

# NAAML P

NATIONAL ASSOCIATION OF ABANDONED MINE LAND PROGRAMS

**NEWSLETTER**  
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## UPCOMING MEETINGS

### Winter Business Meeting

Gulf Shores, Alabama  
Feb. 22 - 24, 2022

## MISSION STATEMENT

1. To provide a forum to address current issues, discuss common problems and share new technologies regarding abandoned mine land reclamation;
2. To foster positive and productive relationships between the states and tribes represented by the Association and the federal government;
3. To serve as an effective, unified voice when presenting the states'/tribes' common viewpoints; and
4. To coordinate, cooperate and communicate with the Interstate Mining Compact Commission, and all other organizations dedicated to wise use and restoration of our natural resources.

## Letter From the President

Dear NAAML P members, friends and partners,

I'll admit that when I began working on this letter to the association my intent was to project hope for passage of the bipartisan infrastructure bill (BIF) while internally feeling significant turmoil over its outcome. As it became apparent late on Friday, November 5th that the House was moving increasingly closer to putting the measure to a vote, I watched in anticipation of what would, and has, become an incredible sea change for SMCRA AML programs across the nation. To many in the know, like our colleagues at IMCC, passage of H.R. 3684 was never in doubt once it passed out of the Senate in a bi-partisan fashion, eventually passing the House in a similar way. Inclusion of significant additional funding for coal AML work, reauthorization of fee collection through 2034, and development of the framework for a national hardrock program in the bill are due in no small part to work by you all as individuals, the Association, and staff at IMCC.

Our association continues to benefit from the assistance IMCC provides on legislative measures and interactions with OSMRE. I have provided a summary of the pertinent AML sections of the BIF that was written and distributed to IMCC membership by Tom Clarke, and also included a write-up by Greg Conrad on the challenges of implementing the BIF. The summary provides an excellent snapshot of details associated with the legislation, while the discussion of BIF challenges will keep us focused on ensuring that we are well positioned to implement this new funding. As most of you are aware, Ryan Ellis returned to IMCC following completion of his Master's Degree in sunny California. He just couldn't stay away from AML, welcome back Ryan!

While the goal for the past five or more years was to secure future AML funding by reauthorizing fee collection for another 15 years, and provide additional funding to our minimum program states, our challenge now is ramping up reclamation of coal AML with the infusion of significant new funds while continuing to implement our reauthorized program responsibilities. For some of our member states and tribes there is the added pressure of administering funds distributed through the AMLER Program. Even though many of our goals were achieved with passage of the BIF our job now is to work with OSMRE to implement these new funds and existing programs in a manner that prioritizes reclamation of our remaining AML issues and facilitates the timely accomplishment of those goals. I have no doubt that all of these challenges will be met as opportunities to be tackled with the same innovative style and approach we use to address the daunting task of addressing our remaining AML inventories.



I would like to extend a huge thank you to Rob Ghiglieri and his staff in Nevada for transitioning at such short notice to a completely virtual platform for our fall conference. Rob and his staff faced down the challenge of hosting an in-person conference in Tahoe, under the shadow of an ongoing pandemic, only to be thwarted by an incredibly devastating wildfire that resulted in the evacuation of our venue mere weeks in advance of the conference. To their credit they were able to deliver a completely virtual experience that allowed attendees to enjoy the plenary session, attend technical presentations, and network with vendors and other AML staff. I thoroughly enjoyed the Bonanza King presentation by Gregory Crouch during the plenary session, in addition to the technical sessions I was able to attend, and as a geologist, found the virtual geologic tour of Tahoe presented by Courtney Brailo, quite fascinating. I know we were all hoping for the opportunity to meet face to face in such a beautiful setting as Lake Tahoe, and share in the comradery that makes our AML programs such an incredible place to work, but that wasn't to be. Our thoughts and prayers go out to those in the Tahoe region that are still dealing with the aftermath of such devastating fires this summer.

As your president, I am honored by the opportunity to represent all of the members in our association. My goal is to ensure that the association provides value to its members through a combined voice on AML topics and hopefully provides resources for our member programs to continue development of their staff in addressing AML issues. I am excited to undertake this challenge with the help of Ben McCammet (OH) as our newly elected Vice President and Dustin Morin (AL) as the newly elected Secretary/Treasurer. Both Ben and Dustin have been invaluable to the association in the past with their input and leadership, and no doubt will continue that in their new roles. I would also like to thank Susan Kozak (IA) for her service to the association as president, vice president and secretary/treasurer. I enjoyed getting to know Susan over the past three years, and saw firsthand the work she put into serving in her respective roles. She had the unenviable task of serving as the first "virtual" president, never having the opportunity to host a business meeting in-person or wield the all-important NAAML P gavel, but she managed all those challenges in stride.

I look forward to seeing many of you in-person at our Winter Business Meeting in Gulf Shores, Alabama, February 22-24, 2022, followed up by our fall conference in Grand Junction, Colorado, October 16-20, 2022. Please feel free to reach out to me with any questions and concerns, or ideas on how the Association can better serve its members. Now is the time to stay engaged as implementation of infrastructure funding will require input and involvement by us all to ensure that it is used to expeditiously accomplish the goals set forth in SMCRA.

*Sincerely,*



**Jeff Graves, NAAML P President**



## **NAAML P Winter Business Meeting**

### **The Lodge at Gulf State Park**

### **Gulf Shores, Alabama**

### **February 22 - 24, 2022**

The Alabama AML program is excited to host the NAAML P memberships 2022 Winter Business Meeting in Gulf Shores, Alabama! The meeting will be held at The Lodge in Gulf State Park February 22-24, 2022. Resting on the Gulf Coast, this eco-friendly resort is part of the 6,150-acre Gulf State Park — boasting 28 miles of trails and a freshwater fishing lake. The Lodge is adjacent to the Gulf State Pier, close to the cities of Gulf Shores and Orange Beach, AL. Explore the area with on-site rental bikes, and enjoy a coast-facing infinity pool and 24-hour fitness center. There are lots of things to do in the area including golf, fishing, shopping, and other attractions. Rooms can be booked at [www.group.hilton.com/AML P](http://www.group.hilton.com/AML P). The closest airport to the meeting facility is the Pensacola International Airport located about an hour away in Pensacola, FL. They offer non-stop flights from many major cities. Rental car information and things to do while you are visiting the area can be found at: <https://www.gulfshores.com/plan/getting-here/>.

