The Ehrenfeld AML Pilot Reclamation/ Recreation & Watershed Improvement Project

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Abandoned Mine Reclamation

Rosebud Mining Company

2020 OSMRE Award Nomination

Office of Surface Mining Reclamation and Enforcement

Abandoned Mine Land Reclamation AWARDS

Cambria County Conservation & Recreation Authority

COMMUNITY FOUNDATION FOR THE ALLEGHENIES

Foundation for Pennsylvania Watersheds

THE AMERICAN CHESTNUT FOUNDATION®

The Ehrenfeld AML Pilot Reclamation / Recreation & Watershed Improvement Project

LOCATION

Problem Area 3041 (PA 3041) and Problem Area 3261 (PA 3261)
Ehrenfeld Borough, Croyle and East Taylor Townships, Cambria County, Pennsylvania

WRITTEN BY: Patrick M. Webb, P.E. and **SUBMITTED FOR:**
Director - Eric E. Cavazza, P.E.,
Environmental Program Manager - Dean R. Baker, P.E.
Construction - Roger F. Rummel, P.E. and Ryan J. Farabaugh, P.E.
Construction Inspection - Ronald R. Lindemuth and Ronald S. Fogel
Design - Thomas C. Malesky, P.E. and Mark T. Sossong, E.I.T.
Development/Permitting - Patrick M. Webb, P.E., Richard L. Beam, P.G., Kelsey Q. Jones, P.E., Maria T. Kasecky, P.E., and Michael A. Stayrook, P.E.
Investigation - Martin E. Hughes, P.E. and Jeffery Kostelac, P.E.
Pennsylvania Department of Environmental Protection
Bureau of Abandoned Mine Reclamation, Cambria District Office
Ebensburg, PA 814-472-1800

PROJECT START DATE

April 28, 2016

PROJECT COMPLETION DATE*

August 25, 2020*

PROJECT COSTS*

Total: $35,313,124.97* from the sources listed below:

OSMRE (P2) Title IV Grant for $5.14/CY Refuse Disposal Fee Agreement: $17,726,302.58*
The American Chestnut Foundation of Asheville, North Carolina: $25,000
Community Foundation for the Alleghenies: $25,000
Cambria Co. Conservation & Rec. Authority: $5,000
OSMRE Fiscal Year 2016 AML Pilot: $4,870,000
Pennsylvania Growing Greener: $500,000
OSMRE (P2) Title IV Grant: $12,141,822.39*
Foundation for Pennsylvania Watersheds: $20,000*

PRIMARY PROJECT PARTNERS

PA DEP, Bureau of Abandoned Mine Reclamation

Office of Surface Mining Reclamation and Enforcement

American Chestnut Foundation of Asheville, North Carolina

PA DEP, Cambria District Mining Office

Cambria County Conservation & Recreational Authority

Foundation for Pennsylvania Watersheds

Arcelor Mittal Pristine Resources, LLC

Community Foundation for the Alleghenies

CONTRACTOR

Rosebud Mining Company, Kittanning, PA

All interviews/videos have been duplicated on YouTube within Figure 6 on page 7

DATE SUBMITTED

* - Values accurate as of: June 15, 2020

All interviews/videos, drawings, pictures, and water samples are available for download at:
"EHRENFELD DIGITAL SUBMISSION"

Executive Summary

The Ehrenfeld Mine, located in East Taylor Township, Cambria County was originally permitted under Title V of the Surface Mining Reclamation Control Act (SMCRA) by the Pennsylvania Department of Environmental Protection's (PADEP) Cambria District Mining Office (CDMO) on October 8, 2008, to Amfire Mining Company (AMC) to surface mine the Upper Kittanning, Upper Freeport and Lower Freeport coal seams. Each coal seam varied in thickness from three feet to five feet. The Ehrenfeld Mine active surface mining permit (SMP) covered 726.3 total acres, and authorized mining on 246.6 of those acres. Portions of the Ehrenfeld SMP also authorized the remining of 125.8 acres of eligible SMCRA Title IV abandoned mine lands within Problem Area (PA) 3261 named South Fork Northwest.

Located near the town of Ehrenfeld, PA, the Ehrenfeld SMP lies within the Little Conemaugh River watershed, which is part of the greater Kiski-Conemaugh watershed and is 5,000 linear feet northwest from an eligible SMCRA Title IV abandoned mine land (AML) site, known as PA 3041 and PA 3261, named the Ehrenfeld AML site. Within the Ehrenfeld AML site, three steep Priority 2 (P2), unvegetated dangerous piles and embankments (DPE) coal refuse areas known as Refuse Pile 1, Refuse Pile 2, and the "Johnstown Path of the Flood Trail" Refuse Pile covering a total of 69.5 acres have been negatively impacting the inhabitants of Ehrenfeld, PA since 1903. Portions of the DPEs were smoldering due to a long and slow-moving coal refuse fire from a surface burning (SB) feature. Additionally, at over 3.2 million tons of refuse materials, the refuse pile areas encompass over 45% of the developed land within Ehrenfeld Borough. The pre-1977 mining activities that created the Ehrenfeld AML site have also contributed to the environmental degradation of the Little Conemaugh River and its tributaries. In order to reclaim the dangerous AML site, the PADEP's Title IV program, Bureau of Abandoned Mine Reclamation (BAMR), designed and received bids for the Ehrenfeld Abandoned Mine Reclamation Project (Contract OSM 11(3041)101.1) on August 20, 2013. Since the coal refuse tested with a very high sulfur content and a very low British Thermal Unit (BTU) value for energy generation, the design called for the coal refuse to be completely excavated and hauled to a permitted coal refuse disposal facility. The lowest responsible bid received was $98,250,244. The low bid proved not feasible and significantly exceeded BAMR's AML budget for the project, therefore the contract was suspended and not awarded.

