

CREATING GOOD JOBS, A CLEAN ENVIRONMENT, AND A FAIR AND THRIVING ECONOMY

WRITTEN TESTIMONY Jason Walsh Executive Director, BlueGreen Alliance Before the 116th United States Congress, House Committee on Natural Resources Legislative Hearing on H.R. 5435, "American Public Lands and Waters Climate Solutions Act of 2019" and H.R. 5859, the "Trillion Trees Act." Longworth House Office Building, Room 1324 Wednesday, February 26, 2020

Thank you Chairman Grijalva, Ranking Member Bishop, and distinguished members of the committee. My name is Jason Walsh, and I am the Executive Director of the BlueGreen Alliance, a national partnership of labor unions and environmental organizations. On behalf of my organization, our partners, and the millions of members and supporters they represent, I want to thank you for convening this hearing today on how we can make public lands part of a climate solution.

Our nation faces the dual crises of climate change and increasing economic inequality. These crises are inextricably linked—as are their solutions. That's why this past summer, the BlueGreen Alliance, alongside our labor and environmental partners, released *Solidarity for Climate Action*, an ambitious, concrete platform to address these crises simultaneously, fighting climate change, reducing pollution, and creating and maintaining good-paying, union jobs across the nation.¹ We need to plan for the future and American workers must be at the forefront of that discussion.

Limiting climate change to the extent required by science will, according to the Intergovernmental Panel on Climate Change (IPCC), "require rapid, far-reaching and unprecedented changes in all aspects of society," and "could go hand in hand with ensuring a more sustainable and equitable society."ⁱⁱ This transformation must happen at the speed and scale demanded by scientific reality and the urgent need of our communities. If we do it right, we can not only avoid the worst impacts of climate change, but create quality, family-sustaining jobs and ensure a more equitable society.

Achieving these goals and getting to our carbon reduction targets is going to be challenging but they are achievable, and public lands will play a critical role in achieving them.

One key strategy for tackling both climate change and the challenges of working people is robust investment in our public lands through natural infrastructure. Natural infrastructure involves the management of naturally occurring or naturalized landscapes to maximize ecosystem services for the purposes of water quality, flooding prevention, carbon sequestration, and climate resilience. On public lands, this includes addressing the public lands

maintenance backlog, recovering America's wildlife, restoring forests and wildlands, reclaiming mines and wells, and improving climate resilience through natural defenses that act as carbon sinks. We appreciate the committee's efforts to craft a technology-inclusive bill that makes public lands a key part of a climate solution.

The Role of Public Lands in Meeting Climate Goals

Our public lands have a critical role to play in carbon sequestration, and in climate resilience and mitigation. Public lands already capture 4% of all U.S. emissions, ⁱⁱⁱ and investments in natural infrastructure, responsible resource development, and reclamation are just a few of the ways public lands could contribute to achieving our climate goals. Investment in these natural systems—such as forest and wetlands restoration, better rangeland management, and restorative agriculture—could remove up to 21% of the current annual emissions of the United States from the atmosphere.^{iv}

Public lands and waters provide carbon benefits while also providing other important benefits like clean water, flood control, outdoor recreation opportunities, and wildlife habitat. For example, forests and grasslands play a major role in the carbon cycle, acting as carbon sinks through the uptake and storage of carbon. National forests store an average of 69.4 metric tons of carbon per acre—a greater density than private forests^v and equivalent to 7 times annual U.S. emissions.^{vi} These areas, along with grasslands and other open space, also play a large role in our nation's water quality—the water supply of 180 million Americans is captured and filtered by national forests and grasslands.^{vii}

America's public lands are noteworthy not just for their environmental importance. They are also an engine of sustainable economic growth and job creation to the nation. In 2018, there were over 318 million visits to national parks.^{viii} These visitors play a huge role in local and national economies, contributing to both local jobs near park facilities as well as the broader outdoor recreation economy. The outdoor economy is an \$887 billion industry in the United States—responsible for 7.6 million jobs—as well as \$65.3 billion in federal and \$59.2 billion in state and local tax revenue.^{ix} According to the National Park Service (NPS), in 2018 park visitors spent \$20.2 billion within 60 miles of NPS lands, supporting 329,000 jobs in rural gateway communities.^x Similarly, activity on Forest Service lands supports more than 205,000 jobs with \$11 billion in local economic impact.^{xi} One of the fastest growing parts of the U.S. economy, these levels of economic activity and jobs are only possible through the maintenance of healthy public land and water ecosystems.^{xii}

