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SHORT COMMENTS

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with the Bathwater*

By Irina Tsukerman, National Security Lawyer and Geopolitical Analyst

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The Orphan Wells Dilemma: Don't Throw Out the Orphaned Baby with the Bathwater

By Irina Tsukerman, National Security Lawyer and Geopolitical Analyst

One of the ongoing questions in balancing economic, security, and environmental interests in energy policy is the question of what to do with “orphan wells”, oil or gas wells that have been abandoned by fossil fuel extraction industries. These wells present a combination of concerns: have the potential to contaminate water supplies, degrade ecosystems, and emit methane and other air pollutants, endangering the environment and presenting a potential threat to human health. In fact, orphan wells have been at times described as “ticking time bombs”, which also contribute to unnaturally occurring [sinkholes](#) and even [lakes](#). Some estimates indicate [that 3.5 trillion cubic feet](#) of these greenhouse gases are leaking into the planet's atmosphere annually from the U.S. alone. Recent studies show that [over 4.6 million Americans](#) (or about 13% of the nation's population) live within a half mile of one of the more than 80,000 documented orphaned gas or oil wells in the U.S. From an economic standpoint, they present an obstacle by shifting the burden of environmental and other costs to governments and the general public.

Moreover, there is also the impact of the main community employer – the oil and gas extractor – creating a local dependency on its jobs as the main source of income and then abandoning the community with no viable economic alternatives. There is a subtle difference between an orphaned well – which no longer produces, and an abandoned well, which may still have economic value, but may present economic challenges to the extractor which make counter any benefits from continuing the effort. The result of well abandonment has resulted in job cuts for over 100,000 oil and gas workers by 2021, when Congress passed the Bipartisan Infrastructure Law, which included provisions to plug in the wells and revitalize communities. Finally, there is a potential security implication of residing near an orphan well, because if left unplugged, these wells are [prone to fires and explosions](#). Incidental damages alone could be tremendous, but a map of the over 120, 000 [documented orphan wells](#) eligible for closure in the US alone could be a [treasure trove of intelligence](#) for criminal masterminds or terrorists. Creating a roadmap to tracking known environmental risks and economic vulnerabilities is also a boon for hostile state actors.

Potential foreign investors seeking to take possession of strategic land in the United States could seek out depreciated territories encumbered by liabilities such as abandoned oil and gas wells to advance their clout and monopoly over other local resources. So far, countries like China have mainly focused on taking control of [supply chain issues in active agricultural properties](#) or buying up lands available for development, but the federal crackdown on hostile actors taking advantage of highly desirable and immediately available real estate could force them down more convoluted avenues towards controlling strategic assets.

There is another angle to this dilemma: the oil and gas companies themselves may be losing out on a portion of the profit because of inability to extract the fossil fuels from some of the wells they abandon. They also face costs of relocation and loss of labor when they move on from wells that are no longer producing. There are several considerations and approaches towards responding to the orphan well dilemma: deterring the wholesale abandonment of the wells and local communities by the industries, absorbing the costs of plugging the wells in a way that limits the burden on taxpayers and authorities, preventing these wells from becoming environmental and security liabilities, and mitigating damages already incurred.

So far, active problem solving is being managed by federal programs. For instance, In November 2021, as part of the Bipartisan Infrastructure Law (BIL), the U.S. government allocated \$4.7 billion to plug orphaned oil and gas wells across the country. The Bureau of Land Management [is leading the effort](#) in plugging orphan wells on federal lands. A year later, the Biden administration allocated \$1.15 billion in funding for states to create [jobs cleaning up the wells](#). The actual costs of plugging in the orphan and abandoned wells [could exceed this budget](#) by 30-80%. There are also alternative solutions suggested by researchers. They could be used for accessing subsurface reservoirs with storage potential for carbon dioxide, hydrogen, and natural gas so long as the locations meet safety standards and the oil and gas leaks are not excessive. The land in some instances could be repurposed towards wind power or towards geothermal development. More recently, a New Mexico bill [passed](#) the House, promoted by Rep. Teresa Leger Fernandez (D), which aims at closing an orphan well loophole and seeking to maintain the \$60 million annual balance for cleaning up abandoned oil and gas wells.

