



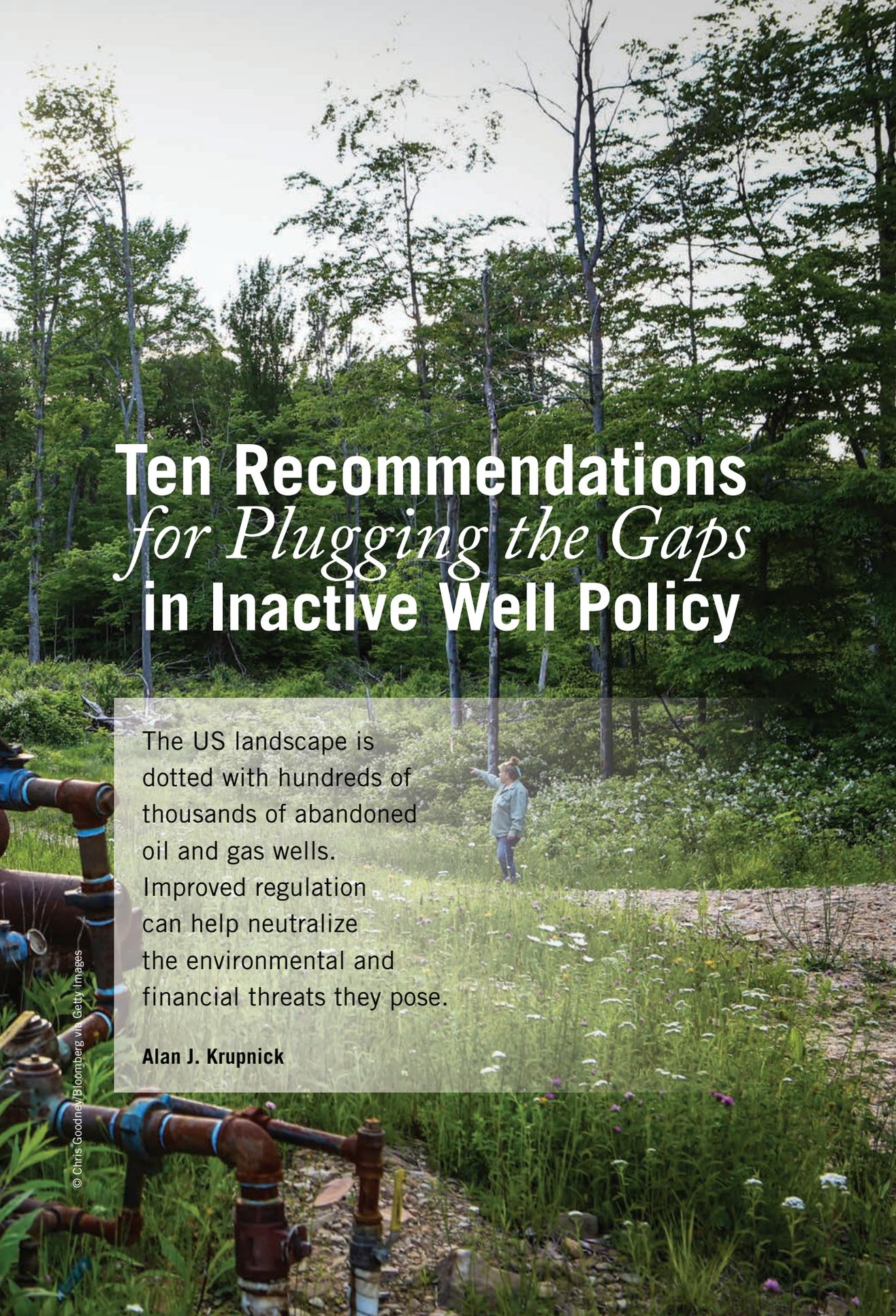
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# Ten Recommendations *for Plugging the Gaps* in Inactive Well Policy

The US landscape is dotted with hundreds of thousands of abandoned oil and gas wells. Improved regulation can help neutralize the environmental and financial threats they pose.

**Alan J. Krupnick**

In places like Pennsylvania, where the first oil well was drilled in 1859, 100-year-old abandoned oil wells are part of the landscape, if you can find them. Some of these inactive wells are so old that they were originally plugged with dirt or lumber, and many of these older wells do not appear on official state records.

Today, of the at least 3.5 million oil and gas wells that have been drilled in North America, less than 25 percent are actively in production. The remaining wells are presumably left inactive, potentially threatening human and environmental health. These inactive wells can leak methane or contaminate nearby lakes, streams, and aquifers. Whether and to what extent even properly plugged wells can leak at some point in their existence are still open questions.

Significant financial concerns also exist about decommissioning inactive wells—that is, permanently plugging the wells and reclaiming the surrounding well sites. States face challenges with managing and decommissioning what are known as orphaned wells, those without a responsible owner. In recent research, my colleagues and I find that the costs of decommissioning these wells presents a large financial burden for states because the bond amounts required of well operators are generally too low to cover decommissioning costs, should a well owner become bankrupt or be otherwise unavailable to pay. Reforming the policies that govern well bonding, management, and monitoring can help mitigate the risks to states, the public, and the environment.

