

SCIENCE, ARTS AND AMD REMEDIATION: BOTH NECESSARY, NEITHER SUFFICIENT¹

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Abstract. AMD remediation and the public support that is often essential to funding that remediation offer the opportunity to reconnect the Sciences and the Arts, to establish a much wider circle of support for our work. Drawing on two examples, one in western Pennsylvania and one in southwestern Virginia, this plenary presentation suggests that science alone may not be sufficient, particularly in places with significant public access or visibility. Engaging what academia traditionally defines as the Arts, whether just good interpretation or broader history, landscape design, even literature, can bring significant improvement to the range of human accessibility of our work in coal country. Good design is more than clean water; it is also an opportunity for public engagement, even delight. Good history opens opportunities for better understanding, of AMD and why it is there, of coal country environments, of our national values and how they have changed over time, even for reflection on the remarkable achievements of our predecessors and our own contemporary role in that continuum of history and environmental concern. Equally important, engaging the Arts also engages a variety of new partners and new sources of support for AMD remediation in coal country, expanding both the community interest in and the support for addressing the most emblematic of environmental problems in the Appalachian coal fields, Acid Mine Drainage.

Additional Key Words: Landscape Design, History, Interpretation, Partnerships, Watershed Assistance

¹ Paper was presented at the 2004 National Meeting of the American society of Mining and Reclamation and the 25th West Virginia Surface mine Drainage Task force, April 18-24, 2004 Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502.

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Proceedings America Society of Mining and Reclamation, 2004 pp 322-332
DOI: 10.21000/JASMR04010322

<https://doi.org/10.21000/JASMR04010322>

This paper must start with a brief caveat. What follows is the result of a dozen years in historic preservation, another decade as a developer and consultant and another ten working in coal country. It is not the official opinion of the Office of Surface Mining: it is my personal perspective.

I should probably add a second. This is the second year in a row that I have been asked to speak to ASMR on this topic. I'm not sure if the organizers decided they wanted a second chance to knock me off or if they thought what I have to say is important enough to repeat. I do recognize that "two in a row" probably means this is my last chance for some time to come. I appreciate the opportunity and intend to take full advantage of it.

We are here to talk about the vast array of coal country science and technology and how each of us can better utilize the best in both fields to do our job. AMD remediation has come a long way even in the ten years I have known what AMD even is, and I deeply respect and appreciate the contributions that many have made. As my title indicates, I'm here to suggest that in some instances, particularly when there is the opportunity to engage the public, science alone is simply not sufficient, no matter how good that science may be.

To be certain, we know that the EPA recognizes AMD as one of the largest water quality problems in the Appalachian coal country. Often desolating entire watersheds, our rust colored streams are the consequence of a proud past filled with hard work and dedication in an era when our national values paid little attention to environmental consequences. Today, AMD is a painful reminder of the poverty and economic abandonment that currently exists in many parts of coal country, the emblematic orange silent signature of dying communities.

We also know that the AMD emanating from Abandoned Mine Lands will be addressed by public funds...eventually. The difficulty, at least as I see it, is that AMD is not at the top of the list of public concerns. Indeed, few in this nation, including policy makers, even know what AMD is; let alone what might be done about it. At least from my historian's perspective, if we are ever going to get sufficient public support to create public sources of funding adequate to address these problems, we must bring AMD remediation to the public mind. It simply cannot be just a science problem, isolated and perhaps unapproachable: it must be more than that. We need AMD treatment systems that voters WANT in their backyard -- and that is what I am here to discuss.

For me, my epiphany was Site 14 in Somerset County, PA, a small site designed by Hydrogeologist Robert Deason. What I saw there was an AMD discharge on permitted land that was pumped to a treatment system that consisted of an aerator and then a series of treatment cells that successfully transformed AMD into legal water that could be discharged back into the local trout stream. What I also saw, and Bob did not, was a quite remarkable fountain surrounded by a black cone of stone and a circular pond of deep red that then flowed down a tumbling limestone waterway into a series of ponds that clearly demonstrated the increasing health of the water in their increasing biodiversity. When I first remarked on the beauty and interpretive value of this system, I was threatened with bodily harm if I ever called anything Bob did a “fountain” again. Happily, Bob is also a teacher of great patience, I’m a fast learner and we soon formed a collegial partnership and a mutual interest in a project I was then only thinking about, one I called “the art thing” for a couple years just because I did not want to define it any tighter than that.