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## **Stan Barnard Award - Autumn Coleman**

### **Montana Department of Natural Resources Conservation**

Autumn Coleman has over 20 years experience in natural resource management primarily in the field of mine reclamation. Autumn spent much of her career with the Montana Abandoned Mine Program and now serves as Bureau Chief for the Montana Department of Natural Resources Conservation. She worked diligently for the NAAML P as the secretary/treasurer, Vice President and President from 2016 to 2019. During her tenure as President, she represented the NAAML P while testifying to Congress on key issues important to the entire membership. In 2016, under Autumn's leadership, the NAAML P Fall conference was held in Bozeman, Mt and was a great success. Although Autumn's career has advanced to cover many natural resource related issues, she stays involved in AML issues due to her passion for the work. All of these traits exhibit her Stan-like qualities making her an excellent choice for the Stan Barnard Memorial Award.

## **Dave Bucknam Award - Melvin H. Yazzie** **Outstanding Instructor Award**

### **Navajo Abandoned Mine Lands Mining Engineer**

Melvin has provided outstanding contributions to the Navajo Abandoned Mine Lands Program in the development and implementation of difficult reclamation projects. He has exemplified excellence for meritorious service in a duty of great responsibility. Mr. Melvin H. Yazzie has dually led Navajo AML with many projects ranging from reclamation of coal and non-coal, public facility projects, and initial Navajo STEM activities among youths. For ten years, he has dedicated and fully supported the National Technical Training Program. These Navajo reclamation programs exhibit a high degree of professional accomplishment, innovative technology, and serve as a model for other municipalities and tribes around the country. For over 30 years as a Navajo AML Mining Engineer, Melvin has been responsible for the inventory of AML sites, engineering design development, NEP A compliance, as well public relations and administrative duties. His resilience and aptitude for designing and applying innovative programming and his unflappable commitment to a service focus, especially in building relationships with high schools, Navajo tribal leaders, Navajo EPA, U.S. EPA, and DOE, have provided a unique and inspiring example of his leadership. His contributions have also been far-reaching in nature, speaking directly to academic institutions and stakeholders to make STEM a prominent initiative among Navajo students. For his distinctive accomplishments, the 2021 Dave Bucknam Award is presented to Mr. Melvin H. Yazzie.

## **Tom Henderson Award - Chris Kiser** **Enhancing Reclamation through Technology**

### **Office of Surface Mining and Enforcement**

An advanced level of technical expertise is required to complete either an Abandoned Mine Land Project design or review a coal mine application package. With industry offering wages that state programs can not begin to meet, retaining licensed professional staff is not always possible, especially in small, minimum program states like Kansas. As stated by OSMRE, "OSMRE advances its mission by providing technical assistance, based on sound science and training, to its State and Tribal partners to enhance their ability to maintain effective programs."

Kansas experienced a large staff turnover when 50% of the staff retired on the same day in 2018. As new staff was hired, training became a priority. During the COVID lock downs and the cancellation of in-person classes, Kansas staff turned to online offerings. Environmental Specialist Tony Anderson struggled with the unfamiliar Global Mapper program. When he needed one on one help, he reached out to Chris. According to Tony, "Chris has been my main resource without the ability for in person training." Having been away from day to day use of AutoCAD for several years, Tony also benefited from Chris's step by step instructions to help him refresh and hone his knowledge of AutoCAD. Without Chris to lend his knowledge, Tony would have faced a very steep learning curve.

Chris is extremely knowledgeable and very personable. He goes the extra mile in his efforts to help the States. He is an asset to OSMRE and to all the States especially those in the region served by the Alton office.

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## NAAML P Scholarship Awards

### Graduate Recipient - Garrett Dildine (Pindine), Ohio University's Honors Tutorial College



Garrett Dildine (Pindine) received a B.S. in civil engineering and a B.A. in environmental studies from Ohio University's (OU) Honors Tutorial College (HTC). As an undergraduate student, he worked for Dr. Guy Riefler as a research assistant and helped secure funding for a multi-million-dollar acid mine drainage remediation facility. Garrett later worked under the supervision of Dr. Damilola Daramola as a researcher at the Institute for Sustainable Energy and the Environment (ISEE). During his tenure at ISEE, he developed a thermodynamic database and conceptual model to improve the efficiency of chemical precipitation of phosphorus from different wastewater streams, some of which are associated with the mining industry, such as rare earth wastewater or coking wastewater. Garrett was also engaged in non-research-related activities at OU, participating in the American Society of Civil Engineers' (ASCE) student club and the Robe Leadership Institute's (RLI) seminar. He founded the charitable student group, One Page One World (OPOW), and served as a teaching assistant and peer tutor for math and science courses. Garrett also

worked as an environmental consultant at Geotechnical Consultants Inc. and will be working part-time, during his upcoming graduate studies, for BBJ Group, LLC on projects related to coal combustion residuals, PFAs research, surface water chemistry, and mining related water quality. He will be pursuing an M.S. in environmental engineering at Carnegie Mellon University (CMU), where Garrett plans to study additional computational chemistry techniques and use gained insights to improve our understanding of harmful environmental impacts associated with abandoned mines and the ways by which we counteract them.

### Western Recipient - Molly Taylor, Montana State University

Molly Taylor is a rising senior at Montana State University majoring in Environmental Engineering with a minor in Water Resources. She is most passionate about river and watershed restoration, especially in ecosystems impacted by mining. She has traveled to Kenya and Malawi through Engineers Without Borders to help develop water and sanitation infrastructure, and studies algal-microbial interactions in an MSU research lab. For the past two years she has interned for both the U.S. Forest Service and Natural Channel Designs, learning about the role of federal and private organizations in restoration and conservation efforts throughout the West.



