

Beyond the Brine: Navigating Environmental Perils and Legislative Solutions for Abandoned Oil & Gas Wells in Texas

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I. INTRODUCTION

Across the West Texas Chihuahuan Desert, what look like oases are bursting through the ground. Normally, a water oasis would be a relief for any human or animal in the hot, arid desert. A place of shelter, refuge, and above all, hydration key to survival. Instead, these oases are leaking

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dangerous brine, methane, and other toxic sludge into the groundwater, land, and air above.¹

Killing everything it touches, the salty water pumped out of a well near Fort Stockton, Texas, has grown over the past twenty years from a puddle to what is now known as Lake Boehmer.² Leaking toxic hydrogen sulfide and other chemicals into the air and groundwater, Lake Boehmer has turned into a rural hot potato that various government entities deny responsibility for, allowing the pool of water to grow and fester.³ Although Lake Boehmer was originally an oil and gas well, the Texas oil and gas regulator, the Texas Railroad Commission, denies responsibility for it because of its conversion into a water well.⁴ This leaves Lake Boehmer and the uncapped well that created it, an abandoned, leaky well pumping pollutants into the water, land, and air.

Further complicating Lake Boehmer's fate is the murky regulatory and judicial ecosystem in Texas. While it is technically a water well gone wild, it's an open question of who owns it. Who manages it? Who is responsible for it? Adding another twist to Lake Boehmer's story is the timing of it. When did it come into existence? More importantly, has it harmed anyone, and if so, when?

This Comment addresses the regulatory problems elucidated by Lake Boehmer and propose legislative and market-based solutions to spur oil and gas producers to wrangle abandoned wells under control. In five parts, this Comment argues that the Texas government can strengthen the state's environmental regulations and be a leader in well remediation, while still being an energy leader by strategically using the Bipartisan Infrastructure Act's historic investment in the U.S. economy. Part II explains what abandoned and marginal wells are, how the oil and gas market creates them, and the ways in which the Texas Railroad Commission regulations turns a blind eye. Part III explores the environmental and climate change dangers posed by leaking wells, with a particular focus on groundwater contamination and methane. Finally, Part IV considers the potential market-based solutions that the Infrastructure Investment & Jobs Act creates, proposes a cap-and-trade

1. Jim Malewitz, *Abandoned Texas Oil Wells Seen as "Ticking Time Bombs" of Contamination*, TEX. TRIB. (Dec. 21, 2016), <https://www.texastribune.org/2016/12/21/texas-abandoned-oil-wells-seen-ticking-time-bombs/>.

2. Russell Gold, *The Dead Sea of West Texas Just Got Deadlier*, TEX. MONTHLY (Apr. 11, 2022), <https://www.texasmonthly.com/news-politics/lake-boehmer-hydrogen-sulfide-railroad-commission/>.

3. *Id.*

4. *Id.*

system that would incentivize oil and gas producers to take back their ownership of abandoned wells to reap profits, and provides legislative solutions Texas can take to remedy the abandoned well crisis. Part V briefly concludes.

II. THE LIFE CYCLE CONUNDRUM

The extraction of oil and gas, a cornerstone of the modern economy, hinges on a complex process that begins deep within the earth's crust. Crude oil, formed over millennia from the decomposition of organic matter, is trapped in reservoirs by impermeable rock or water barriers, awaiting extraction via oil wells. This extraction process, often employing techniques such as hydraulic fracturing (fracking), has revolutionized oil production, significantly boosting output and profitability. Following extraction, crude oil undergoes transportation to refineries, where it is refined into valuable products like gasoline and diesel, shaping industries worldwide. However, this lucrative endeavor is not without its challenges, particularly concerning well management and environmental impact. As wells reach the end of their productive lives or become economically unviable, proper plugging and abandonment procedures are essential to prevent environmental harm. Despite regulatory frameworks mandating operators bear this responsibility, loopholes and inadequate bonding requirements persist, leaving a legacy of abandoned wells posing environmental risks. Compounding these challenges are the conversion of some wells into freshwater wells and the opaque nature of chemical disclosure in fracking operations, further complicating efforts to assess and mitigate environmental impacts. As the industry navigates these complexities, addressing the shortcomings in well management and environmental stewardship is imperative to ensure sustainable and responsible resource extraction practices for future generations.

A. *The Extraction Process*

The production of oil and gas is essentially a quest to draw crude oil out of the ground as efficiently as possible—a process that is almost always accomplished via an oil well.⁵ Crude oil is composed of hydrocarbons formed by the decomposition of animals and plants over

5. See Lindsay Maizland & Anshu Siripurapu, *How the U.S. Oil and Gas Industry Works*, COUNCIL ON FOREIGN RELS. (Aug. 11, 2022 10:20 AM), <https://www.cfr.org/backgroundunder/how-us-oil-and-gas-industry-works>.

millions of years.⁶ Over those millennia, organic remains are covered by layers of earth and the subsequent heat and pressure transforms the remains into crude oil.⁷ This crude oil collects in reservoirs trapped by impermeable rock or water barriers and is subject to a single natural pressure system.⁸ These reservoirs are then tapped by an oil well, which

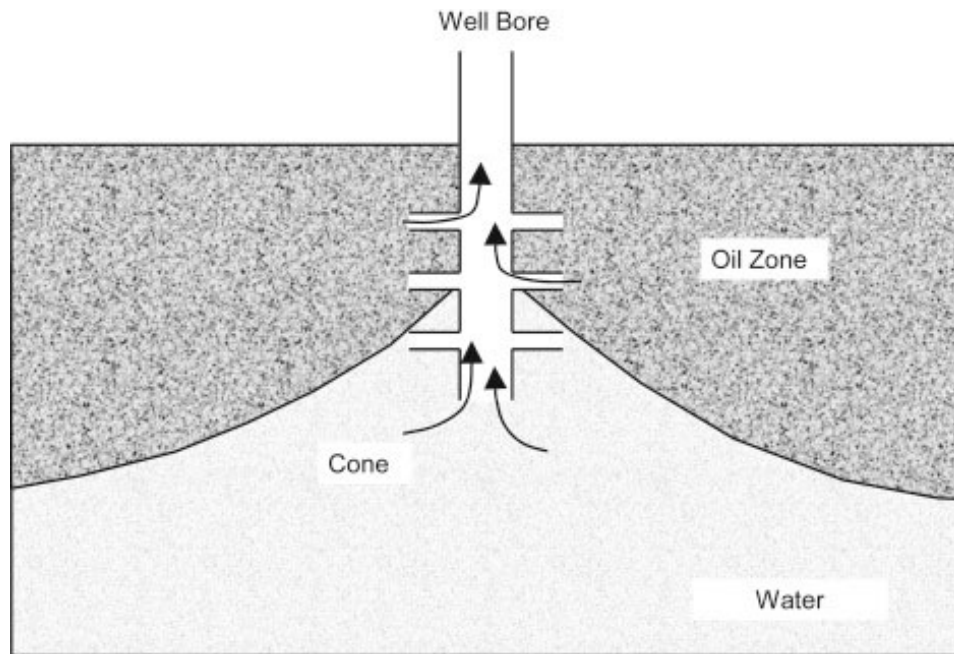


Figure 1: Graphic description of an oil well with water coning. From *Petroleum Production Engineering: A Computer-Assisted Approach* (2007).

dredges up a mixture of crude oil, natural gas, water, and earth to be processed into petroleum products.⁹ These wells are shaped like an inverted cone dug into the earth with liners and casings cemented down to the reservoir several thousand feet below ground.¹⁰

Depending on the reservoir, the crude oil: (1) escapes via natural pressure to the well to be processed, (2) is driven out by water that is

6. U.S. ENERGY INFO. ADMIN., *Oil and Petroleum Products Explained*, <https://www.eia.gov/energyexplained/oil-and-petroleum-products/> (last updated June 12, 2023).

