CALIFORNIA OIL & GAS POLICY BRIEF

June 2019

Our Last Chance

PHASING OUT FOSSIL FUELS

LAST CHANCE ALLIANCE

LASTCHANCEALLIANCE.ORG

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Photo: Harrison Weinberg

FOREWORD

From Evidence to Action: California Oil & Gas Extraction

This brief compiles the public health evidence, climate science and economic data behind the Last Chance Alliance's policy recommendations on California oil and gas extraction. The combined weight of this evidence strongly supports that it is both necessary and achievable for Governor Gavin Newsom to move California beyond fossil fuels to a future that is safe and healthy for every Californian.

About Last Chance Alliance

Last Chance Alliance fights for California's future. A coalition of climate activists, environmental justice organizations, and frontline community leaders, the Alliance is the first cohort of advocates pushing for a phase-out of fossil fuel extraction in California.

This briefing highlights our three core policy recommendations:

STOP permitting new fossil fuel projects;

DROP current oil extraction by announcing a managed phase out of existing fossil fuel production through a just and equitable transition; and

ROLL OUT a 2,500-foot health and safety buffer zone protecting homes, schools, and other sensitive sites.

The slide deck printed on pages six to eleven features the stories of several Californians living on the frontlines of fossil fuel extraction and illustrates the urgency of our recommended actions.

The remainder of this compilation offers highlights of relevant public health, climate, and economic literature relating to oil and gas in California, and our pathway to a fossil-free future:

I. Oil Extraction Has Created a Public Health and Environmental Justice Crisis in California

A deep body of evidence demonstrates that chemicals used in oil and gas drilling, such as the carcinogen benzene, pose health threats to virtually all systems of the body. Californians living near oil and gas wells report suffering from symptoms such as nosebleeds, headaches, and worsened asthma. Research has shown people living near drilling sites have a higher risk for developing many diseases and health conditions, including cancer and asthma (pages 12-13).

The health risks are greatest within a half mile of an active oil or gas well. An independent scientific panel that conducted a landmark statewide study of oil and gas in California recommended that a health and safety buffer be instituted to protect public health (pages 12-13).

Oil and gas wells in California are disproportionately situated in low income and communities of color already unfairly overburdened with pollution (pages 12-13).

II. Avoiding Climate Catastrophe Requires a Managed Decline of California Oil Extraction

There is simply no room in our "carbon budget" for new fossil fuel extraction if the world is to keep global temperatures below 1.5° C and in line with Paris climate goals (pages 15-17).

To meet its climate goals, California must reduce both its production and consumption of fossil fuels. We unpack how a policy decision to stop issuing permits for new oil wells in California would substantially reduce greenhouse emissions while also improving environmental justice and health in communities across the state (pages 15-17).

III. Oil and Gas Extraction Threatens California's Water Supplies

Oil production threatens California's precious water supplies. Numerous studies have documented contamination in groundwater and in water supply wells in multiple locations (page 18).

California has violated the federal Safe Drinking Water Act for many years by allowing thousands of illegal and unsafe injection wells to dump toxic oil waste directly into protected underground drinking water supplies, contaminating those aquifers (page 18). California is also the only major oil-producing state that allows the oil industry to dump its wastewater in unlined pits (page 18).

IV. A Just Transition Away from Oil and Gas Extraction Will Benefit Our Economy

Oil production in California is in long-term decline and represents less than 1 percent of state GDP, and less than 0.2 percent of employment (pages 20-21). Oil and gas jobs in Kern County declined by nearly 40 percent between 2014 and 2017 as the result of industry restructuring and cost cutting, and workers received no social support (pages 20-21).

Society can do better through an orderly and equitable phase-down of fossil fuel extraction to ensure a just transition for impacted workers and communities (page 21).

V. A Summary of Regulatory Failures at DOGGR

In Part V we summarize the systemic failure by California's Division of Oil, Gas, and Geothermal Resources (DOGGR) to enforce existing regulations (pages 22-24). While even full enforcement of regulation would not keep Californians safe from the inherently dirty and dangerous oil and gas industry, DOGGR's practice of protecting oil companies instead of public health and the environment has left Californians with a shocking lack of even the most basic protections.

For example, in the first 3 months of 2019, DOGGR issued more than 1,860 permits, including permits for new drilling, deepening and reworking wells, waste disposal, EOR, and other oilfield permits, and an additional 90 permits to conduct well stimulation without preparing an environmental impact report under the California Environmental Quality Act—our flagship environmental protection and community right-to-know law—for any of them.

MEET THE ALLIANCE

Meet some of the Californians living on the frontlines of fossil fuel extraction and climate change in California

Isabella Zizi is 24-year old resident of Richmond, CA and a member of the Northern Cheyenne, Arikara and Muskogee Creek Nations.

She has lived near the Chevron oil refinery her entire life.

In 2012, Isabella's family and community were exposed to a mass explosion at the **Chevron refinery in Richmond, CA**, which caused 15,000 residents to be hospitalized for respiratory illnesses, nausea and headaches.