### Mid-Continent Recipient - Liz Meyer, Ohio State University



Elizabeth (Liz) Myers is a senior at Ohio University (OU) in Athens, Ohio. She is majoring in civil engineering with a minor in environmental and plant biology.

Liz has a passion for environmental and water resources engineering that is evident both in and out of the classroom. Over the past four summers, she has worked as an undergraduate researcher in the OU civil engineering department. She has been involved with a number of research projects, but her most significant contributions are associated with a major on-going project to economically produce paint pigment from acid mine drainage sourced from abandoned mines in Southeast Ohio. In this project she has built pilot scale treatment facilities, taken field samples, and run lab experiments. Her other projects are in the subjects of stream restoration, wetland surveying, noise pollution, microscopy, and hydrology, and two of these have led to academic publications. In summer 2021, she was selected as an NSF REU recipient at Virginia Tech where she analyzed temperature changes in heavily altered streamways.

Liz is also the President of the OU student chapter of the American Society of Civil Engineers and served as captain of the chapter's environmental competition team, which she has led to two first place victories. In addition to this, she is a sustainability ambassador for the university, where she has volunteered in tree plantings and invasive species pulls.

Liz is a native of Gallipolis, Ohio, where she grew up seeing the effects of mining first-hand in the foothills of Appalachia. She credits this for her compassion and dedication to restoring the natural waterways in the area. Liz is honored to be the recipient for the 2021 NAAML P scholarship for the eastern region.

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## De Ronde AML Reclamation Project - Iowa

### Reclamation/Recreation & Watershed Improvement

#### National Award Winner

Over 2,000 feet of dangerous highwalls, 17 acres of hazardous piles and embankments, six ponds and nearly 25 acres of clogged stream lands located near the City of Beacon posed multiple environmental threats to the area. An attractive nuisance for children and young adults, the site had also been a safety concern for years. To address these hazards, Iowa's AML Program implemented the conventional approach of clearing and grubbing, pit pond dewatering, mass grading, shallow water wetlands, soil neutralization, using intakes and terraced design to control and direct water flow, utilizing geomorphic reclamation in some areas and permanently seeding the reclaimed area. As a result of the Program's efforts, the local watershed has been dramatically improved, leaving the area once again safe for the public.



[Watch a video of De Ronde AML Reclamation Project](#)



[Iowa Department of Agriculture and Land Stewardship](#)  
[Mines and Minerals Bureau](#)

## Stineman Refuse Pile – Path of the Flood Trail - Pennsylvania

### Appalachian States Regional Award Winner

Approximately 27 acres of coal refuse piles located along the "Path of the Flood Trail" in South Fork Borough posed multiple environmental threats to the area. Frequent erosion clogged the unnamed tributary to the Little Conemaugh River and highly acidic water leached into and subsequently impaired local streams. To address these hazards, Pennsylvania's AML Program removed all of the refuse piles. This improved the Little Conemaugh watershed, while creating new opportunities in the area for recreation, tourism and a safer walking trail.



[Watch a video about the Stineman Refuse Pile](#)



[Pennsylvania Department of Environmental Protection](#)  
[Bureau of Abandoned Mine Reclamation](#)

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## Wolf Branch Middle School Sag Subsidence - Illinois Interior States Regional Award Winner

Significant sag subsidence under the Wolf Branch Middle School severely damaged the school building, forcing it to be condemned while displacing more than 400 students and staff. The Emergency Unit of Illinois' AML program worked with the local school district to address the hazards in two phases. Phase 1 consisted of restricting public access to the potentially unstable building while conducting a subsurface exploration. Phase 2 consisted of backfilling the underground mine with grout designed to stabilize the subsidence and prevent further collapse. Although a portion of the school was damaged beyond repair, it is currently being reconstructed and expected to reopen for the 2021-2022 school year.



[Watch a video about the Wolf Branch Middle School Sag Subsidence](#)

[Illinois Department of Natural Resources  
Division of Abandoned Mine Land Reclamation](#)

## The Dutchman Canyon Reclamation Project - New Mexico Western States and Tribes Regional Award Winner

The Dutchman Canyon Reclamation Project addressed public safety concerns and the environmental damage caused by 11 acres of coal refuse piles that were clogging drainages and leaching chemicals in Colfax County, New Mexico. Furthermore, a total of 75 acres had been disturbed by past mining. The New Mexico Abandoned Mine Program took actions to make the area safe for the community by re-grading the coal refuse embankments, removing coal waste where possible, installing drainage structures, rerouting the ranch road, restoring sinuosity to the stream channel and establishing a wetland.



[Watch a video about the Dutchman Canyon  
Reclamation Project](#)

[New Mexico Energy, Mineral, & Natural Resources Dept.  
Abandoned Mine Lands Program](#)

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## The 2020 Noonan Foamed Sand AML Project - North Dakota Small Project Award Winner

An abandoned mine site, located within a Wildlife Management Area, contained multiple subsidence features, which posed a hazard to the public. Due to the remoteness of the site, as well as the lack of any structures in the area, an opportunity presented itself. The North Dakota AML Program evaluated the effectiveness of foamed sand versus cementitious grout mixes to reduce costs associated with traditional drilling and grouting projects. The project is considered small in scale by reclamation standards, but proved that in non-dipping coal seams, foamed sand could provide the same support as cementitious grout at a reduced cost.



[Watch a video about the Noonan Foamed Sand AML Project](#)

[North Dakota Department of Labor  
Abandoned Mine Land Division](#)

## Hardrock Award - Remediation of Physical Safety Hazards

### New Placers Mine Safeguard Project Golden, Santa Fe County, New Mexico

There are hundreds of abandoned mine features located on public and private land parcels in the San Pedro Mountains that pose a safety risk to the public, endanger wildlife, and harm the environment. The New Placers Mine Safeguard Project focused on closing a large portion of the most hazardous features, consisting of 173 closures in total.

