Index	4.11	72.6	84.7	71.7	87.4		93.6	95.6
% Intolerant Individuals (PTV 0-3)	3.4	4.0	5.1				12.9	
% Intolerant Individuals (PTV 0-5)	90.8			98.2				
% Tolerant Individuals (PTV 7-10)	0.0						101.0	101.5
Shannon Diversity	0.84	29.3	29.3	28.9		34.5	43.6	39.3
IBI Score	28.9	33.7	44.1	47.2		32.0	62.0	72.3

% Ephemeroptera:	1.15	% Plecoptera:	1.15	% Trichoptera:	87.93
% Ephemeroptera (PTV 0-4):	1.15	% Dominant Taxon:	79.89		

Habitat:

1 Instream Cover:	16	2 Epifaunal Substrate:	15	
3 Embeddedness:	11	4 Velocity/Depth Regimes:	19	
5 Channel Alterations:	17	6 Sediment Deposition:	10	
7 Frequency of Riffles:	14	8 Channel Flow Status:	15	
9 Condition of Banks:	13	10 Bank Vegetation:	15	**Total**
11 Grazing or Disruptive:	16	12 Riparian Vegetation:	11	172

Impairment:

Insufficient?	Y	Impaired?	N/A	Biology Impaired?	N/A
Habitat Impaired?	N/A	Rock picks influenced?	N	Impact Localized?	N

Designated Use needs reevaluation? N

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 12:57:54 PM

Assessment ID:	61477
Station ID:	20101027-1400-kspyker (Latitude: 40.3786, Longitude: -78.8354)
Method:	6-Dframe Composite, 200 subsample
Location:	KLCON2 - Little Conemaugh River at Mineral Point, Rt. 271 bridge. 7485-806. Iron precipitation.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 61

Code	Standardized ID Level	Number	Tolerance
1080400500	Ceratopsyche	45	4
1080400600	Cheumatopsyche	13	6
1101300600	Optioservus	2	4
1122200000	Chironomidae	1	6

Metrics:

Metric Name	Raw Metric Values	Standardized Metric Values: Freestone Riffle-Run						
		6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	4	12.1	12.9	11.4		12.9	21.6	22.2
Ephemeroptera Richness	0					0.0		
Trichoptera Richness	2					18.2		
EPT Richness	2			8.7	13.1	11.8	25.0	25.0
Trichoptera Richness (PTV 0-4)	1				27.8			
EPT Richness (PTV 0-4)	1	5.3	6.3					
Becks Index (version 3)	0	0.0	0.0	0.0				
Becks Index (version 4)	2				10.1	9.1		16.7
FC + PR + SH Richness	2				17.2			
Hilsenhoff Biotic Index	4.46	68.3	79.7	67.4	82.2		88.1	89.9
% Intolerant Individuals (PTV 0-3)	0.0	0.0	0.0				0.0	
% Intolerant Individuals (PTV 0-5)	77.0			83.2				

% Tolerant Individuals (PTV 7-10)	0.0						101.0	101.5
Shannon Diversity	0.73	25.6	25.6	25.3		30.2	38.2	34.4
IBI Score	18.6	20.8	32.7	30.1		13.7	45.5	48.0

% Ephemeroptera: 0 % Plecoptera: 0 % Trichoptera: 95.08
% Ephemeroptera (PTV 0-4): 0 % Dominant Taxon: 73.77

Habitat:

1 Instream Cover:	15	2 Epifaunal Substrate:	13	
3 Embeddedness:	6	4 Velocity/Depth Regimes:	14	
5 Channel Alterations:	14	6 Sediment Deposition:	5	
7 Frequency of Riffles:	11	8 Channel Flow Status:	16	
9 Condition of Banks:	16	10 Bank Vegetation:	15	**Total**
11 Grazing or Disruptive:	16	12 Riparian Vegetation:	9	150

Impairment:

Insufficient? Y Impaired? N/A Biology Impaired? N/A
Habitat Impaired? N/A Rock picks influenced? N Impact Localized? N
Designated Use needs reevaluation? N

Macroinvertebrate Sample Summary

version: 3.0 9/12/2013 1:20:28 PM

Assessment ID:	61476
Station ID:	20101027-1300-kspyker (Latitude: 40.4197, Longitude: -79.0278)
Method:	6-Dframe Composite, 200 subsample
Location:	KCSEW - Conemaugh River at Seward at Rt. 56 bridge. 7485-803. Sedimentation.

Comments:

Land Use:
Impairment:

Taxa:

Total # Organisms: 240

Code	Standardized ID Level	Number	Tolerance
1080400500	Ceratopsyche	155	4
1080400600	Cheumatopsyche	82	6
1122200000	Chironomidae	3	6

Metrics:

Metric Name	Raw Metric Values	Standardized Metric Values						
		Freestone Riffle-Run						
		6D200 2009 Small	6D200 2009 Large	6D200 2007	2D100	Multihabitat Pool-Glide	Limestone 2006	Limestone 2009
Total Richness	3	9.1	9.7	8.6		9.7	16.2	16.7
Ephemeroptera Richness	0					0.0		
Trichoptera Richness	2					18.2		
EPT Richness	2			8.7	13.1	11.8	25.0	25.0
Trichoptera Richness (PTV 0-4)	1				27.8			
EPT Richness (PTV 0-4)	1	5.3	6.3					
Becks Index (version 3)	0	0.0	0.0	0.0				
Becks Index (version 4)	1				5.0	4.5		8.3
FC + PR + SH Richness	2				17.2			
Hilsenhoff Biotic Index	4.71	65.2	76.1	64.4	78.5		84.1	85.9
% Intolerant Individuals (PTV 0-3)	0.0	0.0	0.0				0.0	
% Intolerant Individuals (PTV 0-5)	64.6			69.8				
% Tolerant Individuals (PTV 7-	0.0						101.0	101.5

10)

Shannon Diversity	0.70	24.6	24.6	24.3	29.0	36.7	33.1
IBI Score	17.4	19.4	29.3	28.3	12.2	43.7	44.8

% Ephemeroptera: 0 % Plecoptera: 0 % Trichoptera: 98.75
% Ephemeroptera (PTV 0-4): 0 % Dominant Taxon: 64.58

Habitat:

1 Instream Cover:	15	2 Epifaunal Substrate:	15	
3 Embeddedness:	6	4 Velocity/Depth Regimes:	18	
5 Channel Alterations:	13	6 Sediment Deposition:	7	
7 Frequency of Riffles:	13	8 Channel Flow Status:	18	
9 Condition of Banks:	15	10 Bank Vegetation:	16	**Total**
11 Grazing or Disruptive:	16	12 Riparian Vegetation:	11	163

Impairment:

Insufficient? Y Impaired? N/A Biology Impaired? N/A
Habitat Impaired? N/A Rock picks influenced? N Impact Localized? N
Designated Use needs reevaluation? N

