SIERRA CLUB

$23 BILLION QUESTION:

WHAT CREATED CALIFORNIA'S ORPHAN AND IDLE WELL CRISIS?

DECEMBER 2023

Executive Summary

Across California's onshore oil-producing regions, a total of 41,568 of the state's 100,696 wells sit orphan or idle, no longer producing oil but slowly leaking methane and volatile organic compounds (VOCs) into the air and the ground, creating an urgent climate and health crisis. In too many instances, operators attempt to delay or evade responsibility for cleaning up their wells despite having assumed the obligation under state law to complete plugging and remediation.[1]

Primarily concentrated in Kern, Los Angeles, Ventura, Fresno and Santa Barbara counties, these wells are overwhelmingly located in rural and predominantly Latino counties with household incomes that are far lower than the state average.[2] Plugging these oil wells will lower greenhouse gas and air emissions that contribute to the climate crisis and damage human health, in addition to offering economic revitalization through the creation of potentially tens of thousands of jobs. To realize these benefits, California needs to hold oil companies accountable for cleaning up and capping these wells as quickly as possible.

The research contained in this report illustrates that a small number of oil companies — Chevron, Aera Energy and California Resources Corporation — hold 68% of idle wells. A recent report from CarbonTracker puts the price to plug and remediate all wells in California at $21.5 billion as of April 2022, including $10 billion for wells that are already orphaned and idle. Adjusting that number for the number of wells in the state's inventory as of one year later, this report calculates that the total cost to plug and abandon all of the state's wells currently stands at $22.9 billion.[3]

The enormity of the idle and orphan well crisis isn't a coincidence, but an outcome of the industry's powerful influence in California. The oil industry successfully lobbied to make it difficult for the state of California to enforce well-capping requirements and impose financial liability for the capping and remediation of orphan and idle wells.

Through such lobbying activity, oil corporations have sought to instead pass the financial burden of cleanup to taxpayers. A review of these corporations' current profits makes clear that — counter to industry's assertions[4] — the state's largest producers have the money needed to pay cleanup expenses in California.

While a study published by Carbon Tracker showed that the state's producers do not have sufficient future revenue from oil and gas production in California to cover the cleanup costs of their operations, the companies highlighted in this report as well as their former owners have more than enough through their past and current profits and revenue streams. Because of this, the burden should not fall to California taxpayers or local governments. But current California law makes it difficult to enforce the industry's financial responsibility.

By following the upward flow of profits for the companies responsible for the majority of California's idle wells, this report clearly shows those entities have the funds to clean up the crisis they initiated and prevent those wells from joining the inventory of orphan wells for which there is no remaining responsible operator.

To protect residents and ensure California's limited state budget is not burdened by the enormous cost of cleaning up oil wells, immediate policy action is needed from the state legislature and Governor Gavin Newsom to close industry loopholes and mandate an urgent timetable for plugging these wells. If California fails to act, residents will be left to pay the bill for a mess created by hugely profitable multinational corporations. On the other hand, taking bold action to plug these dangerous wells could result in cleaned up ecosystems, a reduced public health threat, tens of thousands of jobs and a low-hanging fruit method to cut greenhouse gas emissions. Holding the oil industry accountable to clean up its orphan and idle wells would right decades of wrongs and put California back on track to be a climate leader.

Key Findings:

- A conservative estimate shows that a total of 100,696 unplugged wells exist in California.[5] Of those:
    - 41,568 of the wells are orphan/likely orphan or idle, 36,530 of which are idle.
    - 59,095 are active and only 2,497 of those are "new."
    - The average well in California only produces up to 3.9 barrels per day of oil,[6] far below the "stripper" industry-defined level of 15 barrels per day[7] – and thus those wells sit on the cusp of being idle.
- Orphan and idle wells are known to leak hazardous levels of the carcinogen benzene, making them a health and safety hazard for local communities and posing a risk to local groundwater reservoirs.[8] [9] [10] [11] [12] Plugging these wells will substantially improve public health in the communities where they are concentrated.
- Leaking wells also jeopardize California's fight against climate change. A recent study found that 67% of the unplugged wells it surveyed were leaking methane, a greenhouse gas over 80 times more effective at trapping heat in the atmosphere over a 20-year period than carbon dioxide, according to the Intergovernmental Panel on Climate Change.[13] [14]
- **Just three companies own two-thirds of idle wells in California: Chevron, Aera Energy, and California Resources Corporation.** Aera was owned by Shell and ExxonMobil until March 2023 when the private equity fund IKAV completed the acquisition of the company, while California Resources Corporation was spun-off from Occidental Petroleum in 2014.
- Those three companies, alongside trade associations like the Western States Petroleum Association (WSPA) and California Independent Petroleum Association (CIPA), lobbied to create the current regulatory regime preventing the California Geologic Energy Management Division (CalGEM) from having the full authority to require current and former well owners and operators to plug and remediate oil wells on an expedited basis, if at all. That includes statutes enabling companies to maintain wells in idle status into perpetuity.

- The state program ostensibly meant to encourage idle well remediation actually encourages companies to delay well cleanup. Since the Idle Wells Management Plan (IWMP) program began, the total number of idle wells in California has grown from 29,292 in 2018 to 38,759 in 2021, outpacing the number of wells being plugged and abandoned.

- That program must be reformed to ensure that oil companies — not taxpayers — pay for cleanup costs. By comparing the state's regulatory system to those of other states like Pennsylvania and West Virginia, which have one year deadlines for oil companies to plug idle wells,[15] the flaws in California's statutes are clear.

- This assessment finds that while California's oil industry may be declining, the profits of its leading idle well holding companies and their recent owners – all multinational conglomerates – are not.[16] In 2022, Chevron, Shell, and ExxonMobil made a combined **$133.6 billion in profits** with **Chevron earning $35.5 billion, Shell earning $42.3 billion, and ExxonMobil earning $55.7 billion. Aera Energy's** original parent companies, Shell and ExxonMobil, collectively earned **$98 billion in 2022**. Occidental Petroleum, which was the previous owner of wells now owned by California Resources Corporation, earned **$13.3 billion in 2022** and California Resources Corporation earned **$524 million. In total** these operators earned a combined **$147.3 billion.**[17]

    - **Total profits for the companies directly responsible for the majority of the state's idle wells in 2022 were over 14 times higher than the cost to plug orphan and idle wells in the state ($10 billion), and over six times higher than the amount needed to plug and remediate the state's entire inventory of unplugged wells at $22.9 billion.**

    - During the first three quarters of 2023, Chevron earned $19.1 billion, Shell $18.9 billion, and ExxonMobil $28.4 billion. **This alone is 19 times more money than is needed to remediate all of the idle California wells owned by these companies or their subsidiaries.**

    - **It would cost Chevron,** the top holder of idle wells in California, **just 4.8% of its 2022 profits of $35.5 billion to plug its current inventory of idle wells in California.**

- Two of the three counties with the highest concentrations of orphan and idle wells also have higher rates of unemployment than California more generally as of September 2023.[19] **Plugging orphan and idle wells will create at least 24,038 direct, indirect, and induced jobs statewide including 12,685 jobs attributable to plugging wells in Kern County alone. Plugging all unplugged wells could create at least 54,974 direct, indirect, and induced jobs across the state, with 33,969 attributable to wells in Kern County**. Adding in full well site ecosystem remediation and pollution work could cause that number to rise further still, according to an analysis conducted by the Political Economy Research Institute at University of Massachusetts-Amherst.[20]

Top Three Companies[18]	Total Idle Wells	Cost to Plug Idle Wells	Total 2022 Profits Including Former Parent Companies
Chevron	9,055	$1.7 billion	$35.5 billion
Aera Energy	8,948	$1.8 billion	$98.0 billion (Includes Shell and ExxonMobil profits)
California Resources Corporation	6,658	$1.7 billion	$13.8 billion (Includes CRC and Occidental Petroleum profits)
TOTAL	**24,661**	**$5.2 billion**	**$147.3 billion**

Cover Image Credit: voimages, Envato Elements

Table of Contents

Introduction: Defining Stripper, Idle, and Orphaned Wells

Stripper Wells

Oil and gas production in California peaked decades ago and is now in the final stages of its lifecycle. Evidence of this can be found by examining the details of the state’s oil wells. There are 59,095 “active” oil wells in California, but the average oil well pumps out only 3.9 barrels of oil equivalent per day.[21] When accounting for “other kinds of wells used to support production,” that number drops to two barrels per day – well below 15 barrels per day, the oil industry’s accepted definition of marginally producing “stripper” wells.[22] [23] As such, many active wells are nearing the end of their productive lifespans and sit on the cusp of needing to be plugged.

Idle Wells

According to CalGEM, an idle well is “any well that for a period of 24 consecutive months has not produced oil or natural gas, produced water to be used in production stimulation, or been used for enhanced oil recovery, reservoir pressure management, or injection.”[24] There are roughly 36,530 idle wells in California, 12,410 of which have been identified by CalGEM as long-term idle wells – defined as idle for over eight years.[25] Due to weak regulations addressing idle wells, the industry is largely able to keep these wells idle in perpetuity by paying only a nominal idle well fee.

