Beneath the Surface

How Orphan Oil Wells Could Overwhelm Colorado's Budget

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Introduction

While oil and gas production has come under scrutiny due to our warming climate and the environmental costs to the land, air, and water, the fiscal problems associated with orphan wells deserve significant attention, as well. Despite private companies having the fiscal responsibility to care for oil and gas wells throughout their lifespan, from their creation to capping, this does not happen as frequently as it should. Instead, as a result of inadequate public policies, oil and gas companies are able to shirk their financial responsibilities, in turn leaving the state and taxpayers to foot the bill when wells need to be closed.

Fortunately, the Colorado Oil and Gas Conservation Commission (COGCC) has a real opportunity to put Colorado, our budget, and our environment on a strong footing going forward by promulgating strong rules on financial assurance – also known as bonding – for oil and gas wells in Colorado. As this report shows, current financial assurance regulations in Colorado have not kept up with actual production. Stronger rules are needed to ensure that taxpayers are not responsible for paying for the activities of private companies.

It is important to define the types of oil and gas wells that will be part of this report:	
Producing Wells	All wells producing more than 5 barrels of oil and gas per day.
Idle Wells	Wells producing less than 1 barrel of oil and gas per day.
Low-Producing Wells	Wells producing between 1 and 5 barrels of oil and gas per day.
Stripper wells	A larger category containing producing, idle, and low-producing wells, stripper wells produce less than 15 barrels of oil and gas oil per day.
Orphan Wells	Wells that no longer have an owner responsible for them, due to penalties from the state or a company's financial distress.

The other crucial part of this report revolves around bonding. Before leasing land – for the purposes of this report, federal lands are not accounted for – for oil and gas production, companies have to put forward financial assurances so that the government knows that the company has resources available to plug the well and remedy (a technical term for restoring the natural environment) the surrounding land and water once production is complete. As a result, bonding has been put in place for all levels of government for the financial backing to plug the well.

Key Findings

01 While some independent analyses assume that plugging wells costs between $20,000-$40,000, the true cost of plugging deeper and horizontally drilled wells is likely over $100,000 and up to nearly $300,000 in some extreme cases.

02 Current financial assurance regulations in Colorado allow oil and gas operators to put forward as little as $10,000 for future well clean-up.

03 The current orphan well program in Colorado has less than $4 million in appropriations, even though the current cost of plugging orphan wells – using the COGCC number of $82,500 per well – can be conservatively estimated at $19.3 million.

04 The current future liability of all oil and gas wells in Colorado is a total of $8,298,315,458 – a cost of $3,338.37 per Colorado tax filer, based on 2018 income tax data.

05 That liability will continue to rise as more oil and gas wells are permitted in Colorado.

The Problem at a Glance

Colorado has a backlog of 234 orphan wells and 552 orphan well sites, which has grown every year since 2016. There are more than 42,000 active wells in the state, with more than 7,200 of these producing less than 5 barrels per day. The orphan well program in Colorado currently gets less than $5 million in annual appropriations, but it would cost $19.3 million to clear the current backlog of orphan wells.

The Trouble with Bonding Analysis

Analyzing the true costs of plugging wells can be a difficult undertaking, which makes coming up with an accurate bonding amount hard. Many independent arbiters of the bonding process rely on estimates from state-run orphan wells programs. Orphan well programs are when states become responsible for plugging wells from companies that are either in severe financial distress or no longer exist.

In Colorado, the money for the orphan well program comes from levies and penalties on current oil and gas companies, as well as the original bonding money from oil and gas operators. Using data from orphan well programs can pose some problems, however, as many orphan wells are from many decades ago when drilling technology was more rudimentary and the wells were not as deep. As the Carbon Tracker Initiative – an independent financial think-tank dedicated to analysis of the true market cost of fossil fuels – has written, omitting these variables can lead

to significantly understating the cost of plugging oil and gas wells. And because those costs are borne by the oil and gas industry, which does not tend to publish accurate cost estimates, it is hard to get a true understanding of the costs of plugging oil and gas wells.

As a result, analyses that depend on orphan well data tend to peg costs at around $20,000-$40,000 per well. However, as noted above, these estimates are often inadequate reflections of the true cost of plugging wells. As the Carbon Tracker Initiative's research and analysis shows, some directionally drilled, deeper wells can cost upwards of $300,000 to plug and abandon – a significantly steeper price that is not factored into current financial assurance regulations.