Benthic macroinvertebrate sample summary

Station ID 20101027-1320-kspyker KLCSF3A
Stream Name Clapboard Run (01171891) Stream Code 45819 Strahler 2
Survey ID 61478 Sample Method 6-Dframe Composite, 200 subsample
Collection Date 20101027 Collection Time 1320 Latitude 40.3336394 Longitude -78.8256829
HUC8 05010007 Conemaugh. Pennsylvania.
Station Location Comments
KLCSF3A - South Fork Little Conemaugh River upstream of St. Michael discharge. 7485-807. Iron sedimentation.
Biology / Habitat Comments
Land Use Comments
Station Impairment Status Comments

Taxa List

grids from first pan 28 # grids from second pan 28 Subsample Size 36

Taxa Name	Individuals	PTV	FFG	BCG Attribute (coldwater)	BCG Attribute (warmwater)		*any EV indicator taxa names are*
Isonychia	4	3	CG	3	3		
Maccaffertium	6	3	SC	3	3		
Taeniopteryx	2	2	SH	3	3		
	Soyedina	1	0	SH	1	1	
Sialis	1	6	PR	5	5		
Chimarra	1	4	FC	4	4		
	Diplectrona	3	0	FC	2	2	
Ceratopsyche	7	5	FC	4	4		
Cheumatopsyche	5	6	FC	5	5		
Tipula	4	4	SH	5	5		
Dicranota	1	3	PR	3	3		
Chironomidae	1	6	CG	5	5		

Benthic macroinvertebrate sample summary

Station ID 20101027-1320-kspyker KLCSF3A
Stream Name Clapboard Run (01171891) Stream Code 45819 Strahler 2
Survey ID 61478 Sample Method 6-Dframe Composite, 200 subsample
Collection Date 20101027 Collection Time 1320 Latitude 40.3336394 Longitude -78.8256829
HUC8 05010007 Conemaugh. Pennsylvania.

Metrics and IBI

Metric Names	Raw Metric	Standardized Metric Values						
	Limestone	Freestone Riffle-Run 2009 small	Freestone Riffle-Run 2009 large	6D200 2007	6D200 2D100	Multihabitat 2006	Multihabitat 2009	
Total Richness	12	36.4	36.4	34.3	38.7	64.8	66.7	
Ephemeroptera Richness	2				33.3			
Trichoptera Richness	4				36.4			
EPT Richness	8			34.8	47.1	100.0	100.0	
Trichoptera Richness (PTV 0-4)	2				55.6			
EPT Richness (PTV 0-4)	6	31.6	33.3					
Beck's Index (version 3)	7	18.4	23.3	17.9				
Beck's Index (version 4)	10				50.3	46.5		83.3
FC + PR + SH Richness	9				77.6			
Hilsenhoff Biotic Index	3.72	77.4	83.7	76.4	93.1		99.8	101.9
% Inolerant Individuals (PTV 0-3)	47.2	55.9	71.0				179.6	
% Intolerant Individuals (PTV 0-	80.6			87.1				
% Tolerant Individuals (PTV 7-10)	0.0						101.0	101.5
Shannon Diversity	2.24	78.4	79.3	77.5		92.4	116.9	105.4
IBI score		49.7	54.5	54.7	65.8	48.9	94.1	91.7

BCG Richness Ratio	1.00	% Ephemeroptera	27.8	% Baetis	0.0	% Chironomidae	2.8
BCG % Individuals Ratio	0.89	% Plecoptera	8.3	% Ephemerella	0.0	% Simuliidae	0.0
EV Indicator Taxa	2	% Trichoptera	44.4	% Dominant Taxon	19.4	% Prosimulium	0.0

Not impaired N Biology impaired N Habitat impaired N Insufficient data Y
Rock pick influenced assessment N Impact is localized N Re-evaluate designated use N

Physical Habitat Assessment

Pool-Glide Assessment? N

1. Instream Cover	16	5. Channel Alteration	15	9. Contition of Banks	16
2. Epifaunal Substrate	15	6. Sediment Deposition	10	10. Bank Vegetative Protection	16
3. Embeddedness	10	7. Frequency of Riffles	11	11. Grazing/Disruptive Pressure	16
4. Velocity/Depth Regimes	16	8. Channel Flow Status	18	12. Riparian Vegetative Zone Width	9

Instream Score (1. + 2. + 3. + 6.) = 51 Riparian Score (9. + 10. + 12.) = 41 Total Score = 168

Field

Lab samples

Temperature (°C)	0	Dissolved Oxygen (mg/L)	0	Flow (CFS)	0
pH	0	Total Alkalinity (mg/L as CaCO3)	0	Conductivity (uS/cm)	0

Use Assessment Status for Stream

Aquatic Life Attaining (20010827-1030-ALF)

Fish Consumption
Potable Water Supply
Recreation

TMDL Information (if any)

Kiskiminetas-Conemaugh River Watersheds TMDL (Finalized): AMD - Metals, AMD - pH, AMD - Siltation, AMD - Suspended Solids

Begin Date Meeting Date 1/29/201 End Date Draft Date Final Date 1/29/201

Benthic macroinvertebrate sample summary

Station ID 20101027-1600-kspyker KLCSF1
Stream Name South Fork Little Conemaugh River (01198128) Stream Code 45848 Strahler 4
Survey ID 61479 Sample Method 6-Dframe Composite, 200 subsample
Collection Date 20101027 Collection Time 1600 Latitude 40.3630445 Longitude -78.7945105
HUC8 05010007 Conemaugh. Pennsylvania.
Station Location Comments
KLCSF1 - South Fork Little Conemaugh River at South Fork bridge. 7485-809. Iron precipitation.
Biology / Habitat Comments
Land Use Comments
Station Impairment Status Comments

Taxa List

grids from first pan 28 # grids from second pan 28 Subsample Size 25

Taxa Name	Individuals	PTV	FFG	BCG Attribute (coldwater)	BCG Attribute (warmwater)	
	Diplectrona	1	0	FC	2	2
Ceratopsyche	12	5	FC	4	4	
Cheumatopsyche	10	6	FC	5	5	
Stenelmis	1	5	SC	5	5	
Tipula	1	4	SH	5	5	

any EV indicator taxa names are

Benthic macroinvertebrate sample summary

Station ID 20101027-1600-kspyker KLCSF1
Stream Name South Fork Little Conemaugh River (01198128) Stream Code 45848 Strahler 4
Survey ID 61479 Sample Method 6-Dframe Composite, 200 subsample
Collection Date 20101027 Collection Time 1600 Latitude 40.3630445 Longitude -78.7945105
HUC8 05010007 Conemaugh. Pennsylvania.