Orphan Wells

Orphan wells are those determined to have no financially viable operator to clean them up and are officially the state’s responsibility to plug and remediate. As of May 2023, there are officially 318 orphan wells in California. The state has declared 4,720 wells “likely orphan,” a designation which California agencies can use to access federal cleanup funds.[26] Given the additional 12,410 long-term idle wells in California and the oil industry’s declining production, the number of orphan wells is expected to grow. Yet, the fees and bonds collected from the industry amount to a fraction of what will be needed to clean up these orphan wells, potentially forcing taxpayers to pay for remediation costs of the industry’s operations.[27]

Image Credit: Mint_Images, Envato Elements

Part 1: The Risks of Orphan and Idle Wells and the Rewards of Cleaning Them Up

Industry in "decommissioning phase"

According to the most comprehensive and up-to-date research, conducted by Carbon Tracker, California's inventory of orphan and idle wells is ever-growing, particularly since 2014. In fact, the group called the current era "the decommissioning phase of California's oil industry," further noting that "there is no prospect for a geologic revolution in California" to unlock a new oil boom.[28] In a 2019 press release, CalGEM acknowledged that same reality by noting the state has gone from "a national leader in oil production to a more marginal production state."[29]

CalGEM data show that out of the total of 100,696 unplugged wells in California, only 2,497 are new.[30] CalGEM defines "new" wells as "recently permitted wells or wells in the process of being drilled." This means that industry's liabilities in the state dwarf potential sources of new revenue.

The Carbon Tracker report documents a 42% production decrease from 2014 to 2022, with 39% of wells idle and most remaining wells barely profitable. Oil prices crashed in 2016 and 2020, causing all oil extraction to slow. When prices rose again in 2022, however, California's oil industry did not recover to the same degree as other states and likely never will again. Upon the release of Carbon Tracker's report in May 2023, only two new oil rigs were actively pursuing new drilling operations statewide. Graphs of the steep decline in California oil production can be seen below.

Figure 1: California oil production and producing well count onshore and state waters since 1977.

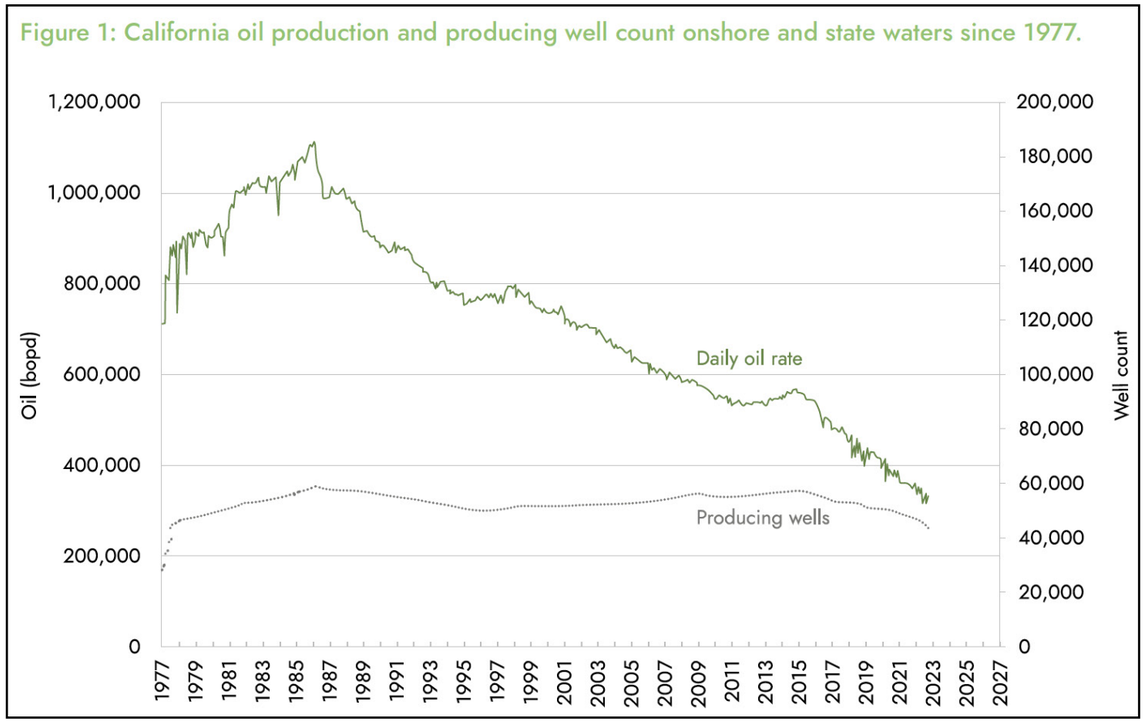

Image Credit: Carbon Tracker[33]

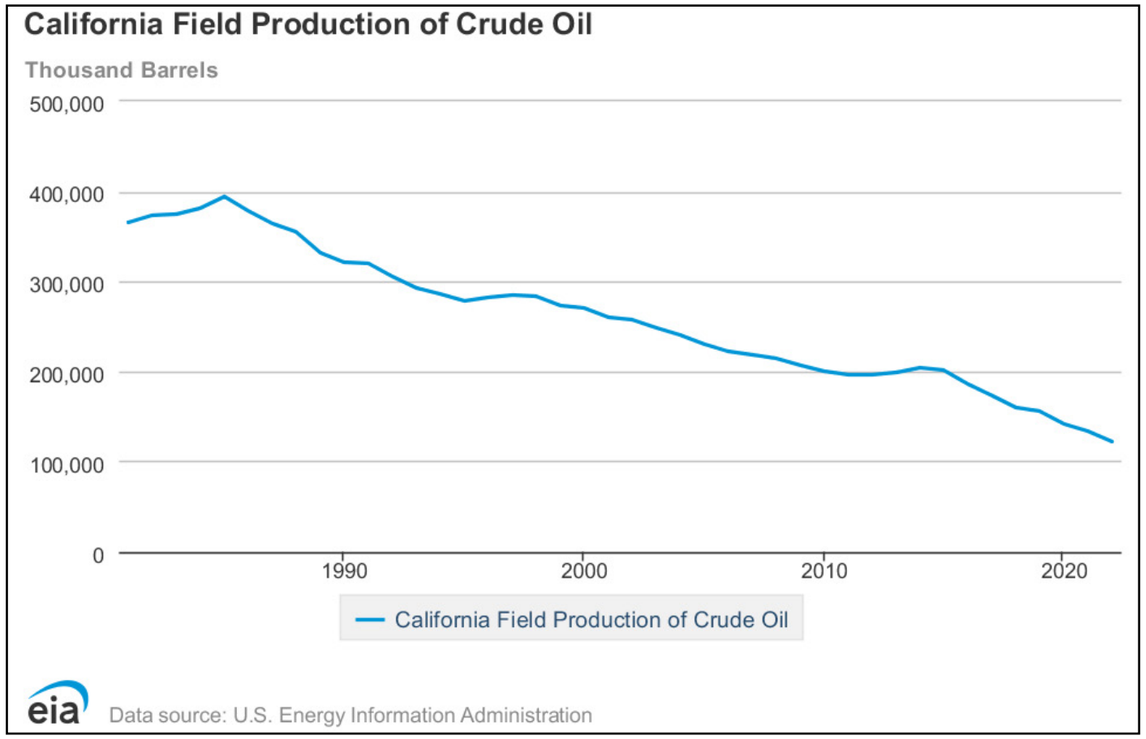

Figure 2: Image Credit: U.S. Energy Information Administration[34]

Given the terminal decline of California's oil and gas production, as well as the diminishing California per well production rate at present, the scope of the already enormous public health and climate crisis could balloon in the years ahead as operators go out of business or otherwise push cleanup obligations off onto taxpayers.[35]

The cost to plug orphan and idle wells

Using state and industry data from April 2022, Carbon Tracker estimates the total cost for plugging all current unplugged wells and related infrastructure such as separation vessels, storage tanks, pipelines, pumps, and compressors at $13.2 billion in direct plugging and remediation costs, and $21.5 billion once "known but unquantified costs and inflation" are factored in.[36] Carbon Tracker breaks down those cost estimates by region. Extrapolating from the regional data gives the average plugging and remediation costs per well in each region shown in the table on the following page. These figures account for broad regional variation in decommissioning costs, but it is important to note that costs to plug individual wellheads will vary depending also on age and well type, among other factors.

Table 1: Regional Well Plugging Cost Averages Used In This Report

Region[37]	Total Decommissioning Costs from Carbon Tracker Analysis[38]	Per-Wellhead Regional Average Plugging Cost Used in This Report[39]
Northern (Sacramento Basin)	$980,000,000	$480,000
Inland	$14,900,000,000	$186,000
Southern (LA Basin)	$2,700,000,000	$454,000
Coastal	$3,000,000,000	$328,000

Applying these regional per-well costs to an updated inventory of California's wells reveals that it will cost an estimated $10 billion to plug and remediate the current inventory of 41,568 orphan and idle wells in the state, out of a total $22.9 billion needed to plug and remediate all unplugged wells. This calculation assumes the need to also decommission and clean up related oil and gas production equipment including separation vessels, storage tanks, pipelines, pumps, and compressors.

