



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Abandoned Mine Reclamation

Implementation of the 2016 AML Pilot Program in Pennsylvania: Successes, Challenges, and Lessons Learned

Tom Wolf, Governor

Patrick McDonnell, Secretary

AML Pilot Program Background

- The AML Pilot Program was authorized by Congress under the Consolidated Appropriations Act (signed by President Obama on December 18, 2015) and provides an additional \$30 million of US Treasury Funds to PA's AML Program
- The funds are to be used “for the reclamation of abandoned mine lands in conjunction with economic and community development and reuse goals”

Language from House Report Accompanying the Bill

“State AML programs, in consultation with state economic and community development authorities, shall develop a list of eligible AML projects in Appalachian counties that have a nexus to economic and community development, and select qualifying AML projects that have the potential to create long-term economic benefits.”

AML Pilot Program Purpose

- Explore ways to return legacy coal sites to productive reuse
- Inform Congress of the programmatic impacts of changes to the underlying federal law (SMCRA) such as those included in the proposed RECLAIM Act which would accelerate distributions from the federal AML Trust Fund for similar economic revitalization and community development projects associated with the reclamation of AML sites

Proposed AML Pilot Projects

- At OSMRE's request (February 24), DEP developed a preliminary list of projects
- Since this is a pilot program, PA selected a wide variety of project types with a variety of possible economic or community development benefits and partners
- DEP is targeting 14 proposed AML Pilot Projects (8 Bituminous and 6 Anthracite) which are located in 10 coal field counties
- Additional Pilot Projects may be considered

AML Pilot Program Proposed Projects

- PA submitted the proposed list of 14 AML Pilot Projects to OSMRE on March 18
- OSMRE reviewed the proposed project list and provided feedback along with a request for additional information on March 30
- PA resubmitted the list with the additional information requested by OSMRE on April 14
- OSMRE indicated that the list had been vetted and approved by OSMRE HQ on May 12

AML Pilot Program Guidelines and Grant Application Timelines

- PA submitted its 2016 AML Economic & Community Development Pilot Program Grant Application to OSMRE on March 28 (to make the funding available for projects)
- Final AML Pilot Program Guidance on use of pilot funds was received by DEP from OSMRE on May 2
- Based on OSM feedback, PA resubmitted a revised AML Pilot Program Grant Application on May 16
- PA's AML Pilot Program Grant Application was approved by OSMRE on June 6

PA's Plan for the AML Pilot Funding

- PADEP-BAMR is allocating nearly all of the AML Pilot Program funds for the construction of Title IV eligible AML & AMD problems
- Project partners will then work to fund and complete non-AML economic development aspects of the projects

AML Pilot Project Types

Three (3) AMD Treatment Projects

One (1) Underground Mine Fire

Two (2) Water Supply Replacement Projects

One (1) Mine Headframe/Hoist Preservation Project

Five (5) Surface Mine Reclamation Projects

Two (2) Coal Refuse Piles

Significant Benefits

- Several Industrial Development or Business Park Opportunities
- Significant Stream Water Quality Improvement and Restored Fisheries
- Mine Pool Geothermal Project
- MicroHydro Plant and Municipal Water Supply
- Restored Public Lands

Significant Benefits

- Increased Tourism, Public Trail Development and Mining Heritage Preservation
- Reforestation/Restoration of American Chestnuts
- Expansion of a Regional Botanic Garden
- New or Upgraded Potable Water Supplies for over 600 Homes and Businesses in Coal Country

Leveraging of Funds

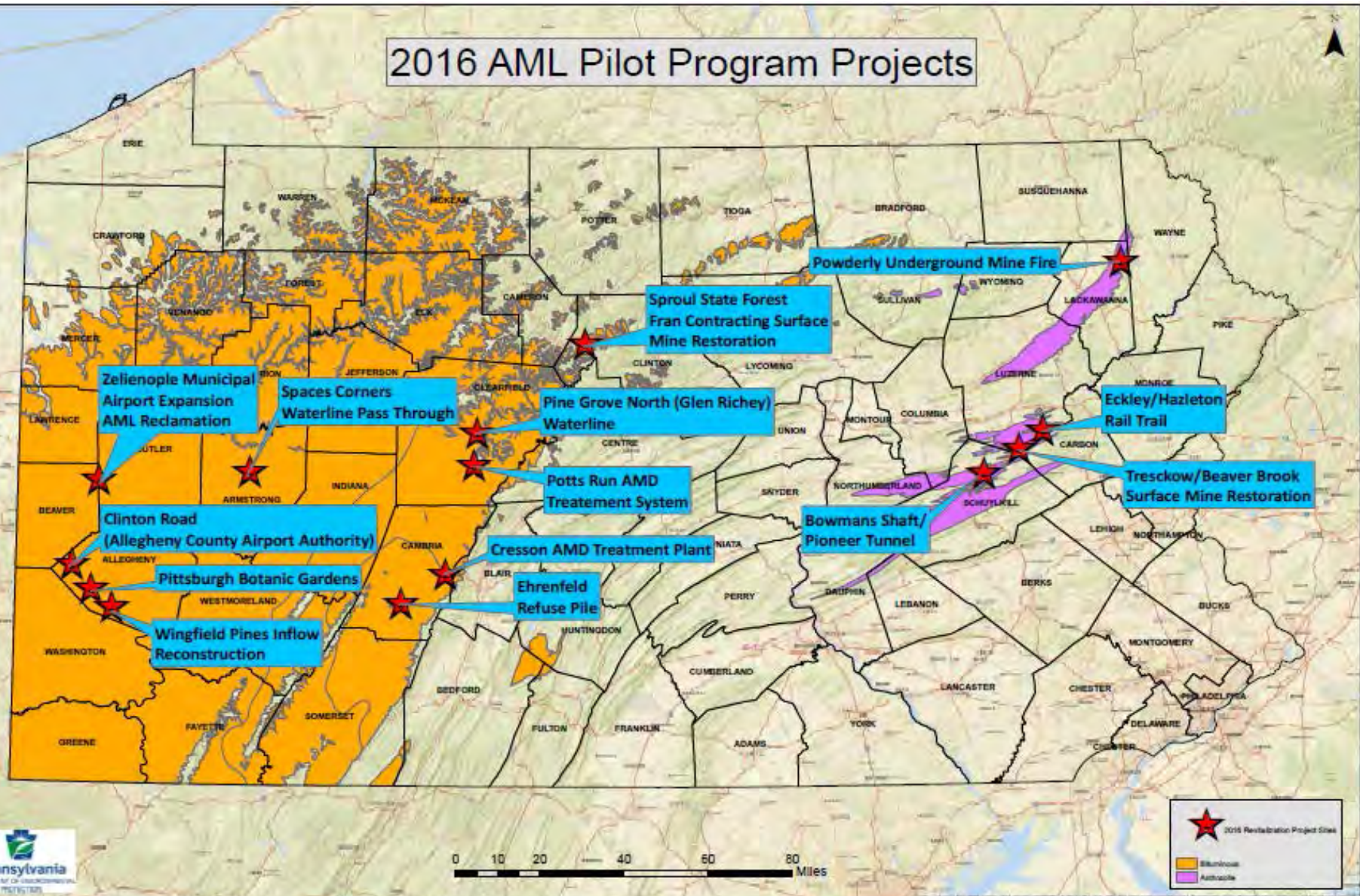
These 14 Proposed AML Pilot Projects have the potential to leverage up to an additional \$4 for every \$1 of AML Pilot Program funding from other AML/AMD funds and/or economic development funds (Both public and private)

Suspension of Some Projects

Due to issues with project partners, property owners, or other factors, four of the original 14 selected projects had to be suspended. Four additional projects were proposed to OSMRE and approved for AML Pilot Program funding. Details for all of the original projects (including those suspended) and the additional projects are included in this presentation.

Final 2016 AML Pilot Projects Location Map

2016 AML Pilot Program Projects



List of 2016 AML Pilot Projects (Active and Suspended)

Project Name	Project Type	Municipality	County
Noblestown Road (Pittsburgh Botanic Gardens) - Phase II	Re-mining, Surface Mine Restoration, and Acid Mine Drainage Remediation	North Fayette Township	Allegheny
Clinton Road (Allegheny County Airport Authority [ACAA] World Trade Center Business Park)	Surface Mine Restoration	Findlay Township	Allegheny
Spaces Corners South/Rayburn Township Joint Municipal Authority Waterline	Waterline Extension Project	Rayburn Township	Armstrong
Point Stadium Discharge - Mine Drainage Treatment and Mine Pool Geothermal Project	Mine Drainage Treatment	Westmont Borough and City of Johnstown	Cambria
Ehrenfeld Refuse Pile	Refuse Pile Reclamation	Croyle Township and Ehrenfeld Borough	Cambria

Project Suspended

Original List of Projects for \$30 Million AML Economic Revitalization Pilot in PA

Project Name	Project Type	Municipality	County
Tresckow/Beaver Brook Surface Mine Restoration Project	Surface Mine Restoration	Banks and Kline Townships	Carbon and Schuylkill
Pine Grove North (Glen Richey) – Waterline Extension	Waterline Extension Project	Lawrence Township	Clearfield
Fran Contracting Surface Mine Restoration Project (Rock and Camp Run Restoration - Sproul State Forest)	Surface Mine Reclamation with Alkaline Addition / Source Remediation	East Keating & Noyes Townships	Clinton
Powderly Mine Fire Area Economic Development/Powderly Creek Northeast Underground Mine Fire	Underground Mine Fire Extinguishment	Carbondale Township and City of Carbondale	Lackawanna
Eckley/Hazleton Rail Trail/Hazel Creek Cleanup	Surface Mine Restoration	Foster Township	Luzerne

Original List of Projects for \$30 Million AML Economic Revitalization Pilot in PA

Project Name	Project Type	Municipality	County
Green Mountain Discharge/Audenried Discharge	Mine Drainage Treatment	East Union and Hazle Townships	Schuylkill & Luzerne
Tamaqua City Revitalization and Improvement Zone	Surface Mine Restoration	Tamaqua Borough	Schuylkill
Bowman's Shaft - Pioneer Tunnel	Mine Headframe & Hoist Preservation Project	Ashland Borough	Schuylkill
Black Dog Hollow/Fredericktown Coal Refuse Pile	Coal Refuse Pile Reclamation	East Bethlehem Township	Washington

Project Suspended

Project Suspended

Project Suspended

Added Projects for \$30 Million AML Economic Revitalization Pilot in PA

Project Name	Project Type	Municipality	County
Wingfield Pines	Mine Drainage Treatment	Upper St. Clair and South Fayette Townships	Allegheny
Zelienople	Surface Mine Restoration	Franklin Township	Beaver
Cresson	Mine Drainage Treatment	Sankertown Borough, Cresson and Gallitzin Townships	Cambria
Potts Run	Surface Mine Restoration and Passive Mine Drainage Treatment	Knox Township	Clearfield

Pittsburgh Botanic Garden



Pittsburgh Botanic Garden

The AML Pilot funding, in combination with other funding, will be used to help complete Phase 1 of the remaining/reclamation work and/or facilitate the phase 2 abandoned mine reclamation work at the Pittsburgh Botanic Garden. Phase 1 involves daylighting old underground mine workings and reclaiming pre-act surface mine cuts on approximately 100 acres of the site while phase 2 will address a dangerous highwall, mine subsidence and AMD on 50 additional acres of the property.

Pittsburgh Botanic Garden Master Plan



PBG Educational Event



Significant Benefits

- The Pittsburgh Botanic Garden will one day be a world-class botanic garden, including:
 - 18 distinct gardens
 - five diverse woodland experiences
 - a visitor's center
 - an amphitheater for outdoor concerts and performances
 - a celebration center to accommodate large outdoor or indoor weddings & corporate events
 - a center for botanic research

Significant Benefits

- The Garden is expected to attract millions of visitors and eventually become an economic engine for the region
- Research suggests it will add 1,200 new jobs and as much as \$88,000,000 in revenue within 10 years of operation
- Serve as a national Gold Standard in reclamation
- Restored Public Lands

Project Partners

- Pittsburgh Botanic Garden
- Allegheny County
- North Fayette Township
- American Chestnut Foundation
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Pittsburgh Botanic Garden Construction



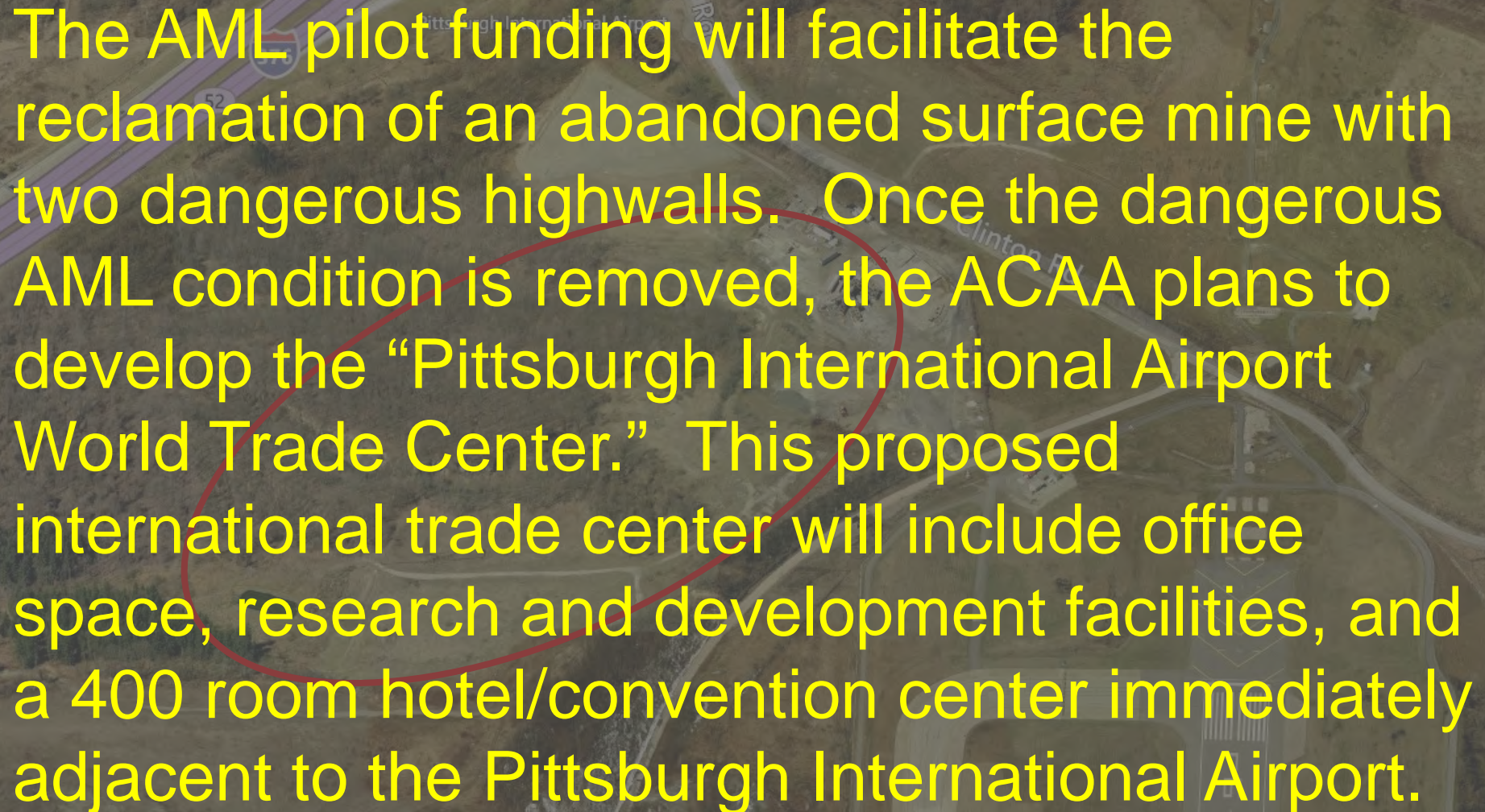
Pittsburgh Botanic Garden Construction



Allegheny County Airport Authority World Trade Center Business Park



Allegheny County Airport Authority World Trade Center Business Park

An aerial photograph of the Pittsburgh International Airport area. A red circle highlights a specific site, likely the abandoned surface mine mentioned in the text. The background shows airport runways, taxiways, and surrounding infrastructure. Labels like 'Pittsburgh International Airport' and 'Clinton Rd' are visible on the map.

The AML pilot funding will facilitate the reclamation of an abandoned surface mine with two dangerous highwalls. Once the dangerous AML condition is removed, the ACAA plans to develop the “Pittsburgh International Airport World Trade Center.” This proposed international trade center will include office space, research and development facilities, and a 400 room hotel/convention center immediately adjacent to the Pittsburgh International Airport.