Invest in Natural Infrastructure for Resilient Communities and Ecosystems

Healthy ecosystems are also a key component in building resilient human communities that can adapt to the impacts of climate change. One important strategy for making communities more resilient to climate change is the protection and restoration of natural infrastructure like watersheds, floodplains, and coastal barriers. Importantly, coastal ecosystems shield people and property from sea-level rise and storm inundation.^{xiii} This natural infrastructure provides

services like water storage and filtration, fisheries production, and carbon sequestration worth an estimated \$125 trillion per year globally—significantly more than the annual output of the global economy.^{xiv} The domestic ecological restoration industry—a broad sector including jobs from project planning and engineering, to on-the-ground earthmoving, forestry, and landscaping—employs 126,000 workers and generates approximately \$9.5 billion in economic output annually.^{xv} Research shows that each dollar invested has a \$15 return in economic benefits.^{xvi}

Because of the health, ecological, and economic benefits of natural infrastructure approaches, cities across the country, including Seattle, Chicago, New York City, Philadelphia, and Nashville have embraced these techniques as part of their stormwater infrastructure programs.^{xvii} In Nashville, a citywide natural infrastructure plan identified potential runoff reductions of 3.5 billion gallons of water a year—a huge improvement for an area that annually sees 756 million gallons of sewer overflow into surrounding rivers and streams. The city is currently implementing projects on a public high school, farmers' market, neighborhood street right of way, and high-rise public housing for seniors, parks facility and a public works complex, with estimated runoff reductions ranging from 340,000 to over 6 million gallons a year.^{xviii} If a full array of natural infrastructure techniques were adopted nationwide for new construction projects over an acre in size, the job creation potential is estimated at 84,000 direct, indirect, and induced jobs created and supported throughout the U.S. economy per year.^{xix}

These investments are also supporting local economies by creating jobs. Natural infrastructure, like all water infrastructure, must be installed and maintained correctly to be effective. Skilled workers are needed to ensure the installation and construction of natural infrastructure projects are effective and maintain water quality standards. In addition, natural infrastructure, along with traditional water systems, requires routine maintenance and upkeep to function optimally, thus sustaining job creation and employment opportunities.^{xx} All of these investments can reduce air and water pollution—including the emissions driving climate change—and make our communities more resilient to the impacts of climate change.

Despite the role that public lands play in our nation's economic and environmental well-being, governing agencies at all levels are challenged to support these resources and our parks and recreation facilities receiving a "D+" grade from the American Society of Civil Engineers.^{xxi} Getting our parks and recreation facilities to a "B" grade over the next 10 years could support or create an estimated 632,000 job-years across the U.S. economy.^{xxii}

Across the country, cities and localities have increasingly been faced with declining state and federal funding for parks. Chronic underfunding of National Park Service budgets has led to an \$11.9 billion backlog of deferred maintenance at NPS sites and the United States Forest Service—which manages a vast series of national forests, grasslands, and other natural areas—also has a significant deferred maintenance backlog of \$5.1 billion. These deficiencies present huge challenges to the agencies responsible for our public lands, and are only worsening as visitation remains high.^{xxiii} Bills that have moved through this committee could help remedy this situation. The Restore our Parks and Public Lands Act (H.R. 1225) and the Land and Water

Conservation Fund Permanent Funding Act (H.R. 3195) would boost local economies while protecting public lands.

Responsible Energy Development on Public Lands

In order to meet our climate goals, we need to expand America's clean energy sources. However, the U.S. Geological Survey estimates that current resource development on public lands currently accounts for 25% of our country's emissions.^{xxiv} Development of wind and solar on public lands and waters has great potential to create jobs while moving us towards the clean energy future needed to combat climate change. The expansion of offshore wind is a demonstrable example of this principle.

America's first offshore wind project at Block Island is a great model of this potential. This project was the result of years of collaboration between labor, environmental organizations, industry, and key government officials and entities. Its five turbines began generating power off the coast of Rhode Island at the end of 2016. They produce enough clean, local energy to power 17,000 homes.^{xxv} Recently, Atlantic coast states have ramped up their interest in building out their offshore wind capacities. More and more state governments have begun passing laws to mandate the development of offshore wind. For example, Massachusetts has set a goal of 1,600 MW by 2027;^{xxvii} New York has mandated 9,000 MW by 2035;^{xxviii} New Jersey requires 3,500 MW by 2030;^{xxviii} and Rhode Island^{xxix} and Connecticut^{xxx} have also set similar (though smaller) commitments.