7. *Id.*

8. Boyun Guo, William C. Lyons & Ali Ghalambor, *PETROLEUM PRODUCTION ENGINEERING: A COMPUTER-ASSISTED APPROACH* 1/4 (Elsevier Science & Technology Books, 2007).

9. *Id.*

10. *Id.* at 1/5.

flushed into the well, or (3) is extracted by a pump.¹¹ An important, common step in contemporary oil extraction is fracking.¹² Fracking consists of pumping water, proppants, and chemicals into reservoirs at high pressure to crack impenetrable rock and free oil and gas that would otherwise be unextractable.¹³ Fracking dramatically improves well productivity; its growing use catapulted U.S. oil production with an increase of seventy-five percent and natural gas production with a thirty-nine percent increase from 2007 to 2016.¹⁴

After the fracking process, crude oil is then piped, trucked, or shipped to refineries in order to transform it from its raw, crude state into a more refined product.¹⁵ These refined products include gasoline, diesel, and plastic, used daily by people across the globe.¹⁶ Natural gas is similarly piped, trucked, or shipped off to be consumed for heating, cooking, and other domestic and industrial purposes.¹⁷

This difficult, resource-intense extraction process undergirds the world's contemporary economy and has led to four trillion U.S. dollars in profit worldwide in 2022, according to the International Energy Association.¹⁸ The state of Texas specifically reaped \$24.7 billion in taxes from its oil and gas industry for fiscal year 2022, breaking all previous records.¹⁹

11. *Id.* at 1/4 to 1/9.

12. See Brad Plumer, *Fracking, Explained*, VOX, <https://www.vox.com/2014/4/14/18076690/fracking> (last updated July 30, 2015, 10:53 PM).

13. Melissa Denchak, *Fracking 101*, NAT. RES. DEFENSE COUNCIL (Apr. 19, 2019), <https://www.nrdc.org/stories/fracking-101#what-is>.

14. *Hydraulic Fracturing*, INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, <https://www.ipaa.org/fracking/> (last visited Jan. 26, 2024) (citing *U.S. Field Production of Crude Oil*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=merfpus2&f=a> (last updated Aug. 29, 2025); *U.S. Dry Natural Gas Production*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/dnav/ng/hist/n9070us2A.htm> (last updated Aug. 29, 2025)).

15. See *The Technical Side of Refining Oil*, VALERO, <https://www.valero.com/refining/oil-refining/refining-science-process#:~:text=Shipping,trucks%2C%20or%20ships%20and%20barges> (last visited Feb. 23, 2024) (explaining the logistics and process of refining crude oil).

16. See COGA Fact Sheet: *Everyday Products & Uses*, COLO. OIL & GAS ASS'N (June 11, 2019), <https://www.coga.org/factsheets/everyday-products-uses> (describing the myriad uses of oil in domestic and industrial products).

17. *Natural Gas Explained*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/energyexplained/natural-gas/> (last updated Oct. 10, 2024).

18. Nerijus Adomaitis, *Oil and Gas Industry Earned \$4 Trillion Last Year, Says IEA Chief*, REUTERS (Feb. 14, 2023), <https://www.reuters.com/business/energy/oil-gas-industry-earned-4-trillion-last-year-says-iea-chief-2023-02-14/>.

19. Mitchell Ferman, *Texas Oil Industry Paid Record \$24.7 Billion in Taxes Last Year*, BLOOMBERG (Jan. 23, 2023), <https://www.bloomberg.com/news/articles/2023-01-23/texas-oil-industry-paid-record-24-7-billion-in-taxes-last-year?embedded-checkout=true>.

B. Tamping the Flow

If all goes to plan, once a well reaches the end of its productive life, it should be properly plugged with cement and taken out of production. In an ideal world, the cement plug keeps any fluids from coming out and spreading above or below ground. When properly operated over their lifetimes, these wells have made operators and royalty owners millions of dollars or more in profit, but, being subject to market conditions, operating them also severely impacts profitability.

If a well is no longer a profitable enterprise for an operator or it reaches the end of its useful life, the operator is required to remove all equipment and plug the well with cement to prevent the leaking of oil, gas, or water.²⁰ Specifically, the Texas Administrative Code requires all wells “to be plugged to insure that all formations bearing usable quality water, oil, gas, or geothermal resources are protected.”²¹ The operator itself or a contractor must plug the well with cement to “isolate each productive horizon and usable quality water strata,” and must do so according to the specifications required by the Groundwater Advisory Unit of the Oil and Gas Division.²² Here lies a major issue in taking oil and gas wells out of production safely. Historically, many of these wells were left abandoned since they were “dry”²³ and never produced oil or turned out to be unprofitable.

Most of Texas’s oil rich reservoirs are far from urban environments and a risky business for any producer. Not only would a producer need to transport workers and equipment out into cowboy country, but they would also need to bear the cost and risks of getting the oil product to a refinery. Texas’s most profitable oil reservoir, the Permian Basin, is a desolate, dry wasteland far from much of the urbanized core of Texas cities. When it’s unclear if a region has much oil below ground, producers drill several “wildcat” wells to determine if the area is worth their efforts. Dug in rural counties, these wells got their name from being supposedly “so far from civilization that the drillers could hear the cries of wildcats.”²⁴ Wildcat wells are high risk because the expense of drilling a well approaches

20. E. Allison & B. Mandler, *Abandoned Wells* 7-1 to 7-2 (Am. Geosciences Inst., 2018), https://www.americangeosciences.org/sites/default/files/AGI_PE_AbandonedWells_web_final.pdf.

21. Tex. Econ. Regul. Code Ann. § 3.14 (d)(1) (West 2023).

22. *Id.* §3.14(d)(2).

23. Be advised that a dry oil well is one that is not producing oil, but which could still in fact be wet with water.

24. See Marlan W. Downey, *Oil and Natural Gas Exploration in* ENCYCLOPEDIA OF ENERGY 549, 549 (Cutler J. Cleveland ed., 2004).

millions of dollars and the probability of its being profitable is a gamble.²⁵ Wildcat drillers do not just drill one well, but instead drill dozens, if not hundreds, in a region to see if they strike a reservoir.²⁶ Most of these wells are nothing but a huge hole in the ground and remain that way once the driller moves on. With such activity going as far back as 1951, the Permian Basin is scarred with wildcat wells throughout.²⁷

At some point, the black gold spewing from wells stops or slows to a point where it is no longer profitable to continue operating. In addition to the cyclical nature of the wells themselves, the market for oil and gas seems to also operate according to a boom-and-bust cycle.²⁸ For example, the Texas oil industry was rocked by boom in the early 1980s, and then suffered a bust a few years down the road.²⁹ The global market has historically followed a similar trend; prices peaked at \$150 per barrel in early 2008, but by the end of the year, dropped to less than \$35.³⁰ Each boom spurs investments and growth in the oil and gas market, which require companies to increase their number of wells and production to meet demand. Yet, when the bust comes,³¹ those same companies are shuttered and forced into bankruptcy proceedings.

Once oil companies enter bankruptcy or are no longer financially able to plug their oil and gas wells, their obligations toward the wells are over.³² Instead, the responsibility falls on the state regulators.³³ Typically, the Texas agency charged with regulating the oil and gas industry in the state—the confusingly named Railroad Commission—only takes over wells that are abandoned. In Texas, abandoned wells are those that have been inactive and out of compliance with Railroad Commission

25. James Chen, *Wildcat Drilling: What It Means, How It Works*, INVESTOPEDIA, <https://www.investopedia.com/terms/w/wildcatdrilling.asp> (last updated Apr. 25, 2022).

26. *Id.*

27. See Albert H. Hedden, Jr., *Developments in West Texas and Southeast New Mexico in 1951*, 36 BULL. OF THE AM. ASS'N OF PETROLEUM GEOLOGISTS 1128, 1128 (1952).