The Ehrenfeld SMP site was operated by AMC until December 29, 2014, when it was then transferred to be owned and operated by the Rosebud Mining Company (RMC). Mining had been completed by AMC at the Ehrenfeld SMP prior to transfer of the site to RMC, and the site had only reclamation activities remaining to complete all obligations under the SMP. After the transfer, RMC began discussions with the PA DEP's BAMR and CDMO regarding the failed attempt to reclaim the AML features within the Ehrenfeld AML site under the suspended OSM11(3041)101.1 AML contract. RMC recommended placing the coal refuse material, along with alkaline addition material, within the Ehrenfeld SMP during the reclamation stage. The blending of the coal refuse with the alkaline addition material would neutralize the acidity of the coal refuse. The additional coal refuse would also produce a gradual final contour to reduce erosion. On August 14, 2015, CDMO approved a revised mining plan to allow alkaline addition and the coal refuse from the Ehrenfeld AML site to be placed within the Ehrenfeld SMP site.

BAMR redesigned the Ehrenfeld AML project to dispose of over 3.2 million tons of coal refuse within the Ehrenfeld SMP site. The project was re-bid on November 19, 2015, and four (4) bids were received. RMC submitted the low-bid amount of $13,455,319 and PA DEP-BAMR awarded contract OSM 11(3041)102.1 to RMC on February 16, 2016, to reclaim the Ehrenfeld AML site. At the same time, RMC continued to operate the Ehrenfeld SMP site and started site preparations for the placement of coal refuse on April 28, 2016. Initial placement of coal refuse within the SMP site occurred on June 16, 2016. The project eliminated several safety hazards on the AML site, significantly improved the appearance of the AML site and improved the water quality of drainage and tributaries that discharge into the Little Conemaugh River.

Project Background

Project Location

Figure 1 shows the location of the 69.5-acre Ehrenfeld Reclamation Project site which is situated in PAs 3041 and 3261, Ehrenfeld Borough, Croyle and East Taylor Townships, Cambria County, PA. The AML site is specifically located adjacent to the Johnstown Path of the Flood Trail that is owned and maintained by the Cambria County Conservation & Recreational Authority. Additional information about the trail can be found by accessing the following internet link: "Johnstown Path of the Flood Trail".

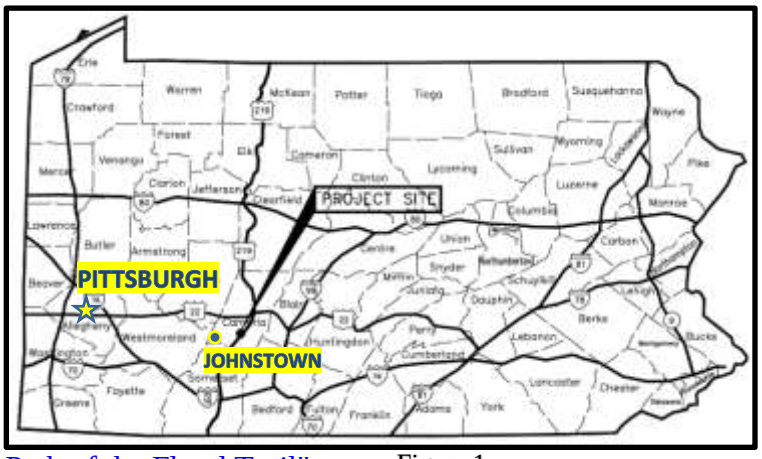

Figure 1

Mining History

The dangerous condition of the refuse pile areas were a direct result of various deep mining activities that began as early as 1903 and most recently performed prior to 1971 by the Pennsylvania Coal and Coke Company's Ehrenfeld Mine No. 3 in the Lower Kittaning Coal Seam and also from the Ehrenfeld Mine No. 8 in the Lower Freeport Coal Seam. These dangerous abandoned mine features meet the Office of Surface Mining Reclamation and Enforcement's (OSMRE's) Priority 2 safety criteria for dangerous piles and embankments (DPE) and surface burning (SB) conditions.

Description of AML Problems

As illustrated in Figure 2, Refuse Pile 1 (55.8 acres) and Refuse Pile 2 (7.7acres) were located within PA 3041. The "Johnstown Path of the Flood Trail" Refuse Pile (6.0 acres) was located within PA 3261. All pile areas were comprised of loose unconsolidated shale and coal refuse with extremely high and steep slopes. At times, eroding coal fines from Refuse Pile 1 would clog the unnamed tributary to the Little Conemaugh River. In addition, all pile areas were leaching highly acidic water that would drain and add to the impairment of the streams. The air quality of the local area was being degraded by burning areas of the Refuse Pile 1 that vented hazardous fumes. Intense site visitation of ATV and motorcycle trails as well as camping areas were evident throughout all pile areas. The closest home was five feet (5') away from Refuse Pile 1's unstable sliding base.

Figure 2

Innovative Use of Current Technology

The Ehrenfeld SMP plan included the disposal of approximately 3,448,697 cubic yards (as-built) of acidic coal refuse materials from the Ehrenfeld AML site to be placed within the Ehrenfeld SMP. The coal refuse was transported from the AML site to the SMP site using Caterpillar 777 rock trucks, where it was deposited in the un-reclaimed areas of the mine. The refuse was then spread using Caterpillar D-11 bulldozers into two-foot layers before being covered by an approximate three-inch layer of alkaline addition material (thickness based on volume of alkaline material needed to neutralize the refuse). This layer of refuse and alkaline addition material was then compacted using Caterpillar 815 compactors, then covered by one foot of on-site spoil material. This layering sequence was repeated as necessary to dispose of all the AML site coal refuse materials transported to the SMP site.