Though comparatively small, Block Island demonstrates the type of diverse, highly skilled workforce needed in the offshore wind industry. The project put more than 300 people to work and employed electricians, welders, ironworkers, pipefitters, pile drivers, engineers, scientists, vessel operators, lawyers, and sales representatives. America's offshore wind industry is growing dramatically and now has even larger projects in development in states like Connecticut, Maryland, Massachusetts, New Jersey, New York, and Rhode Island. This committed development has the potential to dramatically expand both clean energy and job creation in a relatively untapped sector.

In order to truly capture the full benefits and potential of these projects, it is critical that they are built by skilled workers who are paid family-sustaining wages, with project labor agreements in place, and with materials manufactured here in the United States. As the industry grows, sourcing components domestically represents a significant opportunity to help revitalize American manufacturing. The Special Initiative for Offshore Wind's recent white paper predicts an almost \$70 billion buildout of U.S. offshore wind supply chain by calculating growth in a number of sectors, which include wind turbines and towers; turbine and substation foundations; upland, export, and array cables; onshore and offshore substations; and marine support, insurance, and project management.^{xxxi}

Responsible production, transparent and fair leasing decisions, and strong protections for the environment are crucial for any energy development on U.S. public lands and waters. We

therefore support the development of science-based best management practices for renewable energy development. We should also consider smart ways to address issues with existing energy development. For example, many of the Bureau of Land Management's (BLM) fiscal and leasing policies regulating oil and gas drilling requirements on public lands are outdated. These policies carry negative implications for the U.S. taxpayer, costing revenue generation from leases, stifling reclamation efforts, and allowing the release of methane—a greenhouse gas roughly eighty times more powerful than carbon dioxide. Modernization of leasing, bonding, and fiscal policies would ensure fair returns for taxpayers, and protect workers and communities from the pollution and dangerous compounds—such as the carcinogen benzene that accompanies unnecessary leaks.^{xxxii}

Reclamation

Cleaning up abandoned mines and orphaned oil and gas wells in the United States is an example of how America's environmental challenges can also be economic opportunities. Reclamation not only remediates the host of environmental and public health problems associated with these sites, it also frees up that land for new, more sustainable economic development opportunities in industry sectors such agriculture, recreational tourism, manufacturing, and even clean energy production. Immediate job opportunities are also created doing the reclamation work.

The Abandoned Mine Land (AML) Program—created by Congress through the Surface Mining Control and Reclamation Act (SMCRA) in 1977—models the way that reclamation can contribute to both a clean environment and economic opportunities.

The AML program has reclaimed nearly 800,000 acres of damaged land and water across the country.^{xxxiii} Over the course of its first 40 years, it eliminated over 46,000 open mine portals, reclaimed over 1,000 miles of dangerous highwalls, and protected 7.2 million people nationwide from AML hazards.^{xxxiv} However, there are still over 5,000 abandoned coal mines across the country. According to the Office of Surface Mining Reclamation and Enforcement, it will cost at least \$10 billion to reclaim the remaining high priority abandoned coal mines across the country. While a similar program does not exist for hardrock mines or oil and gas wells, the EPA estimates there are more than one million orphaned oil and gas wells throughout the United States.^{xxxvv} The GAO estimates there are at least 161,000^{xxxvi} abandoned hardrock mines throughout the country; others suggest there may be over 500,000.^{xxxvii} Cleaning up these mines and wells not only reduces air and water pollution—including emissions driving climate change—but also continues to spur economic opportunities.