The New Placers Mine Safeguard Project is a continuing effort in coordinating the abilities as well as funding the partnerships between the Bureau of Land Management (BLM), New Mexico Mining and Minerals Division, Abandoned Mine Land Program (NMMMDAMLP), Office of Surface Mining Reclamation and Enforcement (OSMRE), Bat Conservation International (BCI) and three contracted agencies: RMC Consultants, Mine Gates Environmental, and Westland Resources. The New Placers Mine Safeguard Project utilized the design build concept that had been developed in prior BLM projects. The contractors were given the ability to be innovative in the type of closure they constructed as long as it met the requirements of the wildlife recommendations and the closure design was approved by BLM prior to the installation. The design build option brought the cost of mine closures down dramatically compared with previous project contracts.



# Hardrock Award - Impacting the Environment or Human Health

## Fairday Mine Reclamation Project

### Boulder County, Colorado

The Fairday Mine Reclamation (Fairday) project site is located in a remote mountain valley adjacent to an unnamed tributary to James Creek. James Creek serves as a water supply to the nearby town of Jamestown, the Lefthand Water District in Boulder County and other downstream water users. The creek also has a healthy aquatic life population. The Fairday mine originally contained two waste piles, tailings and an open draining adit with a depth of over 1800 feet. In 2005, the USFS consolidated over 3,700 cubic yards of radioactive mine waste and tailings containing uranium and other heavy metals into a repository at the mine site. The repository is located adjacent to the unnamed tributary. Surface flow in the upper portion of the tributary is intermittent. The part of the tributary traversing the lower part of the project is fed continuously by groundwater and has perennial flow. The flood of 2013, a 300 year event, eroded the toe of the existing repository and exposed more than 800 cubic yards of additional radioactive mine waste and tailings. The flood also obliterated the roads to the site which were not repaired prior to the inception of the project. The USFS contacted several contractors to look at the site in 2016. However, the contractors were reluctant to undertake the reclamation of the site due to the lack of road access.



The goal of the project was to repair the existing repository and move the additional waste rock and tailings that were exposed during the flood to a new upland repository away from the tributary. Also, at the request of the local watershed group, three off-site erosion features related to the flood totaling over one acre, were included in the project. These areas were cleared of trash, graded, seeded, mulched and covered with biodegradable erosion control mat and straw wattles. As a cost saving measure, engineering and design was completed in-house by DRMS in the summer of 2017. A CERCLA Removal Action was approved by the USFS and the project was bid in the fall of 2017. Construction took place in the summer of 2018.





# Fish Return to Boulder Creek After Legacy Mine Remediation

## Waterbody Improved

Boulder Creek is an intermittent stream that flows approximately 37 linear miles from its headwaters near Camp Wood Mountain towards the confluence with Burro Creek in Western Yavapai County. The Boulder Creek Watershed is identified as a 10-digit hydrologic unit code (HUC) watershed (15030202-03), part of the larger Bill Williams watershed draining into the Colorado River. Like most streams in Arizona, Boulder Creek's flow responds dramatically to seasonal conditions and is impacted by nearby inactive mines.

In 2000, a reach of Boulder Creek was listed on Arizona's Clean Water Act 303(d) list as impaired for arsenic, copper, and zinc. Boulder Creek is protected for the following designated uses: Aquatic and Wildlife warm water (A&Ww); Fish Consumption (FC); Full Body Contact (FBC); Agricultural Livestock Watering (AgL); and Agricultural Irrigation (AgI).

Historic metal mining from the inactive Hillside Mine was identified as both point and nonpoint sources (NPS) of pollution. An adit was continuously discharging contaminated water at a rate of five gallons per minute and stormwater would interact with the tailings piles to release additional metals to the creek. Remediation efforts conducted between 2016 and 2019 improved water quality by reducing metal loadings in Boulder Creek. The reductions have been so great there is now fish present in Boulder Creek below the adit discharge point – a first.

## Problem

A majority of the land in the site area is a mix of private, Bureau of Land Management (BLM), and state trust land. Ranching, mining, and open range are predominant land uses. Boulder Creek flows into a popular recreational water named Burro Creek and into the Bill Williams River, which is a tributary of the Colorado River.

The Hillside Mine burrowed through the Boulder Creek landscape from its inaugural operations in the late 1800s to its closure in 1951 and is now inactive. Mineral production primarily consisted of silver and gold, with subordinate lead and zinc. The site consists of the head frame, primary and secondary shafts, three tailings piles, and the former mill site. Sulfide-bearing minerals in the tailings were weathered and oxidized, creating high concentrations of metals and acidic water leaching into Boulder Creek. In 2002, ADEQ completed a Total Maximum Daily Load (TMDL) analysis<sup>(1)</sup> and subsequently developed a TMDL Implementation Plan<sup>(2)</sup> in 2004. The analyses identified three tailings piles and the discharging adit as main sources of arsenic, copper, and zinc.

Over the course of the years since the TMDL analysis, ADEQ engaged with EPA and the owners of the tailings piles to develop remediation methods. The BLM completed the remediation of the upper tailings pile in 2015. The lower tailings pile was remediated in 2017 as a coordinated effort between the Arizona State Land Department, Arizona Department of Administration Risk Management (ADOA RM), and ADEQ. The middle tailings pile and discharging adit are located on private land. After multiple years of communication with ADEQ, the private landowner ultimately decided not to take action and ADEQ initiated compliance and enforcement action against the private landowner. During the legal process, ADEQ was granted site access in 2018 and moved forward with funding remediation through the ADEQ Water Quality Assurance Revolving Fund (WQARF). The private landowner was convicted of three felony Clean Water Act violations and ordered to pay over \$2.7 million in fines and over \$2.3 million in restitution and was placed on two years of felony probation.