What motivated this interest in “the art thing” was recognition of two realities. First, if we were ever going to get anywhere with AMD in coal country it would take a lot more public support, real voter support. We could not just wait for the government to fix it, since “the government” seemed to have a few other priorities on its mind at the same time. Second, there could be a lot more going on in an AMD remediation site than just good science. It might also be designed in a way that engaged, even delighted; it could bring understanding of both the problem and the solution through interpretation; it could engage many disciplines and many perspectives in the Arts and in the Sciences. I also realized early on that there were no clear “bad guys” in this story. What we as a nation once supported with our values now has unfortunate environmental consequences to be sure, afflicting thousands of miles of streams and communities. But like Pogo, the “enemy is us,” all of us as a nation, the values we held at the time we created these problems. Fortunately, since “we” did it, “we” might also fix it, an assumption embedded deep in the American character. The challenge was to get enough of “we” to the table and willing to go to work.

I also began to realize AMD is the most wonderfully emblematic of coal country environmental issues. For scientists, Acid Mine Drainage, AMD, is a ubiquitous and unstable acid-and-metals-laden liquid that seeps or gushes from abandoned coal mines, choking streambeds with orange sediment that kills the bottom of the food chain, leaving streams dead.

In a larger human perspective, AMD is the orange, silent signature of dying communities, lost biodiversity, lost opportunity, the emblematic color of slow death. The surface expression of vast underground industrial activity (coal mining) now abandoned, what ASMR members may think of as that unstable aqueous solution, one arts writer aptly described as the "gangrenous puss of deep earth wounds," an equally accurate and far more compelling description.

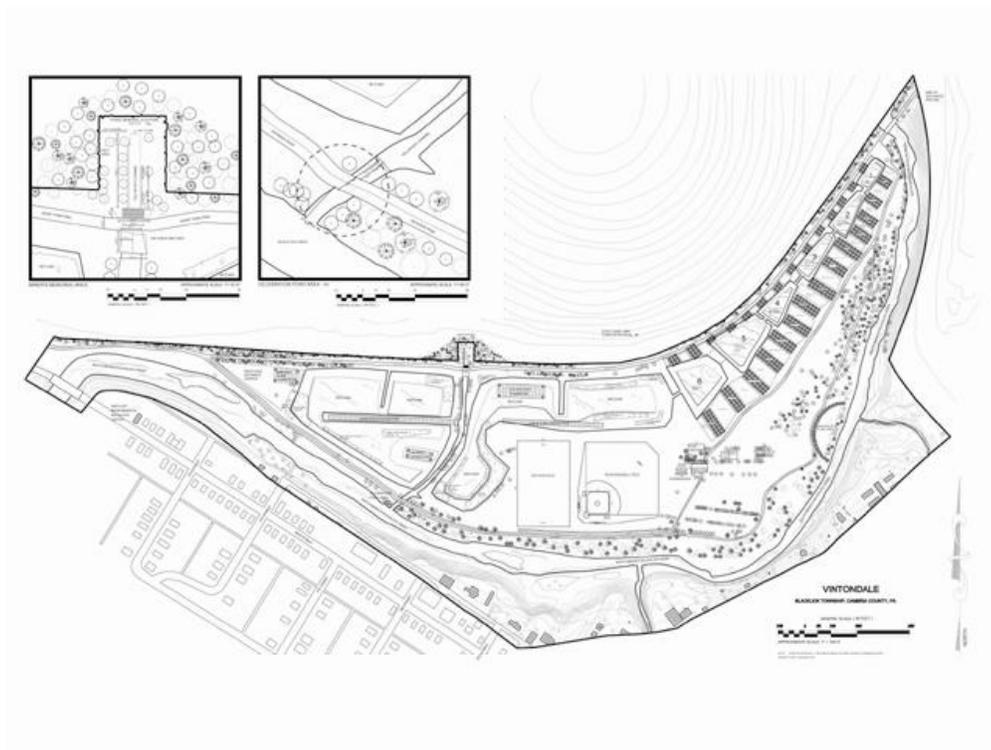


A second realization is also relevant. The Appalachian Coal Country is one of America's forgotten places and perhaps its largest forgotten ecosystem. Most often described and photographed as a land of overwhelming environmental and human desolation, this region stretches from northeastern Pennsylvania down the Appalachian Mountains into central Alabama. Across this vast region you will find a remarkably similar history and culture, places where low levels of hope match levels of income and environmental devastation often overwhelms human aspirations for a better life. Dead orange-coated streams and vast black piles of waste rock called "bony" or "culm banks" or "gob piles" have come to symbolize this place. The broken remnants of company towns, "patch towns," or "coal camps" scattered by the scores throughout these mountains, contain the peoples still caught in the free-fall of mechanization, industrial decline, globalization and an old company-town mindset that can seem passive in its acceptance of these conditions. These are places where the number of families with children living in poverty too often exceeds fifty percent and where the surrounding environment only

enforces a sense of overwhelming abandonment. To me, this vast eastern mountain ecosystem seemed to be a place in which this nation might confront — and even overcome — our own past environmental and economic values, adding thousands of acres of reclaimed, healthy lands and waters — and peoples — to our national treasure — and where I thought it might be possible to demonstrate the utility, even significance, of the arts and the humanities to that recovery process as well, bringing new perspectives, new disciplines and new supporters to AMD remediation.