To date, the AML program has supported 4,761 direct jobs across the country, having a net impact of \$450 million on U.S. gross domestic product in fiscal year 2013. In Central Appalachian states alone that year, the program supported 1,317 direct jobs and delivered a value-added impact of \$102 million.^{xxxviii}

While Abandoned Mine Land funds are used exclusively for reclamation of pre-1977 abandoned coal mines, reclaimed mine lands and the areas surrounding them have great potential to be reused as sites for new economic endeavors. Across the country, abandoned mine sites have been leveraged to create jobs through sustained revitalization efforts, wildlife habitat and restoration, and water quality improvement and spur new economic opportunities in these communities. For example:

- In Mingo County, West Virginia, a sustainable agriculture facility is being constructed on a reclaimed coal mine that will produce commercial-scale fish and vegetables for regional markets;
- Reclamation of an abandoned coal mine that had been leaking pollution into the North Branch Potomac River for decades in western Maryland paved the way for at least 13 commercial angling and whitewater boating outfitters to operate on the river, supporting more than 40 full-time jobs and resulting in an economic impact of nearly \$3 million on the area;
- In Glenrock, Wyoming, a surface coal mine was converted into a 158-turbine wind farm that produces enough electricity to power 66,800 households;
- In Luzerne County, Pennsylvania, a business park was constructed on reclaimed mine land, which now employs over 4,500 people and is home to 39 companies, including Lowe's, FedEx Ground, and Men's Warehouse. While more industrial parks are not the economic solution for many rural communities, this example demonstrates that mine sites could be reclaimed for "brick and mortar" project applications like local businesses, job training facilities, and business incubators; and
- A project in Tuscarawas County, Ohio, is underway to transform a former mining site into a campground and trail system within Camp Tuscazoar's "Hidden Mine Recreation Area." The project will encourage visitors to stay in the area longer, generating more demand for secondary services. The campground is projected to generate direct revenue and contribute both directly and indirectly to the county's economy. xxxix

Federal efforts such as the AML Pilot Program and the RECLAIM Act have been put forward that would expedite the use of existing funds in the Abandoned Mine Land Fund to reclaim abandoned coal mines and stimulate economic development on that reclaimed land. Not only would efforts like this benefit communities by restoring the natural environment, they would also invest long term in the economic diversification of these communities.

We Have To Do This Energy Transition The Right Way

If we do it right, we can create quality, family-sustaining jobs while also reducing carbon pollutions and avoiding the worst impacts of climate change. Strategic investments in building the clean economy—such as in reclamation and clean energy on public lands—are critical, as

are measures to ensure these jobs are quality jobs and that workers and communities impacted have the tools and resources they need to make the shift to a clean energy economy.

As we find solutions to climate change, it's important to improve the quality of jobs created, and it's also essential to provide the tools and resources necessary for workers to transition to good new jobs, to diversify local and regional economies, and to create and sustain quality economic opportunities. This energy transition is already happening. We need to have a conversation about getting ahead of this and we need to do this now.

American workers have faced wage stagnation, difficult working conditions, and a wholesale effort to decimate their ability to organize for the past several decades. Unionization offers the best pathway for quality jobs and more importantly a good, family-sustaining livelihood. A commitment to a globally competitive social safety net and high-quality job creation across all sectors of the economy—but especially related to clean energy, adaptation, and resilience—will only be realized if we commit to:

- Increasing union density across the country through strong support of the right to organize throughout the economy, including in the clean technology sectors;
- Remove policy barriers to organizing and promote productive policies to ensure that workers have a meaningful voice on the job;
- Applying mandatory labor standards that include prevailing wages, safety and health protections, project labor agreements, community benefit agreements, local hire, and other provisions and practices that prioritize improving training, working conditions, and project benefits. This includes respect for collective bargaining agreements and workers' organizing rights such as neutrality, majority sign-up, and first contract arbitration for construction, operations, and maintenance;
- Raising labor standards through improved wages and benefits and the prioritization of fulltime work that eliminates the misclassification of employees and misuse of temporary labor;
- Investing in training, equipment, preparedness, plan development, and other tools including through registered apprenticeship programs to ensure a robust, skilled, and well-prepared workforce to build the natural and clean technology infrastructure necessary to avoid and mitigate the most damaging impacts caused by climate change; and
- Maximizing the utilization and support for established training providers (such as registered apprenticeships, community colleges, and union training centers) and skill certifications for manufacturing.

- Effective and equitable access to high-quality employment, training, and advancement for all workers, particularly those from low-income households, those historically under-represented on the basis of race, gender, and other criteria, and those adversely impacted or dislocated by technological changes, notably those in trade, transportation and energy impacted communities;
- Guaranteed pensions and a bridge of wage support, healthcare, and retirement security until an impacted worker either finds new employment or reaches retirement;
- Dedicated community engagement including workers, community members, and leaders to support and enhance the development of the local economy;
- Massive economic investment in deindustrialized areas, including remediating any immediate loss of tax base or public service for communities;
- Mandated reclamation of closed and abandoned industrial sites to remediate deindustrialized blight, coupled with economic development and diversification; and
- Requirements for fair and safe working conditions throughout global supply chains.