(1): [http://azdeq.gov/sites/default/files/bill\\_williams\\_tmdl\\_boulder.pdf](http://azdeq.gov/sites/default/files/bill_williams_tmdl_boulder.pdf)

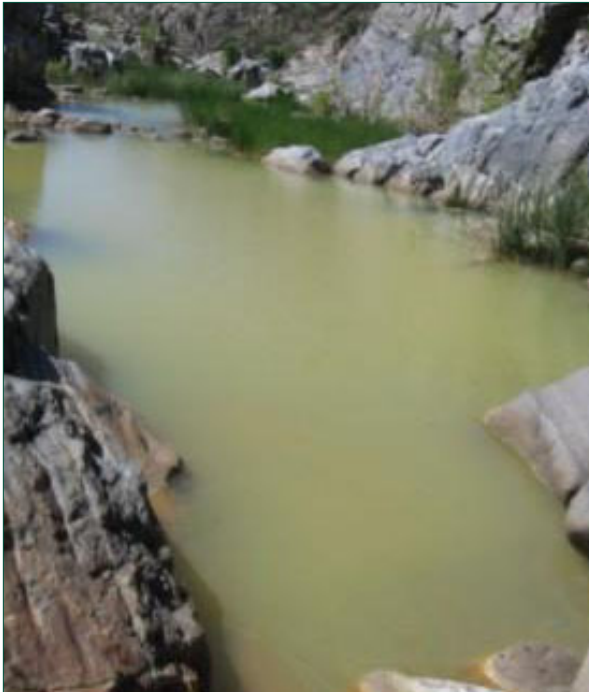
(2): <https://legacy.azdeq.gov/environ/water/assessment/download/bcimp.pdf>



Figure 1: Boulder Creek's flow regimes are contrasted in these two pictures. The left picture is from February 2001, and the right picture is the same location in November 2001.

## Story Highlights

Remediation of the middle tailings pile and adit was completed in 2019. ADEQ and Tetra Tech dewatered and plugged the adit using a primary and secondary concrete hydrostatic plugs. All three tailings piles were graded to minimize erosion and direct stormwater flow away from the piles. Water pumped from the adit was used for construction dust control. The tailings were then covered with non-woven geotextile and capped with waste rock and clean soil. A layer of native seeds was added to promote vegetation growth. Additional openings and shafts to the mine were also closed for public safety.



*Figure 5: Before and after photos of Boulder Creek near the middle tailings pile*



## Results

Remediation of the Hillside Mine improved surface water quality at Boulder Creek. The iron-orange water is now clear and blue. Cattails and other vegetation are re-establishing and fish have returned to the creek. Data collected, using NPS funds, post-remediation from Boulder Creek showed no exceedances of surface water quality standards during several sampling events. The project was a collaborative effort with involvement from the various divisions within ADEQ, ASLD, ADOA RM, Arizona Attorney General's Office, BLM, EPA Region 9, Tetra Tech, and subcontractors. The achievement was only possible with the wide-ranging support and expertise from the team. This project truly improved the water for the beneficial use of all plants, wildlife, insects, and people of Arizona.

## Partners and Funding

ADEQ provided over \$3 million in funding for the project. Funding for the project included:

- Lower tailings pile remediation – ASLD, ADOA RM and ADEQ CWA §319
- Upper tailings pile remediation – BLM
- Adit and middle tailings pile remediation – ADEQ WQARF

Watch ADEQ's YouTube Video [for more >](#)

**Natalie Muilenberg**  
**Arizona Department of Environmental Quality**



*Figure 6: Fish have returned to Boulder Creek after remediation – here is a roundtail chub.*

# Federal, State Partnerships Remediate Legacy Mine and Improve Water Quality in Harshaw Creek

## Waterbody Improved

The Harshaw Creek Basin is in Santa Cruz County, southern Arizona in the rolling hills of Sonoita Valley. The closest town is Patagonia, with a population of over 700. A three-mile stretch of Upper Harshaw Creek (HUC 15050301-025A) was listed as “impaired” by ADEQ in its 1996 and 1998 Clean Water Act 303(d) lists for copper, zinc, and acidity. Sampling data indicated that the high levels of zinc were natural background and not due to anthropogenic sources. For this reason, ADEQ completed a Total Maximum Daily Load (TMDL) for copper and acidity only in 2003.

The reach is primarily ephemeral fed by groundwater during baseflow conditions, with larger flows during storms. The basin is contained within the Coronado National Forest with recreational usage and cattle grazing. Downstream are ranches, farms, and vacation homes. Designated uses for Upper Harshaw Creek are: Aquatic and Wildlife ephemeral (A&We), Partial Body Contact (PBC), and Agricultural Livestock Watering (AgL).

[https://azdeq.gov/sites/default/files/santacruz\\_harshaw\\_tmdl.pdf](https://azdeq.gov/sites/default/files/santacruz_harshaw_tmdl.pdf)

## Problem

Arizona is known for its mining. Large-scale mining began in the Harshaw Creek Basin mid-1800s and continued for approximately 100 years. The Lead Queen Mine site is on USFS land and is inactive. The underground lead, gold, silver, zinc, and copper mine was discovered in 1897 and was in production



Figure 2: The adit at Lead Queen Mine, pre-remediation. An adit is a horizontal entrance to an underground mine primarily used for de-watering and extraction of minerals during operations.

between 1898 and 1940. Historic mining activities left behind a variety of waste rock piles, adits, and shafts. Rainfall would then produce acidic stormwater runoff, leaching metals from surrounding mineral-rich rock, tailings, and waste rock and carry metals into Harshaw Creek.

## Story Highlights

In 2016, USFS remediated the waste rock piles and several other adits and shafts at the site. However, the remedy at the main adit began to fail and discharge pollutants. In 2019, USFS installed a hydraulic plug to cease the discharge. Subsequent site visits confirmed no new seepage coming from the former adit opening.

## Results

Remediation of the Lead Queen Mine improved surface water quality in the Lead Queen Mine tributary, which flows into Harshaw Creek. Data collected post-remediation in 2020 showed no exceedances of surface water quality standards during several sampling events.