Since that day, Isabella has been tirelessly organizing in her community.

Isabella organized a series of Refinery Healing Walks with Idle No More SF Bay from April 2014 until July 2017. Individuals walked in prayer and contemplation for **clean air and a just transition** to a safe and sustainable energy for future generations.

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NALLELI COBO

Nalleli Cobo is a seventeen year old resident of Los Angeles who has been fighting toxic oil wells in her South LA community since she was nine.

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In 2010, at **nine years old**, Nalleli had constant nosebleeds and headaches, developed asthma and was hospitalized for heart palpitations.

Located just two blocks from her school was the infamous **AllenCo oil drilling site**, one of thousands of urban oil drilling sites located across Los Angeles. Most are located in low-income, Hispanic neighborhoods.

Since age nine, Nalleli has been working with her community to fight the AllenCo oil well and establish a 2,500-foot health and safety buffer in Los Angeles.

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Andrew Krowne is from Northridge, CA.
His family was displaced by the Aliso Canyon gas blowout in 2015-2016.

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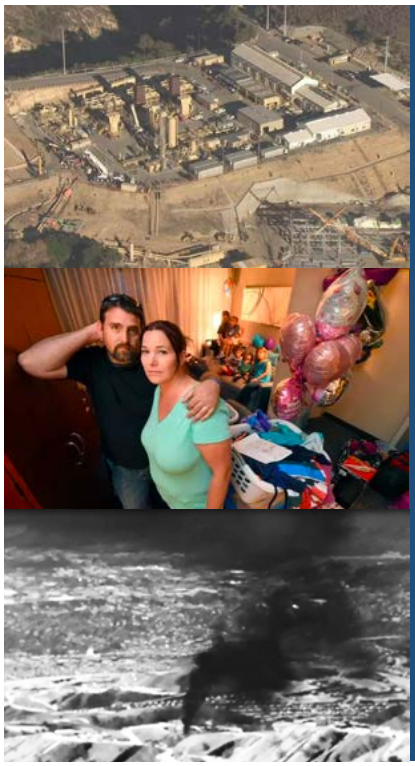

Andrew is a father of five and Treasurer of the Porter Ranch Neighborhood Council.

The Krowne family was **displaced for over 5 months** during the Aliso Canyon gas blowout—the largest-ever uncontrolled leak of natural gas in U.S. history

Fed up with the **lack of government action** to stop the leaks that plagued his community, Andrew developed the Environmental Health Tracker (EHT), which allows users to track health symptoms caused by point-source polluters or large man-made or natural disasters.

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ANABEL MARQUEZ

Anabel Marquez is a mother and grandmother from Shafter, CA. A community leader in the Central Valley, Anabel is an active member of The Center on Race, Poverty & the Environment, and co-director of the local community garden.

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Anabel Marquez and her family are residents of the City of Shafter in Kern County, the epicenter of California's fossil fuel industry and home to some of the worst air quality in the country.

"Everyday the oil pumps are getting closer and closer to my community, to our schools, churches and homes. The oil industry has invaded us."

She is most concerned about the hundreds of trucks that drive through her community each week, bringing in toxic chemicals used to treat oil wells next door.

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These Californians pay the price for California's dirty oil industry

California drills vast quantities of the world's most community-harming and climate-polluting oil.

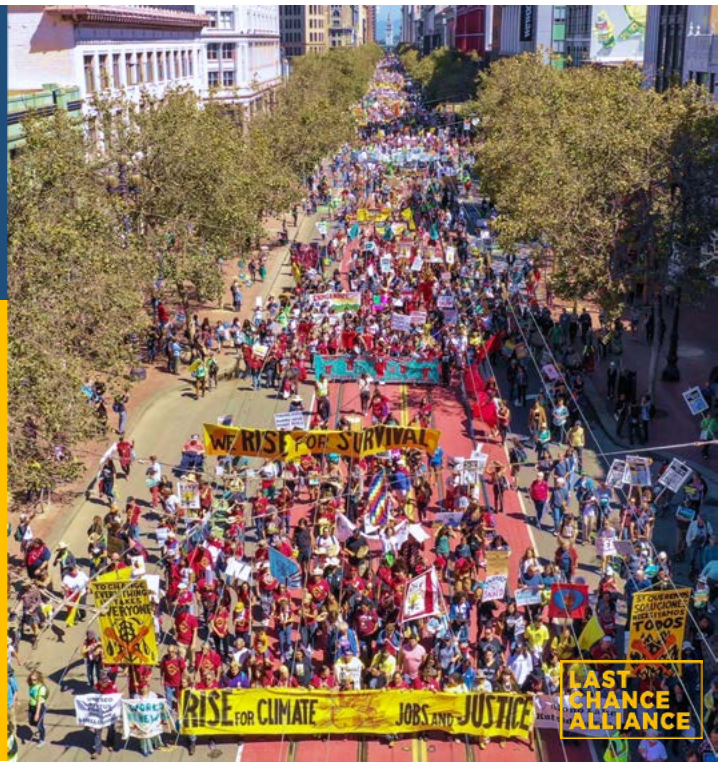
Our state extracts 200 million barrels per year and Governor Jerry Brown permitted over 20,000 oil wells while in office.