28. See Matt Egan, *Texas: America's Boom-and-Bust Oil Capital*, CNN BUS. (Jan. 15, 2015), <https://money.cnn.com/2015/01/15/investing/oil-prices-texas-jobs/>.

29. Spencer Salmon, *Booms and Busts: Preserving Mother Nature While Staring into the Abyss of Bankruptcy*, 16 TEX. TECH ADMIN. L.J. 465, 465-66.

30. Egan, *supra* note 28; Ramaprasad Bhar & Anastasios G. Malliaris, *Oil Prices and the Impact of the Financial Crisis of 2007-2009*, 33 ENERGY ECON. 1049, 1050 (2011) (analyzing the impact of the 2000s financial crisis on oil prices).

31. See generally Ali Abboud & Michael R. Betz, *The Local Economic Impacts of the Oil and Gas Industry: Boom, Bust, and Resilience to Shocks*, 99 ENERGY ECON., July 2021, at 1, 17 (describing the cyclical nature of boom and bust in the oil industry).

32. Tex. Nat. Res. Code Ann. § 89.001 (West 2023).

33. *Id.*

regulations for twelve months.³⁴ Despite rhetoric to the contrary from Commissioner Wayne Christian, the Railroad Commission's running list includes 8,184 abandoned wells spread out across the state.³⁵ Several of these wells have been delinquent for over three years.³⁶

C. *Too Late and a Dollar Short*

Prior to drilling a well, companies are required to put money aside to plug the well should the company cease to exist or be unable to afford to later on. This requirement can be thought of as a "you drill it, you plug it" requirement and is usually accomplished via a bond. Plugging and remediating a well can cost from a base of \$20,000 up to \$75,000 depending on the type of well and how extensive the plugging needs to be.³⁷ However, the regulations in place in Texas only require an operator to have \$25,000 total for ten or fewer wells, \$50,000 total for more than ten but less than one hundred wells, and only \$250,000 total for any operator with one hundred or more wells.³⁸ These bond requirements—known as "blanket bond" requirements—allow operators to remain compliant in the short term. However, when the inevitable oil bust arrives, the Railroad Commission often finds itself with a blanket bond that cannot cover the actual price of plugging the derelict wells. These loose requirements can require an operator of ten wells to post \$25,000 in bonds, amounting to \$2,500 per well, while a major operator of 200 wells would post \$250,000 in bonds, amounting to half that of the smaller operator at \$1,250. Regardless of operation size, it's clear bonding requirements are extremely out of line with actual plugging costs at scale.

The inadequate bonding requirement is a known issue to both independent analysts and the State of Texas itself. Estimates from Carbon Tracker, a financial think tank, projects that Texas faces a \$117 billion total cost to plug its estimated 783,000 wells; however, when analyzed by Texas' most recent Sunset Advisory Committee, the bonds only cover

34. *Id.* at § 89.001(12); *Orphan Wells with Delinquent P-5 Greater than 12 Months*, TEXAS R.R. COMM'N, <https://www.rrc.texas.gov/oil-and-gas/research-and-statistics/well-information/orphan-wells-12-months/> (last updated Dec. 18, 2023).

35. *Orphan Wells with Delinquent P-5 Greater than 12 Months*, *supra* note 34; cf. Wayne Christian, Opinion, *Media Reports on Abandoned Wells Requires Corrections*, MIDLAND REP.-TELEGRAM (July 25, 2023), <https://www.mrt.com/opinion/article/wayne-christian-media-reports-abandoned-wells-18260036.php>.

36. *Orphan Wells with Delinquent P-5 Greater than 12 Months*, *supra* note 34.

37. Daniel Raimi, Alan J. Krupnick, Jhih-Shyang Shah & Alexandra Thompson, *Decommissioning Orphaned and Abandoned Oil and Gas Wells: New Estimates and Cost Drivers*, 55 ENV'T SCI. TECH. 10224, 10226 (2021).

38. 16 Tex. Admin. Code § 3.78 (g)(1)(i)-(iii) (West 2023).

15.9 percent of actual plugging costs.³⁹ Moreover, the Committee points out in a 2017 report that “the backlog of abandoned wells has increased since 2011.”⁴⁰ It goes on to note that “the current statutory blanket bond structure does not account for risk of well abandonment,” and recommends that the state legislature amend its blanket bond requirement to better reflect risk and increase equitability.⁴¹ However, these flaws are not the only blunder by the Railroad Commission that has left abandoned wells flowing.

The dry wells, or wells that never produced oil and gas, discussed in Part I.B. have been a clerical error causing profound problems in Texas. The Texas Natural Resource Code and the Railroad Commission allow a landowner and the operator of an abandoned well to “condition” it into a fresh water well.⁴² To do so, the operator and landowner file an “Application of Landowner to Condition an Abandoned Well for Fresh Water Production,” normally called a Form P-13, and, notably, the operator must plug the well “to the base of the usable quality water.”⁴³ Doing so ends the operator’s duty to plug and transfers it completely to the landowner.⁴⁴ Because the wells never produced oil or gas and were converted into P-13 wells, neither the Railroad Commission nor the operator who drilled the well retains any responsibility for it. Thus, if the water in the well is contaminated by the pressure and fluid dynamics below ground, the operator and Railroad Commission are off the hook.

Many wildcat wells have been converted this way, and despite being plugged and never producing oil or gas, the rise of fracking has caused groundwater contamination.⁴⁵ Because fracking requires injecting the ground with water, proppants, and chemicals, the process alters the natural pressure and groundwater. These disruptions can contaminate previously safe groundwater systems, despite studies and allegations to the contrary by the oil industry and the EPA itself.⁴⁶ To exacerbate the

39. STATE OF TEX. SUNSET ADVISORY COMM’N, STAFF REPORT WITH FINAL RESULTS R.R. COMM’N OF TEX., 85TH LEGISLATURE, at 4 (2017).

40. *Id.*

41. *Id.*

42. 16 Tex. Admin. Code § 3.14 (a)(4) ((West 2023).

43. *Id.*

44. *Id.* § 3.14 (1)(B).

45. See Amal Ahmed, *Abandoned “Dry Hole” Oil Wells Are Polluting Texas Farms, Ranches, and Groundwater. The State Won’t Fix Them.*, TEX. TRIB. (Oct. 13, 2022), <https://www.texastribune.org/2022/10/13/texas-abandoned-oil-wells-railroad-commission/>; Gayathri Vaidyanathan & Climatewire, *Fracking Can Contaminate Drinking Water*, SCI. AM. (Apr. 4, 2016), <https://www.scientificamerican.com/article/fracking-can-contaminate-drinking-water/>.

46. Abraham Lustgarten, *Does an Old EPA Fracking Study Provide Proof of Contamination?*, PROPUBLICA (Aug. 4, 2011, 11:43 A.M.), <https://www.propublica.org/article/>

risk, the mix of chemicals injected into wells are increasingly withheld from disclosure as operators or chemical suppliers claim “trade secret” exemptions.⁴⁷ The opaque chemical disclosures some companies share, and complete lack thereof from others, further complicate water testing.

Testing water, from wells, groundwater, or otherwise, is straightforward; it generally requires a water sample of about 100 mL being sent off to a lab for analysis.⁴⁸ These labs then utilize spectrometry, microbiological water analysis, or other methods to analyze potential contamination.⁴⁹ This is complicated by fracking, because most Environmental Protection Agency (EPA) labs were set up for Superfund⁵⁰ enforcement and are only well equipped for traditional pollutants like pesticides, herbicides, and sulfates.⁵¹ However, most of the chemicals used in fracking are difficult to detect.⁵² This is further complicated since many of the chemicals used in fracking are water-soluble and thus not easily found by a “routine lab-type analysis.”⁵³ Combined with little or no chemical disclosure, detecting groundwater contamination is even more complicated.