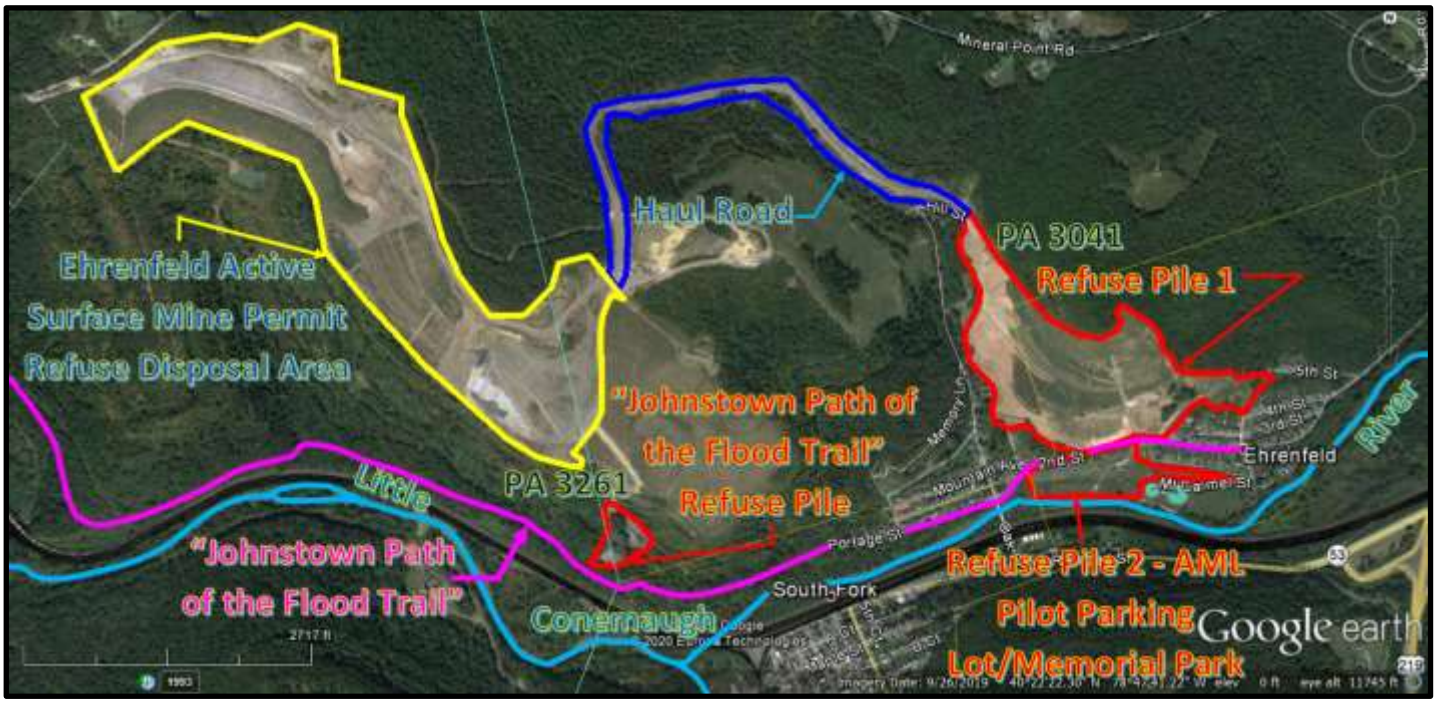

Figure 3

To the extent possible as illustrated in Figure 3, RMC has conducted reclamation at the Ehrenfeld SMP and AML site in a contemporaneous fashion. To facilitate the disposal of coal refuse from the Ehrenfeld AML site at the Ehrenfeld SMP site, portions of the permit area had to remain un-reclaimed for extended periods while permitting and contractual issues related to the proposed AML project progressed. Despite these challenges, RMC has completed reclamation whenever possible and has executed the complex mining plan related to the disposal of coal refuse without creating any additional environmental harm. The reclamation work RMC has completed at the Ehrenfeld SMP has been a social and environmental benefit to the area, eliminating numerous safety hazards, improving the aesthetics of the area, and improving the water quality of the receiving streams.

Due to the size and complexity of the Ehrenfeld AML site, BAMR required RMC to prepare and obtain a National Pollutant Discharge Elimination Systems (NPDES) General Permit for Stormwater Discharges associated with Construction Activities. RMC's approved NDPES General Permit allowed for a maximum disturbance area of six (6) acres before seeding was required. Limiting the maximum disturbance area to six (6) acres resulted in RMC's contemporaneous reclamation of the AML site. The distance from the center of the AML site to the center of the SMP site was approximately 2.4 miles. As directed by the AML contract to connect the SMP site to the AML site, RMC constructed a 5,000 linear feet haul road and maintained the haul road during construction. During peak production, RMC would have ten (10) Caterpillar 777 rock trucks operating and each truck would make approximately twenty (20) trips per day. Therefore, during peak production, there were approximately 200 truck trips per day on the haul road. To achieve contemporaneous

reclamation, RMC had to continuously maintain a heavily travelled haul road to keep access open between the AML site and the SMP site. The AML reclamation process included topsoil excavation (in areas where topsoil existed), topsoil storage, coal refuse excavation, alkaline addition material placement, topsoil placement, lime and fertilizer placement, seeding and mulching. Reclamation challenges included steep slopes (2:1) and permanent drainage channels. The constructed permanent drainage channels were a challenge because they limited equipment access to certain portions of the site. RMC's detailed coordination of the multiple work items allowed the reclamation to be completed in an efficient manner despite the multiple site challenges. The effectiveness of the reclamation is evident when observing the vegetative growth on the AML site and SMP site. Both sites have obtained a minimum seventy-percent (70%) growth. The effectiveness of the reclamation was also evident in the minimal amount of sediment loss from the AML site during construction.

Difficulty of Achieving Reclamation Under Existing Conditions

Special and Unique Considerations

As illustrated in Figure 3 on the previous page, the perimeter of the Ehrenfeld AML coal refuse pile site was adjacent to multiple houses. At one location, the toe of the coal refuse pile was within five feet (5') of a house. During coal refuse removal, RMC used extreme care to ensure runoff was directed away from houses below the pile. RMC used a series of berms, diversion channels and pipes to route water away from downstream structures. RMC used erosion and sediment controls such as rock check dams, compost filter sock, sumps and sediment traps to ensure sediment remained onsite. Due to the steep slope of the final grade and the long slope distances, the design called for six (6) bench channels to be constructed to prevent erosion gullies from forming. Constructing the fifteen foot (15') wide bench channels on steep slopes was a challenge. Four (4) of the bench channels discharged to an approximately 775-foot long gabion basket channel that was constructed perpendicular to the slope. The gabion channel was required due to the steep slope of the final grade and the 100-year design storm criteria. Constructing the gabion channel proved to be very challenging. RMC started coal refuse excavation at the top of the pile and advanced to the bottom of the pile. However, the gabion channel had to be constructed from downstream to upstream. Because the gabion channel serves as a drainageway for the upslope drainage area, construction of the gabion channel could not wait until coal refuse excavation was completed. RMC had to construct the gabion channel in segments as coal refuse excavation proceeded down the slope. RMC would place precast concrete supports at the start of each gabion channel segment and install the gabion baskets downstream to upstream. The concrete supports located at the bottom of the segment would be removed when the next section of gabion channel was constructed. Due to the seventeen-foot (17') width of the gabion channel, RMC had to stage equipment (bulldozers, excavators, rock trucks) on both sides of the gabion channel. In addition, there was extensive handwork to place the gabion stone in each gabion basket and anchor the baskets together. Despite very challenging site conditions, RMC constructed the gabion channel per the design specifications in an efficient and safe manner. The design is available to be download and viewed on the internet at: "Engineer Drawings."