In response to this existential threat, 800 organizations across California are calling for true climate action.

California must:

1. Commit to no new permits for oil or gas drilling, fossil fuel infrastructure, or petrochemical projects, onshore & offshore.

2. Phase out oil & gas production with a fair and equitable transition that protects workers, communities, and economies, starting in places suffering most from the impacts of dirty fuel extraction and infrastructure.



Since the Global Climate Action Summit, our climate crisis – and the lack of federal leadership – has become even more painfully clear in California.

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"This is in every shape or form California's moment."

GOVERNOR GAVIN NEWSOM

It's time for California to demonstrate true climate leadership.

We are running out of chances. Moving beyond oil and gas—both demand and production—is not only possible, but is necessary to protect the future of our economy, our communities and our climate.

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Photo: Gary Kavanaugh

SECTION I

Oil Extraction Has Created a Public Health and Environmental Justice Crisis

California's oil and gas production releases pollutants to the air, water, and soil that endanger surrounding communities.[1] Harmful pollutants include known cancer-causing chemicals like benzene, formaldehyde, and cadmium;[2] ozone-forming chemicals like nitrogen oxides, volatile organic compounds, and methane;[3] and particulate matter including diesel exhaust and silica dust that cause lung and heart problems.[4]

Californians living near active oil and gas wells report suffering from symptoms such as nosebleeds, headaches, and worsened asthma.[5] Research has found that people living near drilling sites have a higher risk for developing cancer[6] increased asthma attacks,[7] higher hospitalization rates,[8] and more upper respiratory problems and rashes.[9] Among pregnant women, living closer to drilling sites is associated with a higher risk of having babies with birth defects,[10] premature births and high-risk pregnancies,[11] and low- birthweight babies.[12]

The California Council on Science and Technology's statewide scientific study, conducted pursuant to SB 4 (2013), found that the most significant exposures to toxic air contaminants such as benzene occur with a half mile from active oil and gas development, and recommended that public health and safety buffers be instituted around all oil and gas wells to protect against the grave health risks from these exposures.[13] Multiple studies provide support for this recommendation, demonstrating that carcinogenic and toxic air contaminants travel two miles or more from the point of production, and that harms and risks increase with proximity to production sites.[14]

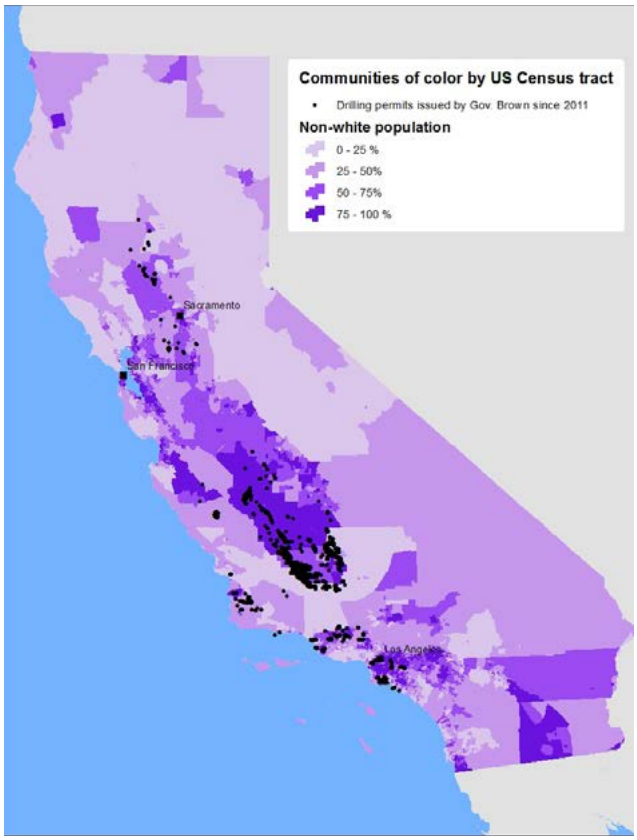
The health harms from oil production are particularly alarming because millions of Californians are exposed to air pollution from drilling, with environmental justice communities hit the hardest. Drilling in California occurs disproportionally in low-income communities and communities of color already suffering from some of the worst air quality in the nation.[15]