We have developed 10 policy recommendations with an eye toward reforming the regulation of onshore inactive wells in the United States. Lessons learned from this research and these recommendations will have implications that reach

“Inactive wells can leak methane or contaminate nearby lakes, streams, and aquifers.”

beyond the oil and gas industry, given that the challenge of ensuring that future environmental costs are borne by polluters is one that is common to other sectors, such as mining and waste disposal.

### Liability and Decommissioning Costs

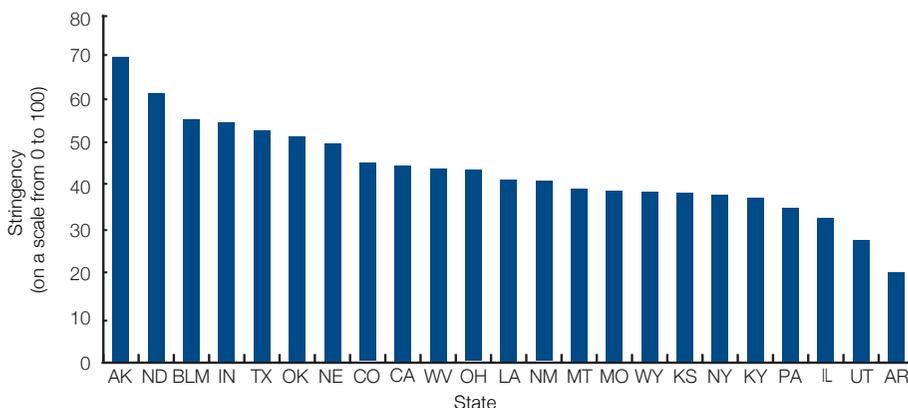
In an infographic in the Spring/Summer issue of *Resources* (no. 192), we compared the average cost of decommissioning inactive wells in 12 states with the average bond amount required and found that costs exceeded bond amounts in 10 of the 12 states. When the costs of decommissioning a well exceed the bond that operators provide to state regulators, the likelihood that the public will bear the costs of decommissioning increases, for a few reasons. Operators have an incentive to leave the well in temporary abandonment status rather than incur the costs of decommissioning. Wells may also be sold to operators that do not have the financial means to decommission these wells. Finally, if wells become orphaned, the revenue that regulators recover from industry bonds could be insufficient to cover decommissioning costs.

The difference between bonds and costs is likely to be even larger when considering wells that are covered by blanket bonds. In some jurisdictions, an operator may choose to file a blanket bond for all of its wells in the jurisdiction, rather than post individual bonds for each well. A blanket bond offers operators a quantity discount. For example, in Michigan—where 92 percent of decommissioning projects have costs that exceed the bond amount—regulators allow

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**Figure 1. Stringency of Five Quantitative Regulatory Elements, by State and Bureau of Land Management (BLM)**



operators to file a blanket bond for \$100,000 for a maximum of 100 wells that are less than 2,000 feet deep, whereas an individual well bond is \$10,000 per well. Individual well bonds for 100 wells at this cost totals \$1 million; however, a blanket bond for these 100 wells would cost only 10 percent of that amount.

### The Stringency of Regulations

We also reviewed 31 regulatory elements (in 22 states) that influence the extent to which inactive wells will create an environmental or financial burden for the public. These regulations stipulate the types and amounts of bonds that operators can post, minimum requirements for wells to obtain temporary abandonment status, site reclamation requirements, and how inactive wells are to be monitored.

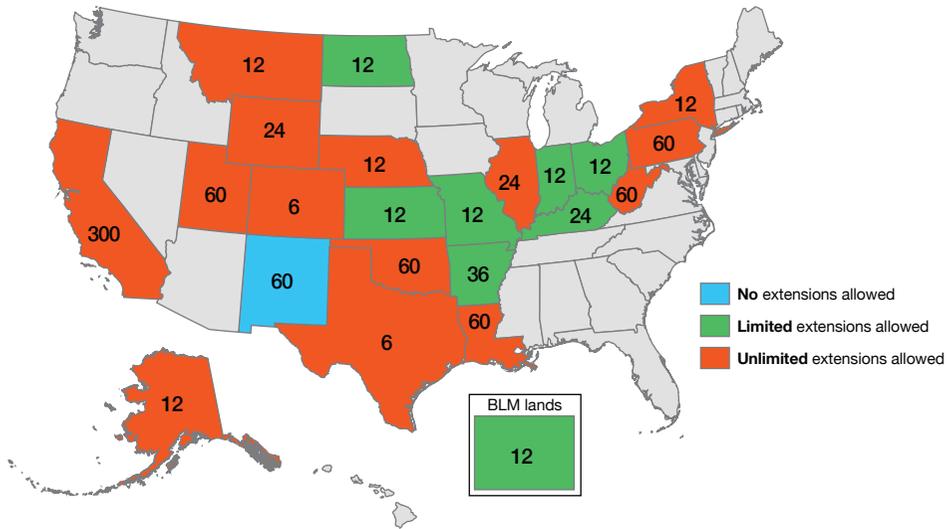
We find significant differences among states, although all states are addressing many of the elements in one way or another. We also compared federal regulations under the Bureau of Land Management (BLM) with those of the states and found that BLM regulations are generally more stringent than the regulations in most states. Figure 1 ranks states and BLM by the average stringency of five quantitative regulatory elements: minimum individual bond amounts, in dollars; minimum blanket bond amounts, in dollars; well idle