Metrics and IBI

Metric Names	Raw Metric	Standardized Metric Values						
		Freestone Riffle-Run						
	Limestone	2009 small	2009 large	6D200 2007	6D200 2D100		Multihabitat 2006	Multihabitat 2009
Total Richness	5	15.2	15.2	14.3		16.1	27.0	27.8
Ephemeroptera Richness	0					0.0		
Trichoptera Richness	3					27.3		
EPT Richness	3			13.0	19.6	17.6	37.5	37.5
Trichoptera Richness (PTV 0-4)	1				27.8			
EPT Richness (PTV 0-4)	1	5.3	5.6					
Beck's Index (version 3)	3	7.9	10.0	7.7				
Beck's Index (version 4)	3				15.1	13.6		25.0
FC + PR + SH Richness	4				34.5			
Hilsenhoff Biotic Index	5.16	59.7	64.5	58.9	71.8		76.9	78.6
% Inolerant Individuals (PTV 0-3)	4.0	4.7	6.0				15.2	
% Intolerant Individuals (PTV 0-	60.0			64.9				
% Tolerant Individuals (PTV 7-10)	0.0						101.0	101.5
Shannon Diversity	1.11	38.6	39.0	38.2		45.5	57.6	51.9
IBI score		21.9	23.4	32.8	33.8	20.0	52.4	53.5

BCG Richness Ratio	0.25	% Ephemeroptera	0.0	% Baetis	0.0	% Chironomidae	0.0
BCG % Individuals Ratio	0.04	% Plecoptera	0.0	% Ephemerella	0.0	% Simuliidae	0.0
EV Indicator Taxa	1	% Trichoptera	92.0	% Dominant Taxon	48.0	% Prosimulium	0.0

Not impaired N Biology impaired N Habitat impaired N Insufficient data Y
Rock pick influenced assessment N Impact is localized N Re-evaluate designated use N

Physical Habitat Assessment

Pool-Glide Assessment? N

1. Instream Cover	14	5. Channel Alteration	15	9. Contition of Banks	15
2. Epifaunal Substrate	18	6. Sediment Deposition	10	10. Bank Vegetative Protection	15
3. Embeddedness	10	7. Frequency of Riffles	19	11. Grazing/Disruptive Pressure	16
4. Velocity/Depth Regimes	8	8. Channel Flow Status	17	12. Riparian Vegetative Zone Width	8

Instream Score (1. + 2. + 3. + 6.) = 52 Riparian Score (9. + 10. + 12.) = 38 Total Score = 165

Field

			Lab samples		
Temperature (°C)	0	Dissolved Oxygen (mg/L)	0	Flow (CFS)	0
pH	0	Total Alkalinity (mg/L as CaCO3)	0	Conductivity (uS/cm)	0

Use Assessment Status for Stream

Aquatic Life Impaired (20010828-1230-ALF)
Abandoned Mine Drainage - Metals, Abandoned Mine Drainage - pH
MEDIUM
Fish Consumption
Potable Water Supply
Recreation

TMDL Information (if any)

Kiskiminetas-Conemaugh River Watersheds TMDL (Finalized): AMD - Metals, AMD - pH, AMD - Siltation, AMD - Suspended Solids
Begin Date Meeting Date 1/29/201 End Date Draft Date Final Date 1/29/201

Fish Assessment Metrics

version: 1.0.0 9/12/2013 1:13:42 PM

Fish Assessment ID:	739
Station ID:	990907-0900-RMS (Latitude: 40.4414, Longitude: -78.6103)
Stream Name:	Little Conemaugh River Site 01
County:	[PA] Cambria
Mean Site Width:	4.1
Site Length:	170
Attaining Use:	Impaired

Metrics:

Taxa Richness: 7	# Intolerant Taxa: 7	# Broadcast Spawning Taxa: 7
# Cyprinid Taxa Less Tolerant Taxa: 7	Modified % Dominance: 53	# Simple Lithophil Taxa: 7
# Darter Taxa: 7	% Tolerant: 207	# Round-bodied Sucker Taxa: 7

Habitat:

Instream Cover:	0	Epifaunal Substrate:	6
Embeddedness:	11	Velocity/Depth Regimes:	6
Channel Alterations:	19	Sediment Deposition:	7
Frequency of Riffles:	9	Channel Flow Status:	16
Grazing or Disruptive:	0		
Bank Stability:			
Left:	7	Right:	7
Bank Vegetation:			
Left:	6	Right:	6
Riparian Zone:			
Left:	9	Right:	9

Total Habitat Score: 118

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	91
2902	Brook stickleback	2
2304	Brown bullhead	2
2149	Creek chub	160
2145	Fathead minnow	10
3408	Pumpkinseed	3
2204	White sucker	106

Fish Assessment Metrics

version: 1.0.0 9/12/2013 1:12:44 PM

Fish Assessment ID:	740
Station ID:	990907-1300-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 02
County:	[PA] Cambria
Mean Site Width:	6
Site Length:	184
Attaining Use:	Impaired

Metrics:

Taxa Richness: 7	# Intolerant Taxa: 7	# Broadcast Spawning Taxa: 7
# Cyprinid Taxa Less Tolerant Taxa: 7	Modified % Dominance: 48	# Simple Lithophil Taxa: 7
# Darter Taxa: 7	% Tolerant: 131	# Round-bodied Sucker Taxa: 7

Habitat:

Instream Cover:	0	Epifaunal Substrate:	15
Embeddedness:	10	Velocity/Depth Regimes:	5
Channel Alterations:	15	Sediment Deposition:	15
Frequency of Riffles:	9	Channel Flow Status:	19
Grazing or Disruptive:	0		
Bank Stability:			
Left:	8	Right:	8
Bank Vegetation:			
Left:	6	Right:	6
Riparian Zone:			
Left:	1	Right:	1

Total Habitat Score: 118

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	292
2101	Central stoneroller	1
2149	Creek chub	336
2148	Longnose dace	12
3701	Mottled sculpin	1
3408	Pumpkinseed	3
2204	White sucker	237

Fish Assessment Metrics

version: 1.0.0 9/12/2013 1:11:27 PM

Fish Assessment ID:	743
Station ID:	990908-1200-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 03
County:	[PA] Cambria
Mean Site Width:	6.6
Site Length:	207
Attaining Use:	Impaired

Metrics:

Taxa Richness: 5	# Intolerant Taxa: 5	# Broadcast Spawning Taxa: 5
# Cyprinid Taxa Less Tolerant Taxa: 5	Modified % Dominance: 75	# Simple Lithophil Taxa: 5
# Darter Taxa: 5	% Tolerant: 114	# Round-bodied Sucker Taxa: 5

Habitat:

Instream Cover:	0	Epifaunal Substrate:	18
Embeddedness:	16	Velocity/Depth Regimes:	17
Channel Alterations:	14	Sediment Deposition:	15
Frequency of Riffles:	14	Channel Flow Status:	18
Grazing or Disruptive:	0		
Bank Stability:			
Left:	8	Right:	8
Bank Vegetation:			
Left:	7	Right:	8
Riparian Zone:			
Left:	2	Right:	2