III. ABANDONED WELLS AND ENVIRONMENTAL AND CLIMATE CONCERNS

Abandoned oil and gas wells, once integral to Texas’s economic landscape, now stand as silent sentinels of environmental degradation, posing significant risks to the land, air, and water. Lake Boehmer, born

does-an-old-epa-fracking-study-provide-proof-of-contamination (explaining how a recently rediscovered 1987 EPA report indicates the dangers of fracking on groundwater); *but see* ENV’T PROT. AGENCY, EPA 816-R-04-003, EVALUATION OF IMPACTS TO UNDERGROUND SOURCES OF DRINKING WATER BY HYDRAULIC FRACTURING OF COALBED METHANE (2004), at 13 (concluding that fracking poses no risk to groundwater).

47. Vivian Underhill, Gary Allison, Holden Huntzinger, Cole Mason, Abigail Noreck, Emi Suyama, Lourdes Vera & Sara Wylie, *Increases in Trade Secret Designations in Hydraulic Fracturing Fluids and Their Potential Implications for Env’t Health and Water Quality*, 351 J. OF ENV’T MGMT. 1, 2 (2023).

48. Tim Sandle, PHARM. MICROBIOLOGY 79 (2006).

49. *Id.* at 67-79.

50. The 1980 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) is sometimes called Superfund. It allows the EPA to clean up contaminated sites but also mandates responsible parties to clean up sites or reimburse the government for EPA cleanup. *What is Superfund?*, Env’t Protection Agency (last updated Sep. 17, 2025), <https://www.epa.gov/superfund/what-superfund>.

51. ENV’T PROT. AGENCY, REG’L LAB’Y NETWORK 2018 ANNUAL REP., EPA 950-R-19-002 (May 2019).

52. *See* Vaidyanathan, *supra* note 45.

53. *Id.*

from a wildcat well repurposed into a P-13 well, epitomizes the consequences of neglect, its briny waters a testament to regulatory loopholes and absentee ownership. Yet, Lake Boehmer is but one among countless ticking time bombs dotting the Texan landscape. Unplugged wells serve as direct conduits for contaminants to seep into aquifers, jeopardizing water quality and ecosystem health for decades to come. Moreover, the legacy of fracking exacerbates these risks, as increased pressure can force oil and brine to the surface, leading to catastrophic spills and even loss of life. Beyond immediate dangers, methane emissions from abandoned wells contribute significantly to climate change, with Texas alone bearing the burden of a plurality of abandoned sites in the country. Despite the grave consequences, regulatory oversights persist, perpetuating a cycle of environmental degradation and economic loss. As Texas grapples with the fallout of its fossil fuel legacy, urgent action is needed to mitigate the environmental risks posed by abandoned wells and safeguard the well-being of present and future generations.

A. Abandoned Wells and Environmental Risks

You can drive to Lake Boehmer from Fort Stockton along Farm to Market Road 1053 in about twenty minutes. You could also crisscross the dozens of private ranches of pristine shrub land in about an hour, but you'll end up at the same salty, briny, and noxiously pungent artificial lake. As Lake Boehmer is the result of a wildcat well converted into a P-13 well, it is outside of the Railroad Commission's responsibilities and is abandoned to the care of forty absentee owners who possess some share of the land adjacent to the lake.⁵⁴ The lake itself is ostensibly named after Bernard Boehmer, one of the many owners that the Texas Department of Licensing and Regulation has been unable to track down.⁵⁵ Unfortunately, leaks and spills like those of Lake Boehmer are increasingly far too common and create long-term environmental problems across the state and beyond.

While a new lake sounds like a wonderful resource, especially in an arid environment, lakes like Boehmer are an environmental ticking time bomb. As a direct conduit to the aquifers below ground, unplugged wells create a direct path for a contaminant to enter without natural filtration by

54. Russell Gold, *The Dead Sea of West Texas*, TEX. MONTHLY (Dec. 8, 2021), <https://www.texasmonthly.com/news-politics/lake-boehmer-dead-sea-west-texas/>.

55. *Id.*

the ground.⁵⁶ Another risk is the long half-lives of many contaminants and the long-term—sometimes decades-long—risks that their presence can have.⁵⁷ This risk is not limited just to that specific well, but extends to the entire aquifer and any well that draws water from it.⁵⁸

In addition to these abandoned water wells, many of the other abandoned, unplugged oil and gas wells pose environmental dangers to their resource community. Fracking's increased pressure in the subterranean geology and aquifers can push oil or salty water to the surface of abandoned oil and water wells.⁵⁹ If these wells are not plugged, unintended environmental and economic consequences can abound. In one case, an unplugged well created a thirty-foot geyser of brine that contaminated the surrounding area for a week.⁶⁰ In another, an unplugged well leaked 330 barrels of water per hour and prompted the Federal Aviation Agency to issue a no-fly order over the wellsite.⁶¹ The dampened reservoir drive can lead to lower than expected production and thus a lower net profit for oil and gas producers. These wells not only cost communities their groundwater and companies their money, but they are also killers.⁶² One unplugged well killed two men and badly injured a third person when a flowline from the abandoned well caught fire and exploded.⁶³ Additionally, the climate change impacts from these lingering wells can be dire.

56. STATE OF TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, RG-347, LANDOWNER'S GUIDE TO PLUGGING ABANDONED WATER WELLS at 3 (Revised 2021).

57. *Id.*

58. *See id.*

59. E. Allison & B. Mandler, *Abandoned Wells: What Happens to Oil and Gas Wells When They Are No Longer Productive?*, PETROLEUM & ENV'T 7, 7-2 (2018).

60. *Id.*

61. Mitch Borden, *State Regulators Struggle to Contain a Leak that's Drenching West Texas Ranch Land with Potentially Toxic Water*, MARFA PUB. RADIO (Jan. 12, 2024 5:30 A.M.), <https://www.marfapublicradio.org/2024-01-12/state-regulators-struggle-to-contain-a-leak-thats-drenching-west-texas-ranch-land-with-potentially-toxic-water>.

62. Mary Claire Patton, *Officials Warn that Texas Has 150K Abandoned Wells After 3 People Die in Underground Cistern*, KSAT (Aug. 16, 2023, 1:54 P.M.), <https://www.ksat.com/news/texas/2023/08/16/officials-warn-that-texas-has-150k-abandoned-wells-after-3-people-die-in-underground-cistern/> (describing the well-related deaths of several people from across Texas).

63. Pritzker Law Firm, *Firestone House Explosion Caused by Pipeline Gas Leak*, PRITZKER HAGEMAN, P.A. (May 2, 2017), <https://www.pritzkerlaw.com/personal-injury/2017/firestone-house-explosion-caused-by-pipeline-gas-leak/>.

B. Greenhouse Gas Impacts of Abandoned Wells

Aside from polluting the ground, air, and water near the wells, the methane emissions are exacerbating climate change globally.⁶⁴ If you were to drive across an active west Texas oil field and look up at the stars, you'd also catch a glimpse of dancing flames.⁶⁵ Even in operational, profitable wells, natural gas—which is mostly composed of methane—is flared.⁶⁶ The logic behind sparking the match is that these rural wells are so far removed from natural gas pipelines that it's economically efficient to burn even if the market price for natural gas were momentarily high.⁶⁷ This disinterest in methane is not limited to active wells, but extends to the abandoned wells scattered across the state.

Worldwide, the largest emissions source of methane is surprisingly agriculture,⁶⁸ yet in the United States, the culprit is the energy sector.⁶⁹ Despite being illicit under Texas law, the state continues to grant dozens of ten-day permits for what it calls emergencies.⁷⁰ These permits are meant to be granted for maintenance, repairs, or plant shutdowns.⁷¹ In practice, these permits are placed on the Railroad Commission's consent agenda and approved without discussion.⁷² The end result is that methane continues to leak from abandoned wells with or without a permit.