Climate and health risks of orphan and idle wells

Unplugged wells cause direct harm to human health and the environment. Emissions from orphan and idle wells threaten California's climate goals, a fact well known by the state's oil and gas regulators and legislative leaders.

CalGEM has stated that "If not properly plugged and abandoned, these wells and facilities can contaminate waterways and soil, serve as a source of climate and air pollutants, and can present physical hazards to people and wildlife."[40] Further, legislative analysis has stated that "improperly maintained well casings [within idle wells] can rust or crack, allowing contaminants such as uranium, lead, iron, selenium, sulfates, and radon to enter into freshwater formations… Unlike wells being produced, where operators will likely see changes in production levels if a leak or damage occurs, leaks or damage to idle wells may go unnoticed".[41]

Researchers have found that about two-thirds (67%) of studied idle wells in California leak methane, which is 28 to 36 times more potent than carbon dioxide when trapping heat in the atmosphere during a 100-year period, according to the Intergovernmental Panel on Climate Change.[42] [43] Over a 20-year period, methane is 84 to 87 times more potent compared to carbon dioxide. Responding to the growing crisis of methane leakage from orphan and idle wells and in the wake of a major methane leak in the Morningstar neighborhood of Bakersfield, Gov. Gavin Newsom created a multi-agency Methane Task Force in 2022 to tackle the issue of methane emissions from idle and orphan well sites.[44] [45]

Recent studies and inspections by both the newly-minted Methane Task Force and CalGEM have found that some orphan wells have leaked huge amounts of methane for long periods of time undetected.[46] New research shows that wells leaking methane are also likely leaking harmful substances that include benzene, a known carcinogen linked to blood cancers.[47] The World Health Organization has concluded that no safe level of exposure to airborne benzene exists.[48]

The California Air Resources Board in a 2017 assessment noted that methane "is also a precursor for tropospheric ozone and is strongly linked with co-emitted reactive trace gasses that are the focus of air quality and public health policies, particularly in high priority regions such as the San Joaquin Valley (SJV) and the South Coast Air Basin (SoCAB)."[49]

Even as far back as 1990, the California Department of Conservation — in bill analysis for proposed legislation on mandating bonding levels for oil and gas producers seeking drilling permits from the state — pointed out that "idle wells can affect public health and safety by causing contamination of groundwater." The agency added that "There is also a modest risk from fire or explosion from leaking gasses, such as methane."[50]

Further, a 2023 analysis published by Environment California pointed out that idle and orphan wells sit within key water reservoirs statewide, which can pose negative ecological consequences because seepage from active and idle oil wells can contaminate groundwater. They found that 79% of unplugged wells sit within a groundwater hydrologic zone and 12% are within 200 feet of a river or creek.[51] A study of Santa Barbara County's wells within the Orcutt Oil Field performed by the Santa Barbara County Grand Jury concluded that 20% of water wells sampled contained chemical contaminants originating from oil drilling.[52] Another study of Los Angeles County's Montebello Oil Field concluded that "petroleum hydrocarbons" from oil wells were detected in 29% of groundwater samples.[53]

Proximity to homes and communities drives safety concerns

According to the FracTracker Alliance, 12,491 idle wells were located within 3,200 feet of a home or other sensitive location in California as of December 2021.[54] The state's oil wells setbacks law passed in 2022 identifies 3,200 feet as the minimum safe distance between community sites and oil extraction.[55] FracTracker's analysis found 25% of these sat in Los Angeles County and over 22% sat in Kern County. Los Angeles County's residents are 74.8% people of color, while Kern County's population is 69.6% people of color, showing the disproportionate impact idle wells have on California's marginalized communities.

Image Credit: cascoly2, Adobe Stock

These wells present not only public health and climate justice issues but also safety hazards to local communities. In the spring of 2023, CalGEM reported to residents of Arvin and Lamont in Kern County that a recent inspection found 15 of the 27 leaking idle wells inspected had methane leaks exceeding 50,000 parts per million – a level at which the gas could cause numerous adverse health impacts and potentially ignite. All of the wells inspected sat within 3,200 feet of homes and schools. Three were located within 1,000 feet of a school.[56]

In 2022, some 45 oil wells leaked methane near homes in neighborhoods around Bakersfield, California.[57] Several of those wells were found to be leaking methane at explosive rates above 50,000 parts per million, according to reports filed by the Governor's Office Emergency Services.[58] The FracTracker Alliance reports approximately 2.7 million Californians live within 3,200 feet of an oil well.

Job creation opportunity

Well remediation creates jobs, cleans up environmental pollution and brings economic opportunity to California counties that need it the most while taking advantage of a large incumbent workforce. The Political Economy Research Institute calculated in 2021 the numbers of direct, indirect, and induced jobs created in California for each million dollars invested in plugging wells.

Based on the estimated 2.4 jobs created per $1 million invested in oil well remediation, plugging and remediating all orphan and idle wells in California could create at least 24,038 jobs. That number jumps to at least 54,974 jobs if all wells in the state were plugged and remediated. Money used for pollution cleanup and ecosystem restoration as part of the remediation efforts would increase the number of jobs significantly.[59]

As detailed below, wells in urgent need of plugging are concentrated in specific legislative districts and are disproportionately impacting communities of color. Notably, some of these districts contain counties with some of the highest unemployment rates in the state, significantly higher than the state average. In September 2023, California's unemployment rate was 4.7%.[60] Kern County, home to 68% of the state's orphan and idle oil and gas wells, as of September 2023 had an unemployment rate of 7.5% and a 56.8% Latino population base.[61] [62] Los Angeles County, home to 9% of the state's orphan and idle wells, had an unemployment rate of 5.8% as of September 2023 and houses a population that is 74.8% people of color.[63] [64] Ventura County is home to 5.7% of orphan and idle wells and its unemployment rate is 4.5%, with the community consisting of 57% people of color.[65] [66] These counties are disproportionately impacted by both issues and would stand to gain on multiple fronts if oil companies cleaned up orphan and idle wells.

Plugging and remediating the idle and orphan wells in Kern County is estimated to create at least 12,685 jobs, depending on the scope of the cleanup involved. Plugging and remediating all wells there would create at least 33,969 jobs. In Los Angeles County, plugging and remediating all of the wells currently in the municipality would create at least 7,491 jobs. Plugging and remediating just the orphan and idle wells there would create at least 3,917 jobs. According to a report by the LA County-City Just Transition Task Force, *Los Angeles Just Transition Strategy, Appendix C: The State of Fossil Fuel Extraction Workers in Los Angeles County*, the entry-level oil extraction workforce is predominantly held by people of color with 58% Hispanic and 6% African American. For mid-level workers it was 58% Hispanic and 11% African American.[67] Oil and gas production has disproportionately burdened these populations in California for generations. The communities who could benefit the most from the direct, indirect, and induced jobs created by speedily cleaning up these well sites, also face the most health impacts if nothing is done.

To facilitate this clean up, labor unions are interested in working with state agencies to ensure labor standards and state workforce programs respect and include an existing workforce that's already maintaining and plugging wells safely, that is unionized, and has been trained through joint labor-management programs, community college training programs or technical training centers.

Part 2: Who Holds California's Idle Wells: An Examination of Their Profits and How They Avoid Financial Liability

In total, 24,661 of 36,530 idle wells in California are operated by just three companies: Chevron, Aera Energy (until March 2023 jointly owned by ExxonMobil and Shell), and California Resources Corporation. Two out of the three are global oil giants or directly linked to parent companies who are. In 2022, Chevron, Shell and ExxonMobil alone made a combined $133.5 billion in profit. When including Occidental Petroleum, the previous owner of California Resources Corporation's wells, that number jumps to $147.3 billion.[68]

While California's commercially viable oil reserves may be declining, the profits of its leading companies and their recent owners — all multinational conglomerates — are not.[69] Major publicly traded oil and gas companies have the financial ability to remediate their idle wells, but current California law makes it difficult to actually hold former owners responsible in practice.

Chevron

Chevron is the top holder of California's idle wells at 9,055. Chevron claimed a profit of $35.5 billion in 2022 and $117 billion in the last 10 years inclusive of 2022. More than a third of Chevron's California wells sit idle. It would cost an estimated $1.7 billion to plug them, representing only 4.8% of last year's reported profit. Plugging all its wells (26,431) in California would cost at least $5.1 billion, or just 4.4% of its aggregate profits over the last 10 years.[70]

These numbers are not a full representation of Chevron's total profit, either. In 2015, the company admitted during a U.S. Senate investigation that it held at least $31 billion in multiple offshore tax havens, which would not be included in profit numbers.[71] In 2017, Reuters documented how Chevron loaned money to itself to avoid paying taxes to the Australian government, which sued over the practice and recouped $268 million.[72] In 2018, Dutch and international unions filed a complaint alleging "massive tax avoidance" by Chevron, which used Dutch subsidiaries created for that purpose.[73] How much Chevron currently holds in offshore accounts is a closely guarded secret.

