Ohio River Valley Institute

Virtual Hearing on "Building Back Better: Creating Jobs and Reducing Pollution by Plugging and Reclaiming Orphaned Wells."

Written testimony prepared for the Subcommittee on Energy and Natural Resources of the US House Committee on Natural Resources

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Introduction

Good afternoon, Mr. Chairman and members of the committee. Thank you for holding this hearing and for your leadership and commitment to jobs and the environment.

My name is Ted Boettner. I am a senior researcher at the Ohio River Valley Institute, and I live and work in Charleston, West Virginia. ORVI is an independent, nonprofit think tank that produces data-driven research and proposes policies to improve the economic performance and standards of living for the greater Ohio River Valley.

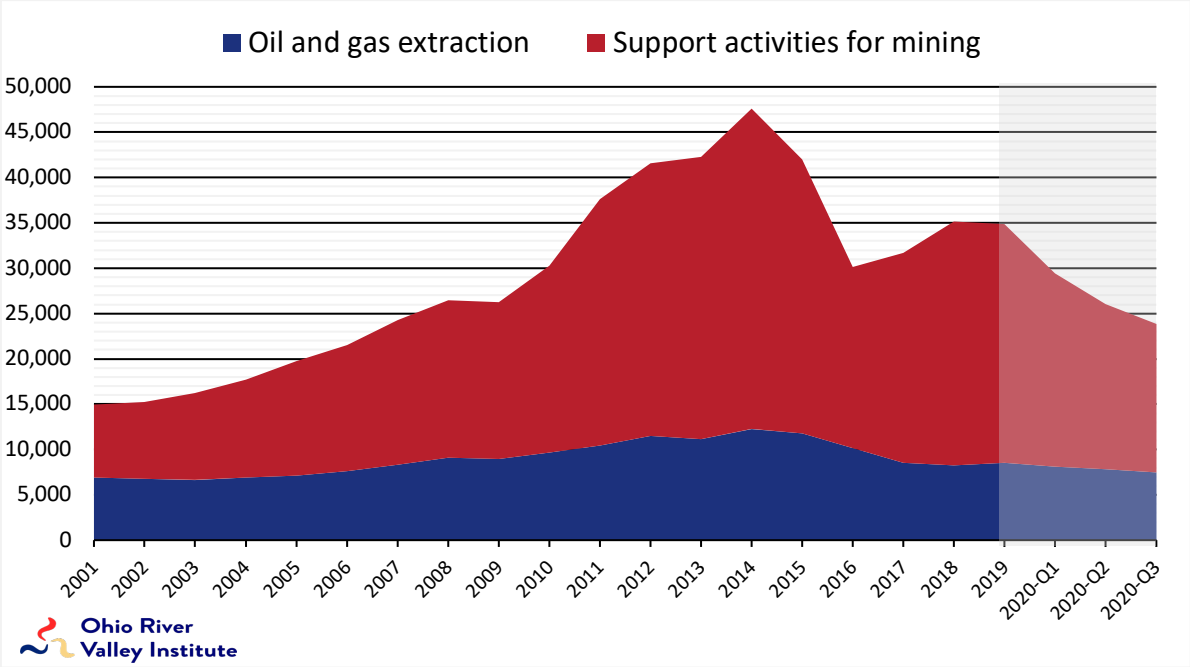
The proposed legislation would bring enormous benefits to the Ohio River Valley region of Appalachia, for two central reasons. First, the region is the birthplace of the American oil industry, and because of that, it has a disproportionate number of orphan wells that need to be plugged and cleaned up. Second, many of these wells are located in economically distressed rural areas that would greatly benefit from the investment and years of job creation created by this legislation.

Economic Context

The Ohio River Valley region has never recovered from the deindustrialization that occurred from the collapse of coal, steel, chemical, and glass industries that once provided good wages and jobs for thousands of working families.[1] Most recently, the region has been particularly hard hit by the decline in coal production and loss of oil and gas jobs.