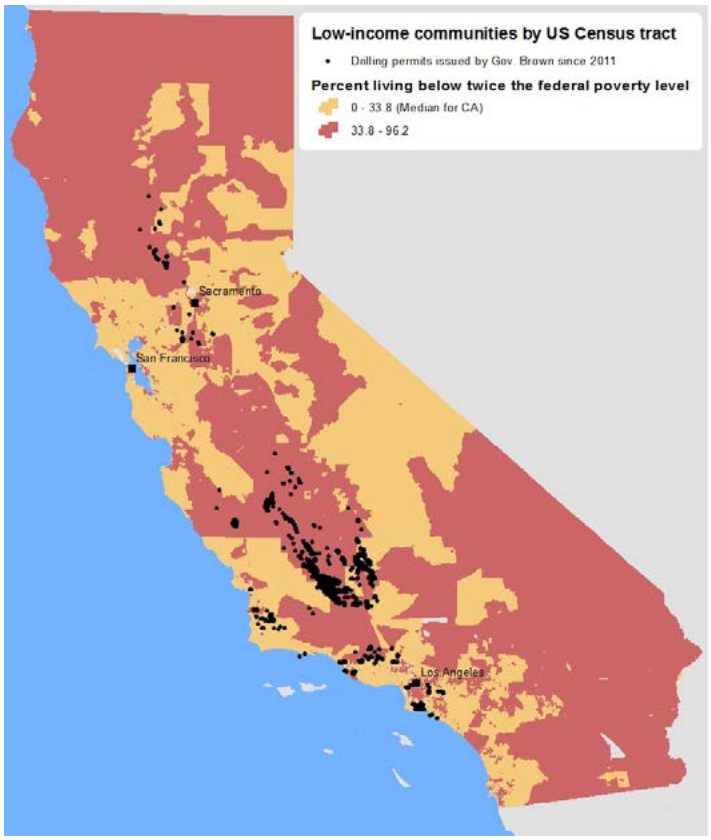
More than 5.4 million Californians live within a mile of at least one oil and gas well. A third of these residents (1.8 million) live in areas already heavily burdened by environmental pollution, and of these, nearly 92 percent are people of color.[16]

Many of California's oilfields operate in densely populated areas.[17] Approximately 8,500 active oil and gas wells are within 2,500 feet of homes, schools, and hospitals, and impact many of the state's most polluted communities.[18] In neighborhoods such as South Los Angeles, wells are located near childcare centers, schools, urban parks and playgrounds, and senior residential and healthcare facilities, many composed of vulnerable populations.[19]

The two largest oil-producing regions in California—the San Joaquin and South Coast air basins—are notorious for having some of the worst ozone and particulate pollution in the nation that threatens the health of local residents.

Oil production has created a public health crisis in our state. Yet between 2011 and April, 2018, the Brown Administration approved permits for more than 21,000 new oil and gas wells, of which 77 percent were in low-income communities or majority communities of color.[20] Californians shouldn't have to wait longer for protections from dangerous drilling.





NOTES

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2 CCST Study, Vol. II at pp. 409-410.

3 *Id.* at p. 186.

4 *Id.* at pp. 46, 187.

5 *Id.* at pp. 417-420; Shamasunder, Bhavna et al., Community-based health and exposure study around urban oil developments in South Los Angeles, 15 International Journal of Environmental Research and Public Health 1 (2018).

6 McKenzie, Lisa M. et al., Ambient nonmethane hydrocarbon levels along Colorado's Northern Front Range: Acute and chronic health risks, 52 Environmental Science and Technology 4514 (2018).

7 Rasmussen, Sara G. et al., Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations, 176 JAMA Internal Medicine 9 (2016).

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12 Stacy, Shaina L. et al., Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest, Pennsylvania. PLoS ONE (2015): e0126425.

13 California Council on Science Technology, An Independent Scientific Assessment of Well Stimulation in California: Executive Summary (All Volumes) at pp. 45-46, see Exhibit A at pp. 4-5 (CCST Excerpts).

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15 Srebotnjak, Tanja et al., Natural Resources Defense Council, Drilling in California: Who's at risk? (2014), available at: https://www.nrdc.org/ sites/default/files/california-fracking-risks-report.pdf(Attached as Exhibit B); see also Liberty Hill Foundation, Drilling Down: The Community Consequences of Expanded Oil Development in Los Angeles (2015), available at: https://www.libertyhill.org/sites/libertyhillfoundation/files/Drilling%20Down%20Report_1. pdf.

16 Srebotnjak, Tanja et al., Natural Resources Defense Council, Drilling in California: Who's at risk? (2014) at p. 4, available at: https://www.nrdc. org/sites/default/files/california-fracking-risks-report.pdf.

17 Czolowski, E.D. et al., Toward Consistent Methodology to Quantify Populations in Proximity to Oil and Gas Development: A National Spatial Analysis and Review, 125 Environmental Health Perspectives 086004 (2017).

18 Trout, Kelly, et al. The Sky's Limit California: Why the Paris Climate Goals Demand That California Lead in a Managed Decline of Oil Extraction. Oil Change International (2018), available at: http://priceofoil.org/content/uploads/2018/05/Skys_Limit_California_Oil_Production_R2.pdf.

19 Shamasunder, Bhavna et al., Community-based health and exposure study around urban oil developments in South Los Angeles, 15 International Journal of Environmental Research and Public Health 1 (2018).

20 Center for Biological Diversity, Analysis: Most Oil Wells Approved by Gov. Brown Are in Low-income Areas, Communities of Color (2018), available at: https://www.biologicaldiversity.org/news/press_releases/2018/california-oil-drilling-08-16-2018.php.