Current Financial Assurance Rules in Colorado

Colorado's current financial assurance regulations date back to 2009, but are currently being updated as a result of the passage of SB19-181. This law, among other details, updated the mission and structure of the Colorado Oil and Gas Conservation Commission to ensure that public and environmental welfare were taken into account when writing oil and gas regulations.

The current regulations allow bonds of either $10,000 or $20,000 for individual wells – depending on the depth of the well – and either $60,000 or $100,000 for blanket bonds. The lower number for blanket bonds is for those companies that have less than 100 wells, and the higher number is for companies that have 100 or more wells they are covering. Blanket bonds allow companies to not have to bond for every single well, but for all wells under their company name. Due to these different rates, a company with more than 100 wells is therefore underpaying the true bonding cost in an extreme way. A company that has 150 wells would have to pay more than $12 million in bonding if they were to pay the true bonding costs, based on cost estimates from the state of Colorado. Instead, they just have to put forward $100,000 under current regulations for all of their oil and gas wells.

As mentioned above, $20,000 per well is the lowest average figure that analysts have put forward as a cost estimate for plugging a well. The current bonding amounts don't come close to covering the costs for all of the wells under a company's purview. While the current rules may not be out of line with what many other states have on their books, SB-181 gives Colorado a chance to update its rules for the future and lead the way on modern regulations for oil and gas bonding.

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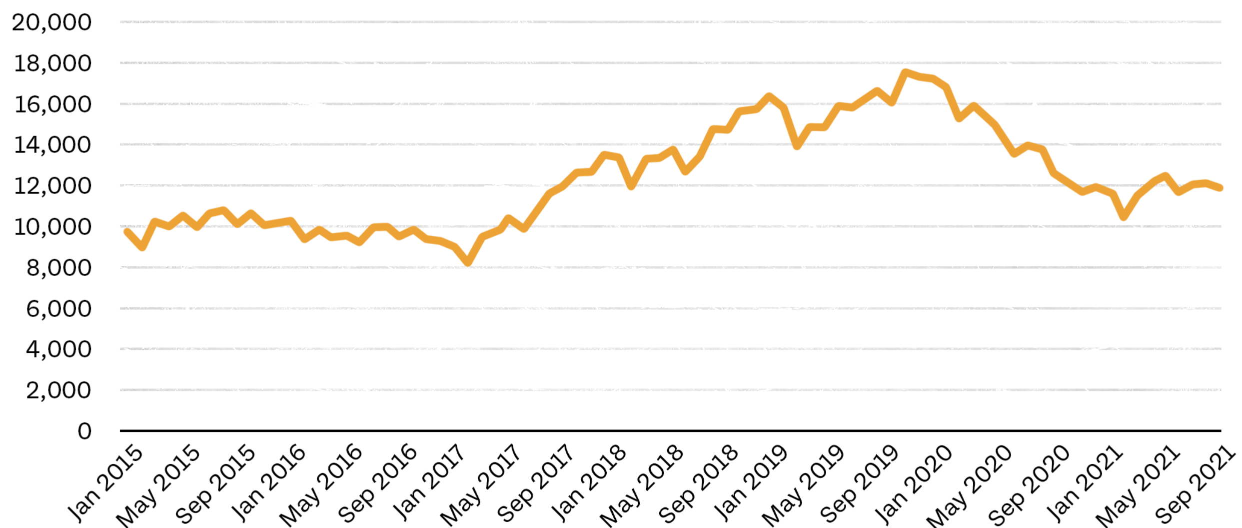
The State of Colorado's Oil and Gas Production

Colorado's oil and gas production has been declining, as seen in the below graph from the U.S. Energy Information Administration. Also, according to recent data, the oil and gas industry has been doing its fair share of plugging old oil and gas wells. But much of that plugging can be attributed to industry choosing to plug wells that are very close to newly directionally-drilled wells. Plugging these old wells help minimize safety concerns, as well as stimulate new production. Data analyzed by the Carbon Tracker Initiative shows that in places like the Wattenberg Boundary in northern Colorado, where new drilling is occurring, companies have been diligent about plugging wells. However, in other areas of the state where activity has slowed, wells have not been plugged at nearly the same rate. This fact implies that there is not much incentive for companies to plug wells, unless they are clearing the way for more drilling.