Tax rebates and other tax-related incentives for taking part in plugging the wells might provide reasons to engage more responsibly. Inducing the companies to stick around for carbon capture projects or other repurposing initiatives would alleviate the costs of having to move business, while retaining business links and providing a lifeline to the local communities. For instance, what if the federal government did not have to shell out funding for clean up jobs, contributing to inflation? What if the private industry could instead redevelop the land towards various types of projects, and could hire the local workers as part of diverse visions contributing to various developments of the local communities?

There is already some level of private sector environment on the technical side of the clean-up. Various companies [produce and sell technology](#) which can help locate and monitor these wells. Some of the technology is sold to oil and gas companies to detect leaks. Nonprofits are also involved in the identification and monitoring of orphan wells and the tracking of greenhouse emissions. These projects work with local landowners and state environmental protection agencies to plug the wells. The awareness of the orphan wells problems is growing in the environmental protection community but is not yet part of the mainstream discourse; it is also missing from the conversation on the energy side. Incentives for helping document unidentified orphan wells could include giving a role and a contracting incentive in restoration and reclamation projects. Private companies could be part of the energy security solution in helping retrofit the wells in a way that could promote alternative energy and conserve energy that would otherwise dissipate. Geothermal reclamation projects are involved in [harvesting heat](#) from these wells towards commercial scale usage. Other projects, such as the concept of earth terraforming towards space infrastructure, are being promoted by organizations like Interplanetary Chamber of Commerce. The concept of partnering with interested energy and tech companies and giving them a stake in commercial space development builds an incentive for taking part in clean up of toxic waste or plugging in abandoned wells.

There are also other potential ideas for addressing the interests of various stakeholders in the matter. For instance, the federal government may consider shifting the burden of plugging in the oil and gas wells to state and local authorities, or engage the oil and gas extractors by holding them accountable for abandoning the wells or for the costs of plugging

in the wells or other risk mitigation measures imposed by the government. In theory, operators are legally required to seal up the wells once they are ready to move on. In reality, most of the orphan wells do not have an owner of record. Greater oversight could prevent the problem from deteriorating further. Regulatory measures with hefty fines or even temporary bans on extraction operations could be one way of getting the industries to becoming more committed “parents” to the wells. On the other hand, positive incentives can get the industry to view these wells as an opportunity rather than a liability alone. In fact, in January 2024, the world’s first carbon credits were issued towards plugging in oil and gas wells, for a women-led company which uses the methodology of leveraging carbon markets towards climate action. Still, one should be wary of the propensity to exploit carbon credits towards [massive fraud](#) as it happened to the tune of over a billion euros in Europe.

However, the problem has far broader scale than the thousands of orphan wells scattered across the US. In fact, [millions of orphan wells](#) scale up the environmental risk and missed economic opportunities around the world exponentially. However, where the US has allocated substantial resources towards advancing remedial solutions within its borders, many countries around the world lack the funding to handle massive projects. Even developed countries, such as Canada, are facing [significant financial burdens](#) in taking care of the orphan wells problem as a result of other major economic factors, such as the pandemic, global oil price shocks, as well as the challenges posed by the broader decarbonization efforts.

Moreover, there is no clear picture about the scope of awareness of orphan wells as a major risk factor and problem outside the US and Canada. Comparative studies of how orphan wells are handled around the world could shed light on blind spots that contribute to global environmental, economic, and security challenges. Indeed, focusing on a narrowly tailored and manageable problem such as abandoned oil and gas wells could be on way to motivate countries that are not otherwise inclined to choose climate change related objectives over economic development to prioritizing mitigating specific risk factors. Gaining a broader understanding of how the orphan well dilemma is handled around the world could contribute to greater international cooperation, sharing of best practices, lead to breakthroughs in innovative technology, and globalize reclamation and revitalization of the impacted communities.



Irina Tsukerman, is a national security lawyer and geopolitical analyst based in the US. Her interests include information warfare, energy security, cybersecurity, big tech and innovation, emerging transnational threats, and Great Power Competition. She is a member of several legal associations and committees focused on these issues. She is also the President of Scarab Rising, Inc., a security and geopolitical risk strategic advisory, and regularly appears on international media to discuss US politics and foreign policy, Russia/Ukraine conflict and related issues, the Middle East and Africa, and other concerns. Irina's writings have been translated into over a dozen languages. She is also a frequent contributor to various academic conferences.