This is a plenary paper, and by now I suspect the hard core scientists think I'm nuts, my boss is probably looking for the exit door and that pad of pick slips he carries, and the rest of the audience is wondering what happens next. In an effort to now redeem myself, let me provide two successful examples of this approach, emphasis on successful.

The Vintondale, Pennsylvania, site is situated on 35 acres of mine-scarred land that once hosted the heart of this small mining town — the Vinton Coal Company plant with its half-dozen major buildings and the Pennsylvania Railroad line that connected Vintondale with the outside world. The northern edge of the site is the old railroad right-of-way, today known as the Ghost Town Tail Trail, which attracts approximately 75,000 users annually, a major factor in selecting this site. The South Branch of Blacklick Creek, a river severely impacted by AMD, curves around the eastern and southern boundaries of the park and separates it from the town.



Like most of coal country, townspeople are still deeply connected to this central place and community involvement has been an integral component of the AMD&ART process from the beginning. More than 80 residents — 10+% of the population — turned out for two public design meetings to write down their ideas on site maps and to talk with AMD&ART team members and each other about their town and the best AMD&ART solution. The resulting design proposal incorporates ideas from everyone that contributed, attracting wide community and agency support and giving our final design the deep imprint of community perspective.

This community support — and a lot of work by AMD&ART AmeriCorps and VISTAs — is what made the “AMD&ART Park” a reality. Using an interdisciplinary team with me literally choreographing the entire process to assure that we incorporated ideas and suggestions from the community and many other sources, this immense swath of desolate land has become a place for recreation, historical reflection, ecological education and AMD remediation. At the eastern end of the park, a sequence of large pools shaped to fit the topography and reduce excavation costs mark the beginning of the treatment system. The AMD discharge flows through this series of settling ponds and a Vertical Flow Pond until it flows into the new wetlands, cleansed of its metallic pollutants and neutralized to a healthy pH. Planted bands of native trees, their fall colors reflecting the increasing health of the water, transition from deep red to orange, then yellow, then to silver-green alongside the system in a Litmus Garden, a native tree arboretum that may also create the opportunity for a fall festival celebrating the Litmus Garden's peak color and Vintondale's recovery. Where black boney, or waste coal, once barely supported scrubby grasses and stunted trees, a new 7-acre wetland environment is attracting a variety of birds and wildlife. That environment, our History Wetlands, also reveals the foundation remains of the Vinton Colliery structures. Planted in a monoculture of Red Maples, these "structures" will again rise to assume the approximate scale of these massive buildings. At the center of the AMD&ART Park, we are working with the community to build an active recreation area, a place filled with baseball, soccer, horseshoes, volleyball, and picnic tables, grassy places for little kids and their moms and more.

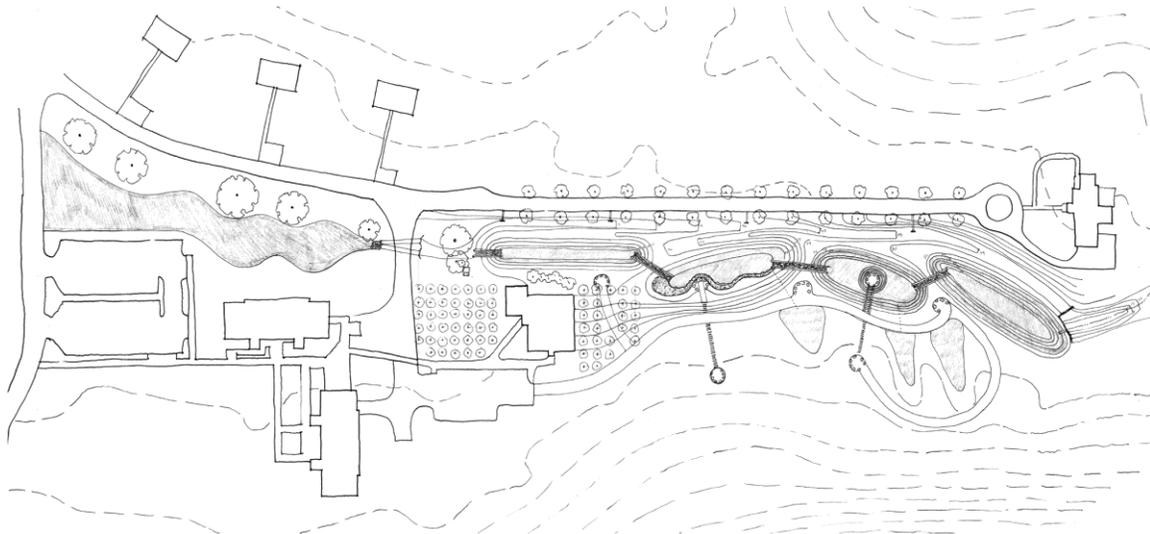
At the site of the Mine #6 portal we are reconstructing, full scale, the heavy timber frame of the mine opening and filling the opening with a black Granite slab etched with the life-size images of miners taken from 1930's film footage from Mine #6. Just across the Ghost Town trail from the portal, a 15 by 25-foot platform at grade will become a mosaic map of the entire site,