Pollutant	Pre-Plug (mg/L)	Post Plug (mg/L)	Designated Use & Standard (mg/L)
Lead (total)	0.021	0.0013	PBC (0.015)
Copper (total)	1.4	0.033	AgL (0.5)
Copper (dissolved)	1.3	0.027	AWe (0.055)
Zinc (dissolved)	4.1	0.082	AWe (2.4)
pH	3.69	7.01	PBC (6.5-9.0)

Table 1: Sampling Results

## Partners and Funding

The project was a collaborative effort between ADEQ and USFS. The subsequent effectiveness monitoring conducted by ADEQ was supported by CWA §319 funds.

**Natalie Muilenberg**  
**Arizona Department of Environmental Quality**

# How Do You Test the Flowability of Your Grout?

I am asking all the underground mine reclamation experts out there! North Dakota AML uses the same standard grout testing procedures every year. We contract with a material testing company to test grout. One of the tests measures flowability. We have a specified slump range of 6 to 11 inches using the standard cone slump test, ASTM C143. If it ain't broke don't fix it, right?

Of course, 2020 was the year of changes. Summer 2020, we rejected a couple of truckloads of grout with 11.5" slumps. Then, the grout supplier on the project, a major concrete producer in the state, questioned the legitimacy of the slump test on grout. This challenged ND AML to research the different tests and reassess our grout specifications. Through research, we found that the ASTM C143 specification has a note that states "concretes having slumps greater than about 9 in. [230 mm] may not be adequately cohesive for this test to have significance. Caution should be exercised in interpreting such results." Our slump range of 6 to 11 inches is not recommended by ASTM for this test.

## Now what?

Through research, we found the spread test, ASTM C1611. This test is typically used on another highly flowable material, self-consolidating concrete. Pictured below is the cone used in both the slump and the spread tests. It is a very similar test in terms of equipment needed, time to take the test, setup, and difficulty.

We will use the spread test in the summer of 2021 concurrently with the slump test. With anything new, there may be some growing pains. This could mean some trial and error at the beginning of the project. However, once we have done enough spread tests, we will have enough data to compare the two tests. If any other AML programs have any experience using either test, please reach out to ND AML with any useful information on this subject. Also, if anyone is curious about how the switch goes in 2021, we will be happy to share our results.

**Ross Edison**  
**North Dakota AML**



*A material tester conducting a slump test in Williston 2019.*



*The testing area is on-site, away from the activity. A shed is used to hold the samples for field curing.*

## NEWSLETTER ARTICLE SPECIFICATIONS

Articles subject to editing. Submit an article by e-mail. Include author's name, title of article, captions for photos. Submit photos in TIF (preferred) or JPG format, and original photo size.

E-mail photos as individual files, not embedded.

**Deadline for Spring Edition is April 15, 2022.**

Email articles to **Justin Adams** ([justin.adams@ky.gov](mailto:justin.adams@ky.gov)) or mail articles to: Justin Adams, Director  
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## **Congress Adopts Bipartisan Infrastructure Framework (BIF); Coal AML Funding Secured**

On Friday, November 5, 2021, in a midnight vote, the House of Representatives passed the much-anticipated Bipartisan Infrastructure Framework bill (BIF), which includes several elements of great importance to IMCC and NAAML P members. The President is expected to sign it into law promptly. The only delay in finalizing this legislation now will be finding an appropriate time on the President's schedule for a signing ceremony.

This bill fulfills the primary legislative goal of IMCC and NAAML P over the past few years, reauthorization of coal AML fee collection. Beyond achieving our basic goal, the BIF brings truly significant, transformative changes to the coal AML program:

- (1) it delivers \$11.3 billion in additional US Treasury funding for coal AML, roughly twice the amount the states have been able to devote to AML work in the 40-year history of the program.
- (2) Congress recognized, for the first time, that coal AML is an issue worthy of an expenditure of general revenue from the US Treasury. This is quite important in view of the trend toward declining coal production, which can be expected to continue as the nation takes action to reduce carbon emissions.
- (3) As revenue from AML fees continues to decline, the newer, modified version of the AML program that governs the Treasury funds will become the coal AML program of the future.

IMCC had a hand in the development of the AML parts of the BIF from its inception. As originally drafted, the BIF included the treasury funding, but not reauthorization. When IMCC's suggestion to include reauthorization in the bill received bipartisan support, this was added and the path forward toward achievement of our long-term legislative goal was laid. IMCC's suggestion for changes in the formula for distribution of the new treasury funds to the states was also accepted. While we didn't get everything we originally sought through reauthorization, or everything we would like to have gotten, we probably ended up getting more than we could have ever conceived when we began the reauthorization effort.

Above all, the adoption of this bill represents the culmination of years of concerted effort by the States and Tribes through IMCC and NAAML P to inform Congress about the continuing importance of coal AML work. Thank you to everyone who contributed to this effort for your hard work and perseverance. IMCC once again served as a trusted source of information and integral part of the process where state mining interests are involved.

The next step for IMCC on coal AML will be working with OSMRE on implementation of the BIF. We have formed a task force of states for that purpose and Glenda Owens, the Acting Director of OSMRE, has committed to collaborating with us. We have already begun the effort through the letter we sent to Acting Director Owens on this past Friday requesting a meeting. For now, it is a time to appreciate the accomplishment this bill represents. After several years of uncertainty, the future of the SMCRA Title IV AML program is now secure

The contents of the BIF concerning AML *and its other mining-related provisions* are summarized below. The complete text of the BIF can be found through the following link: [Text - H.R.3684 - 117th Congress \(2021-2022\): Infrastructure Investment and Jobs Act | Congress.gov | Library of Congress](#)