SECTION II

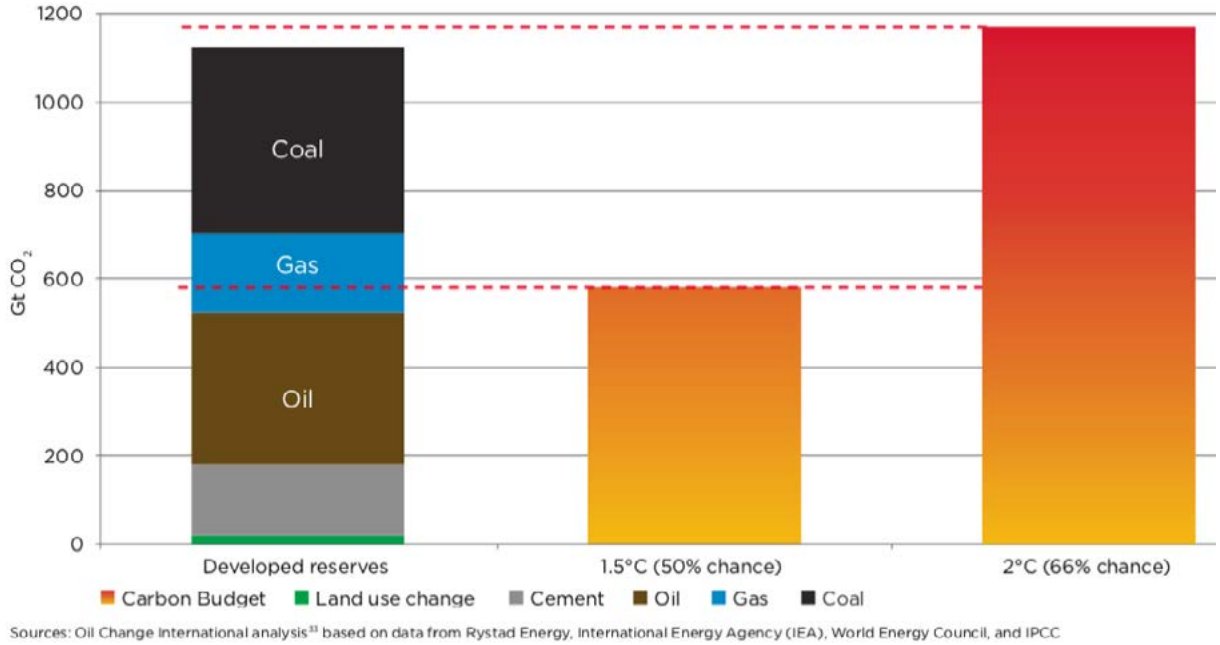
Avoiding Climate Catastrophe Requires a Managed Decline of California Oil and Gas Extraction

Limiting global warming to 1.5 degrees Celsius (°C)—in line with the Paris Agreement and the powerful science presented by the Intergovernmental Panel on Climate Change —will require a rapid transformation of our energy system from fossil fuels to renewable alternatives, such that global carbon pollution is cut nearly in half by 2030 and zeros out by 2050.[1] From the standpoint of global equity and capacity to lead, California should phase out its oil and gas extraction and overall carbon emissions significantly faster than those global benchmarks. By managing a rapid decline of its oil and gas production, California will show the global leadership required to meet the Paris Agreement goals and protect the health of its residents on the front lines of fossil fuel pollution. To show global leadership on climate and to protect the health of its residents, California can and must manage a rapid decline of its oil and gas production.

Too Much Already: Existing Oil and Gas Fields and Coal Mines Exceed 1.5°C

Globally, there is already enough oil, gas, and coal in already-developed fields and mines – places where the infrastructure is built and the capital is sunk – to push the world well above 1.5°C and to exhaust the "carbon budget" for 2°C (Figure 1).[2]

▼ Figure 1: CO2 from Developed Fossil Fuel Reserves vs. Carbon Budgets within Range of the Paris Goals (Jan. 2018)



Sources: Oil Change International analysis based on data from Rystad Energy, International Energy Agency (IEA), Word Energy Council, and IPCC.

This means that meeting global goals will require:

» No new fossil fuel development: Permitting new oil fields and wells in California adds to the oversupply of fossil fuels already in the industry pipeline, as shown in Figure 1.

» A managed phase-out of existing extraction projects: Wealthy, diverse, and resilient economies such as California's must lead in phasing out existing oil and gas fields – to begin lowering the "developed reserves" bar in Figure 1 below the 1.5°C threshold.

How California Can Lead Towards a Managed Decline

» Stop digging a deeper hole: By ceasing to issue permits for new oil and gas extraction wells, California would stop enabling the expansion of fossil fuel production and the associated pollution.

» Prioritize community health and environmental justice in a managed decline: The state should prioritize for closure existing wells that pose the greatest health risks to communities by phasing out wells within 2,500 feet of homes, schools, and hospitals. Public health studies suggest that the greatest exposure to toxic air pollution occurs within one-half mile (approximately 2,500 feet) of active oil and gas wells.