On-site Difficulty of the Project

The Ehrenfeld AML and SMP sites are located within the most restrictive non-special protection watershed in the Pennsylvania bituminous coal field. Within the AML site, a portion of Refuse Pile 1 was located within five feet (5') from the closest house and adjacent to an Unnamed Tributary (UNT) to the Little Conemaugh River. In some areas, coal refuse had been placed in the stream. Decades of runoff from the coal refuse pile had degraded the UNT's water quality and coated the streambed with white aluminum precipitates. As illustrated in "Figure 4" on the following page, RMC's removal of Refuse Pile 1 and 2, placement of alkaline addition material, and establishing vegetation on the site has improved the UNT's water quality. After the coal refuse was removed, RMC placed a combination of R-4 and R-5 rock to stabilize the streambank. Additionally, trees

were planted along the UNT where Refuse Pile 1 once was to establish a wooded riparian buffer along the stream. Additionally, a portion of Refuse Pile 2 was located in the Little Conemaugh River floodplain. RMC's removal of Refuse Pile 2 resulted in the restoration of approximately one (1) acre of floodplain and will reduce flooding risks of downstream communities.

Sample Point Description	Date	Flow	Lab pH	Alkalinity	Hot Acidity	Total Fe	Mn	Al	Sulfate	Suspend Solids
		gpm	SU	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Unnamed Tributary ABOVE Refuse Pile	05/31/16	120	5.7	8.2	2.60	<0.300	0.094	<0.500	<20.0	10.0
	12/20/17	110	7.4	43.2	-26.00	3.249	0.290	0.672	78.6	16.0
	04/11/19	130	6.2	7.8	4.20	<0.300	0.110	<0.500	25.2	<5
	12/19/19	100	5.8	7.4	10.80	<0.300	0.188	<0.500		14.0
EHRENFELD AML REFUSE PILE SITE										
Sample Point Description	Date	Flow	pH	Alkalinity	Hot Acidity	Total Fe	Mn	Al	Sulfate	Suspend Solids
		gpm	SU	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Unnamed Tributary BELOW Refuse Pile	08/06/12	120	4.8	0.0	46.40	0.139	0.854	15.700	261.7	
	06/02/14	130	7.4	27.6	10.00	0.110	0.282	4.628	142.3	18.0
	4/28/2016 - AML Reclamation of Refuse Pile Contract Start									
	05/31/16	140	7.6	33.0	-15.00	0.783	0.234	4.334	116.6	26.0
	12/20/17	130	7.6	87.0	-67.40	3.785	0.347	0.824	110.1	26.0
	04/11/19	150	7.4	45.6	-33.80	<0.300	0.122	0.854	110.4	6.0
	12/19/19	120	7.5	40.4	-21.00	<0.300	0.059	<0.005		36.0

Figure 4

Outfalls for the Ehrenfeld SMP were permitted at the most stringent effluent criteria allowable in a non-special protection watershed, a requirement of the Kiski-Conemaugh watershed Total Maximum Daily Load report, which contained no available waste load allocations that could be used for the permit. A total of fourteen NPDES outfalls were originally permitted for the SMP site, however only five remain (one treatment pond, four sedimentation ponds). During construction, the alkaline addition practices at the Ehrenfeld SMP site have been so effective, that RMC had requested pH variances at two of the remaining outfalls, since the pH was sometimes greater than 9 Standard Units (SU) in the discharge. As illustrated in "Figure 5", this higher pH has benefitted the receiving stream, Little Conemaugh River, which has been degraded by past mining activities and normally exhibits a pH less than 4.5 SU.

Sample Point Description	Date	Flow	Lab pH	Alkalinity	Hot Acidity	Total Fe	Mn	Al	Sulfate	Specific Conductance	Suspend Solids
		gpm	SU	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(uS/cm)	(mg/l)
Monitoring Point of the Unnamed Tributary below EHRENFELD SMP area	12/31/08	90	4.9	6	20	0.08	0.31	4.54	114	307	13.0
	03/17/09	100	5.1	7	20	0.07	0.40	7.67	172	418	27.0
	06/16/09	90	6.3	12	10	0.16	0.35	7.08	16	479	23.0
	09/23/09	20	5.2	9	34	0.13	1.03	14.70	394	748	53.0
	11/13/09	95	6.3	19	-13	0.16	0.69	15.30	37	569	34.0
	03/31/10	100 +	5.6	7	18	0.12	0.26	4.83	103	294	14.0
	06/14/10	75	5.9	11	19	1.14	0.37	14.10	184	411	56.0
4/28/2016 - START OF EHRENFELD AML REFUSE AND AKALINE ADDITION PLACED AT THE EHRENFELD SMP SITE											
Sample Point Description	Date	Flow	pH	Alkalinity	Hot Acidity	Total Fe	Mn	Al	Sulfate	Specific Conductance	Suspend Solids
		gpm	SU	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(uS/cm)	(mg/l)
Monitoring Point of the Unnamed Tributary below EHRENFELD SMP area	03/26/18	500	7.0	20.6	-16.32	<0.1	0.18	2.50	104.0	362	16.0
	06/26/18	80	6.3	3.1	7.36	0.24	<0.05	0.37	19.7	113	8.0
	09/24/18	200	6.5	3.1	0.80	1.91	1.00	<0.10	17.2	125	9.0
	12/28/18	400	6.2	1.9	3.58	1.14	0.14	0.98	16.4	87	35.0
	03/27/19	100	6.2	1.9	1.99	0.16	0.05	0.14	17.9	120	36.0
	06/12/19	115	7.7	48.7	-40.60	0.85	0.11	0.82	71.3	313	30.0
	08/20/19	145	7.7	76.1	-66.27	2.07	0.15	1.49	144.9	447	61.0

Figure 5

Project Start and Completion Dates and Construction Costs

RMC started contractual work at the Ehrenfeld AML site on April 28, 2016 and are currently estimated as of June 15, 2020 to be completed at the AML site by August 25, 2020, near the current total of $35,313,124.97.