### ***New Treasury Funding for Coal AML Programs***

- \$11.3 billion will be deposited into the AML Trust Fund for distribution to eligible states and tribes (i.e. those with an approved AML program). Both uncertified and certified states and tribes are eligible for grants
- The funds are to be distributed in equal, annual amounts over a 15-year period based on the number of tons of coal historically produced in the state or tribe before August 3, 1977. Unlike the way historic coal production is used in the current formula for distribution of AML funds, all states and tribes (whether certified or uncertified) will be included and receive some level of funding.
- The total amount of grant funding for any state or tribe shall not be less than \$20 million over the 15-year period, but only to the extent that a state and tribe has sufficient “covered activities” to substantiate the need for this funding.
- Grants from these funds are ***in addition to*** those otherwise received by states and tribes under the existing AML program
- The funds can only be used for “covered activities”. This is limited to the work permitted by subsections 403(a) (i.e. priority 1, 2 and 3 projects), 403(b) (i.e., water replacement projects) and section 410 (i.e. emergency projects).
- The Secretary of the Interior is required to report to Congress on progress made with the funds six years after the date on which the first distribution of grant funding occurs. The Secretary is required to solicit the input of the states and tribes prior to submitting the report to Congress.
- 20 years after the date of enactment of the Act, the Secretary of the Interior is required to evaluate grants to states and tribes. Following that evaluation, states and tribes are required to return any unused funds to the AML Trust Fund (presumably for AML purposes, but there is no direction as to how the leftover funds are to be distributed).
- The bill allows priority to be given to reclamation projects that employ current or former employees of the coal industry. It is yet to be seen how this priority will be incorporated into the grant process.
- States and tribes are authorized to aggregate bids under these grants into larger statewide or regional contracts.
- \$25 million is reserved for use by the Secretary and states and tribes for financial and technical assistance for the purpose of making amendments to the AML inventory under section 403(c) of SMCRA.

### ***Coal AML Fee Reauthorization and other Title IV-Related Provisions***

- In addition to the infusion of \$11.3 billion in treasury funds into the AML fund, the bill reauthorizes collection of AML fees from industry at 80% of current rates for 13 years.
- Within one year, OSMRE is to complete a report “describing the results of a study on the feasibility of revegetating reclaimed mined site”, where “mined sites” include land eligible for Title IV of SMCRA and other lands.

### ***Development on Current and Former Coal Mine Land***

Two sections of the BIF deal with energy development on “current and former mine land”, with “current and former mine land” defined as land subject to Title V of SMCRA:

- The Department of Energy is required to produce a report on the viability of siting solar energy on current and former coal mine land.
- A program to demonstrate the technical and economic viability of carrying out clean energy projects on current and former coal mine land is established. \$500 million is authorized for this latter program over the next five years.

### ***Critical Minerals/ Rare Earth Elements***

The BIF furthers Congress’ interest in promoting domestic production of critical minerals (as defined by the Energy Act of 2020) in a number of ways.

- Streamlining Federal Permitting for Critical Minerals Production –
  - DOI/BLM and DOA/USFS are directed to complete the federal permitting and review processes with maximum efficiency, specifically by:
    - establishing timelines and schedules for “applications, operations plans, leases, license, permits, and other use authorizations” for critical mineral activities on federal land”;
    - establishing permitting performance goals and tracking progress using those goals;
    - engaging in early collaboration with agencies, project sponsors, and stakeholders;
    - ensuring transparency and accountability; and
    - *engaging in early and active consultation with state, local, and tribal governments to*

- avoid conflicts or duplication of effort,
  - resolve concerns, and
  - allow for concurrent rather than sequential review
- The agencies are directed to produce a report one year after the law is passed which details the steps the agencies have taken to comply with these provisions and quantify the time period for completing the federal permitting and review process for critical minerals. The agencies must also publish the performance metrics they develop and report on their progress in meeting those metrics.
- Enhancing Geologic Mapping for Critical Minerals: Ore Bodies, AML sites, and Mine Waste –
  - Critical minerals data will be added to the National Geologic Mapping Database (NGMD), which is designed to aid mineral exploration and development and other kinds of land use planning.
  - USGS is directed to update data on known mineral deposits to “characterize the whole ore body and emphasize recoverable critical minerals in a given surface or subsurface deposit.” USGS is given ten years to complete this work.
  - USGS is directed to add data on the location of AML sites and mine waste to the NGMD with priority given to AML sites with multiple critical minerals present. A timeframe for this work is not specified.
- Funding for Research and Development Related to Critical Minerals –
  - *Energy and Minerals Research Facility* - USGS is directed to work with an academic partner to build a facility to support “energy and mineral research and appurtenant associated structures”
  - *Rare Earth Elements Demonstration Facility* – DOE is directed to establish a demonstration program for “full scale integrated rare earth element extraction and separation facility and refinery”. It is specifically noted that the facility will provide environmental benefit by using feedstock from AMD, mine waste, or other deleterious materials.
  - *Critical Minerals Mining and Recycling Research* – The National Science Foundation (NSF) is directed to award competitive grants to support basic research to innovate critical minerals mining, recycling, and reclamation strategies and technologies. A critical minerals interagency subcommittee is established within the National Science and Technology Council to coordinate federal science and technology efforts related to securing reliable supplies of critical minerals. The Board of the NSF is directed to review the resulting research for opportunities to improve critical minerals supply chains, with ways to



improve processes with federal agencies, states, and local government specifically noted as an interest.

### ***Potentially, A New Hardrock AML Program***

- The bill *authorizes* \$3 billion to the Interior Department to establish a hardrock AML program, half of which is dedicated to grants to states and half of which is for federal lands. The interior Department is directed to establish a program for these purposes within 90 days of the bill's passage.
- The money is to be used to “inventory, assess, decommission, reclaim, respond to hazardous substance releases on, and remediate abandoned hardrock mine land.”

Importantly, the BIF *authorizes* the funding but does not actually *appropriate* it. As the BIF was being developed in the Senate, the expectation was that funding for the new hardrock AML program would be appropriated as part of the larger spending package planned for adoption through budget reconciliation known as the Build Back Better (BBB) plan or bill. Funding for this program may also be provided through enactment of a federal budget for Fiscal Year 2022. These possibilities will be further addressed below.

### ***Prevailing Wage Requirements***

All AML work performed with the money provided by the BIF is required to comply with Davis-Bacon Act prevailing wage rate requirements.