Figure 2 illustrates the oil production that would be avoided from these two policy steps:[3]

1. No New Wells: If the California Division of Oil, Gas, and Geothermal Resources (DOGGR) were to stop issuing permits for new oil wells, California oil production would decline by 10% per year on average from 2019 to 2030. This would be a steady, predictable decline that the state and communities could plan for, supporting a just transition for affected workers.

2. Phase Out Existing Wells within 2,500 feet of Homes, Schools, and Hospitals: A 2,500 foot buffer zone around homes, schools, and hospitals would affect approximately 8,500 active oil and gas wells in California. These wells accounted for about 12% of state production in 2016. Phasing out existing wells within this zone would lead to a significant, but manageable additional drop in production (i.e., the gray bar in Figure 2), while maximizing health benefits.

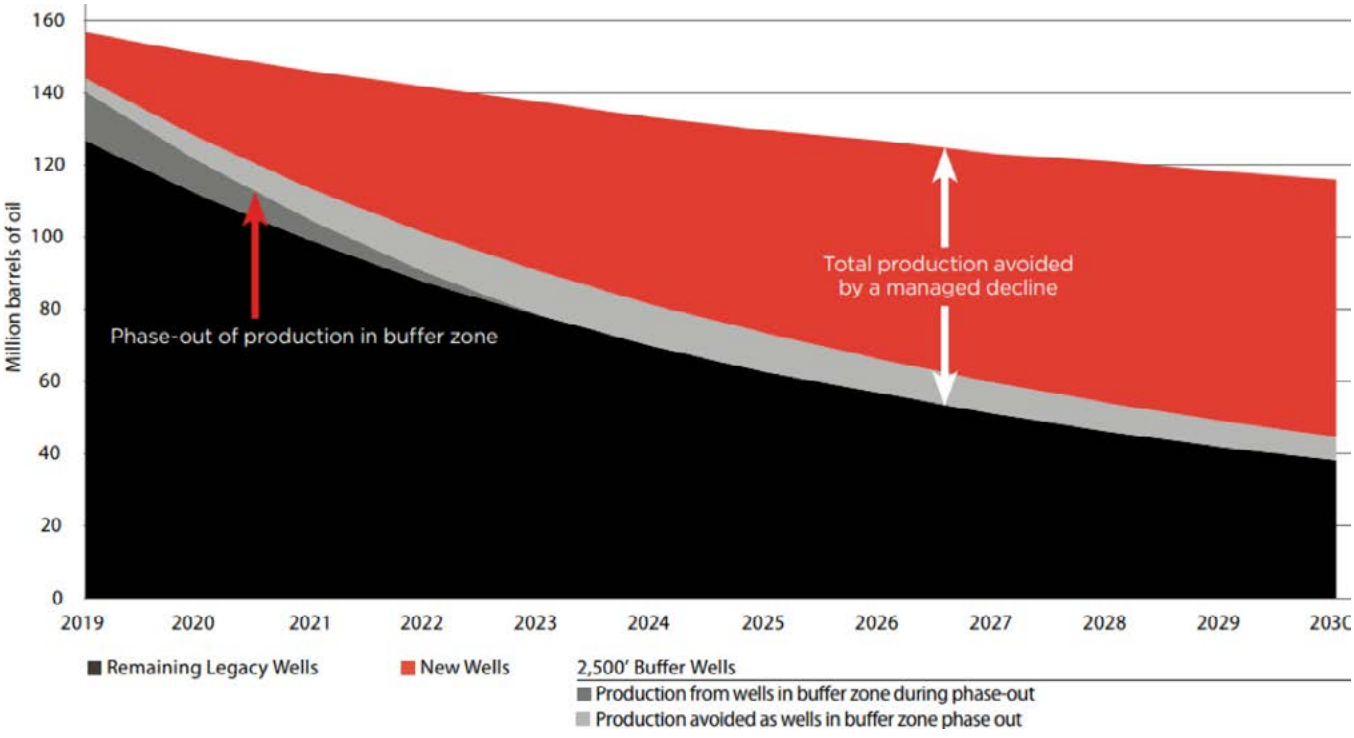
» More than 850,000 Californians currently live within 2,500 feet of an active oil or gas well, including over half a million residents in Los Angeles County alone.[4]

» The affected communities are disproportionately among the most severely polluted in California.

» "[F]rom a public health perspective, the most significant exposures to toxic air contaminants … occur within one-half mile (800 meters [or 2,640 feet]) from active oil and gas development," according to a 2015 report by the California Council on Science and Technology.[5]

Together, these two steps could keep an estimated 660 million barrels of oil in the ground. If extracted and burned, that oil could cause 425 million metric tons of carbon pollution.

▾ Figure 2: Projected California Oil Production with and without New Wells and a 2,500' Health Buffer Zone, 2019-2030



Sources: Oil Change International and FracTracker Alliance analysis, using historical data from DOGGR and DrillingInfo.