While Chevron has not yet plugged the vast bulk of its idle wells, the company has provided dividends to its shareholders for 35 years without interruption. The company's CEO, Michael Wirth, took home $24 million in compensation in 2022.[74] He made an additional $23 million that year disposing of Chevron stock.[75] Chevron owns a fleet of eight active private jets for its executives

to use, worth an estimated $257 million, 15% of what it would take to plug the company's current idle wells.[76] [77]

Aera Energy, Shell, and ExxonMobil

Aera Energy is the second largest holder of idle wells, with 8,948. The group's original parent companies, Shell and ExxonMobil — which owned Aera throughout 2022 — had a combined 2022 profit of $98 billion, more than enough to cover the estimated $1.8 billion plugging cost for their idle wells.[78] Plugging and remediating all 24,060 of Aera's wells at-large would cost $4.7 billion. The $1.8 billion needed to clean up Aera's idle wells in California would only come to 1.8% of the two parent companies' 2022 profits and 0.5% of the two companies' $332 billion profit during the past decade.[79]

In March 2023, Aera Energy was officially acquired by IKAV, a German private equity company (51% ownership), and Canadian Pension Plan (CPP) Investments, the investment arm of the Canadian Retirement System (49% ownership).[80] IKAV is a private company and does not release profit figures, but it has $2.5 billion in assets.[81] CPP Investments also has $570 billion in assets and a 2023 net asset increase of $31 billion.[82]

California Resources Corporation and Occidental Petroleum

The third largest holder of idle wells is California Resources Corporation (CRC), a spinoff created by Occidental Petroleum, with 6,658. Similar to the Aera Energy sale, Occidental was also an oil major that offloaded older assets onto a smaller company. When Occidental transferred billions to itself from CRC, Occidental passed on debt that would eventually lead to CRC filing for Chapter 11 bankruptcy in 2020.[83]

CRC currently has 15,451 total unplugged wells, with 43% of them idle. Plugging CRC's idle wells would cost about $1.7 billion. In 2022, Occidental Petroleum earned $13.3 billion in profits, while California Resources Corporation earned $524 million.[84] Plugging costs for CRC's idle wells are about 13% of the combined profits for Occidental and CRC in 2022. The cost to plug its idle wells is about 324% of CRC's 2022 profits or over three times the amount, however, illustrating how the industry practice of passing aging wells to smaller entities increases the chance that they sit idle forever or become orphan.

Image Credit: Richard, Adobe Stock

Profits of major oil well holders

The table below shows the state's top idle well holders, the total cost it would take to plug those wells, and the 2022 profits for the publicly traded companies that disclose those numbers.

Table 2: California Operators with the Most Idle Wells: Comparing the Cost to Plug Against 2022 Profits

Operator	Idle Wells	Estimated Cost to Plug Idle Wells	Profits of Parent Company in 2022
Chevron	9,055	$1.7 billion	$35.5 billion
Aera Energy	8,948	$1.8 billion	$98 billion (Includes Shell and Exxon Mobil profits; sold to IKAV and CPP Investments in March 2023)
California Resources Corporation	6,658	$1.7 billion	$13.3 billion (Includes CRC and Occidental profits)
Berry Corporation	2,441	$460.7 million	$250 million
Sentinel Peak Resources	2,082	$476.0 million	Private
E & B Natural Resources Management Corporation	1,372	$318.8 million	Private
CalNRG Operating, LLC	1,112	$365.1 million	Private
Crimson Resource Management Corp.	477	$98.4 million	Private
Cat Canyon Resources LLC	288	$94.5 million	Private
Bridgeland Resources	277	$125.8 million	Private

Part 3: How the Oil Industry Takes Advantage of Lax Regulations That Put the Public at Risk

Three ways operators avoid liability

The oil industry uses three main methods to avoid cleaning up its orphan and idle wells – tactics which have created today's crisis in California.

1. Transferring and deserting wells, creating orphans

Some smaller, poorly capitalized oil and gas companies have deserted operations altogether when they are no longer profitable. Alternatively, a larger company can offload marginally producing wells to a smaller company. If the smaller entity lacks the capital to perform even basic maintenance on the well, it increases the likelihood of the well becoming orphan. A 2023 report by the FracTracker Alliance concluded that "Over 96% of the transfers were either to smaller holding companies/ operators, the result of a bankruptcy, or executed to facilitate the exit of a company from the California exploration and production market," with over 99% of such transfers taking place from 2010 and onwards.[85]

In 2020 as oil bankruptcies multiplied, Greg Rogers, a former advisor to the oil industry, stated that oil and gas companies desire to walk away from their responsibility to clean up well sites as a business decision. *"The plan is that these costs will be transferred,"* he said, *"These obligations will be transferred to the state at some point. Why would a company want to go out and spend hundreds of millions of dollars plugging all of these wells when it could instead pay its executives?"*[86]

Image Credit: Kerry Klein, Valley Public Radio

The recently passed Orphan Well Prevention Act, or AB 1167, aims to make this practice much more difficult by ensuring that bonds or surety payments cover the full cost of oil and gas well remediation upon transfer of wells producing less than 15 barrels per day of oil (known as stripper wells). This new law requires operators to post an individual full cost bond for all stripper wells that are transferred, adequate to cover the full cost of plugging, well site remediation, and decommissioning.[87]

2. Inadequate bonding

All oil operators in California are required to provide a bond, which for those owning a large number of wells can also come in the form of a "blanket" bond covering multiple wells. Bonds are held by the regulator in case the operator fails to plug its wells and cannot be tracked down and held directly financially liable for remediating those wells.

Under the current law, $9 million in blanket bonds have been provided in total by the top three unplugged well holders, an amount which covers only 0.06% of the total cost they will eventually have to pay for properly doing a full remediation of all of their unplugged wells (active, idle, and orphan), and only 0.2% when applied just to their orphan and idle wells. This lack of adequate bonding could leave Californians on the hook to pay for the plugging and cleanup of thousands of wells left by the industry. The state has the authority to increase blanket bond amounts to as high as $30 million, which would chip away at the problem and reduce the level of taxpayer liability but has yet to do so for any operator.

3. Leaving wells idle indefinitely

California law — as implemented by CalGEM — provides the oil industry with the legal ability to delay plugging by either paying yearly nominal fees of up to $1,500 per well to keep wells idle in perpetuity. Under the fees program, $150 is assessed for each idle well inactive for three or more years, $300 for eight or more years, $750 for over 15 years and $1,500 for 20 or more years. Before the three year mark, no fees are assessed at all.

Alternatively, operators can avoid paying idle well fees altogether by submitting an Idle Wells Management Plan (IWMP). For those who opt into the Idle Wells Management Plan program, operators with 250 or fewer long-term idle wells must decommission at least 4% of such wells per year, 5% for 251 to 1,250 long-term idle wells and 6% for over 1,250 of them. The state's average all-in cost of plugging and remediating a well and associated infrastructure is 151 times more expensive than the highest idle well fee and 1,513 times more costly than the lowest idle well fee.[88]

Other Jurisdictions

Other states can provide models for California in imposing deadlines for plugging an idle well or imposing joint and several liability for companies transferring wells. For example, state laws in Pennsylvania and West Virginia compel oil well operators to plug wells within one year of ceasing production.[89] Other states, including Colorado and North Dakota, consider a well "idled" after 12 months and then allow the operator an additional 6 months to complete plugging.[90] Although some of these states allow operators to apply to extend these deadlines to keep wells in an idled and unplugged status for longer periods, they typically require additional protections such as per-well

bonds and mechanical integrity tests to prove the wells aren't leaking.

California's statute does have joint and several liability, meaning that prior operators can theoretically be held liable, but it only reaches back as far as transfers that occurred after 1996. Eliminating this cutoff date and separately mandating a timeline during which plugging and abandoning must be completed, would provide a clear legal foundation to pursue existing or previous owners of no longer operational wells for plugging and remediation funds once that timeline has been exceeded (see "Policy Recommendations"). Instead, California's current statutes allow operators to delay well capping and remediation in perpetuity for nominal fees, allowing prior owners to continue to evade responsibility and potentially leaving taxpayers largely on the hook for cleanup.