### **Update on Funding for a Hardrock AML Program**

Even though the BIF does not provide funding for a hardrock AML program, it nonetheless requires the Interior Department to develop one within 90 days of the BIF's passage. Impetus for this program has also been provided by funding included in the President's proposed FY 2022 budget. IMCC has assisted the Interior Department by surveying States and Tribes regarding their existing hardrock AML needs, efforts to address them and recommendations for design of the federal program. We have also led several virtual discussions among a large group of State and Tribal agencies and Interior Department representatives tasked with organizing this program. IMCC will continue to work with the states and Tribes and DOI to shape the development of the new hardrock AML program with the States' and Tribes' input.

The current status of congressional consideration of funding for this program is summarized below.

- The prospects for money for the program through the BBB, which has been the largest potential source of funding, may have faded somewhat. Negotiations

over the BBB in the House of Representatives have been contentious and rapidly evolving over recent weeks. It was initially conceived as a \$6 trillion spending package that first shrunk to \$3.5 trillion when initially compiled in writing and, later, to \$1.75 trillion in an effort to garner sufficient votes in the Senate for its passage. The \$3.5 trillion version included \$2.5 billion for hardrock AML. The first \$1.75 trillion version of the BBB included nearly \$1 billion (\$997 million) for hardrock AML. Changing priorities have left the current the version of the BBB in the House with *no* funding for hardrock AML. Passage of this bill by the House is at least a week away, though, and its spending priorities for the BBB may yet change again. If not, the future of this bill in the Senate, whose priorities are likely quite different than those in the House, is anything but certain. We will keep you informed as developments occur.

- More modest funding for a hardrock AML program appears to be likely as a part of a federal budget for FY 2022. The President's proposed budget includes an Energy Community Revitalization Program that would address hardrock AML and abandoned oil & gas wells. Budget bills from both houses of Congress include funding for this program.
  - A budget bill adopted by the House would provide \$120 million for this program. According to the accompanying report, \$50 million of this amount is for state grants, \$14 million is for Tribal grants, \$53 million is for a Federal program and \$3 million is reserved to the Interior Department for program management.
  - A budget bill recently released by the Senate Appropriations Committee would provide a total of \$65 million for the program. The draft Explanatory Statement for the bill indicates that \$35 million of this amount is for State grants, \$10 million is for Tribal grants, \$18 million is for a Federal program and \$2 million is reserved to the Department for program management.
  - Both the House and Senate bills specify that the amounts provided are in addition to any other available funds. So, any funding that might be authorized for Hardrock AML through the BIF or BBB will be in addition to what is authorized under the budget bill.

**Thomas L. Clarke**  
**Executive Director**  
**Interstate Mining Compact Commission**

## Summary of AML Implementation Issues with the BIF

Annual grants. Will they be handled the same as current grants? If not, how will they be handled? A single grant application for funds from the BIF and the reauthorized AM program would be desirable. How much can be used for administrative costs? How soon can OSMRE develop guidance?

Who are eligible grant recipients? This should include all states and tribes that currently have AML programs.

What are “covered activities”? Authority to do “Priority 3” work with BIF funds is granted. This will clearly allow (1) AMD treatment systems to be built and (2) ongoing operation and maintenance (O&M) costs to be paid. Does this authority extend to dedication of BIF funds for the future, long-term operation and maintenance costs of such systems? This authority is not withheld, but clarity is desirable. Because, as a practical matter, no new AMD treatment project (Priority 3 work) is likely to be built unless money can be dedicated for the long-term O&M costs of that project, we believe the authorization to use BIF funds for Priority 3 work necessarily includes authority to dedicate BIF money to long-term O&M costs. Otherwise, Priority 3 work, as Congress clearly authorizes in the BIF, is unlikely to be done. Therefore, this interpretation is essential to achieving the Congressional intent of performing Priority 3 work with BIF funds. Will OSMRE interpret the BIF this way? Note: A proposed interpretation on the availability of treasury funding under the BIF for long term O&M must also address the BIF’s lack of any mention of the AMD set aside provision in current law, Section 402(g)(6). Arguments can be made that Section 402, as a whole, does not apply to the Treasury money. We are interested in your thoughts on the ramifications of such a position (e.g., the qualified hydrologic unit requirement wouldn’t apply either) as well as all other aspects of the legal interpretation.

How will the distribution formula be applied? It is based on historic coal production, but states that would receive less than \$20 million over 15 years (\$1.33 million per year) are to receive this amount, if they can demonstrate they have sufficient covered activities to justify continuing to receive the money. The BIF does not mention the need for states that receive more than \$20 million, based on the historic coal production formula, to similarly demonstrate their need for the money. If a state no longer needs the money because it has completed all of its “covered activities” will it nonetheless continue to receive money? As states exhaust their inventory of “covered activities”, will OSMRE adjust the distribution formula for the remaining states to pass on the money from those who no longer have the demonstrated need?

Environmental Justice/Justice40 guidance. The states will need clarity on how to address these concerns.

Preference for unemployed or current miners. How will this work? Is it applied during the grants process? Or as a grant condition? Or do states apply it on a project-by-project basis?

Bid Aggregation. Same questions. How will this work? Is it applied during the grants process? Or as a grant condition? Or do states apply it on a project-by-project basis?

Davis Bacon Act. Prevailing wage requirement. The states will need clarity on addressing Davis Bacon Act wage concerns.

Timing and sequence of implementation. The AML reauthorization section of the BIF could be quickly implemented with minor changes to existing regulations and guidance. Will OSMRE delay implementation regulations and guidance on this section in order to produce one package of implementing regulations and guidance? Or will it proceed on two separate tracks for reauthorization and the new provisions from the BIF? How quickly can the new BIF provisions be implemented? Congress intended to put this money to use “as expeditiously as practicable”.

Money for inventory enhancement. How much of this money will go to OSMRE? How much to the states? Is the \$25 million figure a cap on the money available for this purpose? Even though current law only requires Priority 1 and 2 sites to be included in the federal inventory, E-AMLIS includes many other non-Priority 1 or 2 features. Will OSMRE attempt to update E-AMLIS to more comprehensively include “covered activities” under the BIF?

OSMRE reports at the 6 year and 20 year intervals.