No Increase in Oil Imports

Implementing these policies would not result in an increase in oil imports to California, because the decline in production is approximately equal to the projected decline in consumption from measures already on the books.[6] Going forward, as California adopts further measures to reduce its oil use and meet its climate targets, it can reduce its oil production and its oil imports in tandem.

Additional Climate Benefits

Analysis using basic economic principles of supply and demand demonstrates that for every barrel of oil not produced in California, global oil consumption will drop by about half a barrel.[7] And because California produces some of the most carbon intensive oil in the world—three-quarters of oil produced in California is as climate damaging as oil from the tar sands of Alberta, Canada—reining in the state's oil production would yield even greater than average climate benefits.[8]

NOTES

1 IPCC, "Summary for Policymakers," In: Global warming of 1.5°C. An IPCC Special Report, [V. Masson-Delmotte et al. (eds.)], World Meteorological Organization, 2018, p. 14, https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_High_Res.pdf. Note: CO2 emissions from fossil fuels will likely need to decline faster than overall CO2.

2 For sources and methodology, see: Kelly Trout and Lorne Stockman, Drilling Towards Disaster: Why U.S. Oil and Gas Expansion Is Incompatible with Climate Limits, Oil Change International, January 2019, Section I, http://priceofoil.org/2019/01/16/report-drilling-towards-disaster/.

3 This section was compiled by Oil Change International, and unless indicated otherwise, all of the data in this section is from: Kelly Trout et al., Why the Paris Climate Goals Demand that California Lead in a Managed Decline of Oil Extraction, Oil Change International, May 2018, http://priceofoil.org/2018/05/22/skys-limit-california-oil-production-paris-climate-goals/. (Attached as Exhibit C).

4 Kyle Ferrar, "Can Californians Escape Oil and Gas Pollution?," FracTracker Alliance, April 11, 2018, https://www.fractracker.org/2018/04/ca-escape-oil-and-gas-pollution/.

5 California Council on Science and Technology (CCST), "An Independent Scientific Assessment of Well Stimulation in California: An Examination of Hydraulic Fracturing and Acid Stimulations in the Oil and Gas Industry – Summary Report, "July 2015, p. 63, http://ccst.us/publications/2015/2015SB4summary.pdf.

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Photo: Survival Media Agency

SECTION III

Oil and Gas Extraction Threatens California's Water Supplies

Oil and gas production poses a substantial threat to California's surface water and groundwater. Dangerous chemicals used in the production process and those found in oil and gas wastewater—such as benzene and other carcinogens[1]—can reach water supplies[2] through numerous pathways: via natural fractures, new pathways created by drilling and production activity, and through older wells.[3]

California oil and gas activity is particularly dangerous given that many extreme production techniques like fracking occur at shallow depths closer to groundwater.[4]

Numerous studies have documented contamination in groundwater and in water supply wells. In April 2019, the State Water Resources Control Board found "multiple lines of geochemical evidence" showing oil field fluids had migrated to water supply wells in Kern County.[5] This confirmed earlier studies finding "ample evidence of groundwater contamination."[6]

California's oil fields produce a tremendous amount of wastewater, roughly 15-20 barrels for every barrel of oil. The wastewater is laced with benzene and other harmful chemicals.[7] The primary method for disposing of this toxic wastewater is via disposal wells. The state's 1,800 disposal wells inject wastewater into aquifers, some of which have high quality water protected under the federal Safe Drinking Water Act.

California has violated the Safe Drinking Water Act for many years by allowing thousands of illegal and unsafe injection wells to dump toxic oil waste directly into protected underground drinking water supplies, contaminating those aquifers.[8] DOGGR continues to allow hundreds of illegal injection wells to continue operating throughout the state.

California is the only major oil-producing state that allows the oil industry to dump its wastewater in unlined pits. Unsurprisingly, this has led to numerous instances of groundwater contamination.[9,10] For example, waste disposal at the McKittrick unlined pits facility near Buttonwillow has caused extensive groundwater contamination; the pollution has migrated at least 2.2 miles and has mixed with multiple groundwater sources connected to water supply wells along the way.[11] Other groundwater studies have found contamination likely caused by unlined pits.[12] Unfortunately, state and regional boards have not shown a willingness to take meaningful steps toward halting this harmful practice.

Wastewater can also harm surface waters. One study found 575 spills of oil industry wastewater over a five-year period; nearly 18 percent of these incidents impacted waterways.[13]

California allows oil field wastewater to be used for crop irrigation without adequately testing whether this affects the toxicity of crops and soil, or harms worker and public health. Because the oil industry refuses to fully disclose the chemicals used during production, it is impossible to ensure that harmful chemicals have been removed.

In California, water-intensive extraction techniques like fracking mostly occur in precisely areas where water is most scarce.[14] In Kern County, for example, the County estimates that the oil industry will consume 11,760 acre-feet (3.83 billion gallons) of high quality groundwater per year, enough to supply 23,500 homes.[15] And unlike residential use, water used by the oil industry is mixed with hundreds of types of chemicals, making reuse difficult or impossible.