Pittsburgh International Airport World Trade Center (Existing and Proposed)



Pittsburgh International Airport World Trade Center Rendering

World Trade Center



Significant Benefits

- The project is projected to generate \$250 million in private investment and will lead to the creation of 7,000 direct and indirect permanent positions
- The development of the site will also employ over 1,200 construction workers
- The redevelopment of the site will provide for:
 - over one million square feet of Class A office space
 - 90,000 square feet for research and development
 - a 400 room hotel with convention space
 - up to six corporate airplane hangers which will allow corporate tenants to locate their headquarters in office space at the site

Significant Benefits

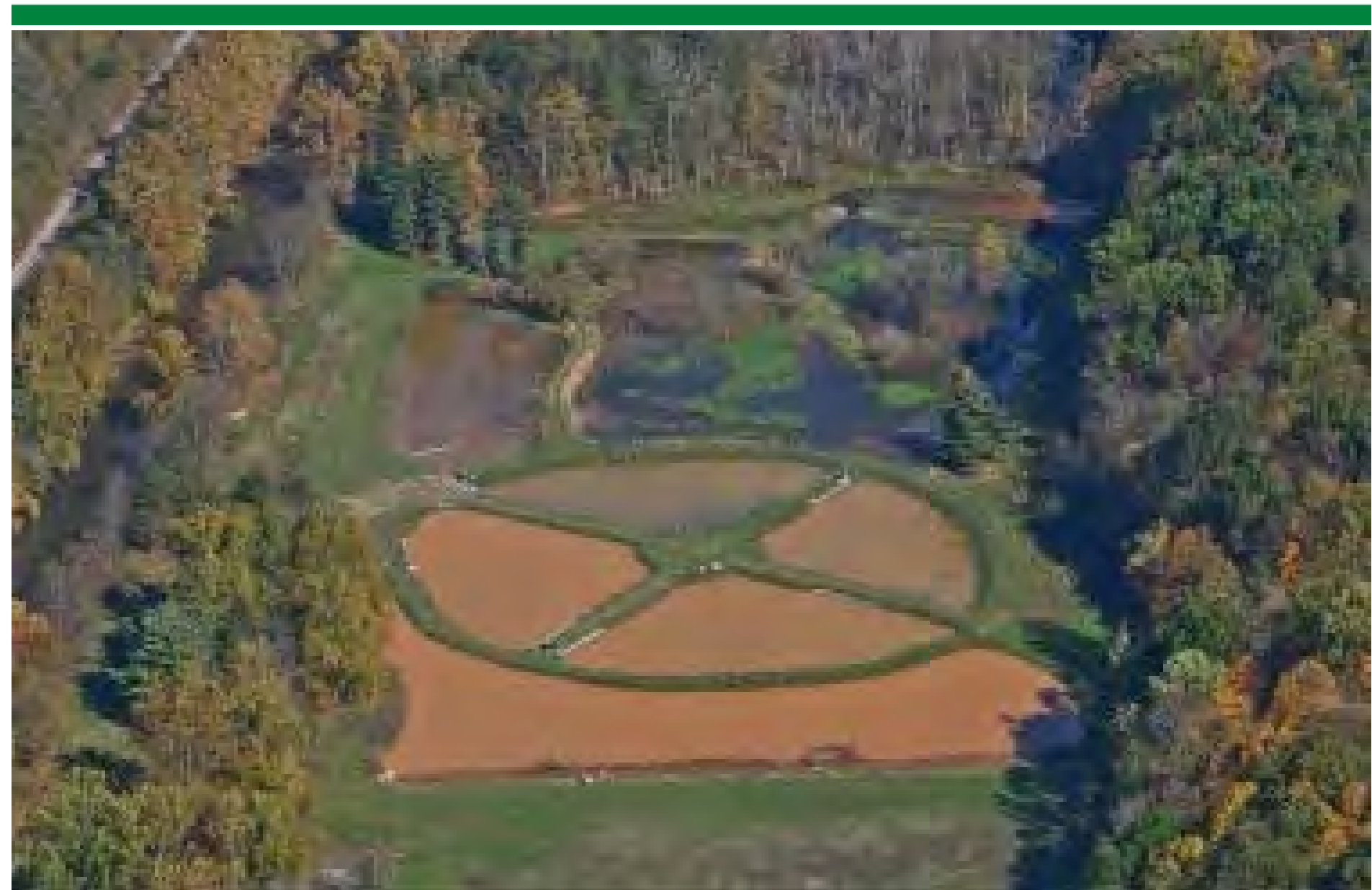
- Over 54 acres of abandoned mine land with dangerous highwalls and spoil areas will be reclaimed and repurposed as part of the proposed 195 acre business park development site
- The Montour recreational bike and walking trail will be relocated and expanded to connect the proposed business park with the existing airport facilities

Project Partners

- Allegheny County Airport Authority
- Pennsylvania Department of Community and Economic Development
- Pennsylvania Department of Transportation
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement



Wingfield Pines Passive Treatment System



▶ Wingfield Pines Passive Treatment System

The AML Pilot funding, will be used to reconstruct the mine water collection system and to restore the inflow to the Wingfield Pines passive treatment system. The current intake structure is a concrete man-hole, used to collect and direct the mine pool water to the treatment system inlet. The intake structure has become inoperable due to mine subsidence which occurred in Dec. 2017 and has ruptured the base, and exposed a portion of the deep mine. This subsidence allowed the mine water to circumvent the intake structure and surface flow into the final pond without treatment.

Wingfield Pines Passive Treatment System

Allegheny Land Trust purchased the 87-acre conservation area in December 2001.

Working in conjunction with local environmental groups, PA DEP BAMR and OSMRE, a passive mine drainage treatment system was implemented in 2009 to address abandoned underground mine AMD problems on the site.



The system operates by gravity and treats iron-laden mine discharge that is flowing at 1,500 – 2,000 gallons per minute across the property before entering Chartiers Creek.

The system accommodates trails, a wetland boardwalk, overlooks, and interpretative signage providing educational opportunities.

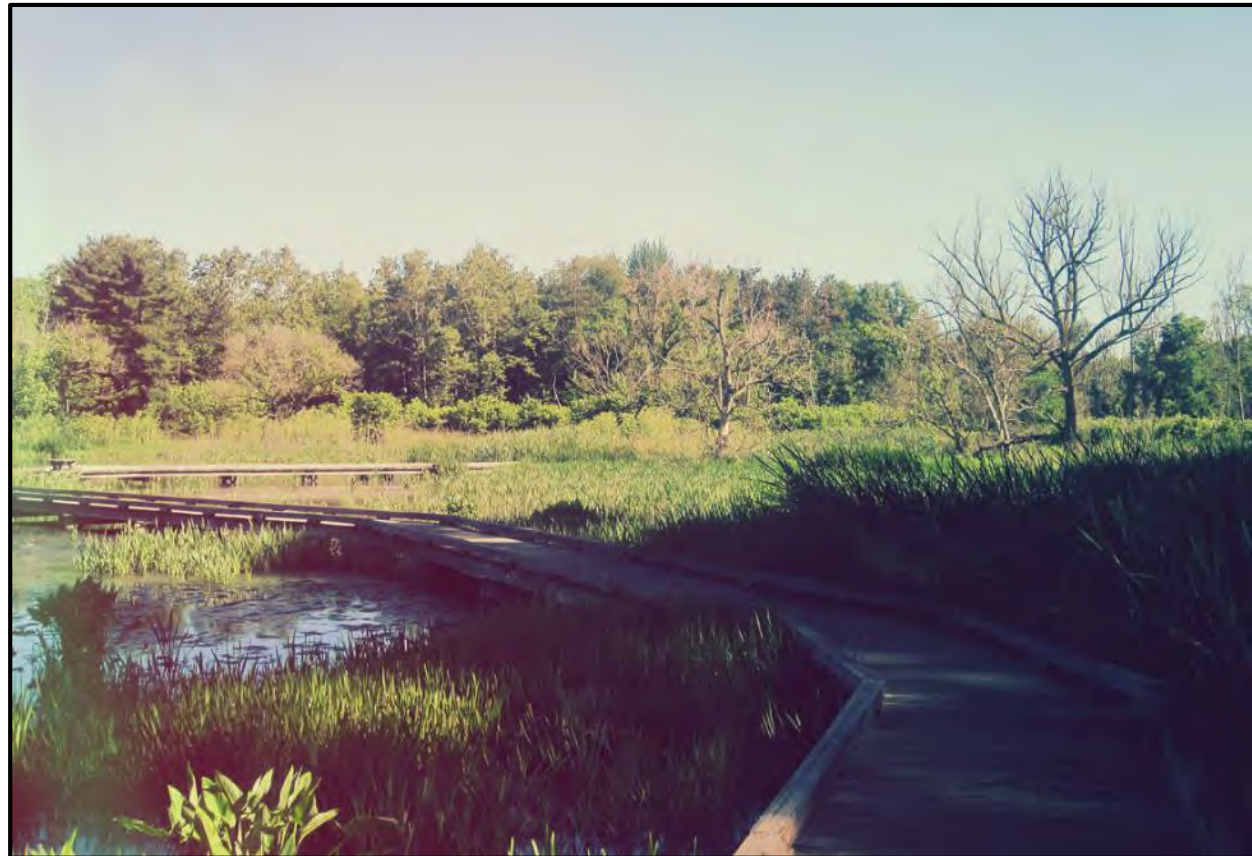
Wingfield Pines Passive Treatment System

The abandoned underground deep mines at the site generate an alkaline discharge with total iron concentrations up to 18.9 mg/L, producing an iron loading of 340 lbs. of iron per day.

The Wingfield Pines passive treatment system has been successful in removing iron from the AMD. Treated effluent is discharged to Chartiers Creek containing less than 2 mg/l total iron.

Allegheny Land Trust (ALT) has been working on development of this site and other water quality improvements to the Chartiers Creek watershed.

This system was completed in 2009 and has successfully removed 43 tons of iron oxides from flowing into Chartiers Creek.



Wingfield Pines Passive Treatment System

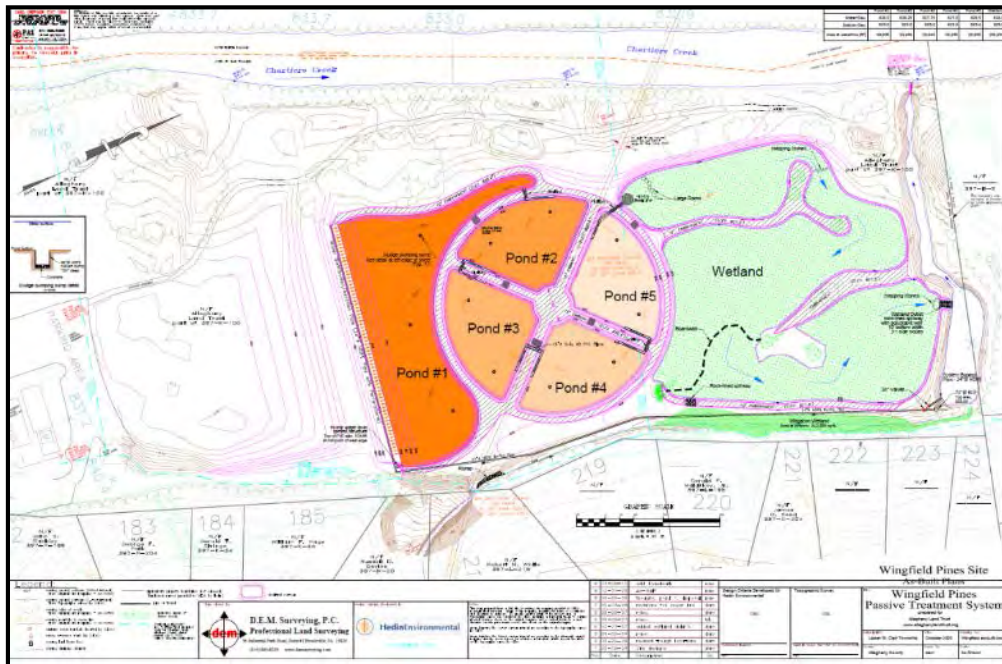
Wingfield Pines is now a community hub for recreation and education. The AMD treatment wetlands offer an outdoor laboratory for students from local high schools, universities, and educational programs.

The area is open dawn to dusk for passive recreation and is a favorite destination for many local hikers, bikers, and boaters.



In December of 2017 a mine subsidence event occurred near the treatment system inflow structure.

This subsidence allowed the water to circumvent the intake structure and surface flow into the final pond without treatment.



Wingfield Pines Passive Treatment System



View looking at the concrete man-way, used as the old mine water collection system. The bottom and the area next to the man-way has been subsided and caused damage to the collection properties of the system.

Significant Benefits

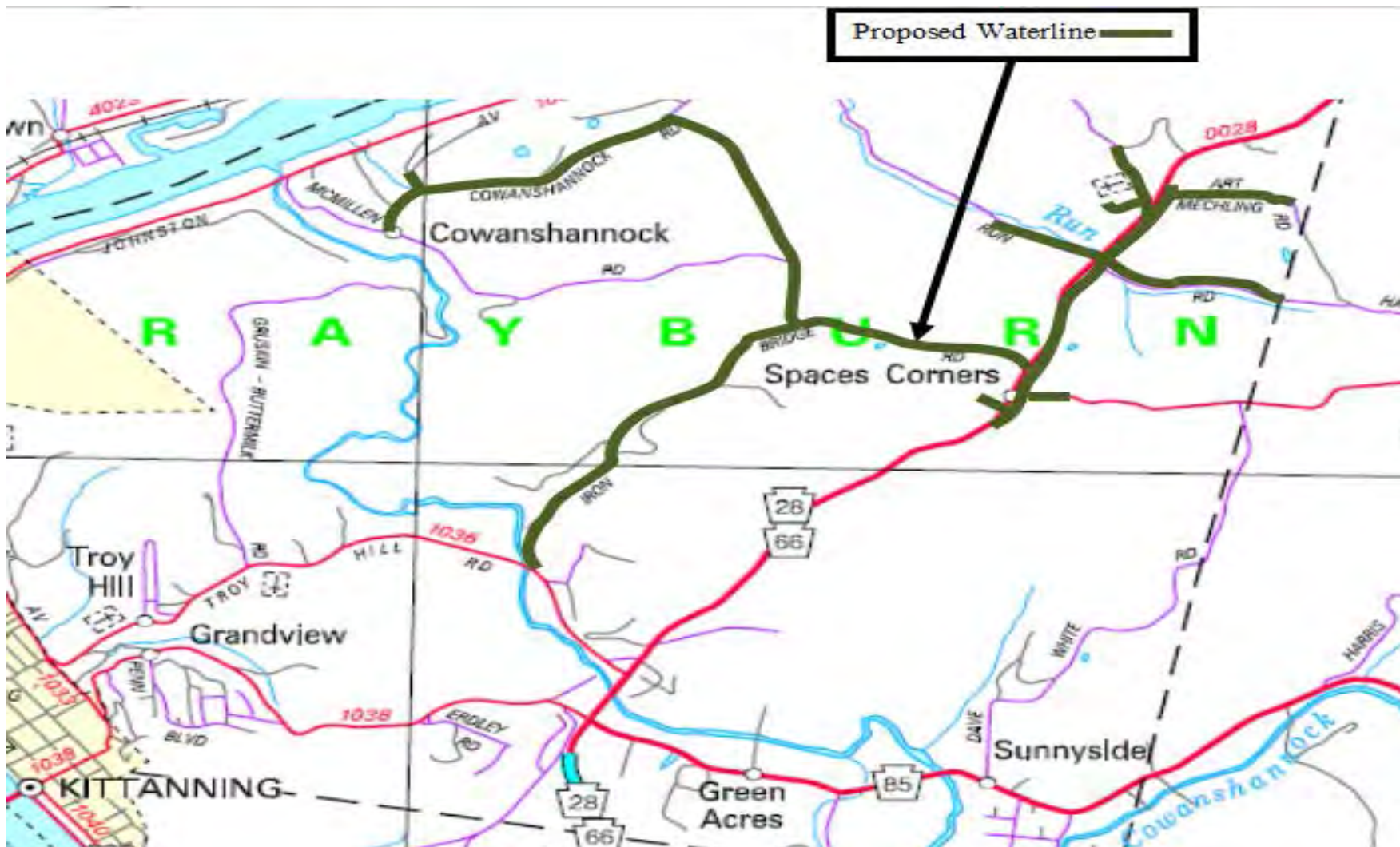
The Wingfield Pines Inflow Reconstruction Project will have significant benefits, including:

- Reestablishment of a extremely effective passive mine drainage treatment facility and its beneficial impacts upon Chartiers Creek .
- The area includes a one-mile loop of flat trail, featuring wetland boardwalks open to the use of hikers and their dogs to enjoy. It has proven to be a favorite destination for many local hikers, bikers, and boaters.
- As Wingfield Pines is maintained and improved upon it will continue to attract a large number of local schools and recreational users.
- As a protected green space made available to the public through the cooperation of many different private and public entities. It will provide long term benefits to the community as a way to enjoy nature while also educating on the science of ecology, biology, and specifically the treatment of abandoned mine drainage.