opening better understanding of the mine and its community. At the point where the now-clean water returns to the river, a national student competition will create a marker for this community victory. Finally, looming over the eastern edge of the site is a massive pile of boney that we hope will one day, after reclamation, provide an excellent vantage point to overlook the park and think a bit about the scale of this human endeavor, the determination and simple grit of the people that started all this, and the commitment of their kids that finished it, closing a circle of critical cultural as well as environmental significance.

Visitors to the park can walk on interpretive trails that draw together historical information, the science behind passive AMD treatment and the newly healed ecosystem that now thrives in the wake of remediation. I hope residents and visitors alike will gain new perspective on the resilience of nature and the ability of humans to work with the environment in a healing process that creates a new community center. The physical presence of the energized place will symbolize the success of community residents in healing these waters, not only by finishing a job unknowingly left unfinished by past generations, but also by creating a new asset for their own families and their own community future. AMD&ART is demonstrating that AMD treatment sites, creatively designed with the community, have the potential to re-instill a sense of place and pride, allowing community members to forge new connections to the local environment and history.

I think there are lessons in AMD&ART successes in Vintondale that can be applied much more broadly. Most importantly, restoring streams contaminated by AMD, or reclaiming any other environmentally devastated area in which people have a stake, requires more than technical fix — sustainable reclamation is not just a science project. A lasting solution to the complex problems of environmental reclamation must be cultural and environmental. A scientific solution may clean the water, but a multidisciplinary solution has the power both to clean the water and to engage community in a healing process. AMD&ART has demonstrated there is great potential to reclaim and restore this part of coal country, to bring the region greater environmental sustainability and economic prosperity. And I think we are establishing a new role for artists and humanists as well, not as solitary visionaries, but as participants; not as some ultimately mystical or magical process, but a important, critical perspective; not as arbitrator, but as co-worker, one among many disciplines equally necessary (but none sufficient) to the recovery and revitalization of this region and its peoples.

Success story #2 is the Wise Legacy Wetlands project right in the center of the campus of the University of Virginia-Wise in the far southwestern corner of Virginia. This is a combined effort between the Guest River Group (GRG), UVA-Wise, the Office of Surface Mining, the National Endowment for the Arts, Virginia Department of Mines, Minerals and Energy, Lonesome Pine Soil and Water Conservation District, Wise County Historical Society, AMD&ART and many other local partners. Surface and underground mining operations have resulted in deteriorated water quality on the campus of the UVA-Wise, especially in the large lake in the center of this growing campus. In fact, much of the campus is on old strip land, yet there is no mention of what should be a proud mining legacy as a part of the history of this place, now a campus.



The Guest River is the third largest tributary to the Clinch River, one of the most biologically diverse rivers in the nation, but serious problems such as acid mine drainage (AMD) continue to impact water quality in the Guest River. The goal of the Guest River Group is to install a series of wetland treatment systems to remediate AMD before it reaches the Guest River. Funding from the OSM Watershed Cooperative Agreement Program and other sources (\$132,000) was awarded to the GRG to construct a wetland treatment system to provide passive treatment of AMD on the campus. That proved just enough of a commitment to begin to gather other agency interests and other sources of funds to a remarkable, truly emblematic, project.

To improve water quality is an admirable goal, but this site has a cultural significance, an emblematic opportunity, that begs to be addressed. In the public's eye, this is already a location

that is already representative of self-improvement, a symbol of positive change in the region. This site can spark discussion about the healing of mined scarred lands and peoples. The many places like this in the region are a product of a proud and hard working past, as well as a painful reminder of the poverty and economic abandonment that currently exists. This Wise Legacy Wetlands Project can become a continuing reminder to generations of college students from the region that AMD and many of the other coal country challenges can be overcome. It will become visible proof that once derelict lands can not only be reclaimed to environmental standards, they can also be reclaimed by its citizens to become a continuing contributors to the regional heritage.