The number of upstream oil and gas jobs – those working in drilling and exploration services - in West Virginia, Kentucky, Ohio, and Pennsylvania has been cut in half over the last six years. (Total upstream oil and gas jobs in the four states fell was 47,600 compared to just 23,900 in the 3rd quarter of 2020) Nationally, the unemployment rate in the mining and oil and gas extraction sector is 15 percent (March 2021), the highest sectoral rate of unemployment in the country.[2] Energy analysts predict many of the oil and gas jobs lost in 2020 may not return and more could be lost to automation over the next 10 years.[3]

Figure 1. Upstream employment in the oil and gas industry in Pennsylvania, Kentucky, Ohio and West Virginia



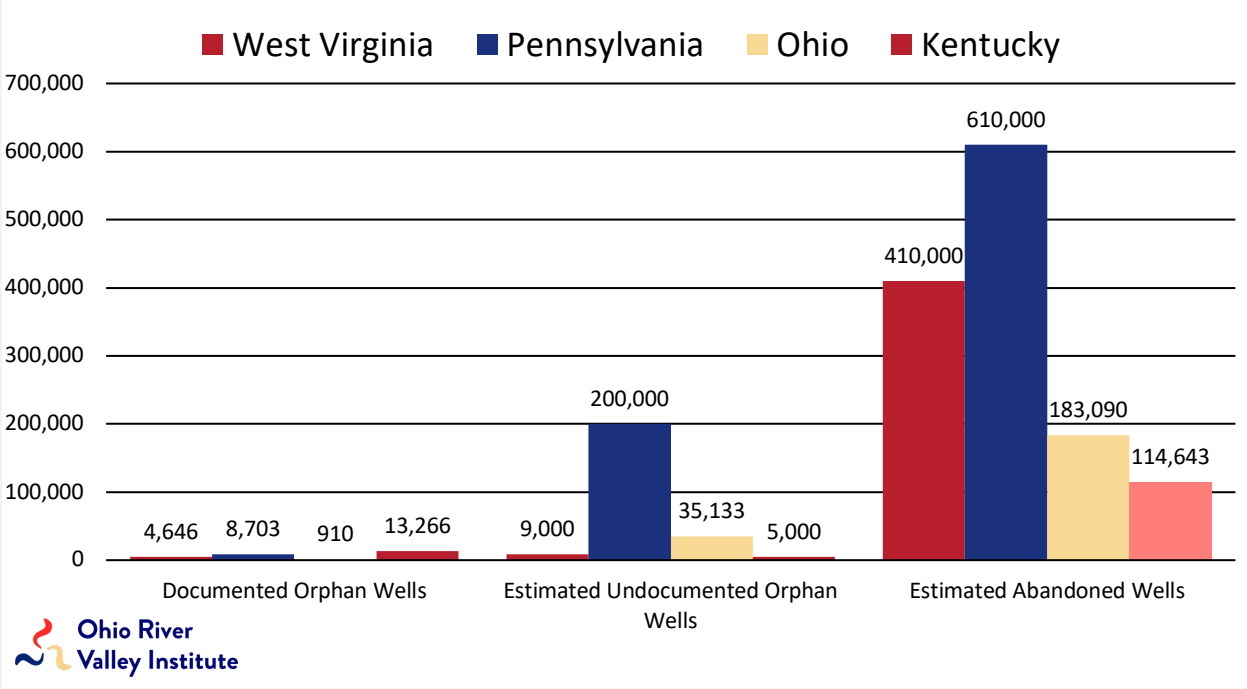
Source: U.S. Bureau of Labor Statistics (QCEW), NAICS Codes 211 and 213. **Note**: In 2019, oil and gas related support activities made up approximately 92.7% of "support activities for mining" in these four states.

Orphan Wells in Ohio River Valley States

Pennsylvania, Kentucky, Ohio and West Virginia are home to half (27,525) of the documented orphan wells (56,600) in the United States.[4] In addition, these four states also contain up to 80 percent or 609,100 of the undocumented orphan wells in the US. (746,000).