Project Partners

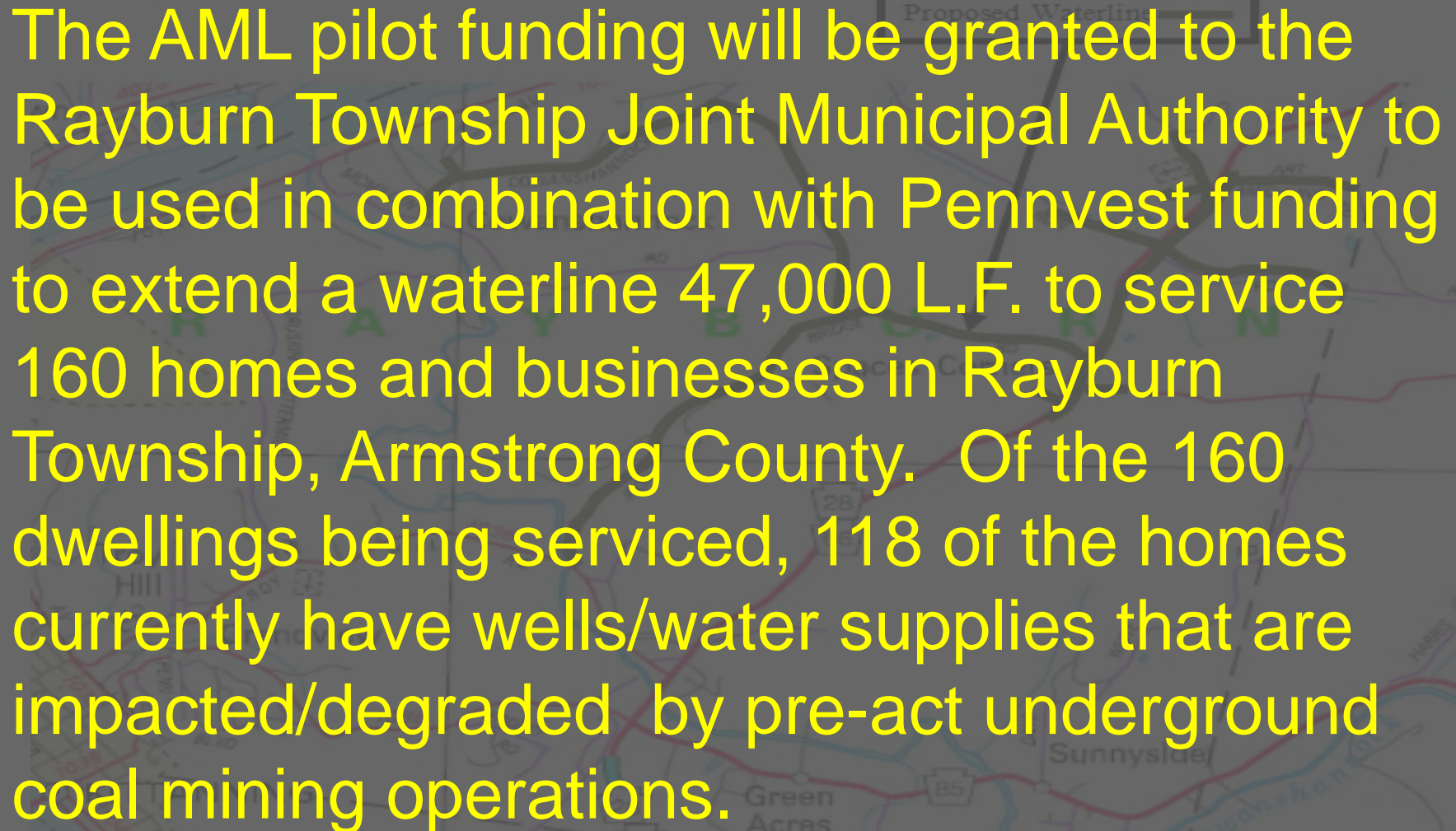
- Allegheny Land Trust - Landowner
- PA DEP BAMR – Technical engineering and project planning as well as project funding source through the AML Pilot Program
- OSMRE – Technical engineering and project planning as well as project funding source through the AML Pilot Program
- Title 4 – Appalachian Clean Streams Initiative – Funding source of initial construction of the Wingfield Pines Passive Treatment System
- PA Growing Greener Grant – Funding source and project management of initial construction of the Wingfield Pines Passive Treatment System
- Tetra Tech & Hedin Environmental – Engineering Consultants

Spaces Corners South/Rayburn Township Waterline Extension Project



Spaces Corners South/Rayburn Township Waterline Extension Project

The AML pilot funding will be granted to the Rayburn Township Joint Municipal Authority to be used in combination with Pennvest funding to extend a waterline 47,000 L.F. to service 160 homes and businesses in Rayburn Township, Armstrong County. Of the 160 dwellings being serviced, 118 of the homes currently have wells/water supplies that are impacted/degraded by pre-act underground coal mining operations.

A map of Rayburn Township, Armstrong County, showing a proposed waterline extension. The map includes labels for 'Proposed Waterline', 'Green Acres', 'Sunnyside', and 'Hill'. The waterline is shown as a red line extending across the township. The map also shows various roads and geographical features.

Significant Benefits

- The project will provide potable water to 160 total residences/businesses
- Increased potential for industrial development due to a potable water supply in this rural area
- Potential for construction of new single family dwellings and small business development
- Without project funding for the waterline extension project, there remains a high potential that residents may relocate which would impact the local tax base and property values of the occupied dwellings with impacted water supplies

Project Partners

- Rayburn Township Joint Municipal Authority
- Pennsylvania Infrastructure Investment Authority (PENNVEST)
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Spaces Corners South/Rayburn Township Waterline Extension Project Construction



Spaces Corners South/Rayburn Township Waterline Extension Project Construction



Spaces Corners South/Rayburn Township Waterline Extension Project Construction



Spaces Corners South/Rayburn Township Waterline Extension Project Construction



Spaces Corners South/Rayburn Township Waterline Extension Project Construction



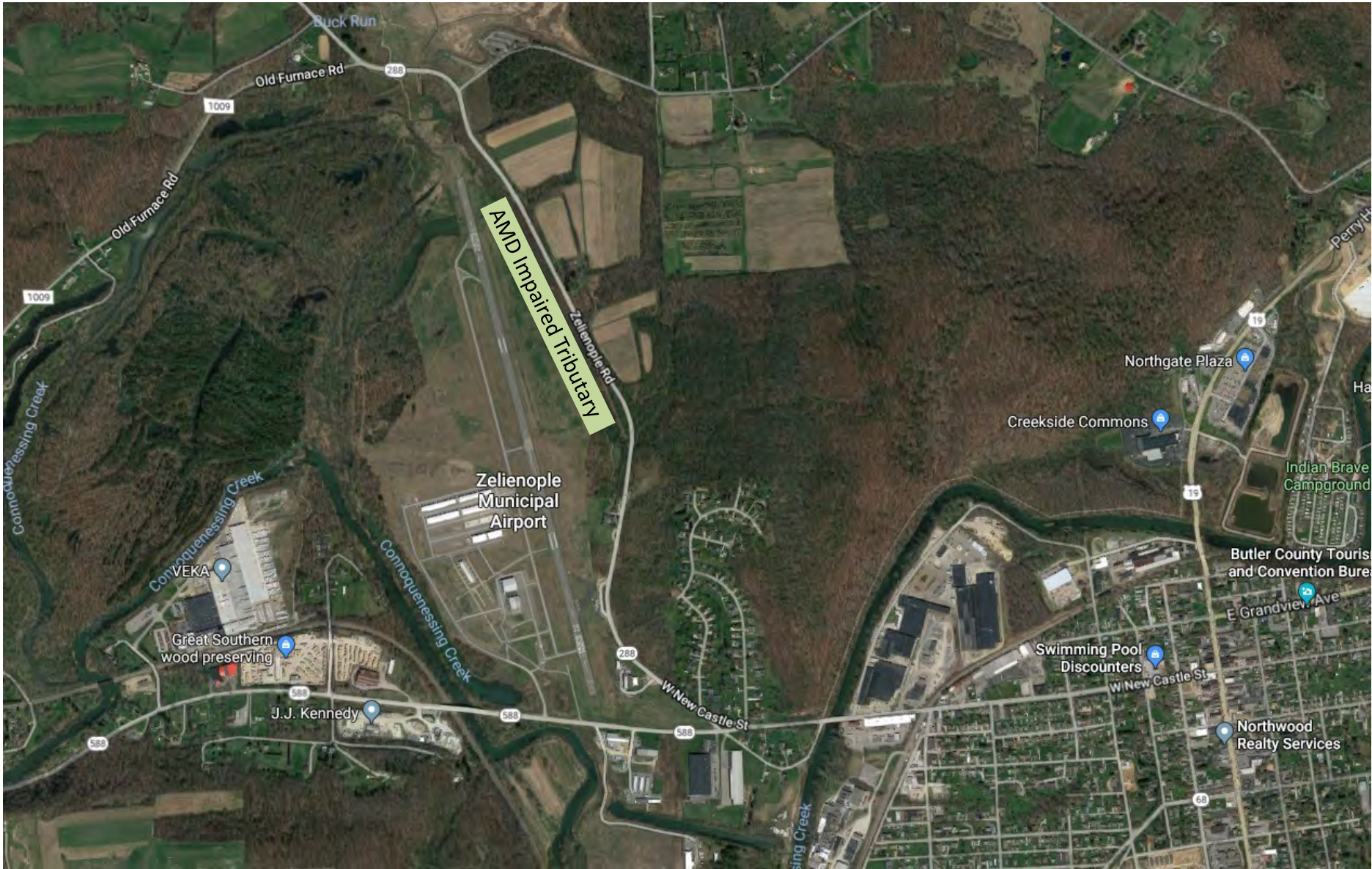
Spaces Corners South/Rayburn Township Waterline Extension Project Construction



Spaces Corners South/Rayburn Township Waterline Extension Project Construction

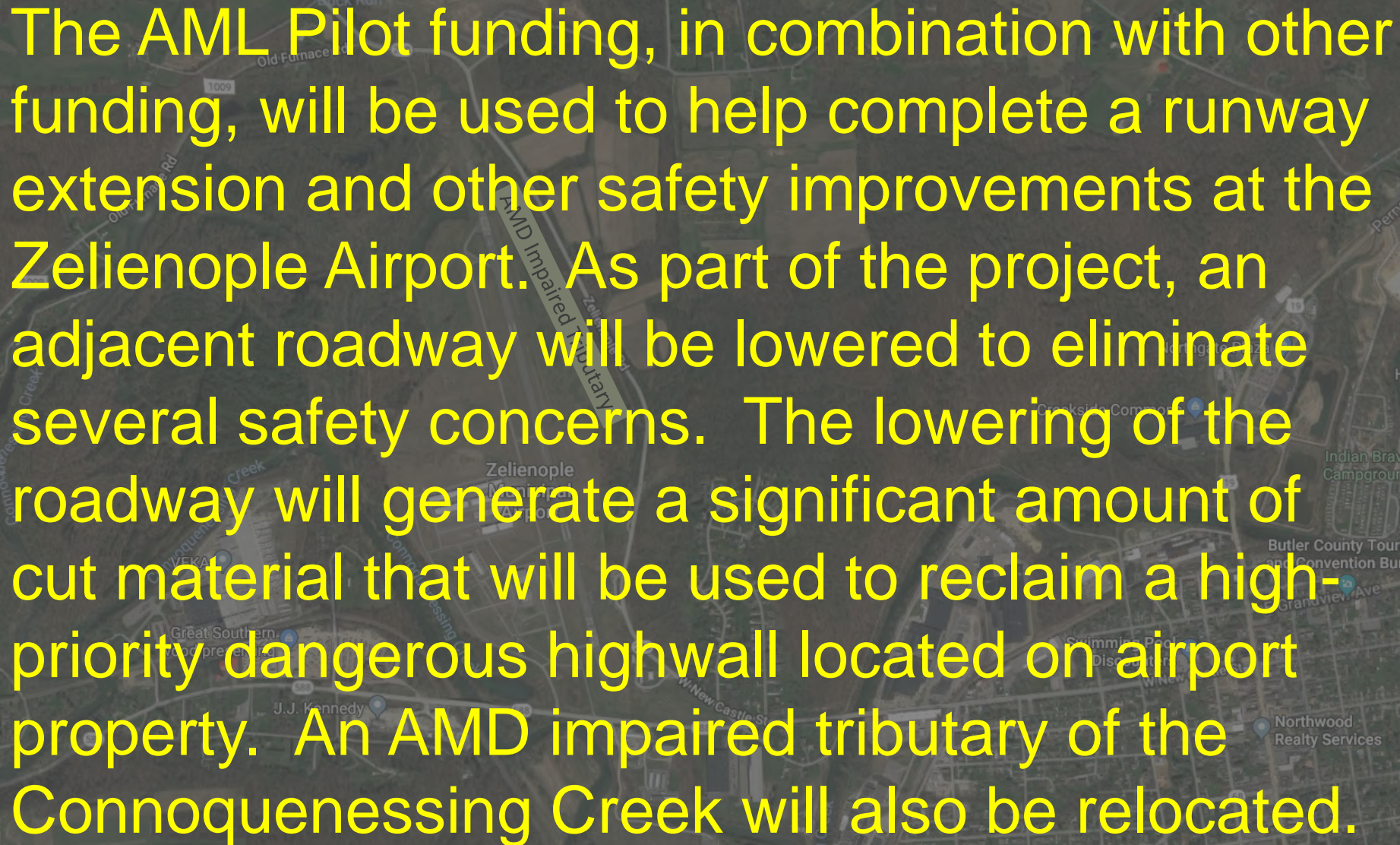


Zelienople Municipal Airport Expansion



Zelienople Municipal Airport Expansion

The AML Pilot funding, in combination with other funding, will be used to help complete a runway extension and other safety improvements at the Zelienople Airport. As part of the project, an adjacent roadway will be lowered to eliminate several safety concerns. The lowering of the roadway will generate a significant amount of cut material that will be used to reclaim a high-priority dangerous highwall located on airport property. An AMD impaired tributary of the Connoquenessing Creek will also be relocated.



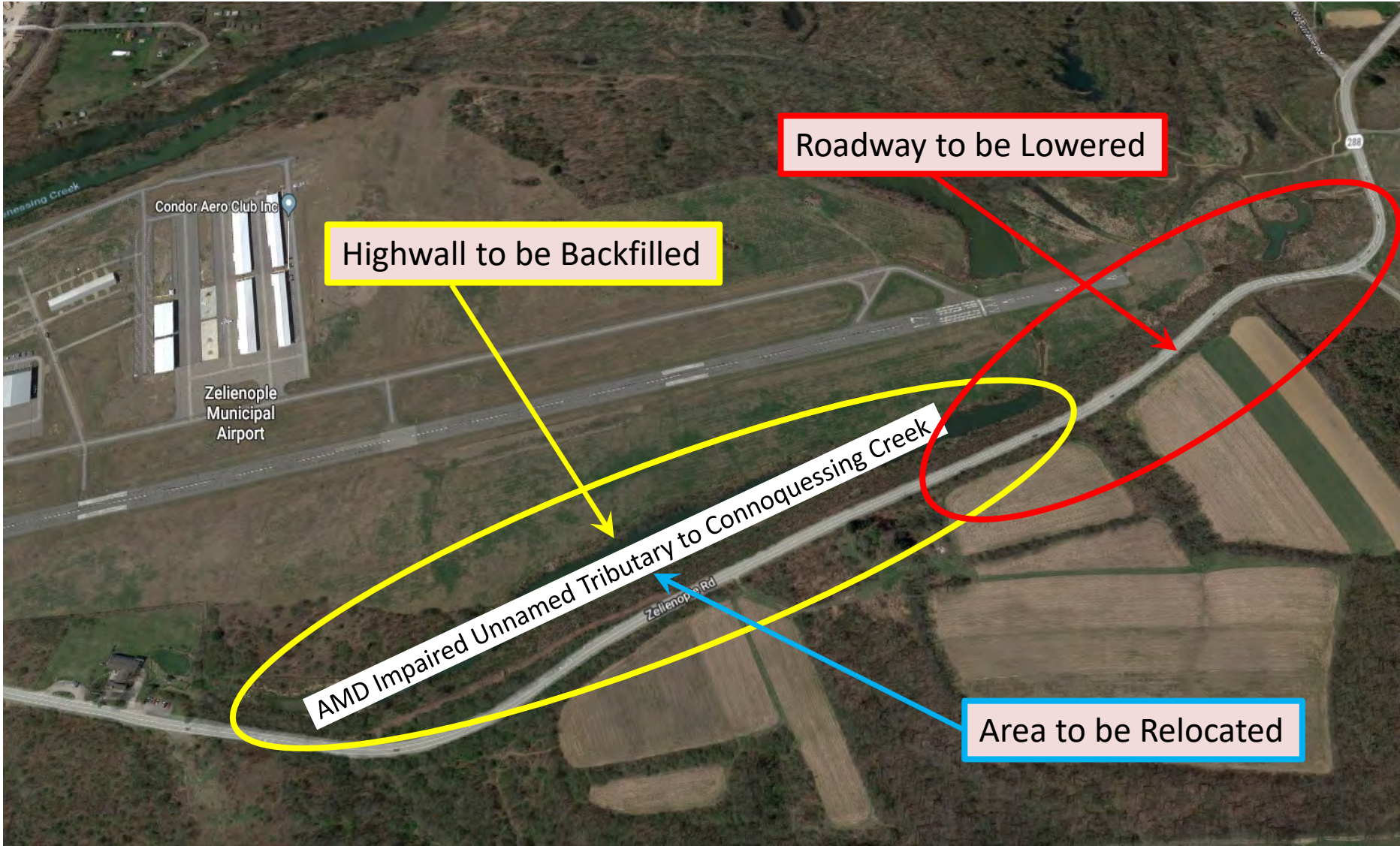
Zelenople Municipal Airport Expansion



Zelienople Municipal Airport Expansion

The project will involve the reclamation of a 44 acre abandoned surface mine with 3,470 linear feet of dangerous highwall, having an average height of 70 feet, by backfilling and grading with on-site spoil material and supplemental waste material from the adjacent aviation safety project. The project will also include relocating a portion of an AMD impaired unnamed tributary of the Connoquenessing Creek with 2,730 feet of conveyance channel. The project will facilitate an extension of the airport runway, regain 24 hour airport operations and improve water quality.