Total Habitat Score: 147

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	1712
2149	Creek chub	601
2148	Longnose dace	196
3701	Mottled sculpin	6
2204	White sucker	336

Fish Assessment Metrics

version: 1.0.0 9/12/2013 1:09:31 PM

Fish Assessment ID:	742
Station ID:	990908-1130-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 04
County:	[PA] Cambria
Mean Site Width:	8.7
Site Length:	200
Attaining Use:	Impaired

Metrics:

Taxa Richness: 9	# Intolerant Taxa: 9	# Broadcast Spawning Taxa: 9
# Cyprinid Taxa Less Tolerant Taxa: 9	Modified % Dominance: 90	# Simple Lithophil Taxa: 9
# Darter Taxa: 9	% Tolerant: 531	# Round-bodied Sucker Taxa: 9

Habitat:

Instream Cover:	0	Epifaunal Substrate:	17
Embeddedness:	10	Velocity/Depth Regimes:	11
Channel Alterations:	15	Sediment Deposition:	11
Frequency of Riffles:	15	Channel Flow Status:	15
Grazing or Disruptive:	0		
Bank Stability:			
Left:	7	Right:	7
Bank Vegetation:			
Left:	7	Right:	8
Riparian Zone:			
Left:	7	Right:	6

Total Habitat Score: 136

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	2185
1608	Brook trout (wild)	2
2149	Creek chub	354
2145	Fathead minnow	1
3503	Greenside darter	23
3510	Johnny darter	9
2148	Longnose dace	69
3701	Mottled sculpin	12
2204	White sucker	376

Fish Assessment Metrics

version: 1.0.0 9/12/2013 1:08:32 PM

Fish Assessment ID:	741
Station ID:	990908-0900-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 05
County:	[PA] Cambria
Mean Site Width:	7
Site Length:	200
Attaining Use:	Impaired

Metrics:

Taxa Richness: 4	# Intolerant Taxa: 4	# Broadcast Spawning Taxa: 4
# Cyprinid Taxa Less Tolerant Taxa: 4	Modified % Dominance: 68	# Simple Lithophil Taxa: 4
# Darter Taxa: 4	% Tolerant: 73	# Round-bodied Sucker Taxa: 4

Habitat:

Instream Cover:	0	Epifaunal Substrate:	12
Embeddedness:	10	Velocity/Depth Regimes:	11
Channel Alterations:	19	Sediment Deposition:	14
Frequency of Riffles:	10	Channel Flow Status:	12
Grazing or Disruptive:	0		
Bank Stability:			
Left:	7	Right:	8
Bank Vegetation:			
Left:	9	Right:	9
Riparian Zone:			
Left:	10	Right:	9

Total Habitat Score: 140

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	9
2149	Creek chub	9
3510	Johnny darter	25
2204	White sucker	52

Fish Assessment Metrics

version: 1.0.0 9/12/2013 1:04:35 PM

Fish Assessment ID:	747
Station ID:	990909-1015-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 08
County:	[PA] Cambria
Mean Site Width:	11.8
Site Length:	200
Attaining Use:	Impaired

Metrics:

Taxa Richness: 3	# Intolerant Taxa: 3	# Broadcast Spawning Taxa: 3
# Cyprinid Taxa Less Tolerant Taxa: 3	Modified % Dominance: 83	# Simple Lithophil Taxa: 3
# Darter Taxa: 3	% Tolerant: 145	# Round-bodied Sucker Taxa: 3

Habitat:

Instream Cover:	0	Epifaunal Substrate:	8
Embeddedness:	3	Velocity/Depth Regimes:	10
Channel Alterations:	14	Sediment Deposition:	7
Frequency of Riffles:	10	Channel Flow Status:	10
Grazing or Disruptive:	0		
Bank Stability:			
Left:	8	Right:	7
Bank Vegetation:			
Left:	9	Right:	9
Riparian Zone:			
Left:	9	Right:	9

Total Habitat Score: 113

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	1
2149	Creek chub	6
3408	Pumpkinseed	2

Fish Assessment Metrics

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Fish Assessment ID:	748
Station ID:	990909-1245-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 09
County:	[PA] Cambria
Mean Site Width:	25.6
Site Length:	200
Attaining Use:	Impaired

Metrics:

Taxa Richness: 3	# Intolerant Taxa: 3	# Broadcast Spawning Taxa: 3
# Cyprinid Taxa Less Tolerant Taxa: 3	Modified % Dominance: 89	# Simple Lithophil Taxa: 3
# Darter Taxa: 3	% Tolerant: 100	# Round-bodied Sucker Taxa: 3

Habitat:

Instream Cover:	0	Epifaunal Substrate:	13
Embeddedness:	9	Velocity/Depth Regimes:	11
Channel Alterations:	18	Sediment Deposition:	15
Frequency of Riffles:	9	Channel Flow Status:	16
Grazing or Disruptive:	0		
Bank Stability:			
Left:	9	Right:	9
Bank Vegetation:			
Left:	9	Right:	9
Riparian Zone:			
Left:	10	Right:	3

Total Habitat Score: 140

Taxa:

Fish Code	Common Name	Number
2147	Blacknose dace	1
2149	Creek chub	20
2204	White sucker	7

Fish Assessment Metrics

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Fish Assessment ID:	749
Station ID:	990910-0830-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 10
County:	[PA] Cambria
Mean Site Width:	32.3
Site Length:	200
Attaining Use:	Impaired

Metrics:

Taxa Richness: 1	# Intolerant Taxa: 1	# Broadcast Spawning Taxa: 1
# Cyprinid Taxa Less Tolerant Taxa: 1	Modified % Dominance: 125	# Simple Lithophil Taxa: 1
# Darter Taxa: 1	% Tolerant: 100	# Round-bodied Sucker Taxa: 1

Habitat:

Instream Cover:	0	Epifaunal Substrate:	13
Embeddedness:	9	Velocity/Depth Regimes:	9
Channel Alterations:	15	Sediment Deposition:	12
Frequency of Riffles:	11	Channel Flow Status:	14
Grazing or Disruptive:	0		
Bank Stability:			
Left:	7	Right:	8
Bank Vegetation:			
Left:	8	Right:	9
Riparian Zone:			
Left:	8	Right:	9

Total Habitat Score: 132

Taxa:

Fish Code	Common Name	Number
2149	Creek chub	22

Fish Assessment Metrics

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Fish Assessment ID:	750
Station ID:	990910-1530-RMS (Latitude: 0, Longitude: 0)
Stream Name:	Little Conemaugh River Site 11
County:	[PA] Cambria
Mean Site Width:	26.8
Site Length:	210
Attaining Use:	Impaired

Metrics:

Taxa Richness: 2	# Intolerant Taxa: 2	# Broadcast Spawning Taxa: 2
# Cyprinid Taxa Less Tolerant Taxa: 2	Modified % Dominance: 87	# Simple Lithophil Taxa: 2
# Darter Taxa: 2	% Tolerant: 100	# Round-bodied Sucker Taxa: 2

Habitat:

Instream Cover:	0	Epifaunal Substrate:	12
Embeddedness:	10	Velocity/Depth Regimes:	8
Channel Alterations:	1	Sediment Deposition:	12
Frequency of Riffles:	10	Channel Flow Status:	11
Grazing or Disruptive:	0		
Bank Stability:			
Left:	1	Right:	4
Bank Vegetation:			
Left:	9	Right:	4
Riparian Zone:			
Left:	0	Right:	1

Total Habitat Score: 83

Taxa:

Fish Code	Common Name	Number
2149	Creek chub	8
2204	White sucker	18

Appendix C
Eligibility Determinations

5400-FM-AMR0001 REV. 8/96

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ABANDONED MINE RECLAMATION

DEP Inquiry No. _____
Project No. _____
PA No. PA2473

ai 1687

OSM ELIGIBILITY DETERMINATION

1. Project Name: D11 Power Borehole - Sonman E Seam Discharge (Little Conemaugh Project)

2. Information by: Michael Timcik P.G. (Name) Ebensburg (Office)

3. Project Location: Portage Township (Municipality) Cambria (County)

4. Property Information: (Attach additional sheet if necessary)

   Landowner's Name: Jeffrey G. Trimbath
   Address: 183 Red Fox Drive
   Duncansville, PA 16635
   Telephone No.: (814) 696-9646

5. Mining Information: Coal ☒ Non-Coal ☐

   a. Mining Conducted by: Sonman Shaft Coal Company then Koppers Coal Company (Eastern Gas and Fuel Associates)
      Source: Abandoned Mined Lands Survey Demonstration for Indiana and Cambria Counties AND Portrait of a Town, Portage Pennsylvania, 1890-1990
   b. Date of Last Mining: November 15, 1962
      Source: Portrait of a Town, Portage Pennsylvania, 1890-1990
   c. Did the current surface owner participate in or exercise control over the mining operation which necessitates this reclamation work? Yes ☐ No ☒
      Source: Phone conversation with Mr. Trimbath (1/30/2015)

6. Bonding Information:

   a. Have bonds ever been posted for the affected property? Yes ☐ No ☒
      If so, have the bonds been forfeited and collected? Yes ☐ No ☒ Amount: _____
   b. Is this an interim permitted site? Yes ☐ No ☒
   c. Is this a primacy permitted site? Yes ☐ No ☒
      If so, has the surety become insolvent? Yes ☐ No ☐

   Date of Insolvency: _____ Source: _____

7. Is this an AMD Abatement and Treatment Program Project? Yes ☒ No ☐

   If so, is this qualified hydrologic unit proposed to be the subject of AMD mitigation expenditures by the Commonwealth? Yes ☒ No ☐

   If so, under what Commonwealth program? BAMR Set-Aside Funds Administered through BCR

8. Is there continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable law or as a result of bond forfeiture? Yes ☐ No ☒

9. Summary of the Condition: An active chemical treatment plant project is proposed for the large AMD discharge at this site. The D11 Power Borehole discharge results from the abandoned deep mine complex known as the Sonman E Seam Mine on the Upper Freeport Coal Seam. The combined discharges from the Sonman Mine Complex account for approximately 9.75% of the AMD pollution load in the Little Conemaugh River.

10. How does the condition affect the environment, prevent the beneficial use of land and water resources, or endanger the public health and safety? The Conemaugh and Little Conemaugh Rivers are severly degraded by AMD discharges from abandoned mines. This discharge is one of the largest in the Little Conemaugh Watershed. Downstream recreational, industrial and other water uses are severely impacted by the present condition. Biological resources are also dramatically impacted.

Michael Timcik 03/30/2015
(Preparer's Signature and Date)

Based upon the foregoing summary of facts, I have concluded that:

I. A. The property referred to above was mined for coal or affected by coal mining processes; and

B. The property referred to above was:

1. mined prior to August 3, 1977, left or abandoned in either an unreclaimed or an inadequately reclaimed condition and there is no continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable federal or state law, or as a result of bond forfeiture; or

2. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before July 30, 1982, and funds for reclamation or abatement available pursuant to a bond or other form of financial guarantee or from any other source are insufficient to provide for adequate reclamation or abatement at the site; or

3. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before November 5, 1990, the surety of the mine operator become insolvent during such period, and as of November 5, 1990 funds immediately available from proceedings relating to such insolvency or from any financial guarantee or other source are insufficient to provide for adequate reclamation or abatement at the site.

and

C. If the property being considered for reclamation or abatement is eligible under B.2. or 3. above, the site qualifies as a priority 1 or 2 site pursuant to Section 403(a)(1) and (2) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233). Further, the Department and the Office of Surface Mining will seek reimbursement to the Abandoned Mine Land Fund for reclamation costs in excess of the bonds forfeited for the site as described in 30 CFR 874.12(g) or

II. In case of an Acid Mine Drainage (AMD) Setaside Program Project, the site:

a. contains any of the priorities stated in Section 403(a) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233) after September 30, 1995; and

b. is proposed to be subject of expenditures by the Commonwealth to abate or treat AMD; or

III. The surface coal mining operations took place on lands eligible for remining pursuant to Section 404 of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1234), in accordance with 30 CFR 874.12 (h).

My conclusion is predicated only on an analysis, based solely on the foregoing summary of facts, of statutory liability against companies or persons in the capacity of "mine operators" and does not address the question of statutory or common law liability against "landowners" who own an abandoned mine.

As a result of my conclusions in the preceding paragraphs, it is my opinion that the property referred to in the foregoing summary of facts qualifies and is eligible under 30 C.F.R. §874.12 or §876.12 to receive funding by the United States Department of the Interior, Office of Surface Mining toward the accomplishment of reclamation activities.