Recent studies find there may be even more wells: as many as 1.3 million abandoned wells in the four-state region, most of which existed prior to modern plugging regulations (before 1952).[5]

Figure 2. Orphan and abandoned wells in Ohio River Valley states



Source: IOGCC (2020, Pennsylvania Department of Environmental Protection, and James, P. Williams, Amara Regehr, and Mary Kang, "Methane Emissions from Abandoned Oil and Gas Wells in Canada and the United States," *Environmental Science & Technology*, 2021, 55 (1), 563-570 (https://pubs.acs.org/doi/10.1021/acs.est.0c04265)

Impact on Ohio River Valley States

Based on the grant formulas in the bill, the four Ohio River Valley states could receive roughly $1.86 billion. The funds could allow the states to plug and reclaim an estimated 49,200 orphan wells, which could create more than 2,340 jobs per year over eight years and reduce methane emissions by an estimated 6,400 metric tons per year or 550,894 metric tons of carbon dioxide equivalent (CO_2e based on a global warming potential of 86 over 20 years).[6]

The funding could also give states and agencies the tools they need to locate and measure methane readings of abandoned wells, to develop a robust inventory of wells based on risk assessments, to invest in innovative technology such as drones that can detect methane, improve best practices, increase staffing and inspections, and develop more uniform standards that can save money over the long run.

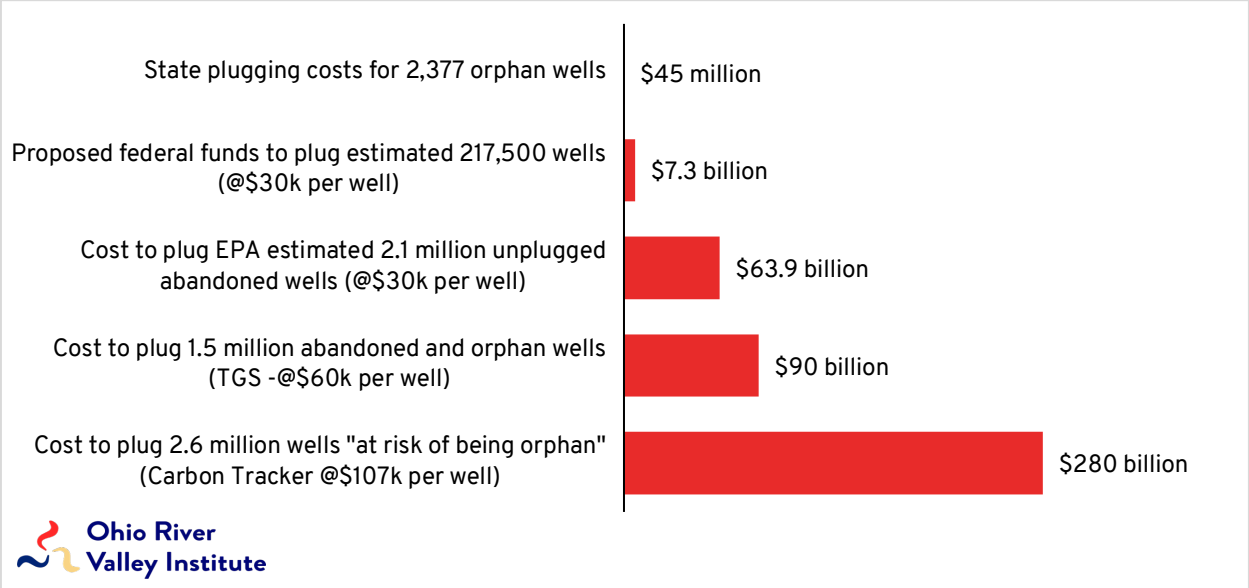
The inclusion of a prevailing wage requirement is critical to ensuring oil and gas plugging services compete on a level playing field, ensuring local workers get hired, and to provide a larger economic impact. Funds for workforce and safety

training are also crucial to ensure that people – especially women and people of color –not in the oil and gas industry can benefit from this investment.[7]

Long-Term Solutions Needed

While this legislation is a much-needed step toward addressing the current orphan well crisis, the next wave of orphan wells is likely to be an even bigger problem. Current bonding is a small fraction (1 to 6%) of estimated plugging and reclamation costs for the estimated 2.6 million oil and gas wells that could soon become wards of the state.[8] Estimates to plug all of these wells could range from $90 billion to $280 billion. This will require annual funding that likely far exceeds the fiscal capacity of states or their ability to recoup funds from financial assurance modifications.