California Legislation and Statutes

Two main statutes, Public Resource Code (PRC) § 3237 and PRC § 3206, shape California's regulatory apparatus on orphan and idle wells, respectivel.[91] [92]

On paper, regulators can ensure that predecessor operators pay cleanup costs for orphan and idle wells when the smaller entities to whom they passed these liabilities cannot foot the bill. However, the Western States Petroleum Association (WSPA) and California Independent Petroleum Association (CIPA), which lobbied for the bills and the resulting policy outcomes, wielded their lobbying prowess to weaken the laws and make it difficult to actually hold prior operators responsible.[93] [94] [95] [96]

Public Resource Code (PRC) § 3237 enables the agency to hold predecessor owners of orphaned oil and gas wells dating back to 1996 accountable for well cleanup costs. Specifically, the law reads that "The supervisor may continue to look [back] to previous operators until an operator is found that the supervisor determines has the financial resources to cover the cost of plugging and abandoning the well or decommissioning deserted production facilities" going back to the 1996 ownership date.[97]

The other main statute, PRC § 3206, focuses on idle wells. Passed by the California Legislature and signed by Gov. Jerry Brown in 2016 as AB 2729, this statute enables idle well holders to either enter into a fee-paying program plan for their long-term idle wells and pay those fees indefinitely (because they are not time-barred under the letter of the law), or commit to plug a small fraction of their total wells.

The fees are small — at most $1,500 per well per year — and a review of CalGEM's programmatic data for the implementation of that statute shows that in an overwhelming number of cases operators are assessed only the lowest fees. As implemented, the statute enables operators for the most part to opt to pay either the small $150 annual fee per well for non-long-term idle wells on the books for three to eight years or no annual fee for those on the books for less than three years. The highest rate of $1,500 per year is only imposed for long-term idle wells that sit idle for eight years or more. On a per-well basis, these annual rates fail to provide any incentive for operators to plug the wells because the fees are so much lower than the average cost to fully remediate a single well site and associated infrastructure.

Under the alternative course whereby operators can opt into a legally defined Idle Wells Management Plan (IWMP), operators are only required to plug from 4% to 6% of their wells per year (depending on the number of wells held, with more wells held necessitating the higher percentage) over a period of up to five years. Thus, even under Idle Well Management Plans, operators leave the vast majority of their idled wells unplugged indefinitely.

Blanket bonds provide an additional mechanism to minimize the oil industry's costs while increasing the risk that taxpayers will ultimately be on the hook for cleanup costs. As described above, well operators must post a bond to provide the state with the funds to plug a well in the event the operator defaults on its clean-up obligations. Operators with multiple wells have the option to satisfy that bonding requirement through the use of "blanket bonds" that cover multiple wells. For those operators with over 10,000 wells of any type — orphan, idle, or active — AB 2729 raised the maximum level of blanket bonds from $2 million to $3 million for the largest producers. Those with 500 to 10,000 wells must post a $2 million bond, those with 50 to 500 must post a $400,000 bond, and those with less than 50 must post a $200,000 bond.[98]

However, the actual cost to plug, abandon and remediate the largest operators' idle oil and gas wells is hundreds of times greater than what's covered under their blanket bonds. It would require 591 times Aera Energy's $3 million blanket bond, 581 times Chevron's and 551 times CRC's to cover actual plugging costs for the companies' idle wells. For Aera, the $3 million blanket bond is equivalent to a bond fee of $335 per well for its idle wells, $331 per well for Chevron and $451 for CRC. In sum, the current bonding paradigm falls far short of the money it would take to cap orphan and idle wells, assuming the regional average plugging and remediation costs outlined in Table 1.

Under AB 1057, passed in 2019, CalGEM received authority to impose $30 million blanket bond for an operator posing a threat of "desert[ing] its well or wells and the potential threats the operator's well or wells pose to life, health, property, and natural resources." If the cost of the potential harm is less than $30 million, CalGEM can alternatively charge those same operators "the reasonable costs of properly plugging and abandoning all of the operator's wells and decommissioning any attendant production facilities".[99] This authority has yet to be used, however.

As it stands, the current statutory paradigm that is the product of industry lobbying allows operators to keep oil and gas wells idle in perpetuity and pay very little to do so.

According to agency-published reports and data collected in anticipation of the yet-to-be-released 2022 report obtained via a Public Records Act request, Idle Wells Management Plans only resulted in the plugging and abandoning of 3,041 total wells between 2018 to 2022.[100] [101] [102] [103]

When examining the companies focused on in this report, Chevron has shuttered 1,214 wells under the program, Aera 958 and CRC a mere 29. By contrast, these three companies held 24,929 idle oil and gas wells statewide collectively as of May 2023. Chevron possesses a total of 9,055 idle wells, Aera 8,948 and CRC 6,658. That means Chevron has only retired 13.4% of its idle wells under the program since it first went into place in 2018, with Aera shuttering 10.7% and CRC 0.4%. For a summary of the three companies' participation in the IWMP, see the table on the following page.

Table 3: Idle Wells Management Program Participation

Operator	# of IWMP Wells Eliminated in 2018	# of IWMP Wells Eliminated in 2019	# of IWMP Wells Eliminated in 2020	# of IWMP Wells Eliminated in 2021	# of IWMP Wells Eliminated in 2022	Total
Aera Energy	218	211	196	167	166	958
Chevron	569	147	260	84	154	1,214
California Resources Corporation[104]	11	6	10	1	1	29

Since the program began, the total number of idle wells in California has grown from 29,292 in 2018 to 36,530 today. Statewide, the number of idle wells plugged and abandoned since the program went into place in 2018 has also fallen every year, apart from a slight uptick in 2020 from 2019 numbers. In 2021, only half as many wells were eliminated as in 2018. A chart depicting these trends published by CalGEM in August 2023 can be seen below.[105]

Table 4: Idle Well Counts, Per Year

Calendar Year	Idle Wells	Long-term Idle Wells	Idle Wells Changed to Plugged	Idle Wells Changed to Active	IWMP Wells Eliminated*
2018	29,292	17,576	1,346	107	988
2019	37,095	17,560	1,927	690	543
2020	37,612	17,786	2,154	532	558
2021	38,759	17,888	2,703	568	464

**These numbers include LTIWs that were plugged and abandoned or returned to use that year. These may be applied to the current year compliance obligation or result in credits generated to be used to meet future year compliance obligations. LTIW refers to long-term idle wells.*

Despite massive participation in the fees program, as opposed to the Idle Wells Management Program, California Assembly analysis has concluded that the fees program, as of March 2023, is only collecting about $10 million annually out of the $22.9 billion it will cost to plug all of the state's unplugged wells and associated infrastructure.[106] That is a mere 0.04% of the money it will take to address the issue and only 0.1% when solely accounting for the total cost of plugging idle and orphan wells. State policy must be strengthened to compel oil companies to pay for the wells left behind after decades spent drilling for oil and gas in California.

Full remediation of oil and gas wells is unfolding slowly in California, but the ultimate cost of cleanup is accelerating quickly. Overall, the California government has $265 million budgeted for plugging wells, including funds from the federal orphan well program and state matching funds. This only amounts to 5.1% of what it will ultimately take to plug all of the top three current idle holders' wells, or 1.1% of their entire fleet of unplugged oil and gas wells statewide.

The numbers make it clear: A policy course correction will be needed to stave off the current fiscal, climate and community public health crisis. Otherwise, Californians may be caught footing the oil industry's bill that has come due.

Part 4: Orphan and Idle Wells by Location

A prominent example of California residents paying for the oil industry's mess can be found in Beverly Hills. Beverly Hills Unified School District absorbed the responsibility of paying to plug 19 wells on the Beverly Hills High School campus after they were abandoned by Venoco Inc.[107] The company was slated to plug the wells by March 2017 but was absolved of this responsibility after declaring bankruptcy. According to the Board of Education, well plugging was paid for with a construction bond passed by Beverly Hills voters in 2018. Residents of Beverly Hills may have the tax base to cover costs to cap local wells, but the vast majority of regions where wells are located are not so well off.

Further, California is eligible to receive up to $140.9 million in federal formula grants via the Infrastructure Investment and Jobs Act signed into law by President Joe Biden in 2021, earmarked for California to plug, abandon and remediate orphan wells.[108] This does not include initial grants and performance grants, which add additional funds. While not state taxpayer money, this is still an example of the totality of U.S. taxpayers holding financial liability to clean up these wells, including those directly impacted in places such as Kern County. The available money is wholly inadequate compared to the billions it will take to get the job done, which means without a policy design change, taxpayers could be forced to foot even more of the bill in the future.

Orphan and idle wells also disproportionately impact communities of color. About 91.8% of all of California's orphan and idle wells sit in just five counties: Kern, Los Angeles, Fresno, Ventura and Santa Barbara. A total of 68.4% of orphan and idle wells and 75.6% of all wells in California are concentrated in Kern County, where the majority Latino residents face a disproportionate pollution burden from oil and gas drilling.