Very briefly, at the eastern or upper end of the site, quite near the Chancellor's home, the first cell will become the primary AMD treatment as well as our opportunity to address the mining that occurred at this site, from home heating coal dug by the owner to a large strip mine just up this hollow and still a part of the campus. The next cell or pond will provide the best overview opportunity, utilizing the natural topography to create a small island in the center of this wetland and on that island creating a circle of partnerships, stone benches that each bear the name of a partner agency in the overall project. The third pond is perhaps the most "natural" in its ragged edges and surrounding riparian zone vegetation. It will be a place where we can respond to the environmental opportunities for interpretation and understanding, while the last pond is both more formal and more exposed and creates opportunity to address agriculture, the other major industry in the last century of regional growth. When it finally flows to the upper end of the large lake that is the center piece for the UVA-Wise campus, the water will be clean -- and anyone that has taken that same journey will understand a great deal more about regional economic growth, regional environments and the many opportunities -- and partners -- there are to address those challenges.

Finally, I think it important to point out that these are not impossible projects; both are, in fact, models for the artful assembly of multiple funders and multiple interests. At AMD&ART, AmeriCorps and VISTA have staffed the entire project: there is no other paid staff and no paid director, my own work with the site is as a volunteer. We used the GFCC permit process to remove 70,000 tons of waste materials that covered what we wanted to become wetlands, costing the project nothing. We worked with the Army Corps of Engineers to bring lake dredge and other materials to create artificial soil and they provided enough to cover the wetlands, the slopes

around the treatment system and the soccer and ball fields with 6 inches or more and it is working well, again at no cost. PennDOT actually purchased the wetlands as replacement wetlands and AMD&ART used some of that money to build the wetlands and the rest to create an endowment for the treatment system and wetlands at the Community Foundation for the Alleghenies, a fund that will spin off interest annually for maintenance costs. Finally, AMD&ART tapped a huge array of small funders, often for as little as \$500, to enable us to assemble the site you see today. It took many hands and a lot of AmeriCorps and VISTA time, and probably a few years off my life, but the money went to the site, the project is now 95% completed and we have a new web site at www.amaandart.org.

For the Wise Legacy Wetlands Project, the local Soil and Water Conservation District hosts the Guest River Project that provides the basic organizational support. The Virginia Division of Mines, Minerals and Energy was an early and effective partner, a local engineering firm provided pro bono design, an OSM Summer Intern created the landscape plan that got the project into a form that others could see and support, the Virginia Department of Transportation is providing more detailed construction design and then doing some of the basic wetlands construction, OSM is providing a Watershed Cooperative Agreement for the treatment system, TVA is providing continuing support and staff expertise, and the OSM Clean Stream Coordinator has been a continuing and helpful presence. We are now after the Virginia Division of Humanities to provide interpretive planning and the college has engaged its faculty in planning, its maintenance staff is committed to long-term maintenance, and its students will provide generations of learners to the site. All this on a very small cash budget.

Most important, these two sites are, I hope, really catalogues of ideas; public sites that incorporate many different approaches to acid mine drainage and coal country legacies that can literally be “shopped” for ideas useful to others. Both sites did that intentionally and it seems to be working. I frankly hope this presentation does even more. These publicly visible sites are places where we can engage the people of coal country in their own history and their own future. If we design to engage the public, if we interpret these sites in ways that allow understanding, if we admit that science is sometimes not sufficient, we create the opportunity for much broader public participation in coal country issues, we may even do some small thing to help reestablish pride in coal country.

I think these sites and others now under development – and hopefully sites that many of you might develop – offer us the opportunity to reconnect the Sciences and the Arts – and to establish a much wider circle of partnerships for our work. Good design is more than clean water; it is also an opportunity for public engagement, even delight. Good history opens opportunities for better understanding, of AMD and why it is there, of coal country environments, of our national values and how they have changed over time, even for reflection on the remarkable achievements of our predecessors and our own contemporary role in that continuum of history and environmental concern. There are no “bad guys” in this story, only different generations with different values. If we honestly engage that understanding in interpreting each of our attempts to address the AMD consequences of some of those past values, we create opportunities for support and engagement that might otherwise not be available. And if we are really good at this, we just might create the public support that brings votes to support the funding on which all this depends, and that means more work, perhaps even more interesting work for all of us.