Name of the Organizations Responsible for the Reclamation, Including Contractors

The responsible organizations were PA DEP, Bureau of Abandoned Mine Reclamation and Cambria District Mining Office; Office of Surface Mining Reclamation and Enforcement (OSMRE); Foundation for Pennsylvania Watersheds; Community Foundation for the Alleghenies; Cambria County Conservation & Recreational Authority; American Chestnut Foundation of Asheville, North Carolina; and Arcelor Mittal Pristine Resources, LLC. The contractor was Rosebud Mining Company from Kittanning, PA.

On-site Effectiveness

Effective/Innovative Use of Technology

BAMR initially bid the Ehrenfeld AML project site in 2013. Due to the existing steep slope of the coal refuse material and with no area to regrade the refuse on site, the design called for the coal refuse to be completely excavated and hauled to a permitted coal refuse disposal facility. Additionally, the coal refuse tested with a very high sulfur content and a very low BTU value that would not be ideal for energy generation. The lowest responsible bid received was in excess of $98 million. This cost significantly exceeded BAMR's AML budget for the project, primarily due to the cost of on-road trucking and the cost to purchase permitted coal refuse disposal air space. BAMR rejected all bids and started work on an alternative design. After RMC acquired the Ehrenfeld SMP from AMC, RMC approached the CDMO and BAMR about placing the coal refuse with alkaline addition materials within the Ehrenfeld SMP during the reclamation stage. Due to the close proximity of the SMP site to the AML site, the coal refuse could be hauled using off-road trucks. RMC believed this design change would significantly reduce the cost of the AML project. RMC worked with DMO to revise the reclamation plan of the SMP site to accept approximately 3,448.697 cubic yards (as-built) of coal refuse.

The AML contract required the lowest qualified bidder to excavate and haul coal refuse from the AML site to the SMP site. Regardless of which contractor submitted the lowest qualified bid for the AML contract, RMC was obligated to accept and grade the coal refuse, incorporating alkaline addition material into the coal refuse and compacting the coal refuse-alkaline material mixture at the SMP site. The refuse was spread using Caterpillar D-11 bulldozers into two-foot layers before being covered by an approximate three-inch layer of alkaline addition material (thickness based on volume of alkaline material needed to neutralize the refuse). This layer of refuse and alkaline addition material was compacted using Caterpillar 815 compactors, then covered by one foot of on-site spoil material. This layering sequence was repeated as necessary to dispose of all the AML site coal refuse materials transported to the SMP site. The same alkaline application and rate was performed for Refuse Pile 2 at the AML site. As for Refuse Pile 1 and the "Johnstown Path of the Flood Trail" Refuse Pile of the AML site, once all the refuse was removed, alkaline addition was incorporated into the top eight inches of the now uncovered original ground. To compensate RMC for the additional reclamation costs at the SMP site, BAMR and RMC agreed to a $5.14 per cubic yard disposal fee. At the design estimated coal refuse volume of 2,478,000 cubic yards (as-bid), the design disposal fee was $12,736,920. Combining RMC's AML site low-bid contract amount of $13,455,319 with the $12,736,920 refuse disposal fee produced a total project cost of $26,192,239. Consequently, the innovated project re-design decreased the overall (as-bid) project cost by $72,058,005. By June 15, 2020, the as-built conditions and change orders of additional work to include the removal of the "Johnstown Path of the Flood Trail" Refuse Pile at the AML site warranted additional refuse removal in excess of up to 970,697 cubic yards. Therefore, the final volume of refuse disposal was measured and paid for a total of 3,448,697 cubic yards at a total refuse disposal fee of $17,726,302.58.

Landscape Conforms to the Natural Environment

Now at the AML site with Refuse Pile 1 (55.8 acres), Refuse Pile 2 (7.7acres), and the "Johnstown Path of the Flood Trail" Refuse Pile (6.0 acres) completely reclaimed with an abundance of flowing native grasses, the natural environment of the site has been completely restored. Also, close to 2,900 tree seedlings comprised of; White Pine, Hemlock, Red Oak, Sugar Maple, Quaking Aspen, Black Locust, Sycamore, Black Willow, White Oak, Black Cherry, and Eastern Redbud were planted within portions of reclaimed Refuse Pile 1. Furthermore, reclaimed areas of Refuse Pile 1 adjacent to the unnamed tributary to the Little Conemaugh River were planted as a riparian stream buffer. Portions of reclaimed Refuse Pile 1 were re-graded as hummocky piles of earthen material in accordance to the Forestry Reclamation Approach (FRA) to accommodate the American Chestnut. The FRA method is endorsed by OSMRE and the Appalachian Regional Reforestation Initiative (ARRI) through the following internet link: "OSMRE and ARRI." In addition to the 2,900 tree seedlings, over 100 American Chestnut seedlings were also donated for planting by the American Chestnut Foundation of Asheville, North Carolina. Furthermore, the refuse disposal area within the SMP, consisting of 107 acres, will

become wildlife habitat, while the remainder of the disturbed permit area (139.6 acres) will be returned to forestland. The wildlife habitat will consist of a seed mixture of perennial ryegrass, redtop and orchard grass, while the forestland will consist of a seed mixture of perennial ryegrass, climax timothy, orchard grass, foxtail millet, annual ryegrass, birdsfoot trefoil and alsike clover. Additional SMP areas will also be reforested with various trees species similar to the trees planted at the AML site. Due to the challenges of coal refuse disposal of the AML site, RMC was authorized to deviate from approximate original contour, however the final reclamation contours are close to the original pre-mining contours and blend well with surrounding topography. The additional coal refuse from the AML site also produced a gradual final contour that reduces erosion.