Zelienople Municipal Airport Expansion



Significant Benefits

- Elimination of 3,470 feet of dangerous highwall
- 24-hour airport operations will be restored by eliminating a 12-acre, 60-foot hillside obstruction currently restricting night operations
- SR 288 will be lowered and realigned to increase safety
- Creation of more than 25 jobs at the Airport
- Increased use of Airport resulting in economic growth for the Cranberry Area

Project Partners

- Landowner, Zelenople Airport Authority
- PA Fish & Boat Commission
- PennDOT Bureau of Aviation
- PennDOT Engineering District 11-0
- USACE – Pittsburgh District
- PADEP – Southwest Regional Office
- Beaver County Conservation District
- Widmer Engineering Pennsylvania
- Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Project Construction – May 2018



Project Construction – May 2018



Point Stadium Discharge Stonycreek/ Conemaugh River Watershed



Point Stadium Discharge Stonycreek/ Conemaugh River Watershed

The AML pilot funding will be used to help fund one of two options to treat or eliminate the Point Stadium Discharge which enters the Stonycreek just upstream of its confluence with the Little Conemaugh River near the Point Stadium in downtown Johnstown. One option would provide only for treatment of the discharge while the second option would use the treated water and/or the mine pool as an industrial water supply or as a geothermal energy source.

Point Stadium Discharge - Two Options

- Option 1:
 - Pump and treat (construct an AMD treatment plant) mine pool from a shaft or borehole on opposite side of river
 - Lower pool elevation to a level where the AMD would no longer discharge at its current outfall
 - Potential to convert a mine pool into a resource, as the treated water could be used as an industrial water supply, and/or for geothermal heating in the downtown Johnstown area
- Option 2:
 - Pipe discharge to existing Dornick Point wastewater treatment system collection system
 - Treat the combined AMD & wastewater at the existing wastewater treatment facility

Point Stadium Discharge Stony Creek/Conemaugh River Watershed



Significant Benefits

- Potential to demonstrate geothermal energy potential from underground mine pools
- Potential to provide geothermal energy for various public facilities in Johnstown
- Cost savings from entities utilizing the geothermal energy will be used to support a trust fund to pay for the continued operation and maintenance of the AMD treatment facility
- Two miles of stream improvement
- Treated AMD could potentially be used as an industrial water source

Project Partners

- Commonwealth Foundation for the Alleghenies
- Foundation for PA Watersheds
- Stonycreek-Conemaugh River Improvement Project (SCRIP)
- Cambria County Conservation District
- Pennsylvania Environmental Council
- Penelec Sustainable Energy Fund
- Lift Johnstown

Project Partners

- Conemaugh Health Systems
- eCap Network
- City of Johnstown
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Suspension of the Project

The project had to be suspended when the hospital was sold and withdrew from the project eliminating the geothermal option and when all options to either relocate or to collect and treat the discharge fell through.

Efforts are continuing with the Foundation for PA Watersheds, a local university, and other project partners to identify a viable option for this discharge.

Ehrenfeld Coal Refuse Pile Reclamation Project



Ehrenfeld Coal Refuse Pile Reclamation Project

The AML pilot funding, along with other funding sources, will be used to complete reclamation of the abandoned Ehrenfeld Coal Refuse Pile. The 3.2 million tons of coal refuse material will be excavated, hauled away, blended with alkaline material, and disposed of in accordance with an approved handling and placement plan authorized within the mining permit for an adjacent surface mining site operated by the Rosebud Mining Company

Ehrenfeld Coal Refuse Pile Reclamation Project Newspaper Headline

The Tribune-Democrat®

HOCKEYVILLE, USA

Serving Greater Johnstown since 1853

MARCH 8, 2016

TUESDAY

\$1.00 NEWSSTAND

Cleanup to create 40 jobs

\$13.4M project will return miners to work in Ehrenfeld



DAVID HURST/THE TRIBUNE-DEMOCRAT

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.

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 "booney" 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.

Akide 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**

Significant Benefits

- Elimination of 3.2 million ton abandoned coal refuse pile with the following significant environmental or health and safety issues:
 - Severe on-site erosion and off-site sedimentation issues in the Little Conemaugh River Watershed
 - Source of acid mine drainage laden runoff
 - Slope stability/past landslide issues
 - Burning coal refuse material
 - Unauthorized recreational use by ATVs
 - Restoration of 62 acres of barren undevelopable land situated in Ehrenfeld Borough and Croyle Township

Significant Benefits

- Sustained employment of 40 miners who would have been laid off due to slump in the coal market
- Recreational development through construction of a parking area to access the Johnstown Flood Memorial Rails to Trails
- Possible future industrial development
- Water Quality Improvement /Watershed Restoration
- Land Restoration including re-establishment of the American Chestnut

Project Partners

- Forest Hills Regional Alliance
- Rosebud Mining Company
- Pristine Resources Inc.
- Cambria County Conservation District
- Foundation for PA Watersheds
- Community Foundation for the Alleghenies
- Stonycreek-Conemaugh River Improvement Project

Project Partners

- Cambria County Recreation Authority
- South Fork Borough
- Ehrenfeld Borough
- Croyle Township
- American Chestnut Foundation
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Ehrenfeld Construction



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Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project



Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project

The AML pilot funding will be used in combination with other funding sources to construct the Cresson Acid Mine Drainage (AMD) Treatment Plant along Cresson Shaft Road in Cresson Twp., Cambria County. The plant will pump water from 3 separate mine pools to eliminate 3 AMD discharges that currently discharge into Trapp Run, Bradley Run and Sugar Run.

Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project



Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project

The elimination of these discharges will restore ~21 miles of stream. The treatment plant will also have the capability to manage the mine pools to provide supplemental flow to the Susquehanna River Basin during low flow conditions. The plant will discharge into Trapp Run which flows into Clearfield Creek to the West Branch Susquehanna River.

Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project

Treatment of AMD will eliminate 3 discharges from the Cresson No. 9, Gallitzin Shaft, and Argyle Stone Bridge Mine Pools

Argyle-Stone
Bridge Discharge



Gallitzin Shaft
Discharge



Cresson No. 9
Discharge



Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Mine Discharges

- Argyle Stone Bridge
 - Average Flow of 860 GPM
 - Impacts Sugar Run – Tributary of the Juniata River
- Gallitzin Shaft
 - Average Flow of 760 GPM
 - Impacts Bradley Run – Tributary of Clearfield Creek
- Cresson No. 9
 - Average Flow of 500 GPM
 - Impacts Trapp Run – Tributary of Clearfield Creek

Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project

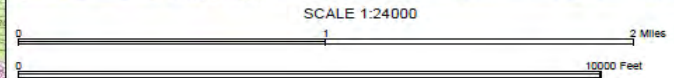
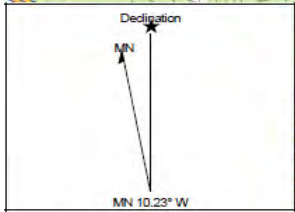
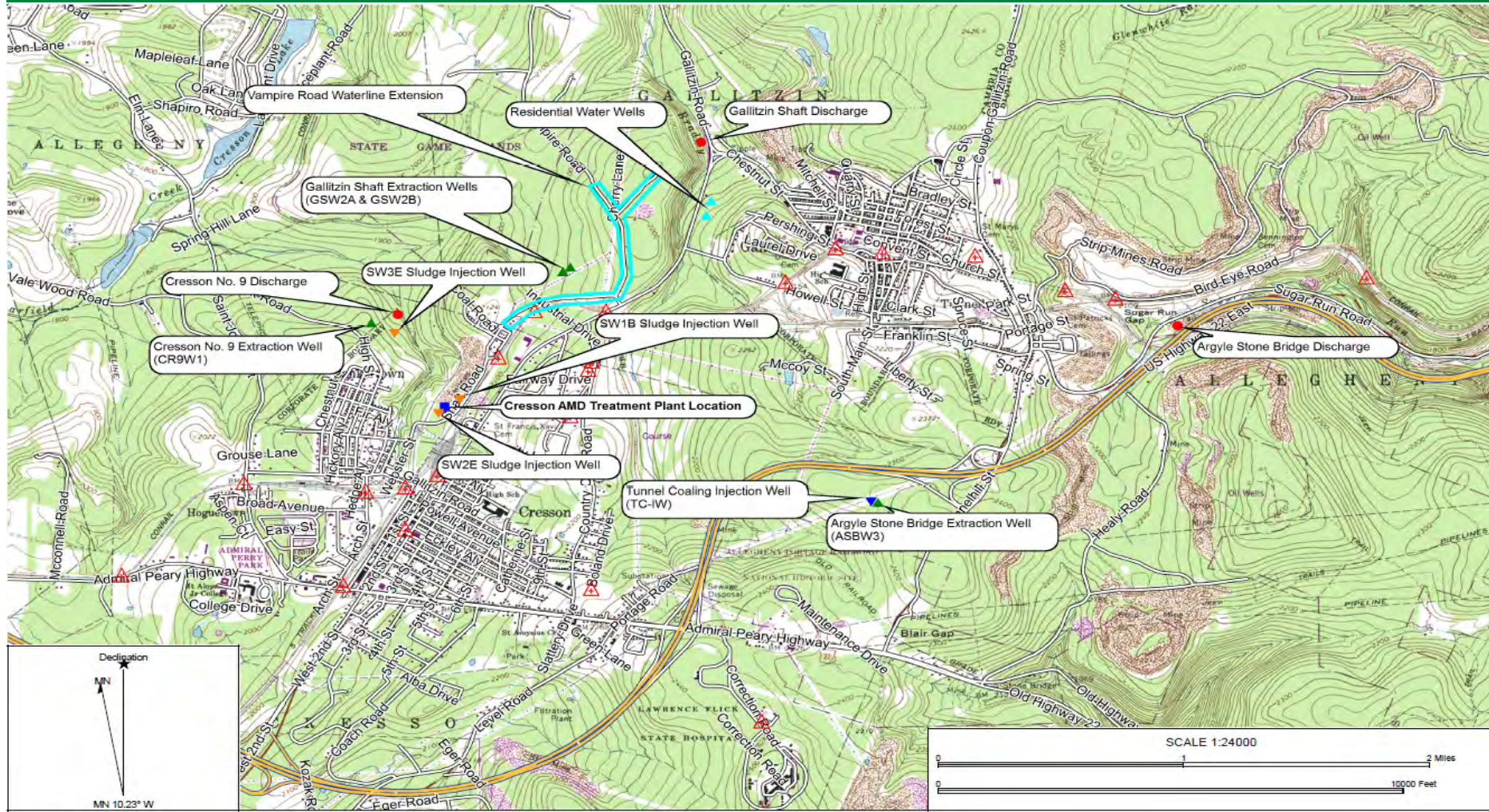
Pollution Loading To Be Removed

Mine Discharge	Acid (lbs/day)	Iron (lbs/day)	Aluminum (lbs/day)	Manganese (lbs/day)
Argyle Stone Bridge	560	48	46	10
Cresson No.9	685	235	32	7
Gallitzin Shaft	185	7	27	6
TOTAL	1,430	290	105	23

Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation - Aerial View



Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation - Map



Name: CRESSON
Date: 02/27/17
Scale: 1 inch = 2,000 ft.

Cresson AMD Treatment Plant Project
AMD 11(2724)102.1 - DGS 193-39
Location of Plant Facilities and Discharges to be Abated

Cresson AMD Treatment Plant Components

- The treatment plant will consist of four (4) AMD extraction wells, a decarbonation unit, a hydrated lime silo, a high-density lime slurry mix tank, a 66-foot diameter solids contact clarifier, and a polishing wetland.
- The plant will be capable of treating 4,400 gpm (~6.3 million gallons per day) but should average treatment of 2,200 gpm.
- Polymer will be added to promote the flocculation and settling of solids.
- Sludge will be disposed of in one (1) of three (3) injections wells.

Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Funding Sources

- Project Funding Sources:
 - Construction (Total Bid Price \$12,671,212)
 - Capital Budget Funding - \$10 Million
 - 2016 AML Pilot Program Funding - \$2 Million
 - AMD Set-Aside Program Funding - \$671,212
 - Operation & Maintenance
 - SRBC Consumptive Use Trust Fund (\$2.4 Million)
 - AMD Set-Aside Program Funding (As Needed)

Significant Benefits

- 21.5 Miles of Expected Stream Restoration
 - 15 Miles of Clearfield Creek from Treatment Plant Effluent to Brubaker Run
 - 6.5 Miles of Sugar Run – Removing the largest source of AMD to Sugar Run
- Mine Pool Management
 - Lower the 3 Mine Pools to Eliminate Discharges
 - Maintain Mine Pool Operating Level
 - Provide 30 days of Emergency Storage
 - Maintain Mine Pool Capacity to supply water for SRBC
- Supply supplemental treated water to the Susquehanna River Basin during conditions of low flow.

Project Partners

- Susquehanna River Basin Commission (SRBC)
- Cambria and Blair County Conservation Districts
- Clearfield Creek Watershed Association
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Cresson Construction