Conclusion

In closing, I want to reiterate that tackling the crisis of climate change—if done right—is a significant opportunity to ensure a more equitable society, protect our environment, increase U.S. global competitiveness, and create quality, family-sustaining jobs across the country. Given the scale of the problem, numerous solutions will be needed and public lands will have to play a key role. We appreciate the committee's efforts to make progress now. We look forward to working with this committee as you move forward.

Thank you again for the opportunity to testify today.

ⁱⁱ IPCC, "Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by

https://www.fia.fs.fed.us/forestcarbon/docs/forest%20carbon%20fact%20 sheet%2020101012.doc

ⁱ BlueGreen Alliance, "Solidarity for Climate Action," June 2019. Available online: <u>https://www.bluegreenalliance.org/work-</u> <u>issue/solidarity-for-climate-action/</u>

Governments," October 8, 2018. Available online: <u>https://www.ipcc.ch/2018/10/08/summary-forpolicymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/</u>

[&]quot; xxiv

^{iv} Science Magazine, "Natural climate solutions for the United States," November, 14 2018. Available online: <u>https://advances.sciencemag.org/content/4/11/eaat1869</u>

^v U.S. Department of the Interior, *U.S. Forests and Carbon*, 2010. Available online:

^{vi} Sierra Club, *Forests, Wood, and Climate Report*. July 2019. Available online:

https://content.sierraclub.org/ourwildamerica/sites/content.sierraclub.org.ourwildamerica/files/documents/Forests%2C%20W ood%20%26%20Climate%20Report_Sierra%20Club_July%202019.pdf?_ga=2.175164322.1625138360.1581451388-1946256526.1580745540

^{vii} American Society of Civil Engineers, *Infrastructure Report Card: Public Parks*, 2017." Available online:

http://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Parks-Final.pdf.

^{viii} National Park Service, "Visitation Numbers," 2018. Available online: <u>https://www.nps.gov/aboutus/visitation-numbers.htm</u> ^{ix} Outdoor Industry Association, *The Outdoor Recreation Economy*, 2017. Available online: <u>https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf</u>.

^x National Park Service, 2018 Visitor Spending Report: Economic Contributions to Local Communities, States, and the Nation, 2018, Available online:

https://www.nps.gov/nature/customcf/NPS Data Visualization/docs/NPS 2018 Visitor Spending Effects.pdf

^{xi} American Society of Civil Engineers, *Infrastructure Report Card: Parks, 2017*. Available online:

http://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Parks-Final.pdf.

xⁱⁱ U.S. Department of Commerce Bureau of Economic Analysis, "Outdoor Recreation Economy Grew Faster Than U.S. Economy

in 2016," 2018. https://www.bea.gov/news/blog/2018-09-20/outdoor-recreation-grew-faster-us-economy-2016

xⁱⁱⁱ Nature, "Coastal habitats shield people and property from sea-level rise and storms,".2013. Available online: https://doi.org/10.1038/nclimate1944

^{xiv} Robert Costanza, et al, *Changes in the Global Value of Ecosystem Services*, April 2014. Available online: <u>http://community-wealth.org/sites/clone.community-wealth.org/files/downloads/article-costanza-et-al.pdf</u>

^{xv} Todd BenDor, et al, *Estimating the Size and Impact of the Ecological Restoration Economy*, 2015. Available online: https://doi.org/10.1371/journal.pone.0128339

^{xvi} Center for American Progress, *The Economic Benefits of Restoring Coastal Ecosystems*, April 2014. Available online: <u>https://cdn.americanprogress.org/wp-content/uploads/2014/04/CoastalRestoration-factsheet.pdf</u>

^{xvii} Natural Resources Defense Council, *Rooftops to Rivers II: Green Strategies for Controlling Stormwater and Combined Sewer Overflows 2013 Update*, 2013. Available online: http://www.laondaverde.org/water/pollution/rooftopsii/files/ rooftopstoriversll-update.pdf

^{xviii} American Society of Landscape Architects, *2013 Professional Awards: Green Infrastructure Master Plan, 2013*. Available online: https://www.asla. org/2013awards/410.html

^{xix} BlueGreen Alliance, *Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment*. Available online: https://www.bluegreenalliance.org/resources

^{xx} BlueGreen Alliance, *Clean Water, Good Jobs*, 2012. Available online: <u>https://www.bluegreenalliance.org/resources/httpwww-bluegreenalliance-orgnewspublicationsclean-water-good-jobs/</u>

^{xxi} American Society of Civil Engineers, 2017 *Report Card for America's Infrastructure*, 2017. Available online: <u>http://www.infrastructurereportcard.org/</u>.