Elimination of Significant Health and Safety Problems

Within the Ehrenfeld AML site, now with all three refuse piles reclaimed that have been negatively impacting the inhabitants of Ehrenfeld, PA, since 1903, there is a renewed sense of community pride. Intense unauthorized ATV refuse pile riding, along with impacts to parts of the burning refuse no longer exist. Additionally, the removal of the constant threat of Refuse Pile 1 from sliding through houses located at the base of the pile and controlled stormwater is now a benefit that is exceeding all expectations. Furthermore, the active mining of the Ehrenfeld SMP has reclaimed over 125 acres of abandoned mine land, daylighted two acres of abandoned underground mines, and eliminated 7,800 feet of dangerous abandoned highwall work that would have been very costly to local governments. The elimination of the Ehrenfeld AML refuse pile areas has been a benefit to all parties. RMC was able to utilize the material in portions of the backfill, saving them the expense of spreading piles of spoil across the mine site. These spoil piles can were spread in their immediate areas and blended to local topography. Local governments and residents have also benefited from the aesthetic improvements, elimination of safety hazards, and environmental improvements. Please access the interviews and construction videos available on YouTube within internet links illustrated in Figure 6 below to learn more.

Table of Interviews / Videos on YouTube: Illustrations of On-site Effectiveness and Innovative Use of Technology
INTERVIEW: Foundation of Pennsylvania Watersheds - **"November 2018 AML/AMD/AML Pilot (30 min. unedited)"**
INTERVIEW: Point Park University's DOWNSTREAM, minute mark 8:26 to 11:56 - **"June 2018 AML & AMD"**
INTERVIEW: Pennsylvania Environmental Council (PEC) 2017 Western PA Awards - **"Spring 2017, Rosebud Mining"**
INTERVIEW: AML Pilot, USDOI, OSMRE, PA DEP, & Local Officials Groundbreaking - **"August 2016 Groundbreaking"**
AML Reclamation Site: Refuse Pile 1, Refuse Pile 2, "Johnstown Path of the Flood Trail" Refuse Pile, and Haul Road
AML: During Construction - OSMRE New Employee Training - **"April 2017 OSMRE (60 plus New Employees) Video 1"**
AML: During Construction - OSMRE New Employee Training - **"April 2017 OSMRE (60 plus New Employees) Video 2"**
AML: During Construction – Refuse Pile 1, Gabion Channel Construction - **"July 2019 Refuse Pile 1 Gabion Channel"**
AML: During Construction – Hydroseeding Refuse Pile 1 - **"September 2019 Hydroseeding"**
AML – DRONE VIDEO: During Construction – Refuse Pile 1 - **"October 2019 Refuse Pile - DRONE VIDEO"**
AML – DRONE VIDEO: During Construction – Haul Road between AML site to SMP site - **"October 2019 Haul Road"**
AML – DRONE VIDEO: During Construction - "Johnstown Path of the Flood Trail" Refuse Pile - **"Oct. 2019 Path Pile"**
AML: Post Construction – Refuse Pile 1 and Refuse Pile 2 - **"April 2020 Refuse Pile 1 and Refuse Pile 2"**
Active Surface Mine Permit (SMP) Site: Refuse Disposal Area
SMP: During Construction – Refuse Disposal within SMP - **"September 2019 Refuse Disposal within SMP Site"**
SMP – DRONE VIDEO: During Construction - **"October 2019 Refuse Disposal within SMP Site Video 1"**
SMP – DRONE VIDEO: During Construction - **"October 2019 Refuse Disposal within SMP Site Video 2"**

Figure 6

Funding

Funding Source	Description	Cost	Funding Percent
U.S.A. General Fund	AML Pilot (FY 2016)	$ 4,870,000.00	13.79%
OMSRE	AML (Title IV Funding)	$ 12,141,822.39	34.38%
	$5.14/CY Refuse Disposal Fee (Title IV Funding - License Agreement Fee Between Rosebud Mining Co. & PA-DEP-BAMR)	$ 17,726,302.58	50.20%
Pennsylvania	State Growing Greener Grant	$ 500,000.00	1.42%
Partners	Foundation for Pennsylvania Watersheds	$ 20,000.00	0.06%
	Community Foundation for the Alleghenies	$ 25,000.00	0.07%
	The American Chestnut	$ 25,000.00	0.07%
	Cambria County Conservation and Recreation Authority	$ 5,000.00	0.01%
	Total (as of 6/15/2020) =	**$ 35,313,124.97**	

Figure 7

Effective Use of Funds

The Ehrenfeld AML Reclamation Project has been one of the largest, complex, and most expensive projects performed to date by Pennsylania's AML program. Because of the intense site visitation of all three refuse pile areas and the close proximity of houses at the base of Refuse Pile 1, elimination of health and safety hazards was the primary focus of the project. The use of the Title IV Funds, identified in Figure 7, served to both eliminate the P2 features and to improve the watershed. Without the benefit of AML Pilot funding, OSMRE Title IV funding, cooperation of Rosebud Mining Company (RMC) to accept and dispose of the refuse within the active surface mine permit, and the combined efforts of both Pennsylvania's Title IV (AML) and Title V (Active Mining) programs, the Ehrenfeld AML Reclamation Project likely would not have been possible.

Leveraging – Use of Partners for Funding or Technology

As illustrated in Figure 7, the Ehrenfeld AML Reclamaiton Project applied many funding partners, most importantly has been the partneship with RMC. Originally in 2013, without the partnership of RMC, BAMR received bids for the Ehrenfeld AML site to be completely excavated and hauled away to be disposed of at a permitted coal refuse disposal facility. The lowest responsible bid received in 2013 was $98,250,244. This low bid proved not feasible and significantly exceeded BAMR's AML budget for the project, therefore the contract was suspended and not awarded. Fast-forwarding to today, June 15, 2020, with the project almost complete at the current total construction cost of $35,313,124.97, in which a cost savings of over 64% is amazing compared to the $98 million construction bid in 2013. Once more, without the benefit of AML Pilot funding, OSMRE Title IV funding, cooperation of RMC to accept and dispose of the refuse within the active surface mine permit, and the combined efforts of both Pennsylvania's Title IV (AML) and Title V (Active Mining) programs, the Ehrenfeld AML Reclamation Project likely would not have been possible.