Cresson Construction

Control Building
May 2018

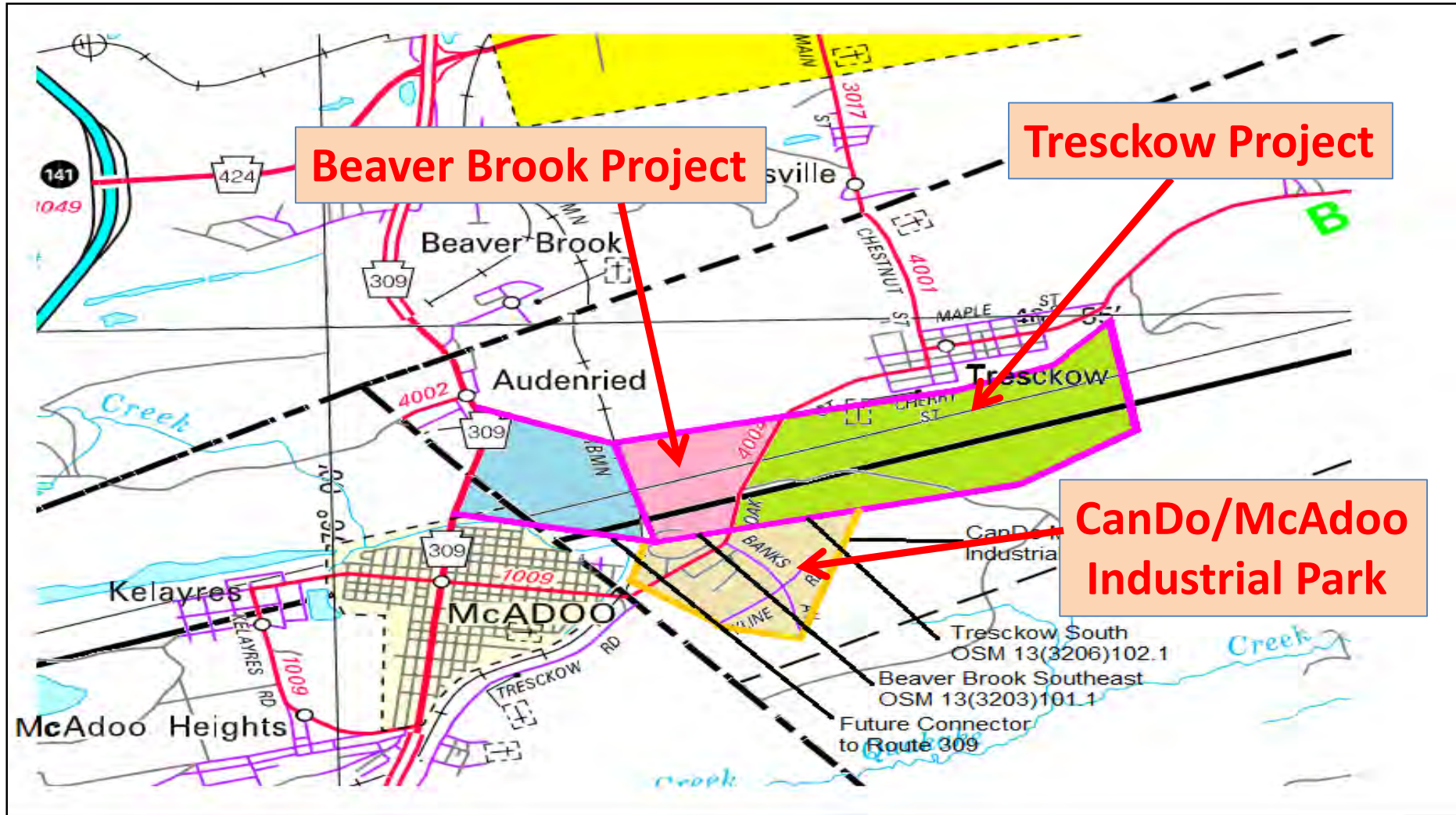


Cresson Construction

Control Building
and Lime Silo
July 31, 2018

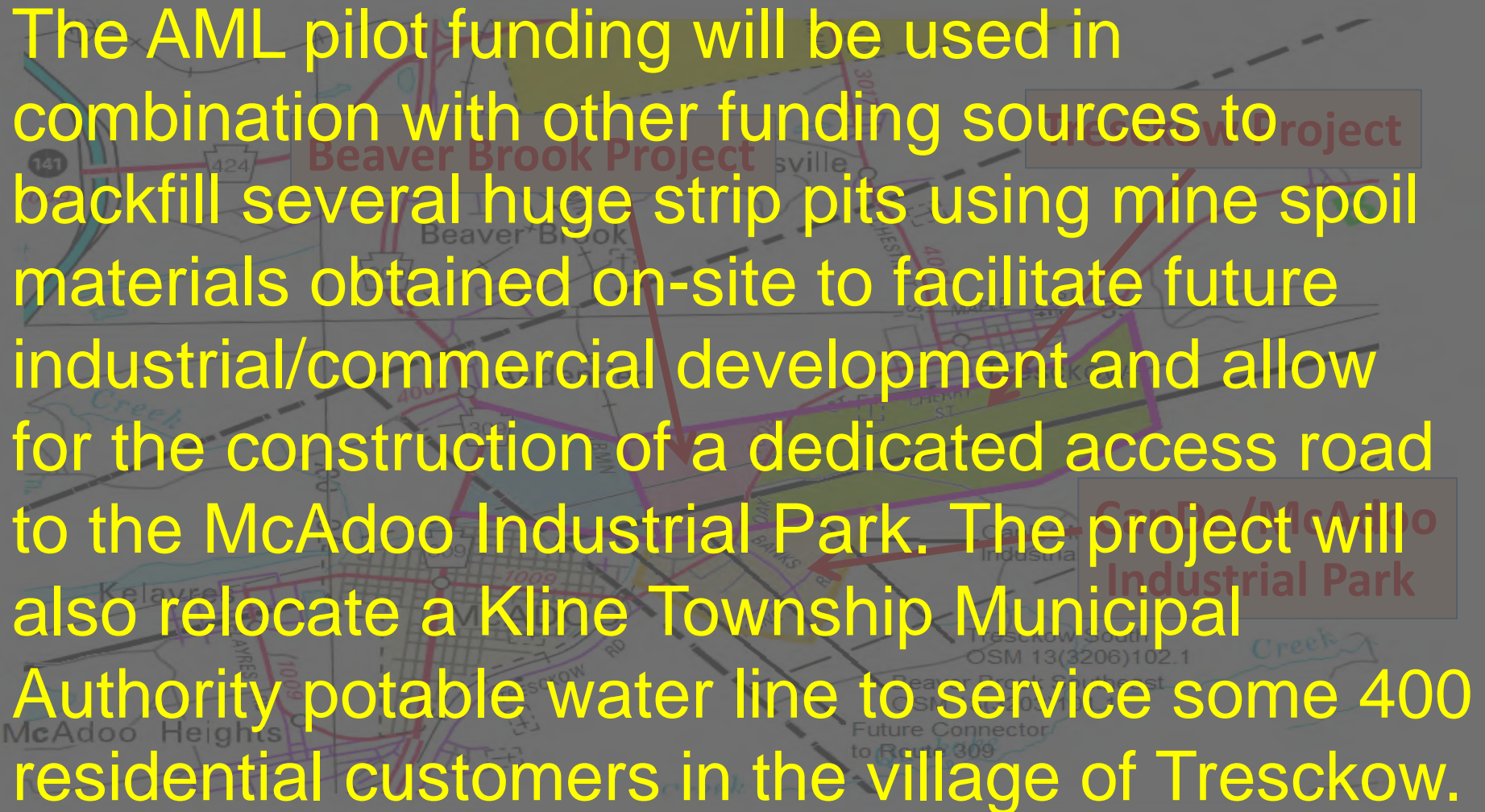


Tresckow/Beaver Brook Surface Mine Restoration Project



Tresckow/Beaver Brook Surface Mine Restoration Project

The AML pilot funding will be used in combination with other funding sources to backfill several huge strip pits using mine spoil materials obtained on-site to facilitate future industrial/commercial development and allow for the construction of a dedicated access road to the McAdoo Industrial Park. The project will also relocate a Kline Township Municipal Authority potable water line to service some 400 residential customers in the village of Tresckow.



Tresckow Pit



Beaver Brook Pit



Significant Benefits (Surface Reclamation)

- Beaver Brook Project will reclaim 96 acres of AML for possible commercial development
- Tresckow South Project will reclaim 202 acres of AML for possible commercial development
- Benefits of potential development of the reclaimed site for commercial/industrial uses:
 - Expansion of the McAdoo Industrial Park
 - Industrial Park has many development sites which are also Keystone Opportunity Zones
 - After all surface mines are reclaimed, PennDot can consider construction of a dedicated highway from Rt. 309 to service the Industrial Park

Significant Benefits (Waterline Relocation)

- Waterline replacement for Tresckow Village
- Economic benefits of providing a public water supply including:
 - Increased capacity to better serve the current industrial and residential customers (At least one factory in the area is looking to expand)
 - Expansion to new customers including future factories in the existing CanDo McAdoo industrial park
 - Potential for residential expansion in the Village of Tresckow

Significant Benefits (Waterline Relocation)

- Economic benefits of providing a public water supply including:
 - Potential new industrial park on either or both reclamation sites with reliable water, electric & sanitary sewerage infrastructure on-site
 - Improved reliability of water in Tresckow for firefighting
 - Improved flow rate and volume can open doors to many small businesses which rely upon significant water (car wash, landscaping business, laundromat, restaurant, grocery store, etc.)

Project Partners

- Landowner
- Community Area New Development Organization (CanDo)
- Pennsylvania Department of Transportation
- Banks Township
- Kline Township Municipal Authority
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Waterline Construction



Waterline Construction



Tresckow South Highwall Reclamation



Tresckow South Highwall Reclamation



Tresckow South Highwall Reclamation

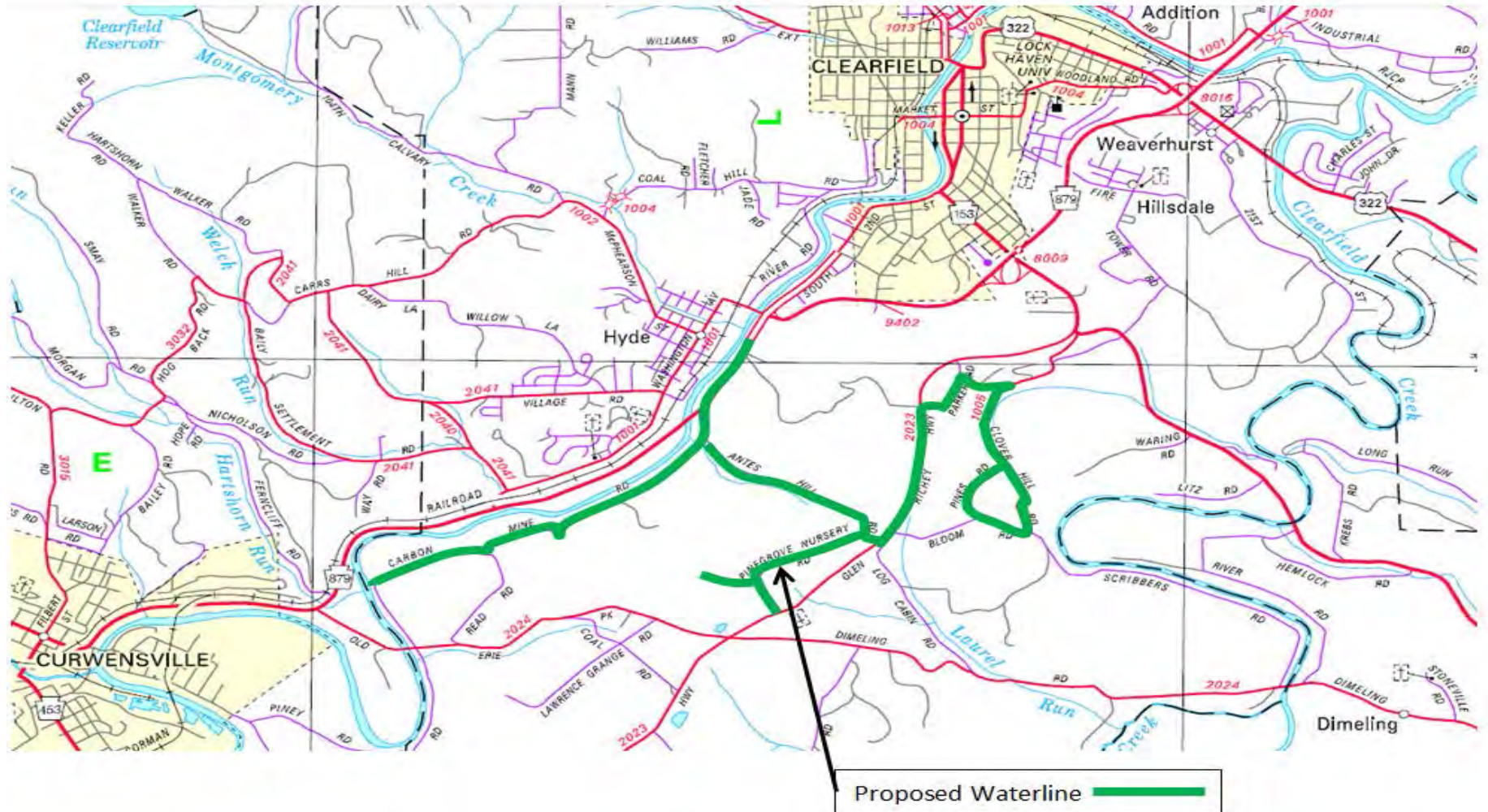


➤ Suspension of the Beaverbrook Project

The Beaverbrook surface mine reclamation project had to be suspended when the landowner leased the property to be re-mined.

The other two phases of the project will continue.

Pine Grove North/Lawrence Township Waterline Extension Project



Pine Grove North/Lawrence Township Waterline Extension Project

The AML pilot funding will be used to construct Phase 1 of 3 of a waterline extension in cooperation with the Clearfield Municipal Authority to service approximately 153 homes and businesses in Lawrence Township, Clearfield County. Phase 1 will service 96 of the 153 homes and businesses which currently have wells/water supplies that are impacted/degraded by pre-act surface and underground coal mining operations.

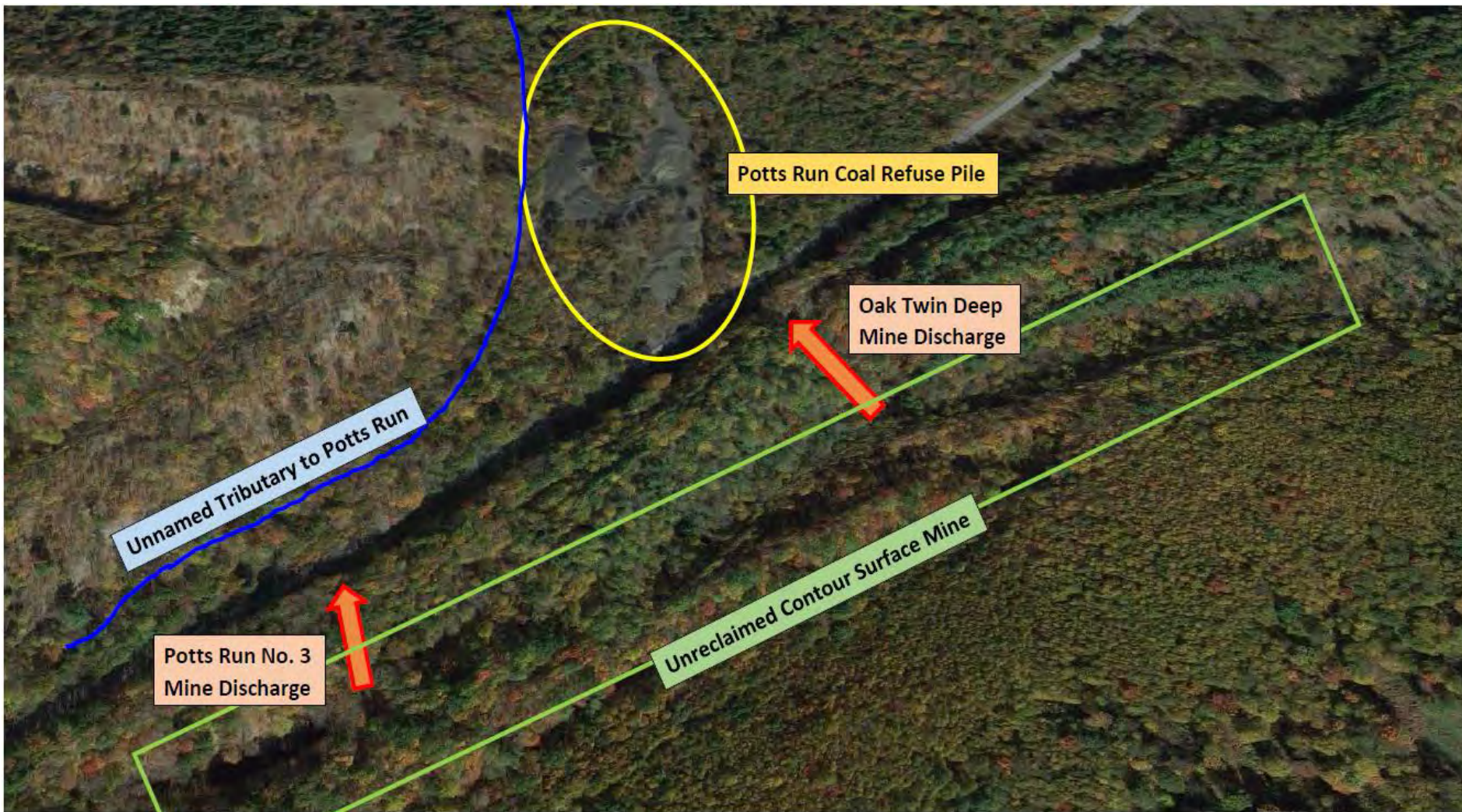
Significant Benefits

- The project (Phase 1 of 3) will provide potable water to 96 total residences/businesses
- Increased potential for industrial development due to a potable water supply in this rural area
- Potential for construction of new single family dwellings and small business development
- Without project funding for the waterline extension project, there remains a high potential that residents may relocate which would impact the local tax base and property values of the occupied dwellings with impacted water supplies

Project Partners

- Clearfield Municipal Authority
- Lawrence Township
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Potts Run Restoration



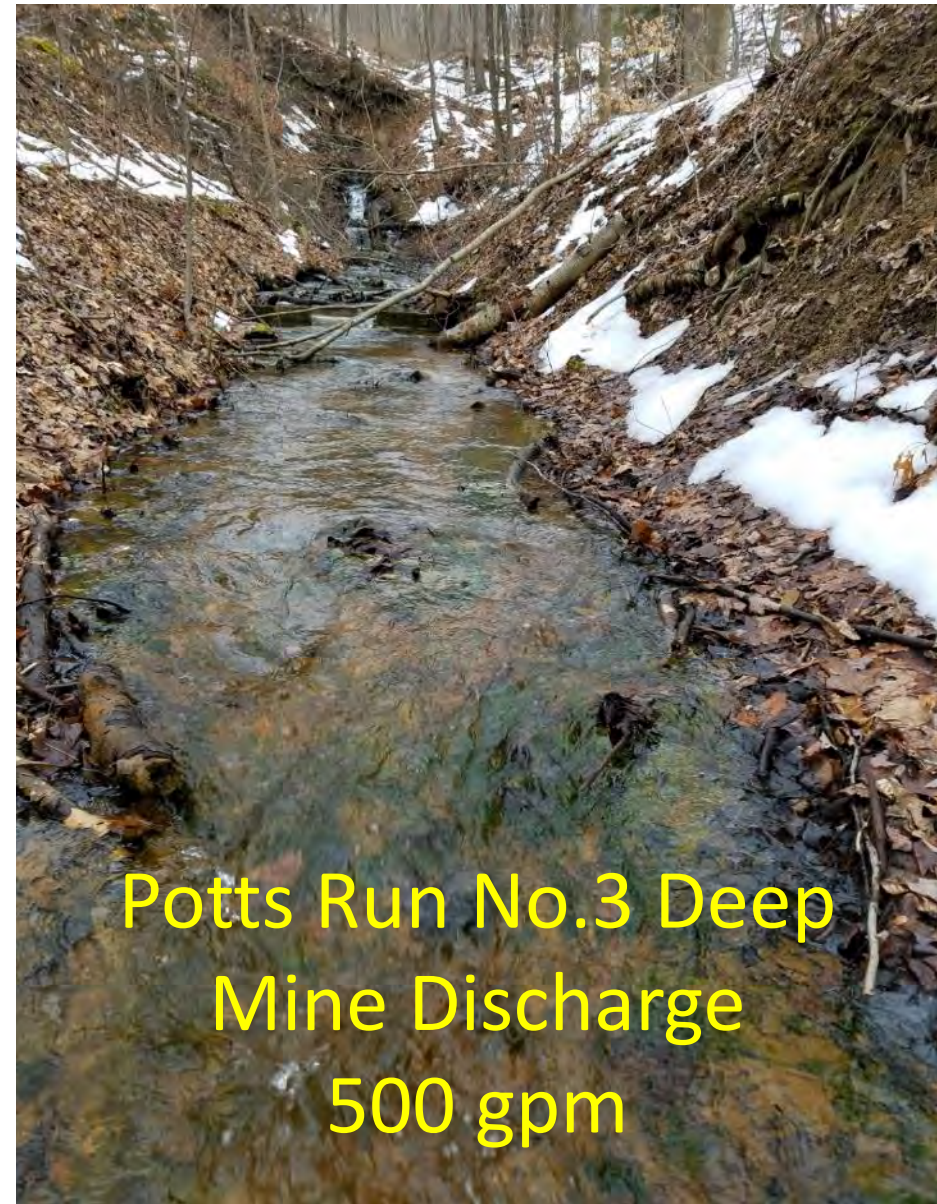
Potts Run Restoration Project

Potts Run Restoration

The AML pilot funding will construct a passive AMD treatment system that will treat 620 gpm of AMD emanating from the Potts Run No. 3 deep mine which closed in the mid to late 1950s. This deep mine drainage was identified as the major source of AMD pollution to Potts Run introducing high loadings of acid, aluminum and iron into the lower 0.4 mile of the Oak Ridge tributary which then enters and pollutes the final 2.7 miles of the Potts Run main stem. Twenty-five acres of abandoned surface mine will also be reclaimed including alkaline addition and reforested using the FRA.