^{axii} BlueGreen Alliance, *Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment*. Available online: https://www.bluegreenalliance.org/resources/making-the-grade-2-0-investing-in-americas-infrastructure-to-create-quality-jobs-and-protect-the-environment/

^{xxiii} American Society of Civil Engineers, *Infrastructure Report Card: Public Parks*, 2017. Available online:

http://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Parks-Final.pdf

^{xxiv} U.S. Geological Survey, *Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005-14*, November 2018. Available online: <u>https://pubs.usgs.gov/sir/2018/5131/sir20185131.pdf</u>

^{xxv} Deepwater Wind, "Block Island Wind Farm." Available online: http://www.dwwind.com/project/blockisland-wind-farm/ ^{xxvi} 4 State of Massachusetts, "Offshore Wind." Available online: https://www.mass.gov/servicedetails/offshore-wind

^{xxvii} 5 New York State Energy Research and Development Authority "Getting to 2035." Available online:

https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-New-York-StateOverview/Getting-to-2035

xxviii State of New Jersey Department of Environmental Protection, Air Quality, Energy & Sustainability.

"Offshore Wind." Available online: https://www.nj.gov/dep/aqes/offshorewind.html

^{xxix} 7 State of Rhode Island Office of Energy Resources "Governor's 1,000 by '20 Clean Energy Goal." Available online: http://www.energy.ri.gov/renewable-energy/governor-clean-energy-goal.php

^{xxx} 8 State of Connecticut Department of Energy & Environmental Protection, "Gov. Malloy and DEEP

Announce Selection of 250 MW of Renewable Energy Projects," June 13, 2018. Available online: https://www.ct.gov/deep/cwp/view.asp?A=4965&Q=603300

^{xxxi} Stephanie A. McClellan, *Supply Chain Contracting Forecast for U.S. Offshore Wind Power*, March 2019. Available online: https://www.ceoe.udel.edu/File%20Library/About/SIOW/SIOW-White-Paper---SupplyChain-Contracting-Forecast-for-US-Offshore-Wind-Power-FINAL.pdf

^{xxxii} Environmental Defense Fund, "Methane Pollution from the Oil & Gas Industry Harms Public Health." Available online: https://www.edf.org/sites/default/files/content/methane_rule_health_fact_sheet_reboot_final_no_citations.pdf

xxxⁱⁱⁱ Appalachian Citizens Law Center, *Abandoned Mine Land Program: A Policy Analysis for Central Appalachia and the Nation*, July 8, 2015. Available online: https://appalachiancitizenslaw.files.wordpress.com/2015/07/exec-summary-abandonded-minereclamation.pdf xxxiv Pennsylvania Department of Environmental Protection, "AML Program Information: Abandoned Mine Reclamation in Pennsylvania." Available online:

https://www.dep.pa.gov/Business/Land/Mining/AbandonedMineReclamation/AMLProgramInformation/Pages/default.aspx U.S. Environmental Protection Agency (EPA), "Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2016: Abandoned Oil and Gas Wells," April 2018. Available online: https://www.epa.gov/sites/production/files/2018-04/documents/ghgemissions_abandoned_wells.pdf xxxvi United States Government Accountability Office, Abandoned Mines: Information on the Number of Hardrock Mines, Cost of

Cleanup and Value of Financial Assurances. July 14, 2011. Available online: https://www.gao.gov/assets/gao-11-834t.pdf xxxvii Earthworks. 1993. Burden of Gilt. Available online: https://earthworks.org/publications/burden_of_gilt/

xxxviii Appalachian Citizens Law Center, Abandoned Mine Land Program: A Policy Analysis for Central Appalachia and the Nation. July 8, 2015. Available online: https://appalachiancitizenslaw.files.wordpress.com/2015/07/exec-summary-abandonded-minereclamation.pdf xxxix lbid.