Benefits to the Community

Community Support for the Project

As illustrated in Figure 8 and within the following media internet link of March of 2016: "Cleanup", the community greatly supported the Ehrenfeld AML Reclamation Project. Additionally, a ground-breaking ceremony was held at the AML site on August 4, 2016, with federal, state and local officials and RMC personnel. The meeting was attended by approximately seventy-five

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Cleanup to create 40 jobs

$13.4M project will return miners to work in Ehrenfeld

BY DAVID HURST

EHRENFELD – There's a mountain of a waste coal pile above Ehrenfeld that serves as little more than a reminder of the old coal town's heyday.

Back then, Ehrenfeld's streets were busy and its air was dusty.

It all reminded Guy Galosi of days he spent sorting coal for the company that made the pile and nights he and his buddies would cram into cars to go see big band greats like Tommy Dorsey play Carrolltown's Sunset Ballroom.

"Those were good times," Galosi said.

Soon, Ehrenfeld's 32 acre "bosney" pile will be a memory, too.

After years of failed attempts, the state Department of Environmental Protection announced a $13.4 million project Monday to remove all 3.2 million tons of it and reclaim the site, a move state officials said will provide work for 40 recently laid-off Rosebud Mining Company miners.

It's also a project that will eliminate acidic runoff flowing into an unnamed Little Conemaugh River tributary while developing a small recreational park on one portion of the site alongside the Path of the Flood Trail, DEP Spokesman John Poister said.

"We can finally award a contract to reclaim this unsightly and hazardous abandoned coal refuse pile," DEP Secretary John Quigley said, adding that officials are "doubly happy" that the project will be a boost for the town, the environment and dozens of mine workers.

Rosebud's $13,455,319 bid was the lowest qualified one received for the project, Poister said. They'll haul the rocky refuse away by truck to a Rosebud property where it will be used as fill inside an old, shuttered coal mines.

Part of the pile is often smoldering, and Rosebud will be tasked with extinguishing it, he said.

Aside from two years serving in the Navy, Galosi said he's spent of all his 88 years in Ehrenfeld. That waste coal pile has been there that entire time, and then some, he said.

Please see MINERS, A-2

A large waste coal pile dwarfs homes in Ehrenfeld on Monday. A $13.4 million project will remove all 3.2 million tons of it and reclaim the site.

Figure 8

(75) people and the keynote speaker, Department of Interior Secretary Sally Jewell, discussed how the project was the first AML Pilot project in the country and how the project would revitalize Ehrenfeld Borough and surrounding areas. The AML Pilot Program provides US Treasury funding to selected states to repurpose reclaimed AML sites for economic revitalization, community development, recreation, and tourism. Funding from the AML Pilot program also supported RMC to re-hire up to 40 RMC employees that were currently laid off prior to the start of the Ehrenfeld AML reclamation contract due to a significant downturn in the coal market The event was reported by the local newspaper at: "Tribune-Democrat," and a video documenting the event is available on YouTube at the internet link: "August 2016 Groundbreaking."

Long-Term Benefits to the Community

The long-term benefits to the community will be limitless now with the elimination of the dangerous refuse pile ares within the Ehrenfled AML Reclamation Project. In recognition of RMC's application of new technologies, substantial cost savings of BAMR's AML fund, increasing public awareness of SMCRA, and environmental stewardship, RMC received the 2017 Western Pennsylvania Environmental Award presented by The Pennsylvania Environmental Council (PEC). The information concerning the award is available on YouTube at "PEC Award - Spring 2017, Rosebud Mining" and at the following internet link: "PEC WEB PAGE." RMC received the award on May 24, 2017, when the Ehrenfeld AML contract was only in its first construction year of the initial proposed three year contract.

Additionally, as illustrated in "Figure 9" , in consideration of post-reclamation land use, Fiscal Year 2016 AML Pilot funding was used for immediate Category A Project Benefits for the re-grading and repurposing of Refuse Pile No. 2. The now reclaimed refuse pile area is being repurposed as an expanded relocated parking lot area for transportation safety improvements of the "Johnstown Path of the Flood Trail" to support and promote recreation and tourism. The relocation of the parking lot will greatly reduce the negative impacts of users sharing the trail along a steep portion of 2nd Street with vehicular traffic. Portions of the parking lot area are also being used as a community park and memorial for families and their friends. Memorial benches and trees have been placed in the now reclaimed Refuse Pile 2 to honor area loved ones. Furthermore, a portion of Refuse Pile 2 was located in the Little Conemaugh River floodplain. RMC's removal of Refuse Pile 2 resulted in the restoration of approximately one (1) acre of floodplain and will reduce flooding risks of downstream communities. Finally, with the larger Refuse Pile 1 area now reclaimed, the property has potential for AML Pilot Category B Project Benefits for the property to be subdivided and redeveloped for future commercial, residential and/or recreational purposes.

Figure 9

Surface Mining Control and Reclamation Act (SMCRA)

Exceeds the Spirit and Intent of SMCRA

Reclaiming the combined 69.5 acres of highly acidic dangerous refuse pile areas, removing the surface burning condition, and improving the Little Conemaugh watershed of the Ehrenfeld AML Reclamation Project not only exceeds the spirit and intent of SMCRA, it truly defined SMCRA. Never before has the Commonwealth of Pennsylvania produced such great success in combining a large Title IV AML site with a large Title V active surface mine site. Without both sites utilizing each other's strengths, each project may have not been completed

at their current successful reclamation states. Additionally, both the Ehrenfeld AML site (Title IV) and the Ehrenfeld SMP site (Title V) were used to facilitate an "OSMRE New Employee Training" event during the Spring of 2017. BAMR staff lead over sixty plus new OSMRE employees to both the Ehrenfeld AML site (Title IV) and Ehrenfeld SMP site (Title V) as illustrated in the following two videos on YouTube located at: "OSMRE (60 plus New Employees) Video 1" and "OSMRE (60 plus New Employees) Video 2."