64. See *International Methane Emissions Observatory*, U. N. ENV'T PROGRAMME, https://www.unep.org/topics/energy/methane/international-methane-emissions-observatory-imeo?gad_source=1&gclid=Cj0KCQiAzoeuBhDqARIsAMdH14Ffc9q9S4Auhc595n3qmor3Zj4XNf8NY1V5gn6z3jsYS4VtE5DMiOsaAh3tEALw_wcB (last updated Sep. 17, 2025) (describing the impact of methane in climate change).

65. See Zachary Mider & Mitchell Ferman, *Flaring Tucks up in Texas Oil Patch, Showing Limits of ESG Pressure*, BLOOMBERG (Oct. 4, 2023, 5:30 P.M.), <https://www.bloomberg.com/news/articles/2023-10-04/flaring-rises-in-texas-oil-patch-showing-limits-of-esg-pressure>.

66. "Flaring" being a nice, industry stand-in for "burning."

67. Gunnar W. Schade, *The Problem with Natural Gas Flaring*, TEX. A&M TODAY (Aug. 3, 2020), <https://today.tamu.edu/2020/08/03/the-problem-with-natural-gas-flaring/>.

68. *Methane Tracker*, INT'L ENERGY AGENCY, <https://www.iea.org/data-and-statistics/data-tools/methane-tracker-data-explorer> (last updated May 7, 2025); *Agricultural Methane: Reducing Emissions, Advancing Recovery and Use Opportunities*, GLOB. METHANE INITIATIVE 1, 1 (Sep. 2011), https://www.globalmethane.org/documents/ag_fs_eng.pdf ("Methane is produced and emitted from the decomposition of livestock manure and the organic components in agro-industrial wastewater.").

69. *Methane Tracker*, *supra* note 68.

70. Tex. Econ. Regul. Code Ann. § 3.32 (West 2023); Martha Pskowski, *Texas Continues to Issue Thousands of Flaring Permits*, INSIDE CLIMATE NEWS (Oct. 18, 2023), <https://insideclimatenews.org/news/18102023/texas-railroad-commission-approval-flaring/>.

71. *RRC Statewide Rules on Flaring/Venting of Produced Gas*, MISSION FLARES & COMBUSTION, (Nov. 25, 2022, 2:22 P.M.), <https://www.missionflares.com/learn/rrc-statewide-rules-on-flaring/venting-of-produced-gas>.

72. Pskowski, *supra* note 70.

That methane is “[eighty] times more powerful than carbon dioxide at trapping heat in Earth’s atmosphere.”⁷³ Not only is methane a potent greenhouse gas, it’s also severely under-accounted for in methane emission estimates and projections.⁷⁴ Texas alone accounts for a plurality of abandoned wells in the United States and is the single largest site for abandoned wells in the country.⁷⁵

IV. RECAPTURING ABANDONED WELLS

Federal programs offer a dual-faceted approach to addressing the issue of orphaned well plugging. Through federal initiatives, billions are earmarked for unplugged well remediation on federal lands and each state stands to receive millions in initial funding to kickstart well plugging efforts. While these funds may not fully cover the cost of addressing Texas’s extensive uncapped well problem, they present a significant step forward, particularly if utilized strategically to target the most egregious offenders. As the global energy landscape shifts towards renewables, there’s a growing recognition of the need to address legacy energy infrastructure such as abandoned wells. Leveraging lessons from programs like the California Compliance Offset Program (COP) and the Climate Action Reserve (CAR), Texas can implement a voluntary cap-and-trade system modeled after COP. Such a system could incentivize oil well remediation and utilize Infrastructure Investment and Jobs Act (IIJA) funding effectively, while allowing industry innovation to drive solutions. Moreover, legislative fixes at the state level, including addressing loopholes in existing laws, updating bonding requirements, and revising well classifications, could further incentivize well plugging and ensure transparency for landowners and buyers alike. By combining federal funding with innovative programs and targeted legislative action, Texas has the potential to not only mitigate environmental risks but also pave the way for a sustainable energy future while minimizing taxpayer burden in the long term.

73. *Control Methane to Slow Global Warming—Fast*, 596 NATURE 461, 461 (2021) (advocating for the reduction of methane consumption).

74. James P. Williams, Amara Regehr & Mary Kang, *Methane Emissions from Abandoned Oil and Gas Wells in Canada and the United States*, 55 ENV’T SCI. TECH. 563, 569 (2021).

75. *Id.* at 567.

Some proponents of well plugging point out that leaking wells are the least of regulator and producers' concerns.⁷⁶ Cameron Rotblat, a legal scholar, argues that in states with significant ongoing production a possible method to ensure sufficient funds to plug abandoned wells without billing taxpayers directly is joint, several, and retroactive liability akin to the liability that attaches under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).⁷⁷ Rotblat, however, notes that an expanded liability program would not have a large impact on states with low production and "early-century orphaned wells."⁷⁸ Because a lack of accurate ownership records or ongoing production leads to "no party [being] held responsible for plugging costs," CERCLA-like liability would be difficult to implement and of little use.⁷⁹ Lessons learned from the Surface Mining Control and Reclamation Act of 1977 led Rotblat to underline that a robust "cooperative federal granting program" is needed to solve the unplugged well crisis.⁸⁰ Picking up where Rotblat led us, we explore how the federal government, the State of Texas, and private industry can work together to plug wells, solve environmental issues, and turn a profit.

A. *Innovation Through the Bipartisan Infrastructure Act*

The Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Act, creates a two-pronged approach to orphaned well plugging.⁸¹ It champions a federal program that allocates \$4.7 billion for plugging, remediating, and restoring unplugged well sites on federal land through the Department of the Interior.⁸² IIJA further allocates \$4.3 billion for wells on state and private lands and \$150 million for those on tribal lands.⁸³ Each state can receive up to \$25 million in

76. Cameron Rotblat, *Caring for the Orphans: Approaches for Mitigating Fugitive Methane Emissions from Orphaned Oil and Gas Wells*, 47 ENV'L. L. REP. NEWS & ANALYSIS 10529 (2017).

77. *Id.* at 10541.

78. *Id.*

79. *Id.*

80. *Id.*

81. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 1082.

82. Press Release, United States Dep't of Interior, Interior Dep't Releases Implementation Guidance to States on Infrastructure Law Efforts to Address Legacy Pollution (Dec. 17, 2021), <https://www.doi.gov/pressreleases/interior-department-releases-implementation-guidance-states-infrastructure-law-efforts>; Mitch Landrieu, *A Guidebook to the Bipartisan Infrastructure Law for State, Local, Tribal, and Territorial Governments, and Other Partners*, THE WHITE HOUSE 1, 369 (May 2022), <https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf>.

83. Press Release, *supra* note 82.

initial funding for well plugging.⁸⁴ While this will not foot the whole bill in Texas, it can help turn the tide and, if properly managed, target the worst offenders.⁸⁵

Some experts predict that oil and gas might follow in the footsteps of coal and decline from being the world's main energy source to a relatively minor energy player in the near future.⁸⁶ Consequently, oil and gas wells would go the way of abandoned mines as well, becoming abandoned oil and gas wells. If the right program is implemented and the right balance struck, the transition to renewable energy sources can spur the remediation of legacy energy infrastructure like abandoned wells.

Coal, despite its decline in the United States and Texas energy mix, accounts for ten percent of anthropogenic methane emissions worldwide.⁸⁷ Functionally the same as leaking methane from a well, coal mines have the option of venting methane to the atmosphere; however, some voluntary capture programs provide incentives by providing greenhouse gas and offset credits for the captured methane.⁸⁸ Two programs provide many lessons and serve as models for Texas to strategically utilize IIJA money allocated to it.