Source: Energy Information Administration

Analysis of Directional Wells Spudded Between 1970 & 2010 and Plugged After 2010

Inside Wattenberg Boundary	Spudded Before 2010	4,567
	Spudded Before 2010 & Plugged	3,049
	Share Plugged	67%
Outside Wattenberg Boundary	Spudded Before 2010	8,423
	Spudded Before 2010 & Plugged	343
	Share Plugged	4%
Statewide Total	Spudded Before 2010	12,990
	Spudded Before 2010 & Plugged	3,392
	Share of Plugged In Wattenberg	90%
	Share of Plugged Outside Wattenberg	10%

*Spudded is the beginning of drilling a new oil and gas well

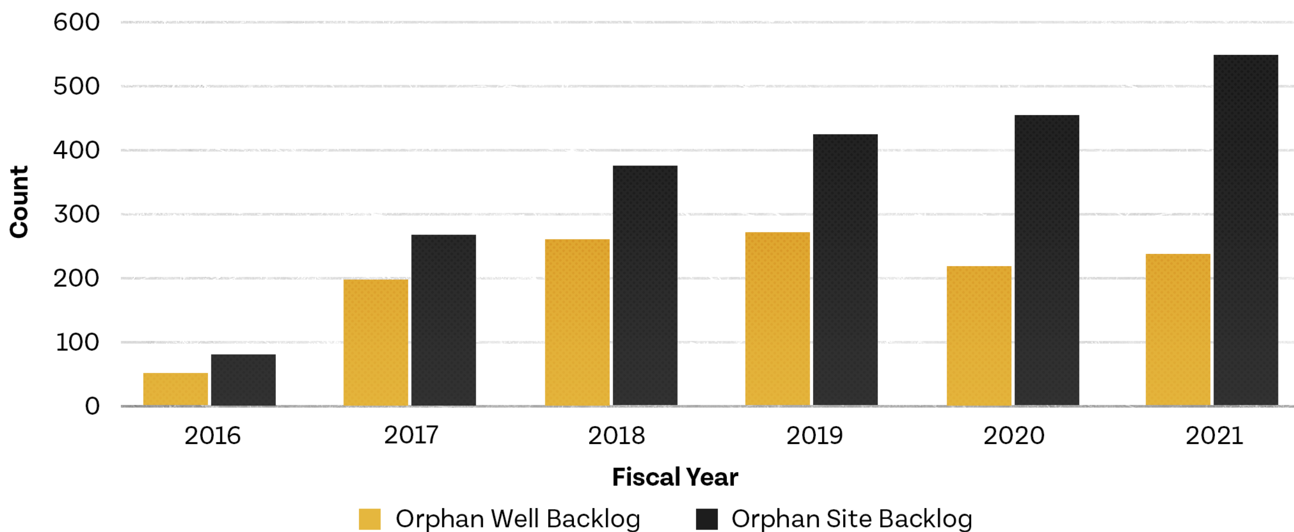
Source: COGCC, August 22, 2021

According to 2021 data, there were more than 42,000 active wells in the state of Colorado. While many of these wells are producing oil and gas, some of them are not, and others are barely producing any. In fact, there are 7,249 wells producing less than five barrels per day with 850 wells that produce no oil or gas. These types of wells are most at risk of near-term orphanage as they become uneconomical to continue to operate.

Orphan Well Program

Colorado operates its own orphan well program that has seen a real increase in work and associated budgetary impacts over the last decade. While created in 1990, the Orphan Well Program has only recently been able to hire full-time employees and have a budget associated with a major statewide program. The money in the budget for the orphan well program comes from financial penalties levied by the state and the bond amounts paid by the oil and gas operators. In fiscal year 2021, that amount was $3.85 million in appropriations.

According to reports from the Colorado Department of Natural Resources, this past year the COGCC has 552 sites and 234 wells on those sites that have been identified as in need of plugging and remediation. As seen in the chart below, the number of orphan wells in need of plugging and remediation has been increasing since 2016.



Source: Colorado Oil and Gas Conservation Commission

The COGCC has estimated that an average well costs $82,500 to plug and remediate, according to data from 2012-2017. That would mean a total of $19.3 million is needed for the orphan well program to break even on just sites with one well for fiscal year 2021-22. That is far below the appropriation currently in law and money available for the program.