Table 5: Top Counties with Highest Concentration of Orphan and Idle Wells

County	Idle Wells	Orphan Wells	Idle and Orphan Total	% of Total Idle and Orphan Wells in State (41,568)
Kern	27,327	1,090	28,417	68.4%
Los Angeles	2,037	1,558	3,595	8.6%
Ventura	1,923	444	2,367	5.7%
Fresno	1,931	239	2,170	5.2%
Santa Barbara	822	789	1,611	3.9%
TOTAL: 5 Counties	**34,040**	**4,120**	**36,549**	**91.8%**
Orange	632	278	910	2.2%
Monterey	476	24	5010	1.2%
Kings	194	48	242	0.6%
Colusa	173	53	226	0.5%
San Luis Obispo	215	5	220	0.5%
Sutter	186	21	207	0.5%
TOTAL: 11 Counties	**35,916**	**4,549**	**40,465**	**97.3%**

Conclusion & Recommendations

California's 41,568 idle and orphan wells pose considerable threats to the environment and the health of local communities. Three oil companies are responsible for 68% of the state's idle wells: Chevron, Aera and California Resources Corporation. Despite oil industry claims that paying for adequate bonding will saddle them with undue financial burdens,[109] this report shows that these three operators — including their original corporate parents who profited from the wells — are financially capable of plugging and abandoning their wells in full. Yet, the legislation on the books that the industry helped to write currently enables these companies to delay remediation and this delay increases the risk that operators will attempt to pass the costs to the public instead. Immediate policy action is needed to empower and require CalGEM to hold current and previous oil operators accountable for the full cost of cleaning up their idle and orphan wells and force them to plug their wells as soon as possible. In the meantime, CalGEM must use its existing authority to hold the oil industry accountable to clean up the mess it has created for generations in California.

California communities like Beverly Hills serve as cautionary tales of what the rest of the state can expect if the oil and gas industry is not held accountable. Relying on the $140.9 million in federal formula grants coming from the Infrastructure Investment and Jobs Act signed into law by President Joe Biden in 2021 is both financially inadequate and allows the oil and gas industry to avoid financial responsibility. Gov. Gavin Newsom and California legislators must enact effective regulation enabling oil and gas well remediation at a faster rate and in a more robust fashion. To address policy loopholes and ensure gas and oil operators are held liable, we recommend the following policy changes.

Policy Recommendations

Impose specific deadline requirements for idle well cleanup

California should require operators to plug all future idle wells maintaining that status for longer than 12 months. Note that PRC § 3008(d) defines "idle well" as a well that has not produced in 24 consecutive months. Imposing a one-year deadline would require changing the definition of "idle well." Legislation could require operators to show within 30 days of idling that an idle well has a high likelihood of being reactivated within five years or less. An operator would have to submit documentation to substantiate this assertion and provide assurances that the well does not pose a risk to the environment and nearby communities, and CalGEM would have to make an express finding that the operator has met the "high likelihood" standard. The operator would also have to renew this demonstration annually. Otherwise, the idle well must be plugged. Legislation should impose a high standard given the low likelihood that idle wells will return to production: in 2021, only 568 of 38,759 idle wells (1.5%) were reactivated.[110] All plugging and abandonment requirements should expressly include surface restoration and remediating any degradation of water, soil or vegetation.

Mandate clear timelines for cleanup once a well is defined as "idle"

Requiring all currently idle wells to be plugged immediately would be challenging. Yet the current idle well rules resulted in a paltry 7.2% of them plugged in 2021.[111] California needs to pursue new legislation that requires operators to plug a far greater number of wells on a faster timeline.

- Plugging 10% of the operator's existing idle wells in the first year of a new law's effective date and the same number of wells each year thereafter would give operators 10 years to clear their inventory of idle wells. Legislation could simplify the idle well management plan requirements to require 10% of idle wells be plugged each year for all operators. Legislation should also require operators to prioritize plugging wells that are located close to homes and other sensitive receptors.

- Legislation could eliminate the payment of idle well fees as an alternative to complying with the idle well management plan. In 2021, idle well fees generated $5 million for the Hazardous Idle-Deserted Well Abatement Fund.[112] Funding for plugging orphan wells will be made up by clarifying that the per-barrel assessment fee (PRC §§ 3111, 3402) will be set to cover all of CalGEM's costs related to plugging orphan wells. Specifically, the cap on expenditures for plugging and abandonment work (PRC § 3258) should be eliminated, and legislative language should clarify that the per-barrel assessment fee will be adjusted annually to reflect the full cost of the agency's plugging activity the prior year. CalGEM would use its existing authority for its plugging activity and adjust the assessment fee under PRC §§ 3401-3413.

Increase financial assurance amounts

California must set well remediation bonds at amounts adequate to fully cover all plugging and cleanup costs, including surface remediation. CalGEM should calculate the bond amount for each well based on the agency's documented costs remediating orphaned wells and must require that financial assurance amount be posted as a condition of continuing operations. The $30 million cap (PRC § 3205.3) should be eliminated so that operators must as a requirement to continue operations cover the full costs of plugging and abandonment and site restoration. The use of so-called blanket bonds (PRC § 3205) should be eliminated for operators of all sizes.

Amend PRC § 3237 to extend predecessor liability pre-1996 and tighten exclusions

Currently, the language in PRC § 3237 only allows for clean up costs to be clawed back to well operators that owned wells dating back to 1996. Legislation is needed to amend 3237 to allow CalGEM to recoup fees from solvent operators prior to 1996. Legislation is also needed to tighten the existing loophole excusing predecessors from liability for "the costs of plugging and abandoning a well or decommissioning deserted production facilities by a subsequent operator if those costs are necessitated by the subsequent operator's illegal operation of a well or production facility." This language should either be removed entirely, or a narrow definition of "illegal operation" should be provided that excludes "illegal" acts such as failing to comply with abandonment and plugging requirements. These changes would allow for true predecessor liability for clean up and prevent future costs from falling on taxpayers.

Ensure the workforce employed to plug idle and abandoned wells include incumbent, experienced oil and gas workers in California's workforce development plan

The workforce development plan should include fiscal responsibilities of remediation, labor and workforce costs and considerations to safely and efficiently remediate wells.

Methodology For Data Collection

- The numbers of idle, orphan, active and total wells were obtained through CalGEM records, both from their website and obtained through records requests. All were accessed in April and May 2023. These datasets showed that the state has 100,696 unplugged onshore oil and gas wells, consisting of the following well type classifications: Air Injection, Core Hole, Cyclic Steam, Dry Gas, Dry Hole, Gas, Gas Storage, Gas Disposal, Injection, Liquefied Gas, Multi-Purpose, Observation, Oil & Gas, Pressure Maintenance, Steamflood, Unknown, Water Disposal, Water Source, Waterflood. According to the analysis, 41,568 of the wells are orphan/likely orphan or idle, 36,530 of which are idle; 59,095 are active and only 2,497 of those are "new".

- All unemployment rates were obtained from the California Employment Development Department, as of July 2023: https://labormarketinfo.edd.ca.gov/geography/lmi-by-county.html

Image Credit: Susan Vineyard, Adobe Stock

- The average cost to plug a well and decommission associated infrastructure in the state was calculated from *There Will Be Blood: Decommissioning California's Oilfields*, published by Carbon Tracker Initiative in May 2023 by Dwayne Purvis: https://carbontracker.org/reports/there-will-be-blood/. This report estimated the total cost for plugging all current unplugged wells and related infrastructure — such as separation vessels, storage tanks, pipelines, pumps and compressors — at $13.2 billion in direct plugging and remediation costs and $21.5 billion once "known but unquantified costs and inflation" are factored in. *There Will Be Blood* broke down this state-wide cost across four regions as shown in the table on the following page. These geologic regions largely align with CalGem's regional breakdown shown in the maps on the following page.

- To calculate regional per-well cost averages, the regional totals were divided by the number of wellheads per region in the database underlying *There Will Be Blood*, provided by the report's author Dwayne Purvis. The rounded average regional cost per wellhead was then applied to each of the wells in the database for this report, depending on their region. Each well was assigned a region based on the county in which it is located; *There Will Be Blood* author Dwayne Purvis provided a primary region for each county.