COP is a mandatory, compliance-based scheme that operates as part of the state's larger cap-and-trade program.⁸⁹ In broad terms, the cap-and-trade program establishes a declining limit on major greenhouse gas sources and covers eighty percent of the state's emissions.⁹⁰ Each year a set number of "allowances," which are the equivalent of one metric ton of carbon dioxide, are released.⁹¹ Each year an annual floor price auction

84. *Id.*

85. *Id.*

86. Christian Bogmans & Claire Mengyi Li, *A Greener Future Begins with a Shift to Coal Alternatives*, INT'L MONETARY FUND (Dec. 8, 2020), <https://www.imf.org/en/Blogs/Articles/2020/12/08/blog-a-greener-future-begins-with-a-shift-to-coal-alternatives>; see Seth Feaster, *Coal Use at U.S. Power Plants Continues Downward Spiral; Full Impact on Mines to Be Felt in 2024*, INST. FOR ENERGY ECON. & FIN. ANALYSIS (Nov. 02, 2023), <https://ieefa.org/resources/coal-use-us-power-plants-continues-downward-spiral-full-impact-mines-be-felt-2024>.

87. *Texas Comptroller Energy Tour: Coal Energy Overview*, TEX. COMPTROLLER OF PUB. ACCTS., <https://comptroller.texas.gov/economy/economic-data/energy/2023/coal.php> (last visited Feb. 20, 2024); ENV'T PROT. AGENCY, EPA-430-B-20-002, *U.S. Greenhouse Gas Emissions Trading Programs that Include Coal Mine Methane* 1 (2021).; ENV'T PROT. AGENCY, EPA-430-R-19-010, *GLOBAL NON-CO2 GREENHOUSE GAS EMISSIONS PROJECTIONS & MITIGATION 2015-2050* 12-15 (2019).

88. ENV'T PROT. AGENCY, EPA-430-B-20-002, *U.S. Greenhouse Gas Emissions Trading Programs that Include Coal Mine Methane* 1 (2021).

89. *Id.* at 2.

90. *Cap-and-Trade Program*, CAL. AIR RES. BD., <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/about> (last visited Feb. 20, 2024).

91. *Id.*

occurs as well, with prices increasing steadily annually.⁹² The increasing price and reduced availability of allowances is meant to encourage reductions in greenhouse gas emissions. This program uses performance standards as their metric, meaning it uses a “threshold for technologies or processes that must be met or exceeded in order for a project to be additional.”⁹³

Under COP, these performance standards are met if the process used destroys methane from abandoned mines—including mines that are active at the surface and below-ground mines—but does not cover any sort of pipeline injection or methane drainage system, which is considered “business-as-usual.”⁹⁴ Moreover, if the greenhouse gas emissions were reduced as part of a “federal, state, or local regulations; or other legally binding mandates” they cannot be counted toward offset credits.⁹⁵

The other path, which would not require a statewide cap-and-trade system, is the Climate Action Reserve (CAR). CAR is a nonprofit that operates a voluntary offset program and carbon trading system.⁹⁶ CAR sets standards to “develop, quantify, and verify [greenhouse gas] emissions reduction projects for a variety of projects in the United States and Mexico.”⁹⁷ Similar to COP, CAR’s program allows for mine methane removal offsets through a performance standard threshold.⁹⁸ For each metric ton of carbon dioxide equivalent removed, the company receives an offset credit.⁹⁹

A COP-like system provides a massive opportunity for the state of Texas to incentivize oil well remediation and to capitalize on IJA money allocated to the state. Texas does not need to look far away for a program to import, since it has a massive, successful cap-and-trade program operating in the city of Houston to control nitrogen oxide emissions.¹⁰⁰ A flexible program like COP would allow industry to provide solutions and avoiding a top-down, “command and control” system would allow Texas

92. *Id.*

93. Rotblat, *supra* note 76, at 3.

94. *Id.*

95. *Id.*

96. ENV’T PROT. AGENCY, *supra* note 88, at 4.

97. *Id.*

98. *Id.*

99. *Id.*

100. See *Mass Emissions Cap and Trade Program*, TEX. COMM’N ON ENV’T QUALITY, https://www.tceq.texas.gov/airquality/banking/mass_ect_prog.html (last visited Feb 21, 2024).

to continue its economic growth but also allow technological changes to lead the way.¹⁰¹

Thus, Texas should adopt a voluntary, statewide cap-and-trade program modeled after COP. While it may be difficult to create the initial statewide methane cap, and there might be underlying fears of a large cap scaring industry away or slowing economic growth,¹⁰² advocates and regulators should highlight that the lowest hanging fruit are the leaking, uncapped wells across the state. The same wells that, left uncapped, create toxic, dangerous conditions that limit economic growth.¹⁰³ Moreover, a cap-and-trade program won't destroy industry nor end job growth, but instead would develop stable jobs that won't disappear if the oil and gas market dips as it historically does, and also would cost the taxpayer less over the long term.¹⁰⁴

While the cost of plugging abandoned wells and incentivizing industry to plug them might seem high, the cost of not plugging them is higher still for everyone involved. The crux of Texas' environmental laws and liability scheme is essentially that if you caused the damage, you pay for it. Whether the "damage" is using someone's property under a mineral lease, it's paid for through royalties.¹⁰⁵ Similarly, if the damage is leaking pollutants into the land, it should be paid through plugging and remediation, with the only major exception being an adjustment for corporations that caused damage but which are no longer able to pay because they are bankrupt. In those situations, the state, and ultimately the taxpayer, takes up the bill and remedies the damage caused by the drilling.¹⁰⁶ When the Railroad Commission plugs a well, the costs are covered by the public at large no matter which way the cost gets billed. In short, the status quo is broken since all remediations lead to

101. See Richard Schmalensee & Robert N. Stavins, *Lessons Learned from Three Decades of Experience with Cap and Trade*, 11 R. ENV'T ECON. & POL'Y 59, 74 (2017).

102. See Miranda Willson, *Does the Nation's First CO₂ Cap and Trade System Work*, E&E NEWS, (Apr. 4, 2022) <https://www.eenews.net/articles/does-the-nations-first-co2-cap-and-trade-system-work/>.

103. See, *Idle & Orphan Oil & Gas Wells: State & Provincial Reg. Strategies 2021*, INTERSTATE OIL & GAS COMPACT COMM'N at 5 (2021).

104. See Silvio Marcacci, *Plugging Abandoned Oil Wells Is One 'Green New Deal' Aspect Loved by Both Republicans and Democrats*, FORBES (Sep. 21, 2020), <https://www.forbes.com/sites/energyinnovation/2020/09/21/plugging-abandoned-wells-the-green-new-deal-jobs-plan-republicans-and-democrats-love/?sh=6154dd462e10>.

105. 55 *Texas Jurisprudence Oil & Gas* §350 (Tracy Bateman, George L. Blum, Russell J. Davis, John J. Dvorske, John A. Gebauer, Stephanie A. Giggetts, Lonnie E. Griffith, Jr., Tammy E. Hinshaw, Rachel M. Kane, Sonja Larsen, Sally J.T. Necheles, Jaime Marie Nies, Jeffrey J. Shampo, Eric C. Surette, Karl Oakes, Elizabeth Williams & Theodore Wyman eds., 3d ed. 2024).

106. See Tex. Nat. Res. Code §89.001.

environmental, climatic, or tax costs borne by the public if companies are not able to meet their cleanup burdens.

Instead, Texas faces a once in a lifetime opportunity to continue its leadership in the business and energy sectors for generations to come. With IIJA money allocated to it, Texas should implement a COP-like system with Texas-specific characteristics. Those Texas-specific characteristics would be the unique incentives for producers to plug leaking, abandoned wells throughout the state. Namely, Texas should create a methane cap-and-trade incentive program modeled off Bitcoin and provide specific monetary incentives for innovative, productive reutilization of abandoned wells.