Increased Public Awareness of SMCRA

In addition to the Ehrenfeld AML Reclamation Project being acknowledged as the 2017 Western Pennsylvania Environmental Award winner presented by PEC, the reclaimed AML site has also been recently honored by the Interstate Mining Compact Commission (IMMC). The IMMC had selected RMC's overall work at both the Ehrenfeld AML site (Title IV) and SMP site (Title V) as their 2020 National Reclamation "Coal Winner". Unfortunately, due to the COVID-19 crisis that has crippled the United States of America and the world, the 2020 meeting/award presentation in Lexington, KY was cancelled. The meeting/award presentation currently has been rescheduled for late October 2020 in New Orleans, LA, in which staff from RMC and staff from BAMR will be honored. Furthermore, the Ehrenfeld AML Reclamation Project has increased public awareness of SMCRA on another national level. In October of 2018, the Ehrenfeld AML site was featured in a television documentary produced by Point Park University's School of Communication Environmental Journalism program in association with WQED Multimedia. The documentary can be viewed by accessing the following internet link at: "WQED" and additionally on YouTube at: "Downstream." The Ehrenfeld AML site and SMCRA are discussed during minute mark 8:26 through 11:56.

Transferability to Other AML Projects

The removal and or reprocessing of acidic mine refuse materials in combination with applying alkaline addition materials to abate AMD for the Ehrenfeld AML Reclamation Project has been similar to past BAMR's projects like; Dents Run AML/AMD Ecosystem Restoration Project, Huling Branch AML Reclamation/ATV Recreation & Watershed Improvement Project, and the Mather, PA – Reclaiming a Company Town Refuse Pile. All projects were regarded as award winning projects. As illustrated in Figure 10, the "Stineman Refuse Pile – Path of the Flood Trail" 2017 AML Pilot Project is ongoing and once completed will remove a dangerous refuse pile and create a relocated portion of the Johnstown Path of the Flood Trail. This AML project site is located just two miles south west of the Ehrenfeld AML site in the nearby town of South Fork, PA. The refuse pile is being removed and reprocessed for fuel at a local waste coal-fired power plant owned by Robindale Energy. More information about Robindale Energy can be found at the following internet link at: "CO-GEN."

Figure 10

Summary/Conclusion

The Ehrenfeld AML Reclamation Project was a success story which included elimination of almost 70 acres of P2 dangerous refuse pile areas, surface burning conditions, and improving the AMD impacts of the Little Conemaugh River. AML Pilot funding for the repurposing of the reclaimed areas for the Johnstown Path of the Flood Trail parking lot and memorial park will serve visitors for the foreseeable future. The Ehrenfeld AML Reclamation Project site serves as an outstanding example of the effective utilization of AML Pilot funding and the AML/AMD abatement accomplishments in Pennsylvania that all AML programs can follow.

"Figure 11 - AML - Pre-Construction Aerial Oblique, 2012"

"Figure 12 - AML - Pre-Construction Aerial Oblique, 2012"

"Figure 13 - AML - Pre-Construction Aerial Oblique, 2012"

"Figure 14 - AML - Pre-Construction Aerial Oblique, 2012"

"Figure 15 - AML - Pre-Construction - Refuse Pile 1, 2012"

"Figure 16 - AML - Pre-Construction - Refuse Pile 1, 2012"

"Figure 17 - AML - Pre-Construction - Refuse Pile 1, 2012"

"Figure 18 - AML - Pre-Construction - "Johnstown Path of the Flood Trail" Refuse Pile, 2017"

"Figure 19 - AML - During Construction - Refuse Pile 1, June 2016"

"Figure 20 - AML - During Construction - Refuse Pile 1, June 2016"

"Figure 21 - AML - During Construction - Refuse Pile 1, October 2016"

"Figure 22 - AML - During Construction - Refuse Pile 1, October 2016"

"Figure 23 - AML - During Const. Aerial Oblique - Haul Road / Refuse Pile 1, April 2017"

"Figure 24 - AML - During Const. Aerial Oblique - Haul Road / Refuse Pile 1, April 2017"

"Figure 25 - AML - During Const. - Refuse Pile 2/AML Pilot Parking Lot, February 2018"

"Figure 26 - AML - During Const. - Refuse Pile 2/AML Pilot Parking Lot, April 2019"

"Figure 27 - AML - During Construction - Refuse Pile 1, July 2019"

"Figure 28 - AML - During Construction - Refuse Pile 1, July 2019"

"Figure 29 - AML - During Construction - Refuse Pile 1, October 2019"

"Figure 30 - AML - During Construction - Refuse Pile 1, October 2019"

"Figure 31 - AML - During Const. - “Path of the Flood Trail” Refuse Pile, March 2020"

"Figure 32 - AML - Post-Const. (before seed) - “Path of the Flood Trail” Pile, April 2020"

"Figure 33 - AML - Post-Const. Refuse Pile 2/AML Pilot Memorial Parking, June 2020"

"Figure 34 - AML - Post-Const. Refuse Pile 2/AML Pilot Memorial Parking, June 2020"

"Figure 35 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 36 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 37 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 38 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 39 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 40 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 41 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 42 - AML - Post-Construction Refuse Pile 1, June 2020"

"Figure 43 - SMP - Active Surface Mine, 2012"

"Figure 44 - SMP - Refuse Disposal Start, 2016"

"Figure 45 - SMP - Refuse Disposal During Construction, 2017"

"Figure 46 - SMP - Refuse Disposal During Construction, 2019"

"Figure 47 - SMP - Post Construction Refuse Disposal, June 2020"

"Figure 48 - SMP - Post Construction Refuse Disposal, June 2020"

"Figure 49 - SMP - Post Construction Refuse Disposal, June 2020"

"Figure 50 - SMP - Post Construction Refuse Disposal, June 2020"

Dedication

The Pennsylvania 2020 Award Nomination of The Ehrenfeld AML Pilot Reclamation / Recreation & Watershed Improvement Project is dedicated to the memories of Ehrenfeld Mayor **Ray Plummer** and Rosebud Mining Company's Superintendent of Surface Mining Operations **Mark Kirkpatrick** that passed before project completion. Within the former area of Refuse Pile 2 that is now the newly constructed AML Pilot Memorial Parking Lot for the Johnstown Path of the Flood Trail, trees will be planted in their memory. Additionally, the images of **Ray** and **Mark** below "will be used for a sign that will be installed within the park."

Both **Ray** and **Mark** are sadly missed.

Mayor Ray Plummer

Rosebud Mining's Superintendent of Surface Operations Mark Kirkpatrick