Table 5: Calculating Regional Cost Estimates Used In This Report

Region	Decommissioning Cost Including Inflation and Extrapolated Liabilities (Millions) *As Published in Table 5 of There Will Be Blood*	Number of Wellheads *Provided by the authors of There Will Be Blood*	Average Cost Per Wellhead *Calculated based on There Will be Blood*	Rounded Average Cost Per Wellhead Used in This Report	Number of Wellheads in This Report's Dataset
Northern (Sacramento Basin)	$980	2,040	$480,392	$480,000	2,070
Inland	$14,900	79,995	$186,262	$186,000	81,204
Southern (LA Basin)	$2,700	5,948	$453,934	$454,000	8,687
Coastal	$3,000	9,160	$327,511	$328,000	8,735
Total (CA-wide)	$21,580	97,143	$227,482 *Weighted average based on wellheads in this report's dataset*	$227,000	100,696

Figure 3: CalGEM Districts Map; Image Credit: California Geologic Energy Management Division

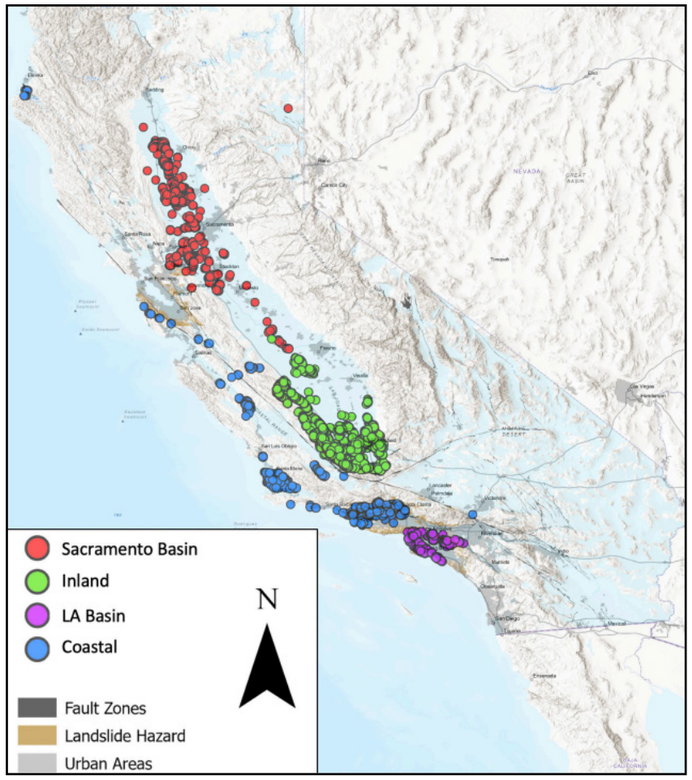

Figure 4: There Will Be Blood: Decommissioning California's Oilfields Image Credit: Carbon Tracker Initiative

- Using these regional averages with our own dataset yielded the following per-region costs.

Table 6: Total Plugging Costs by Region

District	Wellheads	Total Plugging Cost
Northern	2,070	$ 993,600,000
Inland	81,204	$ 15,103,944,000
Southern	8,687	$ 3,943,898,000
Coastal	8,735	$ 2,865,080,000
Total	**100,696**	**$ 22,906,522,000**

- District-by-district and county-by-county costs to plug wells were calculated by multiplying the number of wells in the respective jurisdiction by the regional per-wellhead cost to which the county or district corresponded. Each county and district was assigned to one of the four regions by the authors of Carbon Tracker Initiative's There Will Be Blood report. Sources for counties represented in each state Senate and Assembly district can be found here:

  https://www.senate.ca.gov/sites/senate.ca.gov/files/2023-24_senate_counties_represented_fz.pdf; https://www.assembly.ca.gov/assemblymembers

- All corporate profits were based on the "net income" of public companies as reported by Seeking Alpha: https://seekingalpha.com/. Aera Energy, LLC profits in 2022 and for the decade leading up to it were calculated based on the combined profits of ExxonMobil and Shell, since they were the owners of Aera Energy, LLC until completion of a sell-off in early 2023. California Resources Corp. profits were calculated both on their own, as well as combined with those of Occidental Petroleum, from which the company was spun off in 2014.

- Throughout this report, wells held by the following operators are aggregated under California Resources Corporation: California Resources Elk Hills, LLC; California Resources Long Beach, Inc.; California Resources Production Corporation; THUMS Long Beach Co.; Tidelands Oil Production Co.; and Oxy Long Beach, Inc. Wells held by the following operators are aggregated under Aera Energy: Exxon Mobil Corporation; Shell Western E&P Inc.; Mobil Oil Corporation; Aera Energy LLC; Arco Western Energy Co.; and Arco Oil and Gas Co. Wells held by the following operators are aggregated under Chevron: Chevron U.S.A. Inc. and Union Oil Company of California.

- Job creation numbers for plugging and abandoning orphan and idle wells is available on pg. 81, Table 4.4, of a 2021 study published by the Political Economy Research Institute housed within the University of Massachusetts-Amherst.[113] It found 2.4 jobs created for every $1 million spent on plugging and abandoning those wells, 12.3 jobs for every $1 million spent on pollution cleanup, and 18.6 jobs for every $1 million spent on ecosystem restoration. We multiplied every million dollars spent on plugging costs by 2.4 to estimate the number of direct, indirect, and induced jobs spent on plugging and abandonment activities.

- It is noted that wells have different plugging costs depending on a number of criteria, and we are using a regional average. This average cost assumes the needs to also decommission and perform cleanup regarding related oil and gas production equipment including separation vessels, storage tanks, pipelines, pumps, and compressors.

- The number of wells leaking methane is estimated based on a 2020 academic study's finding that 67% of the unplugged wells it surveyed in California were leaking methane.[114] We multiplied total wells by 67% to estimate the number of wells leaking methane.

- The numbers of Idle Wells Management Program participants comes from CalGEM's website of legislative-mandated reports covering the years 2018 – 2022: https://www.conservation.ca.gov/calgem/pubs_stats/Pages/legislative_reports.aspx

Appendix

Overview of California and the top five Assembly and Senate districts and counties by orphan and idle well count. All mentions of Chevron U.S.A. Inc., Aera Energy LLC, or California Resources Corp. include wells operated by related companies, as explained in the methodology section.

CALIFORNIA

There are more than 100,000 wells in California and only 2,497 of them are newly permitted. Of all idle and orphan wells, 68% are in Kern County and 9% are in Los Angeles County, the county with the second highest number.

$10 Billion

Cost to plug ALL IDLE & ORPHAN WELLS using regional cost averages

$22.9 Billion

Cost to plug ALL UNPLUGGED wells using regional cost averages

TOP OPERATORS OF IDLE WELLS IN CALIFORNIA	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Chevron U.S.A. Inc.	17,316	9,079	$35.5 billion
Aera Energy LLC	15,096	8,948	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	9,993	6,902	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	41,568
TOTAL WELLS	100,696

WELLS LEAKING METHANE: 67,466

67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 24,038

Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

ASSEMBLY DISTRICT 32

ASSEMBLYMEMBER VINCE FONG

REPUBLICAN

Assembly District 32 has more orphan and idle wells than any other district in California. This district includes Kern County with an unemployment rate of 7.5% in September 2023 and Tulare County with an unemployment rate of 9.7% in September 2023.

$2.8 Billion

To Plug ALL IDLE & ORPHAN WELLS in AD 32 at $186,000 per well.

$6.7 Billion

To Plug ALL WELLS in AD 32 at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN ASSEMBLY DISTRICT 32	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
California Resources Corp.	5,350	3,562	$13.8 billion (combined profits of CRC & OXY)
Chevron U.S.A. Inc	5,118	3,281	$35.5 billion
Aera Energy LLC	3,009	3,217	$98 billion (combined profits of ExxonMobil & Shell)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	15,123
TOTAL WELLS	35,759

WELLS LEAKING METHANE: 23,959

67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 6,751

Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

ASSEMBLY DISTRICT 35
ASSEMBLYMEMBER JASMEET KAUR BAINS

DEMOCRAT

Contains Kern County which had an unemployment rate of 7.5% in September 2023, almost twice the state rate at the time of 4.7%.

$2.5 Billion
To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$7.5 Billion
To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN ASSEMBLY DISTRICT 35	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Aera Energy LLC	9,955	4,453	$98 billion (combined profits of ExxonMobil & Shell)
Chevron U.S.A. Inc	10,614	4,413	$35.5 billion
California Resources Corp.	1,703	1,203	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	13,291
TOTAL WELLS	40,334

WELLS LEAKING METHANE: 27,024
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 5,933
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

ASSEMBLY DISTRICT 27
ASSEMBLYMEMBER ESMERALDA SORIA

DEMOCRAT

Contains counties with September 2023 unemployment rates much higher than the state average: Merced with an unemployment rate of 7.7%, Fresno with an unemployment rate of 6.6%, and Madera at 6.6%

$393 Million
To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$851 Million
To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN ASSEMBLY DISTRICT 27	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Chevron U.S.A. Inc	1,094	1,036	$35.5 billion
Aera Energy LLC	1,025	533	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	49	200	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	2,112
TOTAL WELLS	4,574

WELLS LEAKING METHANE: 3,065
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 943
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

ASSEMBLY DISTRICT 38

ASSEMBLYMEMBER STEVE BENNETT

DEMOCRAT

Contains Ventura, which has an unemployment rate of 4.5% as of September 2023, less than the state average. Ventura recently proposed increasing oil and gas bonding amounts.

$709 Billion
To Plug ALL IDLE & ORPHAN WELLS at $328,000 per well.

$1.2 Billion
To Plug ALL WELLS at $328,000 per well.

TOP OPERATORS OF IDLE WELLS IN ASSEMBLY DISTRICT 38	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
CalNRG Operating, LLC	344	1,032	Private
Aera Energy LLC	678	503	$98 billion (combined profits of ExxonMobil & Shell)
Carbon California Operating Company, LLC	424	122	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	2,161
TOTAL WELLS	3,777

WELLS LEAKING METHANE: 2,531
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 1,701
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

ASSEMBLY DISTRICT 37

ASSEMBLYMEMBER GREGG HART

DEMOCRAT

This district includes San Luis Obispo and Santa Barbara, two counties that have been devastated in the past by oil spills.