Figure 3. Estimated costs to plug onshore orphan and abandoned wells



Source: IOGCC (2020), EPA (2020), TGS-NOPEC Geophysical Company (2020)[9], and Carbon Tracker Initiative (2020)
Note: Plugging costs can vary dramatically. One recent estimate of over 7,5000 wells in four states found the average plugging cost to be $20,000 per well, while plugging and remediation costs averaged $76,000.[10]

This problem is compounded by the fact that the shale industry is in poor financial health, with negative cash flows and large amounts of debt.[11] (The top 30 shale-focused oil and gas producers have spent $158 billion more on drilling and capital expenses than they generated in selling oil and gas over the last 10 years and they collectively owe nearly $90 billion in long-term debt.)

In my opinion, the Abandoned Mine Land program, which assesses a fee on the current coal industry to finance cleanup of damage from historical coal mining,

provides a longer-term model to help finance and reclaim the full extent of the abandoned well problem. An AML equivalent fee on crude oil and natural gas production could provide an estimated $3.7 billion in 2022 based on projected production from the Energy Information Administration.[12] Another option would be to create a new federal executive level agency that directly employs displaced oil and gas workers, such as the Abandoned Well Act proposed by researcher Megan Milliken Biven.[13]

One thing is clear. More investments in research and development are needed to improve the materials and procedures for plugging oil and gas wells.[14] Currently, it is not one plug and you're done. Nor is there a "gold standard" or uniform "best practices" for plugging wells. Wells will need to be monitored forever to ensure that they are not leaking, and new technology and plugging practices are crucial to reducing costs and environmental problems over the long run.

Conclusion

Appalachian communities did not fuel our nation's prosperity without a cost. Abandoned and orphaned oil and gas wells interfere with and devalue the property rights of farmers and other surface owners, deter development, hurt ecosystems, contribute to the climate crisis, and threaten the health and safety of nearby people. This legislation is an enormous opportunity to repair the damage from orphan wells, boost jobs, mitigate greenhouse gases, and improve health and safety in our communities.

In my opinion, the legislation will need to include funds for job and safety training, additional time for states to scale up their programs, a clearer definition of what constitutes an "oil and gas industry job," and funding for research and development.

Thank you for giving me the opportunity to testify today and for your leadership and public service.

For more information on the benefits and costs of plugging and restoring oil and gas wells in the Ohio River Valley states, please see report: "**Repairing the Damage from Hazardous Abandoned Oil and Gas Wells: A Federal Plan to Grow Jobs in the Ohio River Valley and Beyond**" Link: https://ohiorivervalleyinstitute.org/hazardous-aog-wells/

ENDOTES

[1] See Ronald Eller, *Uneven Ground: Appalachia since 1945*, The University Press of Kentucky, July 2003; Lou Martin, *Smokestacks in the Hills*, University of Illinois Press, 2016; Allen Dieterich-Ward, Beyond the Rustbelt: Metropolitan Pittsburgh and the Fate of Industrial America, University of Pennsylvania Press, 2015; and Rick Wilson, Sean O'Leary, and Ted Boettner, "The State of Working West Virginia: Weirton Steel to Walmart," *West Virginia Center on Budget and Policy and American Friends Service Committee*, August 31, 2013, retrieved from https://wvpolicy.org/wp-content/uploads/2018/5/SWWV2013.pdf

[2] See Table A-31, Bureau of Labor Statistic (CPS), retrieved from https://www.bls.gov/web/empsit/cpseea31.htm