3/4/15
Date

Tracey D. Tubbs
Assistant Counsel
Office of Chief Counsel
Department of Environmental Protection
Commonwealth of Pennsylvania

5400-FM-AMR0001 REV. 8/96

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ABANDONED MINE RECLAMATION

DEP Inquiry No. _____
Project No. _____
PA No. PA2473

ei 1688

OSM ELIGIBILITY DETERMINATION

1. Project Name: D12 Hole - Sonman E Seam Discharge (Little Conemaugh Project)

2. Information by: Michael Timcik P.G. (Name) Ebensburg (Office)

3. Project Location: Portage Township (Municipality) Cambria (County)

4. Property Information: (Attach additional sheet if necessary)

   Landowner's Name: Jeffrey G. Trimbath
   Address: 183 Red Fox Drive
   Duncansville, PA 16635
   Telephone No.: (814) 696-9646

5. Mining Information: Coal ☒ Non-Coal ☐

   a. Mining Conducted by: Sonman Shaft Coal Company then Koppers Coal Company (Eastern Gas and Fuel Associates)
   Source: Abandoned Mined Lands Survey Demonstration for Indiana and Cambria Counties AND Portrait of a Town, Portage Pennsylvania, 1890-1990

   b. Date of Last Mining: November 15, 1962
   Source: Portrait of a Town, Portage Pennsylvania, 1890-1990

   c. Did the current surface owner participate in or exercise control over the mining operation which necessitates this reclamation work? Yes ☐ No ☒
   Source: Phone conversation with Mr. Trimbath (1-30-2015)

6. Bonding Information:

   a. Have bonds ever been posted for the affected property? Yes ☐ No ☒
   If so, have the bonds been forfeited and collected? Yes ☐ No ☒ Amount: _____
   b. Is this an interim permitted site? Yes ☐ No ☒
   c. Is this a primacy permitted site? Yes ☐ No ☒
   If so, has the surety become insolvent? Yes ☐ No ☐

   Date of Insolvency: _____ Source: _____

7. Is this an AMD Abatement and Treatment Program Project? Yes ☒ No ☐

   If so, is this qualified hydrologic unit proposed to be the subject of AMD mitigation expenditures by the Commonwealth? Yes ☒ No ☐

   If so, under what Commonwealth program? BAMR Set-Aside Funds Administered through BCR

8. Is there continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable law or as a result of bond forfeiture? Yes ☐ No ☒

9. Summary of the Condition: An active chemical treatment plant project is proposed for the large AMD discharge at this site. The D12 Sonman discharge results from the abandoned deep mine complex known as the Sonman E Seam Mine on the Upper Freeport Coal Seam. The combined discharges from the Sonman Mine Complex account for approximately 9.75% of the AMD pollution load in the Little Conemaugh River.

10. How does the condition affect the environment, prevent the beneficial use of land and water resources, or endanger the public health and safety? The Conemaugh and Little Conemaugh Rivers are severly degraded by AMD discharges from abandoned mines. This discharge is one of the largest in the Little Conemaugh Watershed. Downstream recreational, industrial and other water uses are severely impacted by the present condition. Biological resources are also dramatically impacted.

(Preparer's Signature and Date) 03/02/2015

Based upon the foregoing summary of facts, I have concluded that:

I. A. The property referred to above was mined for coal or affected by coal mining processes; and

B. The property referred to above was:

1. mined prior to August 3, 1977, left or abandoned in either an unreclaimed or an inadequately reclaimed condition and there is no continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable federal or state law, or as a result of bond forfeiture; or

2. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before July 30, 1982, and funds for reclamation or abatement available pursuant to a bond or other form of financial guarantee or from any other source are insufficient to provide for adequate reclamation or abatement at the site; or

3. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before November 5, 1990, the surety of the mine operator become insolvent during such period, and as of November 5, 1990 funds immediately available from proceedings relating to such insolvency or from any financial guarantee or other source are insufficient to provide for adequate reclamation or abatement at the site.

and

C. If the property being considered for reclamation or abatement is eligible under B.2. or 3. above, the site qualifies as a priority 1 or 2 site pursuant to Section 403(a)(1) and (2) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233). Further, the Department and the Office of Surface Mining will seek reimbursement to the Abandoned Mine Land Fund for reclamation costs in excess of the bonds forfeited for the site as described in 30 CFR 874.12(g) or

II. In case of an Acid Mine Drainage (AMD) Setaside Program Project, the site:

a. contains any of the priorities stated in Section 403(a) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233) after September 30, 1995; and

b. is proposed to be subject of expenditures by the Commonwealth to abate or treat AMD; or

III. The surface coal mining operations took place on lands eligible for remining pursuant to Section 404 of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1234), in accordance with 30 CFR 874.12 (h).

My conclusion is predicated only on an analysis, based solely on the foregoing summary of facts, of statutory liability against companies or persons in the capacity of "mine operators" and does not address the question of statutory or common law liability against "landowners" who own an abandoned mine.

As a result of my conclusions in the preceding paragraphs, it is my opinion that the property referred to in the foregoing summary of facts qualifies and is eligible under 30 C.F.R. §874.12 or §876.12 to receive funding by the United States Department of the Interior, Office of Surface Mining toward the accomplishment of reclamation activities.

3/4/15
Date

Tracey D. Tubbs
Assistant Counsel
Office of Chief Counsel
Department of Environmental Protection
Commonwealth of Pennsylvania

5400-FM-AMR0001 REV. 8/96

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ABANDONED MINE RECLAMATION

DEP Inquiry No. _____
Project No. _____
PA No. PA2473

ji 1689

OSM ELIGIBILITY DETERMINATION

1. Project Name: D13 Relief Borehole – Sonman E Seam Discharge (Little Conemaugh Project)

2. Information by: Michael Timcik P.G. (Name) Ebensburg (Office)

3. Project Location: Portage Township (Municipality) Cambria (County)

4. Property Information: (Attach additional sheet if necessary)

   Landowner's Name: Jeffrey G. Trimbath
   Address: 183 Red Fox Drive
   Duncansville, PA 16635
   Telephone No.: (814) 696-9646

5. Mining Information: Coal ☒ Non-Coal ☐

   a. Mining Conducted by: Sonman Shaft Coal Company then Koppers Coal Company (Eastern Gas and Fuel Associates)
   Source: Abandoned Mined Lands Survey Demonstration for Indiana and Cambria Counties AND Portrait of a Town, Portage Pennsylvania, 1890-1990
   b. Date of Last Mining: November 15, 1962
   Source: Portrait of a Town, Portage Pennsylvania, 1890-1990
   c. Did the current surface owner participate in or exercise control over the mining operation which necessitates this reclamation work? Yes ☐ No ☒
   Source: Phone conversation with Mr. Trimbath (1-30-2015)

6. Bonding Information:

   a. Have bonds ever been posted for the affected property? Yes ☐ No ☒
   If so, have the bonds been forfeited and collected? Yes ☐ No ☒ Amount: _____
   b. Is this an interim permitted site? Yes ☐ No ☒
   c. Is this a primacy permitted site? Yes ☐ No ☒
   If so, has the surety become insolvent? Yes ☐ No ☐

   Date of Insolvency: _____ Source: _____

7. Is this an AMD Abatement and Treatment Program Project? Yes ☒ No ☐

   If so, is this qualified hydrologic unit proposed to be the subject of AMD mitigation expenditures by the Commonwealth? Yes ☒ No ☐

   If so, under what Commonwealth program? BAMR Set-Aside Funds Administered through BCR

8. Is there continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable law or as a result of bond forfeiture? Yes ☐ No ☒

9. Summary of the Condition: An active chemical treatment plant project is proposed for the large AMD discharge at this site. The D13 Relief Borehole discharge results from the abandoned deep mine complex known as the Sonman E Seam Mine on the Upper Freeport Coal Seam. The combined discharges from the Sonman Mine Complex account for approximately 9.75% of the AMD pollution load in the Little Conemaugh River.