$528 Million
To Plug ALL IDLE & ORPHAN WELLS at $328,000 per well.

$829 Million
To Plug ALL WELLS at $328,000 per well.

TOP OPERATORS OF IDLE WELLS IN ASSEMBLY DISTRICT 37	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Cat Canyon Resources LLC	215	288	Private
E&B Natural Resources Management Corp.	104	239	Private
Pacific Coast Energy Company LP	227	122	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	1,611
TOTAL WELLS	2,528

WELLS LEAKING METHANE: 1,694
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 1,268
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

SENATE DISTRICT 12
SENATOR SHANNON GROVE

REPUBLICAN

This district includes three counties with September 2023 unemployment rates much higher than the state average: Tulare at 9.7%, Kern at 7.5%, and Fresno at 6.6%.

$3.2 Billion
To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$7.7 Billion
To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN SENATE DISTRICT 12	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Aera Energy LLC	5,643	4,413	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	5,676	3,850	$13.8 billion (combined profits of CRC & OXY)
Chevron U.S.A. Inc	5,119	3,281	$35.5 billion

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	17,299
TOTAL WELLS	41,264

WELLS LEAKING METHANE: 27,647
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 7,722
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

SENATE DISTRICT 16
SENATOR MELISSA HURTADO

DEMOCRAT

This district includes portions of three counties with September 2023 unemployment rates much higher than the state average: Tulare at 9.7%, Kern at 7.5%, and Fresno at 6.6%. It also contains all of Kings County with an unemployment rate of 7.0%.

$2.1 Billion
To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$6.6 Billion
To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN SENATE DISTRICT 16	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Chevron U.S.A. Inc	10,613	4,415	$35.5 billion
Aera Energy LLC	7,321	3,257	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	1,393	1,058	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	11,431
TOTAL WELLS	35,321

WELLS LEAKING METHANE: 23,665
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 5,103
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

SENATE DISTRICT 33
SENATOR LENA GONZALEZ

DEMOCRAT

This district sits in Los Angeles County, which as of September 2023 had an unemployment rate of 5.8%.

$352 Million
To Plug ALL IDLE & ORPHAN WELLS at $454,000 per well.

$518 Million
To Plug ALL WELLS at $454,000 per well.

TOP OPERATORS OF IDLE WELLS IN SENATE DISTRICT 33	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
California Resources Corp.	758	282	Private
Signal Hill Petroleum, Inc.	226	242	Private
Chevron	0	19	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	775
TOTAL WELLS	1,142

WELLS LEAKING METHANE: 844
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 1,284
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

SENATE DISTRICT 21
SENATOR SCOTT WILK

REPUBLICAN

This district includes Los Angeles and San Bernardino counties. In September 2023, the unemployment rate was 5.8% for LA County and 4.8% for San Bernardino County.

$1.3 Billion
To Plug ALL IDLE & ORPHAN WELLS at $328,000 per well.

$2.2 Billion
To Plug ALL WELLS at $328,000 per well.

TOP OPERATORS OF IDLE WELLS IN SENATE DISTRICT 21	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
CalNRG Operating, LLC	369	1,100	Private
Aera Energy LLC	678	512	$98 billion (combined profits of ExxonMobil & Shell)
Cat Canyon Resources LLC	215	288	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	4,099
TOTAL WELLS	6,813

WELLS LEAKING METHANE: 4,565
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 3,227
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

SENATE DISTRICT 14

SENATOR ANNA CABALLERO

DEMOCRAT

This district contains portions of counties with September 2023 unemployment rates much higher than the state average: Tulare at 9.7%, Merced at 7.7%, Fresno at 6.6%, and Madera at 6.6%.

$406 Million

To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$866 Million

To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN SENATE DISTRICT 14	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Chevron U.S.A. Inc	1,094	1,036	$35.5 billion
Aera Energy LLC	1,025	533	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	61	238	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	2,181
TOTAL WELLS	4,657

WELLS LEAKING METHANE: 3,120

67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 974

Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

KERN COUNTY

Kern County is home to 68% of California's idle and orphan wells. Its population is 69.6% people of color and its unemployment rate is 7.5% compared with a statewide average of 4.7%, both as of September 2023.

$5.3 Billion

To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$14.2 Billion

To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN KERN COUNTY	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Chevron U.S.A. Inc.	15,732	7,694	$35.5 billion
Aera Energy LLC	12,964	7,670	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	7,053	4,765	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	28,417
TOTAL WELLS	76,096

WELLS LEAKING METHANE: 50,984

67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 12,685

Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

LOS ANGELES COUNTY

Los Angeles County is home to 8.6% of the state's idle and orphan wells. Its population is 74.8% people of color and its unemployment rate is 5.8% compared with a statewide average of 4.7%, both as of September 2023.

$1.6 Billion
To Plug ALL IDLE & ORPHAN WELLS at $454,000 per well.

$3.1 Billion
To Plug ALL WELLS at $454,000 per well.

TOP OPERATORS OF IDLE WELLS IN LOS ANGELES COUNTY	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
California Resources Corp.	869	401	$13.8 billion (combined profits of CRC & OXY)
Signal Hill Petroleum, Inc.	230	242	Private
Sentinel Peak Resources California, LLC	726	239	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	3,595
TOTAL WELLS	6,875

WELLS LEAKING METHANE: 4,606
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 3,917
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

FRESNO COUNTY

Fresno County is home to 5.2% of the state's idle and orphan wells. Its population is 73.3% people of color and its unemployment rate is 6.6% compared with a statewide average of 4.7%, both as of September 2023.

$404 Million
To Plug ALL IDLE & ORPHAN WELLS at $186,000 per well.

$860 Million
To Plug ALL WELLS at $186,000 per well.

TOP OPERATORS OF IDLE WELLS IN FRESNO COUNTY	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Chevron U.S.A. Inc.	1,094	1,036	$35.5 billion
Aera Energy LLC	1,025	533	$98 billion (combined profits of ExxonMobil & Shell)
California Resources Corp.	61	241	$13.8 billion (combined profits of CRC & OXY)

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	2,170
TOTAL WELLS	4,625

WELLS LEAKING METHANE: 3,099
67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 969
Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

VENTURA COUNTY

Home to 5.7% of the state's orphan and idle wells, Ventura County is the southernmost coastal county of California's Central Coast, and includes Oxnard, Ventura, Ojai, Simi Valley and other cities. The county has suffered from many spills and leaks, including a 2016 spill of more than 44,000 gallons and a 2008 leak of 280,000 gallons by the same company (Crimson Pipeline). Unemployment rate was 4.5% in September 2023.

$776 Million

To Plug ALL IDLE & ORPHAN WELLS at $328,000 per well.

$1.3 Billion

To Plug ALL WELLS at $328,000 per well.

TOP OPERATORS OF IDLE WELLS IN VENTURA COUNTY	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
CalNRG Operating, LLC	369	1,100	Private
Aera Energy LLC	678	503	$98 billion (combined profits of ExxonMobil & Shell)
Carbon California Operating Company, LLC	424	122	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	2,367
TOTAL WELLS	4,030

WELLS LEAKING METHANE: 2,700

67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 1,863

Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

SANTA BARBARA COUNTY

Santa Barbara County is home to 3.9% of the state's orphan and idle wells. Its population is 47.5% Latino and its unemployment rate is 3.7% compared with a statewide average of 4.7%.

$528 Million

To Plug ALL IDLE & ORPHAN WELLS at $328,000 per well.

$829 Million

To Plug ALL WELLS at $328,000 per well.

TOP OPERATORS OF IDLE WELLS IN SANTA BARBARA COUNTY	ACTIVE WELLS need to be plugged soon	IDLE WELLS need to be plugged now	PROFIT OF OPERATOR IN 2022
Cat Canyon Resources LLC	215	288	Private
E & B Natural Resources Management Corporation	104	239	Private
Pacific Coast Energy Company LP	227	122	Private

WELL TYPE	TOTAL
ORPHAN/ IDLE WELLS	1,611
TOTAL WELLS	2,528

WELLS LEAKING METHANE: 1,694

67%, average of active and idle wells that leak. See methodology section for details.

JOBS CREATED FROM PLUGGING IDLE/ORPHAN WELLS: 1,268

Estimate of 2.4 direct, indirect and induced jobs created in shuttering and full remediation of orphaned oil and gas wells. See methodology section for details.

Endnotes

1 This report uses the term “well” as shorthand, but it is wellheads that are accounted for throughout. A wellhead is the “combination of valves, fittings, and piping that controls the flow of gas into and out of the underground storage formation,” the Pipeline and Hazardous Materials Safety Administration explains. Wellbores, by contrast, connect to and extend from wellheads vertically or horizontally in order to capture oil and gas.

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17 SeekingAlpha was used to access Chevron Corporation, Shell plc and ExxonMobil Corporation financials. Net Income used for profit calculation.

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