For Colorado, the estimated cost is staggering. In total, it would cost the state over $8 billion to plug every currently active well in Colorado.

The Liability to Colorado Taxpayers

As mentioned above, there is not much incentive for oil and gas companies to plug wells and reclaim the land if there is not more drilling to be done in the near vicinity. Without that incentive, oil and gas companies have little reason to plug wells, ensuring that many currently active wells will become orphan wells that need to be taken care of by the state. That leaves Colorado – and by extension, Colorado taxpayers – to pay for plugging all wells when oil and gas companies move on. With deeper and more complicated drilling taking place over the last several years, the cost per plugged well will only continue to go up.

The Carbon Tracker Initiative has taken a look at the estimated cost of plugging and abandoning (P&A) every active well to states with oil and gas production. They analyzed the depth of the well and how that figures into the cost of plugging wells and remediating the site of production. For Colorado, the estimated cost is staggering. In total, it would cost the state over $8 billion to plug every currently active well in Colorado. That cost, if industry abandons and orphans wells, would be borne by the state over time as wells dry up and become uneconomical to continue.

P&A Well Cost

	Wells	Liability Estimate	Percent
Producing	13,425	$1,969,672,557	24%
Stripper	29,907	$4,014,022,255	48%
Injection + Other	11,351	$1,598,627,847	19%
Temporarily Abandoned (LP>24<60)	3,056	$483,875,187	6%
Zombie* (LP<60)	1,972	$232,117,612	3%
Total	59,711	$8,298,315,458	100%

*Zombie wells are wells that produce little or no oil and gas and whose owners likely don't have money to plug the wells.

The above chart shows that stripper wells are the largest section of wells and liability in the state. Stripper wells are smaller wells – below 15 barrels of oil produced per day – generally owned by smaller companies. Because smaller companies have less profit margin and are producing much less oil and gas on a daily basis, they are more likely to experience financial distress and orphan wells at higher rates.

The more than $8 billion outlined above is significantly more than the current orphan wells operating budget and would leave the state with severe financial liabilities, if allowed to happen. Using 2018 tax returns from the Colorado Department of Revenue, that is equivalent to a bill of $3,338.37 for every tax filer in Colorado.

To put in perspective how much that money is, in terms of the Colorado budget, here are some figures from the fiscal year 2021-22 state budget:

- The entire state Department of Education budget – including federal funds – is only $6.57 billion.
- Every single cash fund added up is $9.88 billion.
- The entire General Fund – income and sales taxes that make up the largely discretionary pot of money for the General Assembly to appropriate every year – was just $16 billion.

As the Bell Policy Center has previously shown, 50% of the General Fund budget will be taken up by just three programs by fiscal year 2023-24: The Department of Corrections, K-12 education needs, and the state share of Medicaid. Factoring in the arbitrary cap on spending in Colorado – known as the TABOR cap – there is very little wiggle room for Colorado's budget writers to adequately fund the programs Coloradans rely upon. Without real reforms to the financial assurance system, paying for plugging orphan wells at this scale will completely swamp the entirety of the state budget.

Conclusion

As the COGCC deliberates on how best to structure the financial assurance regulations, it is crucial that the likelihood of large amounts of uncapped wells are properly factored into the calculations.

Without a robust system that ensures companies are putting money towards bonding that is commensurate with the risk to the budget, Colorado taxpayers will be on the hook for many, if not all, of the wells and the environmental damage that would follow. Given the differences between the types of companies that operate in this state – some large companies with money to put up front and smaller companies that have less assets to bond – and the difference in cost between different drilling techniques, a system that tiers out various operators and wells makes sense. However, if the COGCC goes down the route of separating out companies and wells by size and depth, the definitions of these tiers need to be precise and clear, so that oil and gas operators cannot exploit loopholes and nuance to game the system.

It is clear that new financial assurance rules are needed to combat the ticking fiscal bomb – the likelihood of billions of dollars worth of uncapped wells – in our system. If the bonding requirements ensured enough money to the state to clean up these wells, then the General Fund, and the broader budget would not have such a high level of unfunded liability. But until that happens, the state could be on the hook for billions in oil and gas cleanup, endangering other aspects of our budget and the Colorado taxpayers who fund it.