Potts Run Restoration Project

Potts Run Restoration



Potts Run No.3 Deep
Mine Discharge
500 gpm

Potts Run Restoration



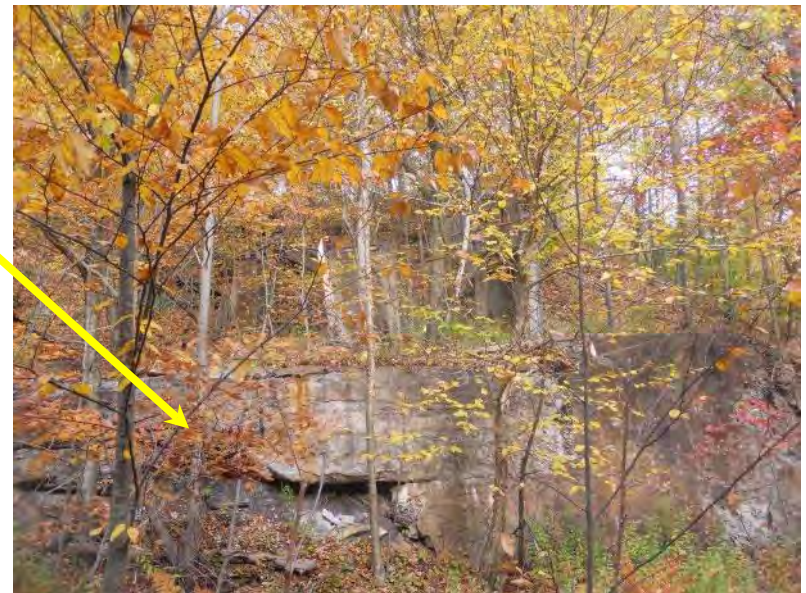
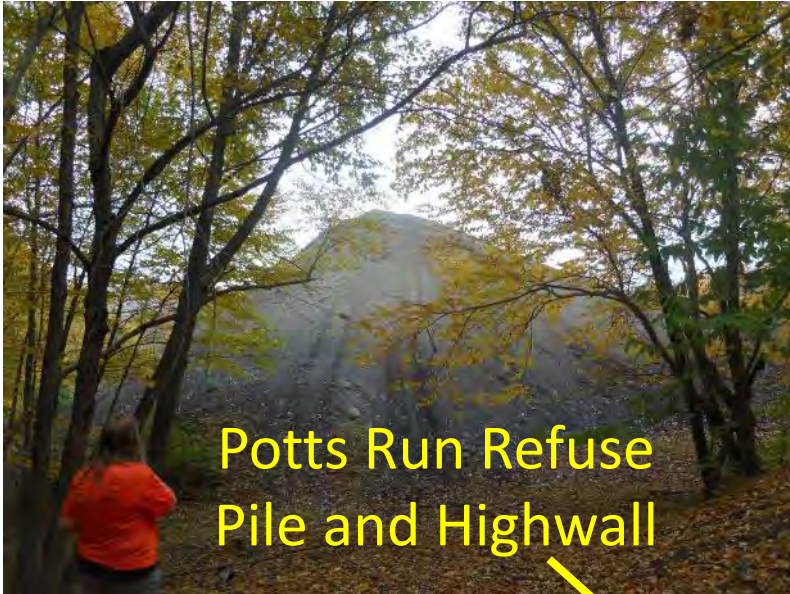
Oak Twin Deep Mine
Discharge
120 gpm

Potts Run Restoration

Quality and Flow Characteristics of the Potts Run Discharges

Discharge Description	Flow (gpm)	pH (units)	Acidity (mg/l)	Alkalinity (mg/l)	Fe (mg/l)	Al (mg/l)	Mn (mg/l)	Sulfate (mg/l)
Potts Run No.3 Discharge	510	3	107	0	5.6	8.5	2.7	240
Oak Twin Discharge	104	3.5	65	0	0.7	6.4	7.2	306

Potts Run Restoration



Potts Run Restoration



Unreclaimed
Contour
Surface Mine



Potts Run Treatment Concept

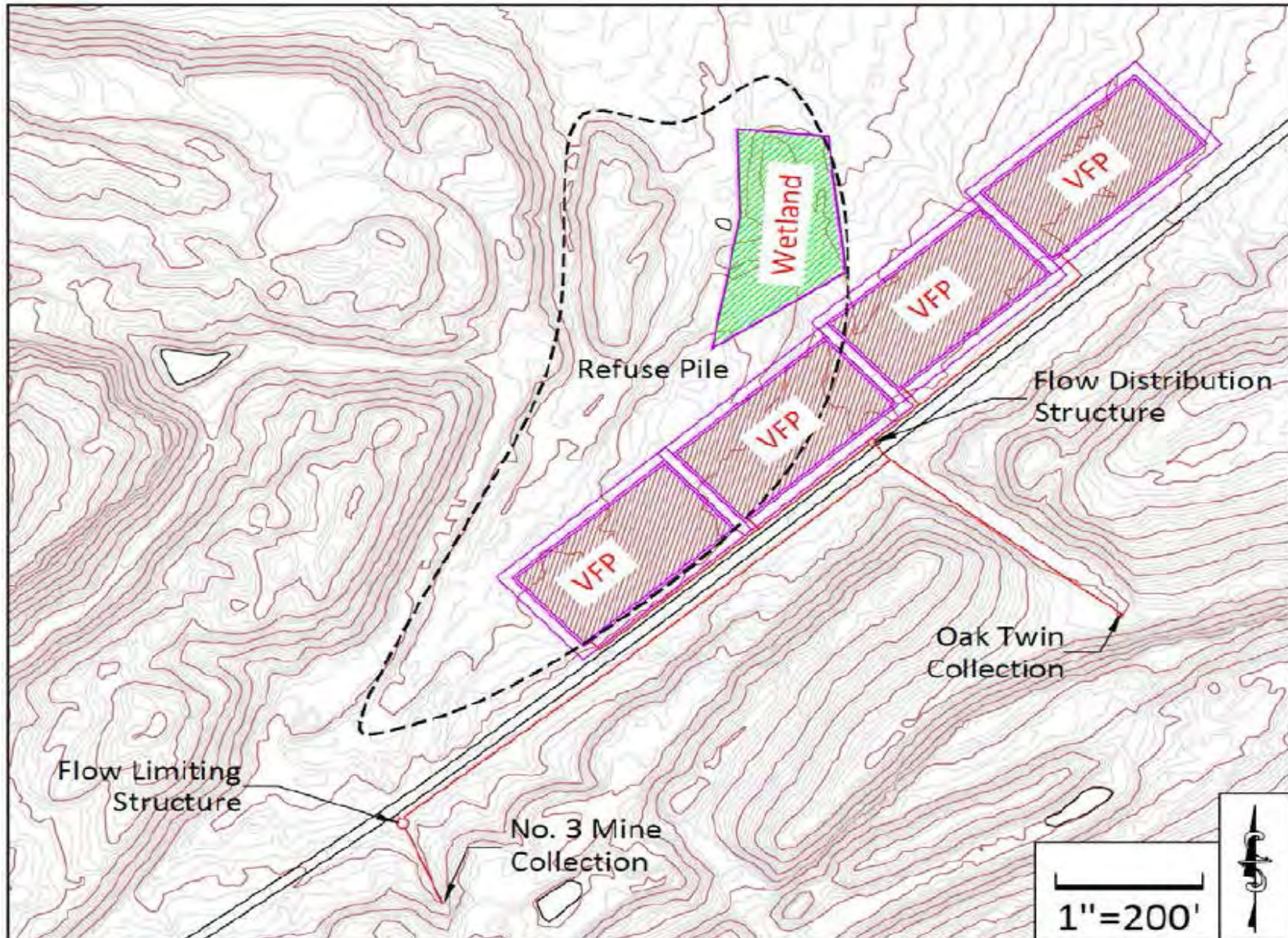


Figure 3

No. 3 Mine
Concept Treatment Plan

DATE:	May 2014	FILE NO.:	Potts Run.dwg
DESIGNED BY:	MAW	ISSUED BY:	AS
CHECKED BY:		DATE:	AS
APPROVED BY:		SCALE:	AS SHOWN



HedinEnvironmental

195 Castle Shannon Blvd.
Pittsburgh, PA 15228
www.hedinenv.com

Significant Benefits

- Potts Run has a Cold Water Fishery designated use but is listed as impaired due to AMD on the Commonwealth's 303(d) list of impaired waters.
- Treatment of the Potts Run No. 3 deep mine drainage should result in the removal of Potts Run from the impaired waters list.

Significant Benefits

- Increased property values, tourism and recreational use for the area.
- The project will recoup a recreational use loss valued at \$102,393 annually that is presently being experienced by these same waters by creating a projected 14 full-time temporary jobs and 5 full-time permanent jobs.

Primary Project Partners

- Trout Unlimited
- Landowners
- Foundation for PA Watersheds
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Fran Contracting Surface Mine Restoration Project (Rock and Camp Runs)

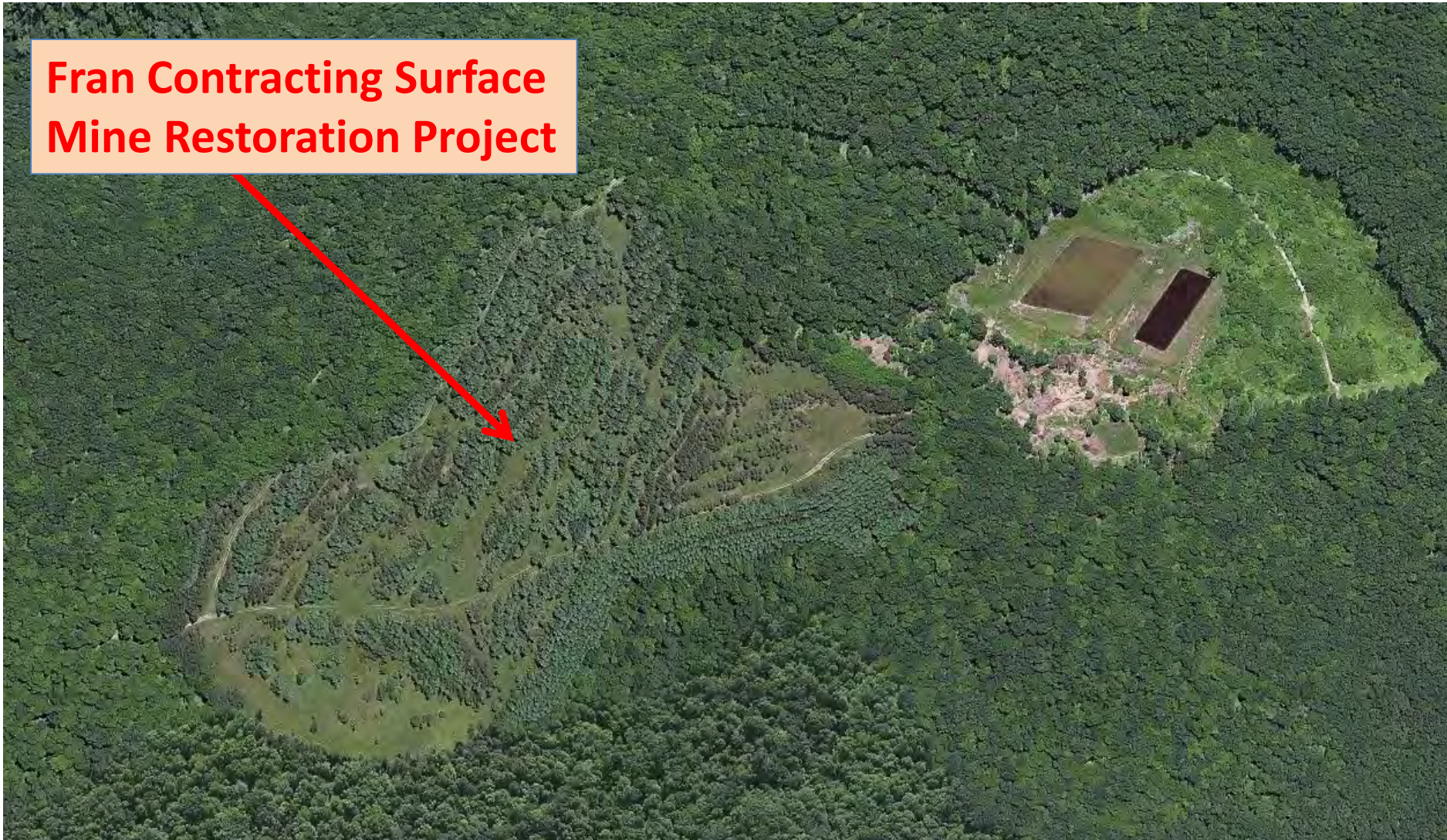


Fran Contracting Surface Mine Restoration Project (Rock and Camp Runs)

The AML pilot funding will be used to fund the reclamation of the Camp Run No. 2 AML site in Sproul State Forest to restore water quality in the Rock and Camp Run tributaries of Cooks Run. The site will be reclaimed by excavating and removing or treating the acid forming materials on site by mixing them with alkaline material to neutralize acidity. The reclaimed site will be reforested to bring the land & water back to pre-mining conditions.