Bitcoin, or at least its underlying logic, can alleviate Texas's uncapped well crisis. Bitcoin is a decentralized digital currency, underpinned by a peer-to-peer network.¹⁰⁷ Satoshi Nakamoto, or at least someone writing under that pseudonym, detailed the inner workings, benefits, and incentive structure of Bitcoin in a 2009 whitepaper.¹⁰⁸ Bitcoin works as an electronic ledger with transactions monitored and verified by the entire network.¹⁰⁹ The total number of bitcoins available was set by the creators at about 21 million, meaning that no single entity can dump more bitcoins into the market.¹¹⁰ The scarcity of bitcoin provides its value, but its issuing system creates its own incentives as well. Users nowadays can get bitcoins by buying on an exchange, or they can "mine" bitcoins, having their computers crunch the complicated math of all the transactions across the network.¹¹¹ Being the first computer to do so unlocks bitcoins for that user; thus, there's an incentive to be first.¹¹² However, as the total number of bitcoins released through this system increases, each transaction provides less until all the bitcoin are released.¹¹³ Using an incentive structure similar to Bitcoin's would allow the State of Texas to hit the sweet spot between commanding companies

107. T.S., *How Does Bitcoin Work?*, THE ECONOMIST (Apr. 12, 2013), https://www.economist.com/the-economist-explains/2013/04/11/how-does-bitcoin-work?ppccampaignID=18151738051&ppcadID=&utm_medium=cpc.adword.pd&utm_source=google&ppccampaignID=17210591673&ppcadID=&utm_campaign=a.22brand_pmax&utm_content=conversion.direct-response.anonymous&gad_source=1&gclid=Cj0KCQjwqdqvBhCPARIsANrmZhP7YggjquAr6XgiLCK8UWmwM9vSl_YYFx946ghBylnE1KFjlmfdf7QaAoSLEALw_wcB&gclsrc=aw.ds.

108. *Id.*; see, e.g., Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2009), <https://bitcoin.org/bitcoin.pdf>.

109. T.S., *supra* note 107.

110. *Id.*

111. *Id.*

112. *Id.*; Nakamoto *supra* note 108, at 4.

113. Nakamoto *supra* note 108, at 4.

to clean up their historic messes and making it worth each company's efforts to remediate wells.

Texas can craft a strong methane cap-and-trade program with IJA funds that mirrors bitcoin. Both cap-and-trade markets and bitcoin require a pre-set total, whether it be methane emissions or bitcoins. Moreover, a decentralized program would likely not face strong political headwinds given Texas' penchant for privatized public services.¹¹⁴ Like bitcoin, this market can be structured to provide larger emissions credits, at above-market prices, to incentivize the plugging of the biggest polluters first. Then, once the largest emitters are capped, credits can tumble down to at-market rates. Similarly, this system does not need to be managed by the state but can be proposed and run through a private organization like CAR. Aside from this bitcoin-based model, Texas can kill two birds with one stone by providing grants aimed at reintegrating the newly capped wells into the energy mix.

On top of the bitcoin-based cap-and-trade program, Texas can address the underlying problems that caused the 2021 power crisis and prevent future crises through reintegration grants. In 2021 winter storm Uri forced much of Texas into a cold, powerless standstill.¹¹⁵ While Texas leads the country and world on energy, the storm brought to light shortcomings in Texas' energy mix and winterization.¹¹⁶ Texas's over-reliance on "dispatchable"¹¹⁷ natural gas plants and their lack of winter

114. See generally Cayla Harris, *Privates Foster Care Is Coming to Texas's Biggest Cities. Here's What It Could Look Like*, SAN ANTONIO EXPRESS-NEWS (Dec. 1, 2023), <https://www.expressnews.com/politics/article/privatized-foster-care-18330872.php> (outlining the possible impacts of privatized foster systems in Texas); *Effects of Medicaid Privatization in Texas*, NATIONAL BUREAU OF ECONOMIC RESEARCH (Sep. 9, 2019), <https://www.nber.org/brd/effects-medicaid-privatization-texas> (describing the impacts of Texas' privatization of Medicare).

115. See Carey W. King, Josh D. Rhodes, Jay Zarnikau & Ning Lin, *The Timeline and Events of the February 2021 Texas Electric Grid Blackouts* (2021); Chen-Hun Lee, Mikel Maron & Ali Mostafavi, *Community-Scale Big Data Reveals Disparate Impacts of the Texas Winter Storm of 2021 and Its Managed Power Outage*, 9 HUMANITIES & SOC. SCIS. COMM'N 1 (2022) (describing the impacts of Uri across Texas).

116. Denise Ramos, *Texas Energy Crisis: Why Is the State's Power Grid so Fragile?*, EARTH.ORG (July 19, 2023), <https://earth.org/texas-energy-crisis-why-is-the-states-power-grid-so-fragile/>; Baker Institute, *Winterization and the Texas Blackout: Fail to Prepare? Prepare to Fail*, FORBES (Feb. 19, 2021, 10:55 A.M.), <https://www.forbes.com/sites/thebakersinstitute/2021/02/19/winterization-and-the-texas-blackout-fail-to-prepare-prepare-to-fail/?sh=388bc3967c83>.

117. Following Uri, much of the conversation in Texas has focused on blaming renewable energy for blackouts and focusing on "dispatchable" energy, i.e., energy sources that can be turned on and off at a moment's notice like natural gas plants. Cf. Camila Domonoske, *No, the Blackouts in Texas Weren't Caused by Renewables. Here's What Really Happened*, NPR (Feb. 18, 2021, 3:11 P.M.), <https://www.npr.org/sections/live-updates-winter-storms-2021/2021/02/18/968967137/no-the-blackouts-in-texas-werent-caused-by-renewables-heres-what-really-happened>

preparedness forced the state's regulator to "brown-out" much of the state.¹¹⁸ This can be alleviated through a reintegration grant program.

A reintegration grant program would provide funds set aside for any projects that would both reduce emissions by capping an unplugged well and providing a new energy source for the Texas grid. The main possibility is that of gravity energy storage. Gravity energy storage functions by mechanically storing energy through an object's vertical displacement.¹¹⁹ Essentially, with a solar panel array powering it, the existing oil well has a winch attached to it with a large weight. While the sun is out, the winch lifts the weight from the bottom of the well, but once the sun sets and the array is no longer providing energy, the weight descends and the vertical displacement of it "falling" to the bottom of the well provides electricity via a generator.¹²⁰

Gravity storage would expand the availability and usability of renewable solar energy. While solar energy is a potent energy source, its expansion is limited by intermittency and storage problems.¹²¹ When the sun isn't out, solar panels can't convert solar energy into electricity, and even if they could, there isn't enough battery capacity to make a meaningful impact on energy grids.¹²² Solving a major problem, the weight and winch system of a gravity well serves as a mechanical battery for the solar energy produced by the solar panel arrays, thus transforming a leaking well into a new source for renewable energy storage and strengthening Texas's energy grid reliability.

By harnessing IJIA funds and innovating with bitcoin-based markets and reintegration grants, Texas would not only continue to lead without obstructing business, but would carve a greener path forward for renewable energy and the state.

118. See King *et al.*, *supra* note 115, at 10.

119. Dante Isaac Aleman, *Renewell: The Storage Potential of Gravity Wells*, RENEWELL at 2 (2021), <https://renewellenergy.com/wp-content/uploads/2022/12/P2-The-Storage-Potential-of-Gravity-Wells-Renewell-Energy.pdf>.

120. John Cox, *Oil Well Project Would Commercialize Gravity Energy Storage*, BAKERSFIELD.COM (July 16, 2023), https://www.bakersfield.com/news/oil-well-project-would-commercialize-gravity-energy-storage/article_0bfe18fe-2277-11ee-9cbe-3b8234f9923b.html.

121. Robert Fares, *Renewable Energy Intermittency Explained: Challenges, Solutions, and Opportunities*, SCI. AM., <https://www.scientificamerican.com/blog/plugged-in/renewable-energy-intermittency-explained-challenges-solutions-and-opportunities/>; John Aziz, *Does Solar Energy Have a Battery Problem?*, THE WEEK (Jan. 11, 2015), <https://theweek.com/articles/444064/does-solar-energy-have-battery-problem>.