10. How does the condition affect the environment, prevent the beneficial use of land and water resources, or endanger the public health and safety? The Conemaugh and Little Conemaugh Rivers are severly degraded by AMD discharges from abandoned mines. This discharge is one of the largest in the Little Conemaugh Watershed. Downstream recreational, industrial and other water uses are severely impacted by the present condition. Biological resources are also dramatically impacted.

Michael Timcik 03/02/2015
(Preparer's Signature and Date)

Based upon the foregoing summary of facts, I have concluded that:

I. A. The property referred to above was mined for coal or affected by coal mining processes; and

B. The property referred to above was:

1. mined prior to August 3, 1977, left or abandoned in either an unreclaimed or an inadequately reclaimed condition and there is no continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable federal or state law, or as a result of bond forfeiture; or

2. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before July 30, 1982, and funds for reclamation or abatement available pursuant to a bond or other form of financial guarantee or from any other source are insufficient to provide for adequate reclamation or abatement at the site; or

3. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before November 5, 1990, the surety of the mine operator become insolvent during such period, and as of November 5, 1990 funds immediately available from proceedings relating to such insolvency or from any financial guarantee or other source are insufficient to provide for adequate reclamation or abatement at the site.

and

C. If the property being considered for reclamation or abatement is eligible under B.2. or 3. above, the site qualifies as a priority 1 or 2 site pursuant to Section 403(a)(1) and (2) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233). Further, the Department and the Office of Surface Mining will seek reimbursement to the Abandoned Mine Land Fund for reclamation costs in excess of the bonds forfeited for the site as described in 30 CFR 874.12(g) or

II. In case of an Acid Mine Drainage (AMD) Setaside Program Project, the site:

a. contains any of the priorities stated in Section 403(a) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233) after September 30, 1995; and

b. is proposed to be subject of expenditures by the Commonwealth to abate or treat AMD; or

III. The surface coal mining operations took place on lands eligible for remining pursuant to Section 404 of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1234), in accordance with 30 CFR 874.12 (h).

My conclusion is predicated only on an analysis, based solely on the foregoing summary of facts, of statutory liability against companies or persons in the capacity of "mine operators" and does not address the question of statutory or common law liability against "landowners" who own an abandoned mine.

As a result of my conclusions in the preceding paragraphs, it is my opinion that the property referred to in the foregoing summary of facts qualifies and is eligible under 30 C.F.R. §874.12 or §876.12 to receive funding by the United States Department of the Interior, Office of Surface Mining toward the accomplishment of reclamation activities.

3/4/15
Date

Tracey D. Tubbs
Assistant Counsel
Office of Chief Counsel
Department of Environmental Protection
Commonwealth of Pennsylvania

5400-FM-AMR0001 REV. 8/96

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ABANDONED MINE RECLAMATION

DEP Inquiry No. _____
Project No. _____
PA No. PA0623

ei 1690

OSM ELIGIBILITY DETERMINATION

1. Project Name: Hughes Borehole Discharge Project (Little Conemaugh Project)

2. Information by: Michael Timcik P.G. (Name) Ebensburg (Office)

3. Project Location: Portage Township (Municipality) Cambria (County)

4. Property Information: (Attach additional sheet if necessary)

   Landowner's Name: Robert & Virginia Anslinger ET AL Trustees (Surface and Minerals)
   Address: 350 DeGaetano Road (The site is located at Sportsman Road (Rear) in Jamestown, PA)
   Indiana, PA 15701-8446
   Telephone No.: (724) 349-5559

5. Mining Information: Coal ☒ Non-Coal ☐

   a. Mining Conducted by: C. A. Hughes Coal Company - Hughes #2 Deep Mine
      Source: GAI Consultants - Phase I SRB - Low Flow Mine Storage and Treatment Project Evaluation
   b. Date of Last Mining: 1954
      Source: GAI Consultants - Phase I SRB - Low Flow Mine Storage and Treatment Project Evaluation
   c. Did the current surface owner participate in or exercise control over the mining operation which necessitates this reclamation work? Yes ☐ No ☒
      Source: Conversation with Robert Anslinger (1-30-2015). Mr. Anslinger confirmed he purchased the shares in C.A. Hughes Coal Company, but they were purchased after the above referenced mining operation ceased. He noted that he "thought" they may have removed some coal pillars after his purchase, but that the mining operation had already ceased when he purchased the shares.

6. Bonding Information:

   a. Have bonds ever been posted for the affected property? Yes ☐ No ☒
      If so, have the bonds been forfeited and collected? Yes ☐ No ☒ Amount: _____
   b. Is this an interim permitted site? Yes ☐ No ☒
   c. Is this a primacy permitted site? Yes ☐ No ☒
      If so, has the surety become insolvent? Yes ☐ No ☐

   Date of Insolvency: _____ Source: _____

7. Is this an AMD Abatement and Treatment Program Project? Yes ☒ No ☐

   If so, is this qualified hydrologic unit proposed to be the subject of AMD mitigation expenditures by the Commonwealth? Yes ☒ No ☐

   If so, under what Commonwealth program? BAMR Set-Aside Funds administered through BCR

8. Is there continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable law or as a result of bond forfeiture? Yes ☐ No ☒

9. Summary of the Condition: An active chemical treatment plant project is proposed for the large AMD discharge at this site. The Hughes borehole discharge results from the abandoned deep mine complex known as the Hughes #2 on the Lower Kittanning Coal Seam. This discharge accounts for approximately 8% of the AMD pollution load in the Little Conemaugh River.

10. How does the condition affect the environment, prevent the beneficial use of land and water resources, or endanger the public health and safety? The Conemaugh and Little Conemaugh Rivers are severly degraded by AMD discharges from abandoned mines. This discharge is one of the largest in the Little Conemaugh Watershed. Downstream recreational, industrial and other water uses are severely impacted by the present condition. Biological resources are also dramatically impacted.