Fran Contracting Surface Mine Restoration Project (Rock and Camp Runs)

**Fran Contracting Surface
Mine Restoration Project**



Significant Benefits

- Improved/restored water quality in Camp Run, Rock Run, and Cooks Run
- Restored Public Lands
- Reforestation including reintroduction of hybrid American Chestnut Trees
- Restoration of the land and water back to its pre-mining condition will allow for citizens that enjoy hunting, fishing, hiking, ATV riding and sightseeing to utilize the area
- Increased tourism to the area

Project Partners

- Allegheny Mountain Chapter of Trout Unlimited
- Department of Conservation & Natural Resources, Sproul State Forest
- Kettle Creek Watershed Association
- Trout Unlimited
- East Keating & Noyes Townships
- Western Clinton Sportsman's Club

Project Partners

- Pennsylvania Fish & Boat Commission
- American Chestnut Foundation
- Penn State University
- Clarion University
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Fran Project Construction



Fran Project Construction



Fran Project Construction



Fran Project Construction



Powderly Creek NE Underground Mine Fire and Economic Development Project



Powderly Creek NE Underground Mine Fire and Economic Development Project

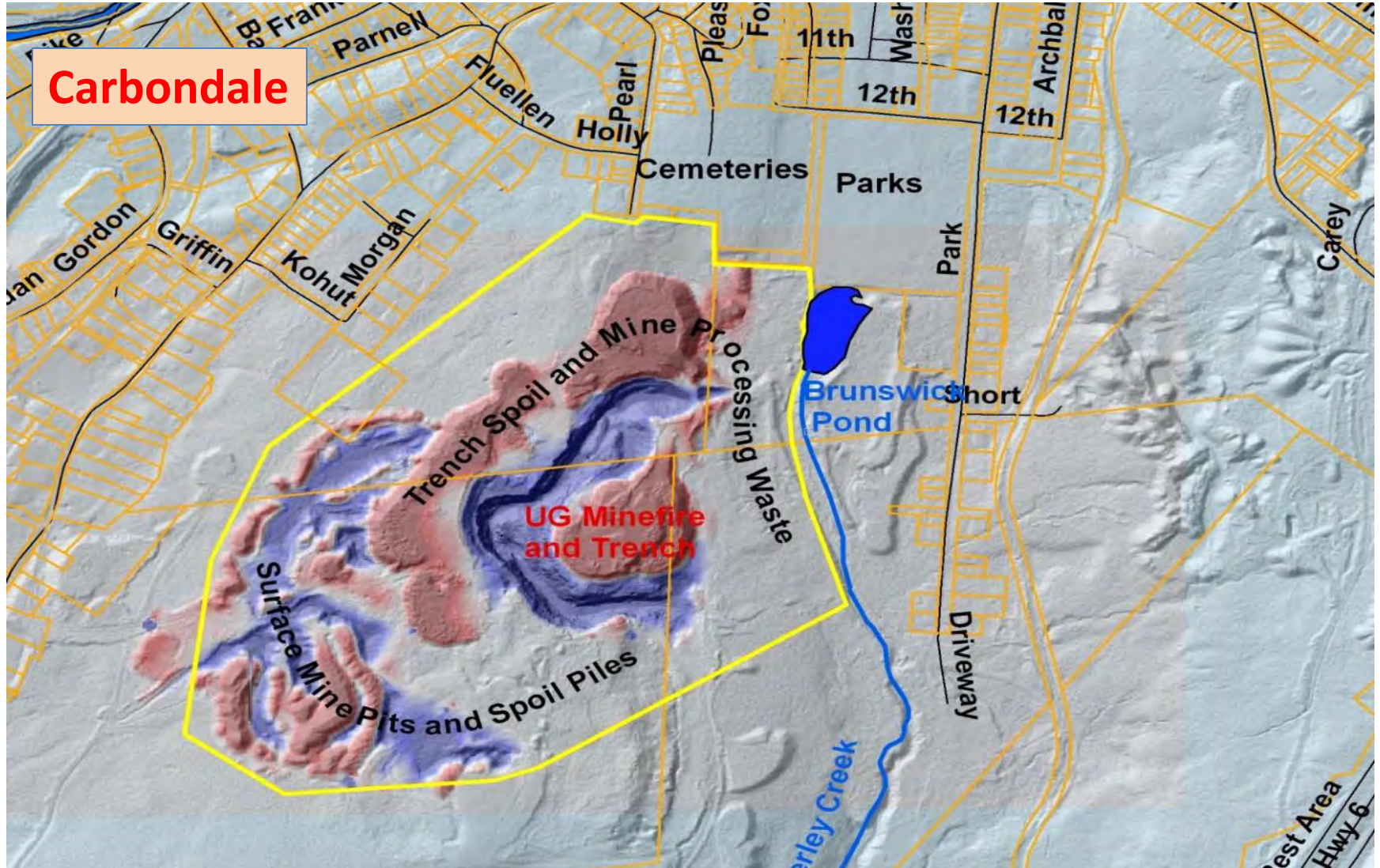
The AML pilot funding will be used in combination with other funding to undertake a reclamation project to extinguish the Powderly Creek underground mine fire just outside the City of Carbondale. Additional AML features adjacent to the mine fire area will also be reclaimed in order to create site conditions suitable for future industrial development. The total acreage of AML being reclaimed (including the mine fire area) is 82 acres.

Powderly Creek NE Underground Mine Fire and Economic Development Project



Powderly Creek NE Underground Mine Fire and Economic Development Project

Carbondale



Significant Benefits

- Improved air quality for nearby residents due to extinguishment of the underground mine
- Restoration of 82 acres of abandoned mine land back to pre-mining conditions
- Potential for industrial/commercial development of the land following extinguishment of the mine fire and reclamation of adjacent AML features
- The four-lane Robert P. Casey Memorial Highway (U.S. Route 6) runs from Interstate 81 near Scranton north past Carbondale adjacent to the project site

Project Partners

- Landowner
- Carbondale City
- Carbondale Enterprise Development Zone
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Powderly Project Construction



Powderly Project Construction



Powderly Project Construction



Powderly Project Construction



Powderly Project Construction



Powderly Project Construction



Powderly Project Construction



Eckley/Hazleton Rail Trail/Hazel Creek Cleanup



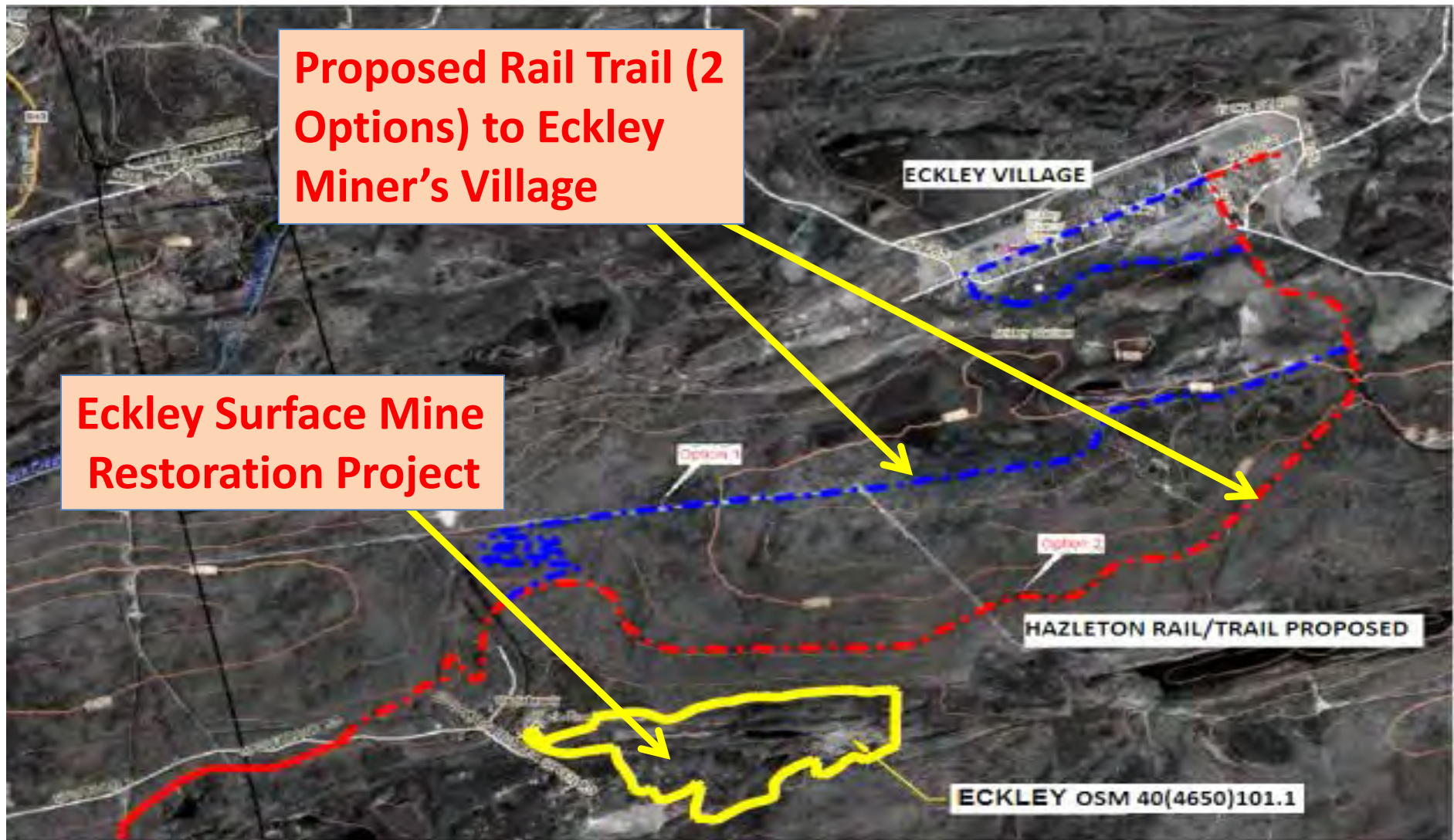
Eckley/Hazleton Rail Trail/Hazel Creek Cleanup

The AML pilot funding will be used to reclaim a 70 acre abandoned surface mine with 2,500 linear feet of dangerous highwall ranging in height from 40 to 50 feet by backfilling and grading with on-site spoil material, including construction of wetlands, and reconstructing 3,200 feet of stream. The project will facilitate an extension of the Greater Hazleton Rails to Trails to connect with the Eckley Miner's Village and improve water quality in Hazel/Black Creeks.

Eckley/Hazleton Rail Trail/Hazel Creek Cleanup

Proposed Rail Trail (2 Options) to Eckley Miner's Village

Eckley Surface Mine Restoration Project



HAZLETON RAIL/TRAIL PROPOSED

ECKLEY OSM 40(4650)101.1

Significant Benefits

- Reclamation of 70 acres of AML facilitating the extension of the Greater Hazleton Rails to Trails to connect with the Eckley Miner's Village tourist site and to eventually connect with the larger Delaware Lehigh National Heritage Corridor Trail system
- Improved/restored water quality in Hazel Creek and the Black Creek Watershed
- Increased tourism to the area
- Improved opportunities for fishing, hiking, and sightseeing

Project Partners

- Landowner
- Greater Hazleton Partnership
- Greater Hazleton Chamber of Commerce
- Weatherly Borough
- Wildlands Conservancy
- Eastern PA Coalition for Abandoned Mine Reclamation

Project Partners

- Pennsylvania Department of Conservation and Natural Resources
- Pennsylvania Department of Transportation
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

▶ Eckley Reclamation Project Construction



▶ Eckley Reclamation Project Construction



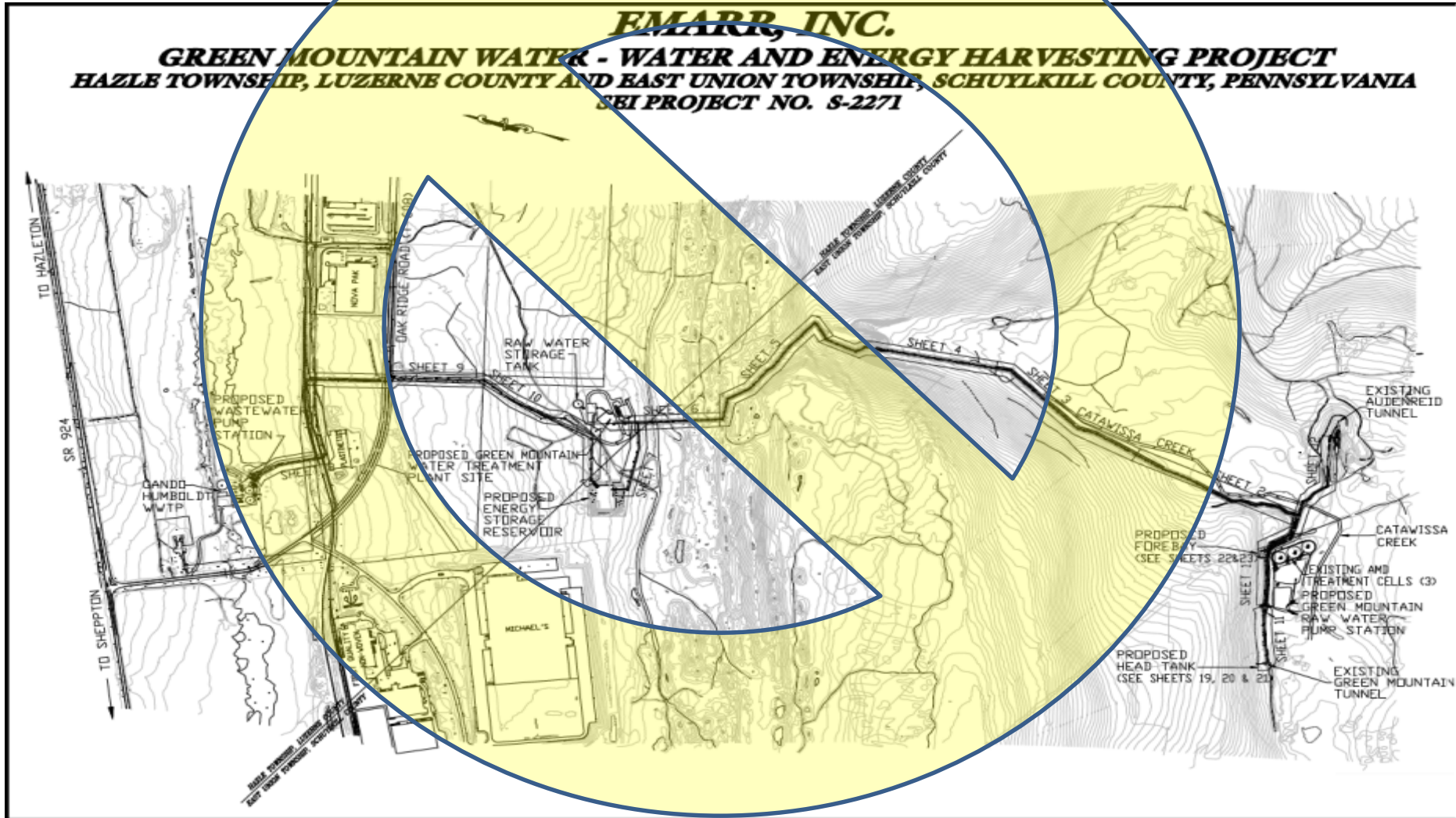
▶ Eckley Reclamation Project Construction



▶ Eckley Reclamation Project Construction



Green Mountain Discharge/Audenreid Tunnel Discharge



Green Mountain Discharge/Audenreid Tunnel Discharge

The AML pilot funding will be used to treat the mine water discharge from the Green Mountain Tunnel and to improve the treatment of water from the Audenreid Tunnel. The project will result in the delivery of finished potable water to the Hazleton City Authority (HCA) that will increase the available safe yield of the area's water supply. Also, geothermal energy will be recovered from the raw water for cooling and heating the water treatment buildings.

Green Mountain Discharge/Audenried Discharge

**Audenreid
Tunnel
Discharge**



Significant Benefits

- Treat the Green Mountain Tunnel discharge
- Improve treatment of the Audenreid Tunnel discharge
- Deliver finished potable water to the Hazleton City Authority that will increase the available safe yield of the area's water supply
- Facilitate the sustainable recovery of the upper Catawissa Creek Watershed while developing the water and energy assets to provide a source of revenue to fund the ongoing AMD treatment cost
 - Microhydro for electricity
 - Geothermal for heating and cooling

Project Partners

- Community Area New Development Organization (CanDo)
- Eastern Middle Anthracite Regional Recovery (EMARR)
- Hazleton City Authority
- Natural Lands Trust (NLT)
- Eastern PA Coalition for Abandoned Mine Reclamation (EPCAMR)
- Schuylkill/Columbia County Conservation Districts
- Catawissa Creek Restoration Association
- Butler Enterprises

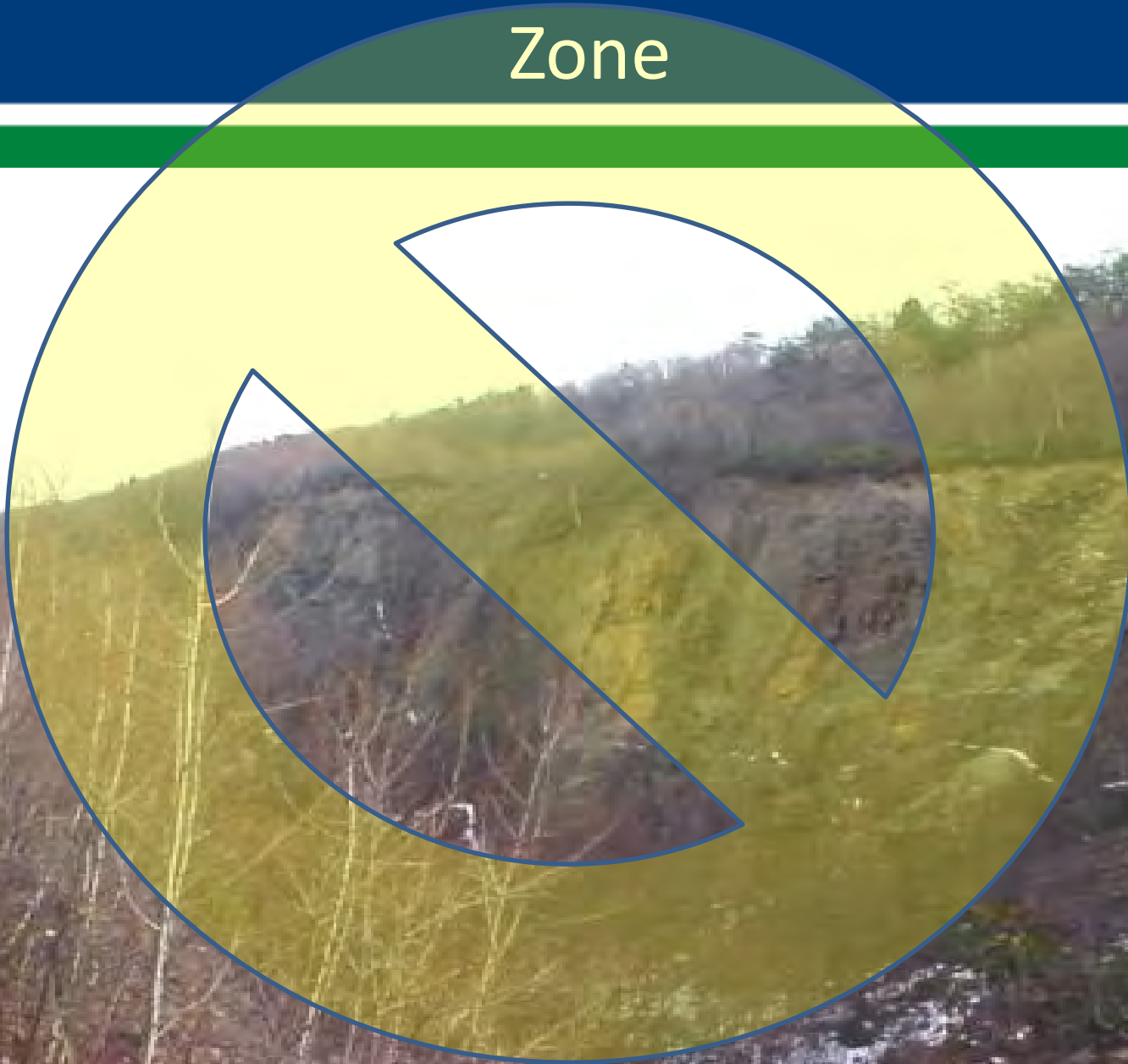
Project Partners

- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement
- Hazleton Environmental and Schumacher Engineering will be providing design and construction oversight

Suspension of the Project

The project had to be suspended because the property owner would not allow the proposed treatment facility to be constructed on their property. They are proposing to sell their property, which includes over 5,500 acres, to the Commonwealth of PA, Department of Conservation and Natural Resources. If that occurs, the project may be reconsidered in the future.