time, in months; duration of temporary abandonment, in months; and timing of reclamation requirements, in months. In the figure, each regulatory element is normalized such that the least and most stringent regulations receive a score of 0 and 100, respectively. Scores are then averaged with equal weights across the five elements. We find that Alaska ranks at the top, with North Dakota coming in second. Utah and Arkansas have the least stringent regulations for these elements. The fact that the highest stringency index is 70 (out of 100) implies that no state is regulating all five elements in the most stringent way.

There are interesting similarities and differences among the states. Almost all offer the option of blanket bonds. Requirements for temporary abandonment—including well testing and monitoring, proof of future economic viability, and mandated well closure requirements—are uncommon.

All the states we surveyed regulate the duration of temporary abandonment, where an operator may choose to stop production but not to permanently decommission the well. This means that operators can use temporary abandonment status to simply avoid or delay decommissioning costs even if the wells have very low future economic potential. Figure 2 shows how long wells are allowed to remain in temporary abandonment status in different states. This

**Figure 2. Duration of Permissible Temporary Well Abandonment (months)**



ranges from 6 months in Colorado and Texas to 300 months in California. All but New Mexico explicitly allow some form of extension of this status, either limited or unlimited. For example, North Dakota permits operators to apply for only one extension that lasts two years.

We also found that requirements for well plugging and site reclamation vary greatly in the amount of detail set forth in the regulations. This reflects both the different regulatory approaches taken by states and the fact that well plugging and abandonment requirements may be dealt with on a case-by-case basis with a large amount of regulator discretion. Whereas most states require preapproval of plugging plans, relatively few require inspection after plugging, and almost none require inspection (or even reporting or notification) after site reclamation is complete.

### Ten Policy Recommendations for State Regulatory Reform

Based on our findings, we highlight a number of priority areas for policy reform for state oil and gas agencies, BLM, and other relevant agencies to consider.

Some recommendations do not apply to states that are already addressing these issues (or to BLM, when that is also the case). Such states can serve as a model for others. We use the term “states” to refer to all jurisdictions, including BLM. More detail on these recommendations can be found in our report and executive summary.

1. Compare bond amounts required of operators against decommissioning costs in each state and revise bonds accordingly to more closely approximate decommissioning costs.
2. Include provisions in bonding regulations to ensure that states do not bear the cost of particularly expensive decommissioning projects.
3. Calibrate bond amounts to account for a variety of factors that influence decommissioning costs, such as well depth.
4. Consider introducing surface damage agreements in addition to traditional plugging and reclamation agreements.
5. Tighten the conditions under which wells are allowed to be transferred from one operator to another.
6. Tighten requirements for maintaining temporary abandonment status.



7. Conduct legislative audits to evaluate the stringency of state monitoring efforts and the success of state plugging programs.

8. Develop more sustainable means for state financing of orphaned well decommissioning efforts.

9. Improve state reporting on the numbers of inactive wells of various types and statuses, costs, and how regulations are applied in the field and through permitting

10. Given the heterogeneity of state regulations, consider using the Regulatory Exchange (supported by the Groundwater Protection Council and the Interstate Oil and Gas Compact Commission) or other bodies to share regulatory information among states and learn from other states' experiences.

If implemented thoughtfully, these policy recommendations would help mitigate the environmental threat and financial burden posed by the population of inactive wells in

the United States, which will only continue to grow with the ongoing development of shale oil and gas resources. Ultimately, developing effective policies will depend on a deeper understanding of where the environmental and financial risks are greatest; how operators are currently making decisions about temporary abandonment, well transfers, types of bonds, and permanent decommissioning; and how regulations can best be reformed. ●

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The authors thank the Paul G. Allen Family Foundation for supporting this project.

#### FURTHER READING

Ho, Jacqueline, Alan Krupnick, Katrina McLaughlin, Clayton Munnings, and Jhih-Shyang Shih. 2016. *Plugging the Gaps in Inactive Well Policy*. Washington, DC: RFF.

Ho, Jacqueline, and Alan Krupnick. 2016. Who Pays to Plug Inactive Oil and Gas Wells? *Resources* 192 (Spring/Summer): 4–5.