[3]See Rystad Energy, "Robots could replace hundreds of thousands of oil and gas jobs, save billions in drilling costs by 2030," March 29, 2021, retrieved from https://www.rystadenergy.com/newsevents/news/press-releases/robots-could-replace-hundreds-of-thousands-of-oil-and-gas-jobs-save-billions-in-drilling-costs-by-2030/ ; Duane Dickson et al.,"The future of work in oil, gas and chemicals," *Deloitte Insights*, October 5, 2020, retrieved from https://www2.deloitte.com/us/en/insights/industry/oil-and-gas/future-of-work-oil-and-gas-chemicals.html and Chad Wilkerson, "The Changing Energy Landscape and Its Effect on the Economy," *Federal Reserve Bank of Kansas City*, April 7, 2021, retrieved from https://www.kansascityfed.org/documents/7911/Evening_at_the_Fed_4-7-2021_updated.pdf

[4] "Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies," *Interstate Oil and Gas Compact Commission*, March 2020 Update, Retrieved from https://iogcc.ok.gov/sites/g/files/gmc836/f/2020_03_04_updated_idle_and_orphan_oil_and_gas_wells_report_0.pdf

[5] "Paper #2-25: Plugging and Abandonment of Oil and Gas Wells," *National Petroleum Council* (Prepared by the Technology Subgroups of the Operations & Environment Task Group), September 15, 2011, retrieved from https://www.npc.org/Prudent_Development-Topic_Papers/2-25_Well_Plugging_and_Abandonment_Paper.pdf

[6] These estimates are based on plugging 27,525 documented orphan wells in WV, PA, OH, and KY and an additional 21,750 undocumented orphan wells. The plugging and restoration coats are $33,000 per well in PA (18,703 wells), $54,011 in WV (7,49 wells), $87,508 in OH (4,810 wells), and $6,500 in KY (18,266 wells)– based on state agency information (WV DEP, PA DEP, OH DNR, and KY EEC). Job estimates are derived from an industry calculator used by the PA DEP. Annual methane reduction per well is 0.13 annual metric tons based on EPA (2020) estimates for unplugged abandoned wells in 2018.

[7] Nationally, 80.6% of oil and gas extraction worker are white, 14.9% are women, 4.1% are Black, 10.5.% are Asian, and 13% are Hispanic or Latino in 2020. U.S. Bureau of Labor Statistics, Labor Statistics from the Current Population Survey, household data annual averages, Table 18: Employed persons by detailed industry, sex, race, and Hispanic or Latino ethnicity, 2020 https://www.bls.gov/cps/cpsaat18.htm

[8] Robert Schuwerk and Greg Rogers, "Billion Dollar Orphans: Why Millions of oil and gas wells could become wards of the state," *Carbon Tracker Initiative*, retrieved from https://carbontracker.org/reports/billion-dollar-orphans/

[9] Matt Mayer," Abandoned Wells: How big is the problem, and what can be done?," *TGS*, November 2020, retrieved from https://www.tgs.com/well-intel/well-intel-abandoned-wells-how-big-is-the-problem-and-what-can-be-done
[10] Daniel Raimi et al.," Decommissioning Orphaned and Abandoned Oil and Gas Wells: New Estimates and Cost Drivers," *ChemRxiv*, 2021, retrieved from https://doi.org/10.26434/chemrxiv.14378483.v1
[11] Clark Williams-Derry et al., "In a Tumultuous 2020, Shale Firms Slashed Capex To Generate Cash," *Institute for Energy Economics and Financial Analysis*, March 2021, retrieved from http://ieefa.org/wp-content/uploads/2021/03/Shale-Producers-Spilled-2-Billion-in-Red-Ink-Last-Year_March-2021.pdf
[12] Ted Boettner," Repairing the Damage from Hazardous Abandoned Oil and Gas Wells: A Federal Plan to Grow Jobs in the Ohio River Valley and Beyond," *Ohio River Valley Institute*, April 2021, retrieved from www.ohiorivervalleyinstitute.org
[13] Abandoned Well Act of 2020, retrieved from https://images.currentaffairs.org/2021/01/AWA-Report-1.pdf
[14] Mercy Achang et al.," A Review of Past, Present, and Future Technologies for Permanent Plugging and Abandonment of Wellbores and Restoration of Subsurface Geological Barriers," *Environmental Engineering Science*, Vol.37 (6), June 2020, retrieved from https://www.liebertpub.com/doi/10.1089/ees.2019.0333#B29