Tamaqua City Revitalization and Improvement Zone



Tamaqua City Revitalization and Improvement Zone

The AML pilot funding will be used to remove legacy AML piles in the area of Slum Creek, regrading about 19 acres to a riparian/ park setting, including grading for a future fork of the proposed Panther Valley rail-trail system. Thirteen acres of legacy crop falls will be backfilled using the material from the Slum Creek project. An existing haul road will be improved so that in later phases it can become a segment of the planned Tamaqua Bypass.

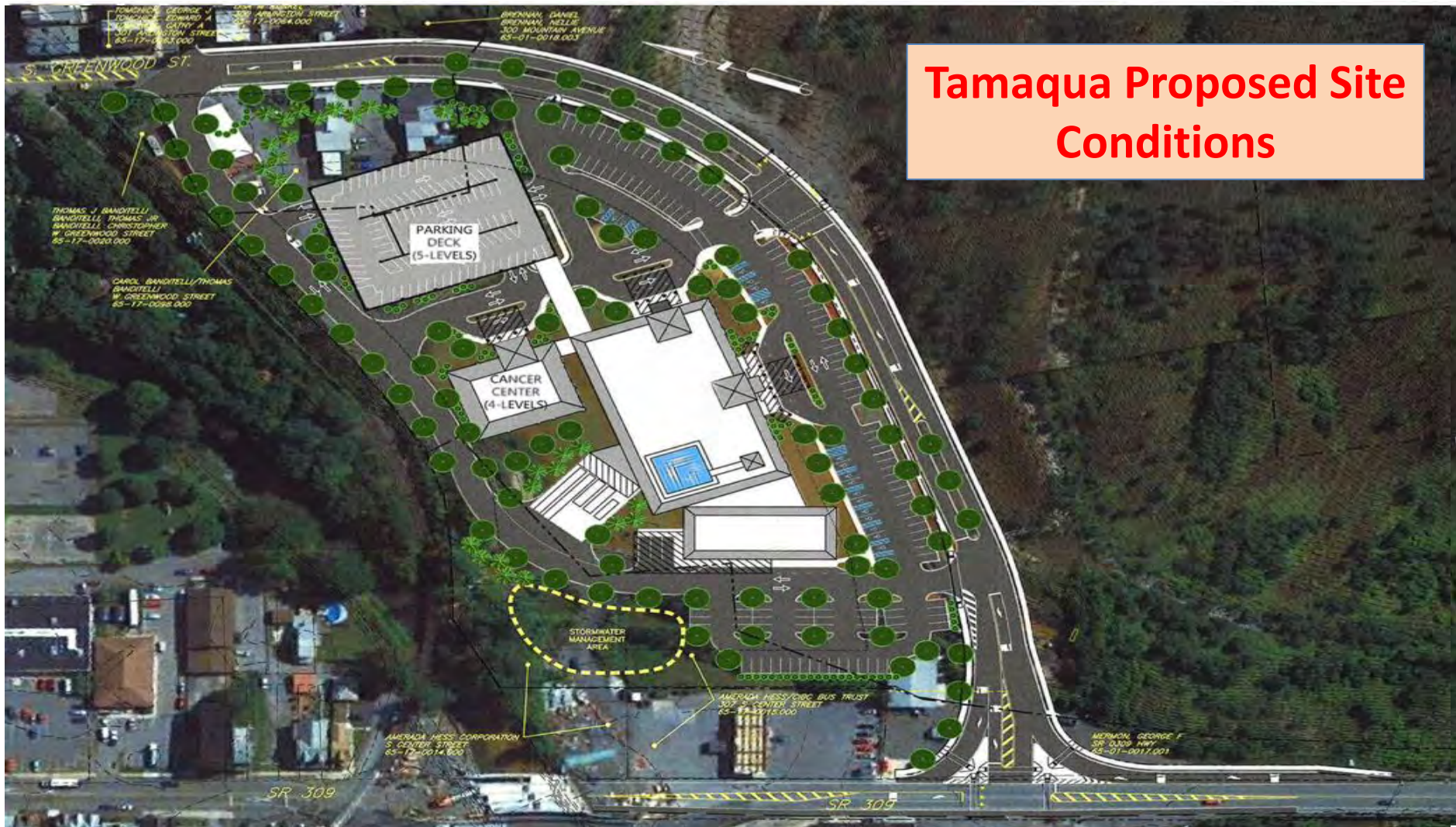
Tamaqua City Revitalization and Improvement Zone



**Unreclaimed AML Site
(Slum Creek Area)
near Tamaqua**

Tamaqua City Revitalization and Improvement Zone

Tamaqua Proposed Site Conditions



Significant Benefits

- Reclamation of 32 acres of AML which will serve as a catalyst for the large scale economic development to follow in and around Tamaqua's existing City Revitalization and Improvement Zone (CRIZ) parcels
- The new gateway feature (to be constructed in a later project phase) will serve as a future traffic bypass linking Routes 309 and 209 directly alleviating traffic congestion in downtown Tamaqua
- Redirecting vehicular traffic to the bypass route will restore charm and character to the existing downtown, improve pedestrian and vehicular safety, improve local travel efficiency, and improve emergency response times in the local area

Significant Benefits

- St. Luke's Miners Hospital is currently evaluating the feasibility of constructing a Cancer Treatment Campus within the Tamaqua Area Mine Reclamation/Economic Development project area, which will provide life-saving treatment for cancer patients in and around the Tamaqua area
- Other community revitalization/development under consideration after the reclamation project and bypass construction are completed include meeting and conference space and geothermal infrastructure

Project Partners

- Landowners – Lehigh Anthracite/BET Associates
- Tamaqua CRIZ Authority
- Tamaqua Area Community Partnership
- Tamaqua Industrial Development Enterprises
- Tamaqua Borough
- Schuylkill County
- St. Luke's Hospital
- Schuylkill Headwaters

Project Partners

- Kaufman Engineering
- Pennsylvania Department of Community and Economic Development
- Pennsylvania Department of Transportation
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Suspension of the Project

The land reclamation project for the proposed trail had to be suspended when the landowner would not allow the planned reclamation on their property and the gateway portion of the project which would have been the first step in the Tamaqua Bypass and business development could not be advanced due to the permitted treatment facility which the mine operator is unwilling to relocate.

Bowman's Shaft - Pioneer Tunnel Mine Headframe & Hoist Preservation Project



Bowman's Shaft - Pioneer Tunnel Mine Headframe & Hoist Preservation Project

The AML pilot funding will be used to paint and erect a salvaged headframe and hoisting drum as exhibits at the Pioneer Tunnel tourist coal mine in Ashland Borough, Schuylkill County. The mining artifacts were recovered from the North Mahanoy Colliery, Park No. 1 Shaft. The shaft, which was located near several homes in Mahanoy Township, was backfilled in 2015. During the project, the headframe and hoist were carefully disassembled and preserved.

Bowman's Shaft - Pioneer Tunnel Mine Headframe & Hoist Preservation Project



Significant Benefits

- Increased tourism and Preservation of Anthracite Mining Heritage
- The Pioneer Tunnel provides employment opportunities for the people of the Anthracite Region, as well as being a regional tourist attraction
- The tourist mine and museum are listed among the top ten tourist attractions in Pennsylvania
- It accommodates about 30,000 guests each season (April 1 to October 31) with 30% of the guests being school groups from elementary through college
- The addition of the headframe will provide additional educational opportunities

Project Partners

- Pioneer Tunnel Coal Mine & Steam Train
- Ashland Community Enterprises
- Schuylkill County
- Ashland Borough
- Pagnotti Enterprises
- SDL Construction and Keystone Anthracite
- PA Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Pioneer Tunnel Project Construction



Pioneer Tunnel Project Construction



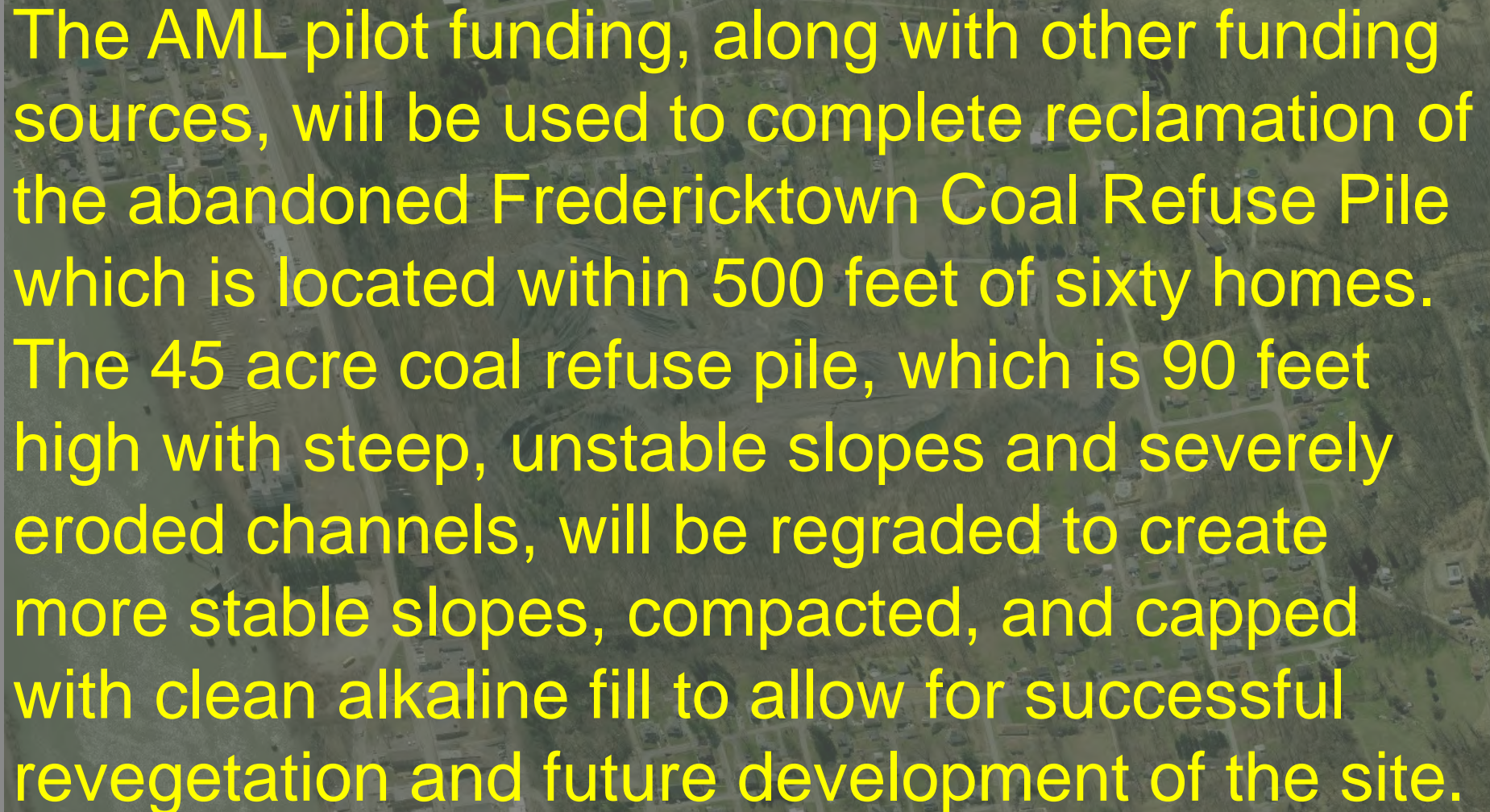
Pioneer Tunnel Project Construction



Black Dog Hollow/Fredericktown Coal Refuse Pile Reclamation Project



Black Dog Hollow/Fredericktown Coal Refuse Pile Reclamation Project

An aerial photograph showing a residential neighborhood with houses and streets. In the background, a large, dark, eroded coal refuse pile is visible, situated near a road. The pile has steep, unstable slopes and eroded channels.

The AML pilot funding, along with other funding sources, will be used to complete reclamation of the abandoned Fredericktown Coal Refuse Pile which is located within 500 feet of sixty homes. The 45 acre coal refuse pile, which is 90 feet high with steep, unstable slopes and severely eroded channels, will be regraded to create more stable slopes, compacted, and capped with clean alkaline fill to allow for successful revegetation and future development of the site.

Black Dog Hollow/Fredericktown Coal Refuse Pile Reclamation Project



Significant Benefits

- Elimination of the health and safety hazards and environmental impacts of this coal refuse pile including:
 - Severe on-site erosion and off-site sedimentation issues in the Village of Fredericktown and the Monongahela River Watershed
 - Reduced acid mine drainage laden runoff
 - Slope stability and hazardous erosion gullies
 - Unauthorized recreational use by ATVs
 - Elimination of several hazardous facilities situated on the refuse pile

Significant Benefits

- Restoration of 45 acres of barren undevelopable land situated in the Village of Fredericktown in East Bethlehem Township
- Recreational development through construction of recreational and greenspace public park
- Improved quality of life for local residents
- Improved recreational opportunities
- Increased tourism
- Possible future industrial development
- Water quality improvement

Project Partners

- East Bethlehem Township
- Landowner, Hobo Ventures, Inc.
- Pennsylvania Department of Environmental Protection
- Office of Surface Mining Reclamation and Enforcement

Suspension of the Project

The project was suspended due to permitting issues with the alkaline material planned for beneficial re-use at the site as a soil amendment.

Other reclamation alternatives are now be evaluated for a future reclamation project at the site.

AML Pilot Project Implementation Successes

- Extinguished the Powderly Underground Mine Fire resulting in ~100 acres of developable land
- Provided a safe and reliable potable water supply to ~160 homes & businesses
- Preserved and relocated a historic mine headframe to a tourist mine
- Kept 40 miners employed who would have been laid off due to slumping coal market
- Successfully obligated \$25 million of AML Pilot Program funding to qualified projects
- Eliminated safety hazards and restored a lost stream to the surface
- Facilitated a multi-use trail expansion to a historical site (Eckley Miner's Village)

Project Implementation Challenges

- Property owner support and concurrence for planned projects
- Coordinating with project partners
- Clearly identifying each partner's roles and responsibilities
- Project permitting
- Follow through on the community development/economic revitalization component by partners
- Timing of grants and other funding from other sources
- Time required to get projects designed, permitted and under contract
- Partners following all grant agreement terms and conditions
- Municipal zoning inconsistent with post-reclamation development
- Managing public/media attention

Lessons Learned

- Secure formal landowner support and/or agreements up front
- Clearly explain grant agreement terms and conditions to partners
- Projects rely on good cooperation and follow through by all project partners
- Verify other grants/funding sources identified by partners
- 36 months is a short amount of time to implement projects – need to plan ahead and keep the projects moving
- Property owners and municipalities need to work on rezoning at least 12 months (or longer) in advance of reclamation completion
- Very few “Shovel Ready” projects to readily utilize funding
- Significantly more staff time and resources are required to meet deadlines for AML pilot projects



Bureau of Abandoned Mine Reclamation

For more information about the AML Pilot Program in Pennsylvania, visit:

www.pa.gov/AML

Tom Wolf, Governor

Patrick McDonnell, Secretary