122. See *Grid-scale Storage*, INT'L ENERGY ASS'N, <https://www.iea.org/energy-system/electricity/grid-scale-storage> (last visited Mar. 16, 2024).

B. Legislative Fixes for Low Hanging Fruit

While a cap-and-trade program would be a large lift for the Texas legislature, there are some smaller changes that could potentially transform the uncapped well landscape. Three actions that the legislature can take to incentivize well plugging are addressing the loophole from *Ranchero Esperanza, Ltd. v. Marathon Oil Co.*, updating bonding requirements for well drilling to reflect the true risk and cost of well capping, and altering P-13 well classifications.

In *Ranchero Esperanza, Ltd. v. Marathon Oil Co.*, the Texas Court of Appeals addressed standing, accrual of the cause of action, limitations, and the discovery rule.¹²³ In December 2004, Ranchero Esperanza bought a ranch in West Texas as well as an “undivided one-half interest in the Trinity Aquifer under the property.”¹²⁴ Located on the property was Well 812 in an area called the Olson Unit.¹²⁵ Marathon Oil Co. had formed the Olson Unit in 1965 to recover oil products via water injection, but had closed operations in the area and capped Well 812 in 1989 through a contractor as per Texas law.¹²⁶ Aspen Operating Company, LLC acquired and operated the Olson unit in 2004.¹²⁷ Subsequently on July 20, 2008 Aspen noticed salt water flowing from Well 812, stopped the flow, and remediated the well.¹²⁸ Later, Aspen determined that one of its own nearby wells “had a subsurface leak in its downhole tubing and casing, causing large volumes of salt water to leak out of its wellbore and traverse . . . to Well 812.”¹²⁹ However, Ranchero Esperanza did not file suit for negligence, trespass, and nuisance against Aspen and Marathon Oil until July 27, 2010.¹³⁰ Ranchero Esperanza alleged that

brine from Well 812 polluted the surface of the ranch, killing vegetation, and claimed the “problem with the Olson Unit wells on Ranchero Esperanza[’s land] did not become apparent until [their] foreman, Ken Hartman, saw an uncontained flow of brine from the Olson Unit Well 812 on July, 28 2008.”¹³¹

123. *Ranchero Esperanza, Ltd. v. Marathon Oil Co.*, 488 S.W. 3d 354, 356 (Tex. Ct. App. 2014).

124. *Id.*

125. *Id.*

126. *Id.*

127. *Id.*

128. *Id.*

129. *Id.* at 357.

130. *Id.*

131. *Id.*

On appeal, the court had to determine whether Ranchero Esperanza had standing to sue and, if it did, whether their claims were barred by the state's two-year statute of limitations.¹³² The court acknowledged that "injury to land is a personal right belonging to the [landowner] at the time of injury, and a mere subsequent purchaser cannot recover for an injury committed before [their] purchase."¹³³ So if the injury accrued before Ranchero Esperanza's purchase they would lack standing since they were not assigned any causes at purchase. Marathon Oil argued that the accrual should start in 1989 when the well was plugged, and Ranchero Esperanza replied that it should start in 2008, at the first leak.¹³⁴ The court held that there must be "some injury, 'be the damage slight[.],' for the cause to accrue; thus the first leak in 2008 started the clock."¹³⁵

The two-year statute of limitations, however, should have barred Ranchero Esperanza from bringing claims since they were technically a week too late. To toll the running of the statute of limitation, Ranchero Esperanza invoked the discovery rule.¹³⁶ The discovery rule "is an exception to the general rule of accrual; when applicable, it provides that an action does not accrue until the plaintiff knew, or in the exercise of reasonable diligence should have known, of the wrongful act adn resulting injury."¹³⁷

The court ultimately found that Ranchero Esperanza's action accrued when signs of salt water damage were known to them on July 20, 2008 and the state's two-year statute of limitations has run since then. That this was a week too late for Ranchero Esperanza to recover "is an exception to the general rule of accrual; when applicable, it provides that an action does not accrue until the plaintiff knew, or in the exercise of reasonable diligence should have known, of the wrongful act and resulting injury."¹³⁸ Ranchero Esperanza argued that its cause of action did not accrue until their foreman discovered the leak on July 28, 2008, and thus filing on July 27, 2010 was timely.¹³⁹ Yet, the court held that "the type of injury alleged in this case surface damage arising from salt water emerging from an oil well—is not inherently undiscoverable.

132. *Id.* at 363.

133. *Id.* at 359 (quoting *La Tierra de Simmons Familia, Ltd. v. Main Event Entertainment, L.P.*, No. 03-10-00503-CV, 2012 Tex. Ct. App. WL 753184, at *5 (Tex. Ct. App. Mar. 9, 2012).

134. *Id.* at 360.

135. *Id.* at 360-63.

136. *Id.* at 365.

137. *Id.* at 365 (citing *Murphy v. Campbell*, 964 S.W.2d 265, 270 (Tex. 1997)).

138. *Id.* (quoting *Murphy v. Campbell*, 964 S.W.2d 265, 270 (Tex. 1997)).

139. *Id.* at 365.

Accordingly, the discovery rule does not apply”¹⁴⁰ Therefore, *Ranchero Esperanza*’s claims were time-barred.

While this case only ended *Ranchero Esperanza*’s claims, it effectively limited future landowners from being able to bring a claim. The court’s holding clears up that as a matter of law, salt water damage accrues when the plug fails and is therefore discoverable.¹⁴¹ Yet, in reality it might be nearly impossible to discover a leak that occurs hundreds of feet below the ground across ranch lands that might stretch for dozens of miles. Here, a possible solution is a legislative one.

The legislature could easily change the statute of limitations to protect landowners affected by oil production like the plaintiffs in *Ranchero Esperanza*. A path forward could be altering the statute of limitations to run once a failure is apparent and known, rather than when it is discoverable. The status quo places an intense burden on property owners to scour land records, obtain 100-year old contracts, and traverse their land frequently to find damage. A legislative change could resolve this burden for landowners and further incentivize oil producers to properly plug their wells. Moreover, a requirement that plugged wells be public record would prevent buyers from being completely unaware at purchase time.

Another solution calling for a Texas state representative brave enough to propose it in the legislature is adjusting the well bonding requirement. As explained *supra* in Part II, bonding requirements decrease as your number of wells increase. Changing bonding requirements to reflect the true cost and danger of oil well plugging and remediation would not change much retroactively, but the prospective changes it would demand of oil producers ensures that at some point, the unplugged well epidemic ends.

Finally, the legislature would be wise to revise P-13 water well classification with a name reflective of what the wells are. The current system is failing and leading to several blowouts and contamination of land and wells near or connected to active production zones. The legislature could change regulations to no longer allow “dry” oil wells to be labeled as purely water wells and instead label them “water adapted oil wells”. This would reflect the true nature of these wells that were originally drilled for oil production, and make it crystal clear to buyers that their wells might one day have oil coming through them.

140. *Id.*

141. *Id.* at 364.

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V. CONCLUSION

Unplugged wells are contaminating Texas' air, soil, and water and disrupting life across the state. Left unabated, the contamination will enhance the effects of climate change and have serious consequences across the state. The existing legal and regulatory system built up around oil extraction and production has proven ineffective and, in practice, contributes to the exacerbation of the problem. The only way to prevent another Lake Bohmer is to try new solutions and approaches, or else we risk a hazardous crisis engulfing the state. Legislative solutions plug the cracks of the sinking ship by establishing a regulatory system incentivizing caution and remediation. Changes like a cap-and-trade system with Texas-specific characteristics will prove necessary to protect the state's environment and resources. Finally, Texas should address the *Ranchero Esperanza* accrual loophole, bonding requirements, and water well classification to ensure the state's long-term success.