05/22/2015
(Preparer's Signature and Date)

Based upon the foregoing summary of facts, I have concluded that:

I. A. The property referred to above was mined for coal or affected by coal mining processes; and

B. The property referred to above was:

1. mined prior to August 3, 1977, left or abandoned in either an unreclaimed or an inadequately reclaimed condition and there is no continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable federal or state law, or as a result of bond forfeiture; or

2. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before July 30, 1982, and funds for reclamation or abatement available pursuant to a bond or other form of financial guarantee or from any other source are insufficient to provide for adequate reclamation or abatement at the site; or

3. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before November 5, 1990, the surety of the mine operator become insolvent during such period, and as of November 5, 1990 funds immediately available from proceedings relating to such insolvency or from any financial guarantee or other source are insufficient to provide for adequate reclamation or abatement at the site.

and

C. If the property being considered for reclamation or abatement is eligible under B.2. or 3. above, the site qualifies as a priority 1 or 2 site pursuant to Section 403(a)(1) and (2) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233). Further, the Department and the Office of Surface Mining will seek reimbursement to the Abandoned Mine Land Fund for reclamation costs in excess of the bonds forfeited for the site as described in 30 CFR 874.12(g) or

II. In case of an Acid Mine Drainage (AMD) Setaside Program Project, the site:

a. contains any of the priorities stated in Section 403(a) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233) after September 30, 1995; and

b. is proposed to be subject of expenditures by the Commonwealth to abate or treat AMD; or

III. The surface coal mining operations took place on lands eligible for remining pursuant to Section 404 of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1234), in accordance with 30 CFR 874.12 (h).

My conclusion is predicated only on an analysis, based solely on the foregoing summary of facts, of statutory liability against companies or persons in the capacity of "mine operators" and does not address the question of statutory or common law liability against "landowners" who own an abandoned mine.

As a result of my conclusions in the preceding paragraphs, it is my opinion that the property referred to in the foregoing summary of facts qualifies and is eligible under 30 C.F.R. §874.12 or §876.12 to receive funding by the United States Department of the Interior, Office of Surface Mining toward the accomplishment of reclamation activities.

3/4/15
Date

Tracey D. Tubbs
Assistant Counsel
Office of Chief Counsel
Department of Environmental Protection
Commonwealth of Pennsylvania

5400-FM-AMR0001 REV 8/96

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ABANDONED MINE RECLAMATION

DEP Inquiry No. _____
Project No. _____
PA No. PA2716

01691

OSM ELIGIBILITY DETERMINATION

1. Project Name: Miller Shaft Discharge (Little Conemaugh Project)

2. Information by: Michael Tuncik P.G. (Name) Ebensburg (Office)

3. Project Location: Portage Township (Municipality) Cambria (County)

4. Property Information: (Attach additional sheet if necessary)

   Landowner's Name: John C. Nicholson
   Address: 165 Mitchell Road (Site Address is Bluebird Lane (Rear) Portage, PA)
   Lilly, PA 15938
   Telephone No.: (814) 736-4849

5. Mining Information: Coal ☒ Non-Coal ☐

   a. Mining Conducted by: Johnstown Coal & Coke Co. or Portage Coal Co. - Portage #2/4 C" Seam Mine
   Source: Abandoned Mined Lands Survey Demonstration for Indiana and Cambria Counties
   b. Date of Last Mining: ~1954
   Source: Portrait of a Town, Portage Pennsylvania, 1890-1990
   c. Did the current surface owner participate in or exercise control over the mining operation which necessitates this reclamation work? Yes ☐ No ☒
   Source: Phone conversation with John C. Nicholson (1/30/2015)

6. Bonding Information:

   a. Have bonds ever been posted for the affected property? Yes ☐ No ☒
   If so, have the bonds been forfeited and collected? Yes ☐ No ☒ Amount: _____
   b. Is this an interim permitted site? Yes ☐ No ☒
   c. Is this a primacy permitted site? Yes ☐ No ☒
   If so, has the surety become insolvent? Yes ☐ No ☐

   Date of Insolvency: _____ Source: _____

7. Is this an AMD Abatement and Treatment Program Project? Yes ☒ No ☐

   If so, is this qualified hydrologic unit proposed to be the subject of AMD mitigation expenditures by the Commonwealth? Yes ☒ No ☐

   If so, under what Commonwealth program? BAMR Set-Aside Funds Administered through BCR

8. Is there continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable law or as a result of bond forfeiture? Yes ☐ No ☒

9. Summary of the Condition: An active chemical treatment plant project is proposed for the large AMD discharge at this site. Although the historic name, "Miller Shaft Discharge", is retained for project consistancy, the discharge actually emanates from the abandoned deep mine complex known as the Portage #2/4 on the Upper Kittanning Coal Seam. This discharge accounts for approximately 13.4% of the AMD pollution load in the Little Conemaugh River.

10. How does the condition affect the environment, prevent the beneficial use of land and water resources, or endanger the public health and safety? The Conemaugh River is severly degraded by AMD discharges from abandoned mine sites. This discharge is one of the largest in the watershed. Downstream recreational, industrial and other water uses are adversley impacted by the present condition. Biological resources are also dramatically impacted.

(Preparer's Signature and Date) 03/09/2015

Based upon the foregoing summary of facts, I have concluded that:

I. A. The property referred to above was mined for coal or affected by coal mining processes; and

B. The property referred to above was:

1. mined prior to August 3, 1977, left or abandoned in either an unreclaimed or an inadequately reclaimed condition and there is no continuing responsibility for reclamation by the former mine operator, permittee or agent of the permittee under applicable federal or state law, or as a result of bond forfeiture; or

2. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before July 30, 1982, and funds for reclamation or abatement available pursuant to a bond or other form of financial guarantee or from any other source are insufficient to provide for adequate reclamation or abatement at the site; or

3. mined and left unreclaimed or inadequately reclaimed after August 3, 1977 but before November 5, 1990, the surety of the mine operator become insolvent during such period, and as of November 5, 1990 funds immediately available from proceedings relating to such insolvency or from any financial guarantee or other source are insufficient to provide for adequate reclamation or abatement at the site.

and

C. If the property being considered for reclamation or abatement is eligible under B.2. or 3. above, the site qualifies as a priority 1 or 2 site pursuant to Section 403(a)(1) and (2) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233). Further, the Department and the Office of Surface Mining will seek reimbursement to the Abandoned Mine Land Fund for reclamation costs in excess of the bonds forfeited for the site as described in 30 CFR 874.12(g) or

II. In case of an Acid Mine Drainage (AMD) Setaside Program Project, the site:

a. contains any of the priorities stated in Section 403(a) of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1233) after September 30, 1995; and

b. is proposed to be subject of expenditures by the Commonwealth to abate or treat AMD; or

III. The surface coal mining operations took place on lands eligible for remining pursuant to Section 404 of the Surface Mining Control and Reclamation Act of 1977 (30 USC 1234), in accordance with 30 CFR 874.12 (h).

My conclusion is predicated only on an analysis, based solely on the foregoing summary of facts, of statutory liability against companies or persons in the capacity of "mine operators" and does not address the question of statutory or common law liability against "landowners" who own an abandoned mine.

As a result of my conclusions in the preceding paragraphs, it is my opinion that the property referred to in the foregoing summary of facts qualifies and is eligible under 30 C.F.R. §874.12 or §876.12 to receive funding by the United States Department of the Interior, Office of Surface Mining toward the accomplishment of reclamation activities.

3/4/15
Date

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