Given the importance of water resources, allowing oil and gas activity to continue to degrade and contaminate our water is detrimental to Californians.

NOTES

1 Stringfellow W.T., et al. Comparison of chemical-use between hydraulic fracturing, acidizing, and routine oil and gas development, PLoS ONE (2017):e0175344. https://doi.org/10.1371/journal.pone.0175344

2 California Council on Science and Technology, An Independent Scientific Assessment of Well Stimulation in California (CCST) Vol. II (July 2015), p. 107, available at https://ccst.us/reports/an-independent-scientific-assessment-of-well-stimulation-in-california-volume-2/

3 *Id.*, pp. 108-109.

4 *Id.*, p. 118 ("The shallow depths of fracturing raise concern about the possibility that out-of-zone fractures may directly intercept protected groundwater resources.").

5 State Water Resources Control Board, 2018 Annual Performance Report: Model Criteria for Groundwater Monitoring in Areas of Oil and Gas Well Stimulation (April 5, 2019), p. 36.

6 CCST, Vol. II at p. 112.

7 DOGGR, Benzene in Water Produced from Kern County Oil Fields Containing Fresh Water (1993).

8 State Water Resources Control Board Chief Deputy Jonathan Bishop admitted during a hearing before the Senate Natural Resources and Water Committee and Environmental Quality Committee that *"[a]ny injection into the [protected aquifers] has contaminated those aquifers."* (March 10, 2015 Joint Hearing)

9 Central Valley Regional Water Quality Control Board, Staff Report re McKittrick 1 and 1-3 Facility (2018), pp.17-18, available at: https://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/mckittrick/7_mck113_stfrpt.pdf

10 State Water Resources Control Board (2019), p. 36.

11 Central Valley Regional Water Quality Control Board, Staff Report re McKittrick 1 and 1-3 Facility (2018), pp. 17-18.

12 State Water Resources Control Board (2019), p. 36.

13 CCST, Vol. II (2015), p. 127.

14 Freyman, Monika, Hydraulic Fracturing & Water Stress: Water Demand by the Numbers, Ceres (2014) p. 59 (finding 98 percent of fracking occurs in areas of high or extreme water stress).

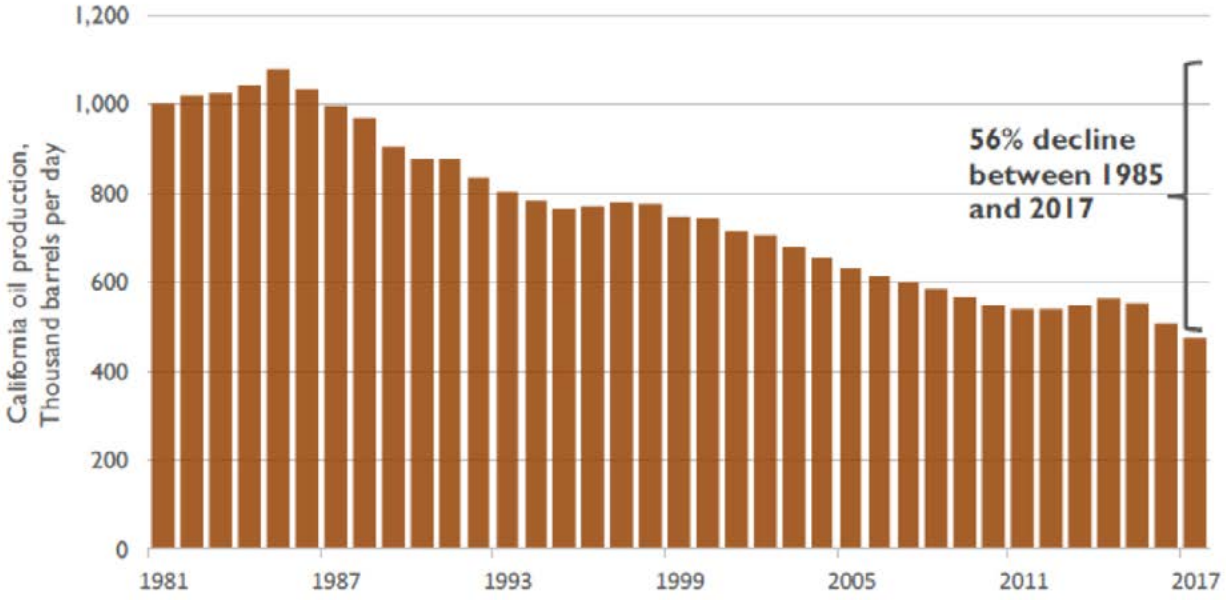
15 Kern County, Oil and Gas Ordinance Environmental Impact Report (July 2015), 4.17-21. The State Water Resources Control Board estimates that 1 acre-foot is enough to supply two average households for one year (State Water Resources Control Board, SB 1281 Water Report Summary, First Quarter 2015, p. 4).

SECTION IV

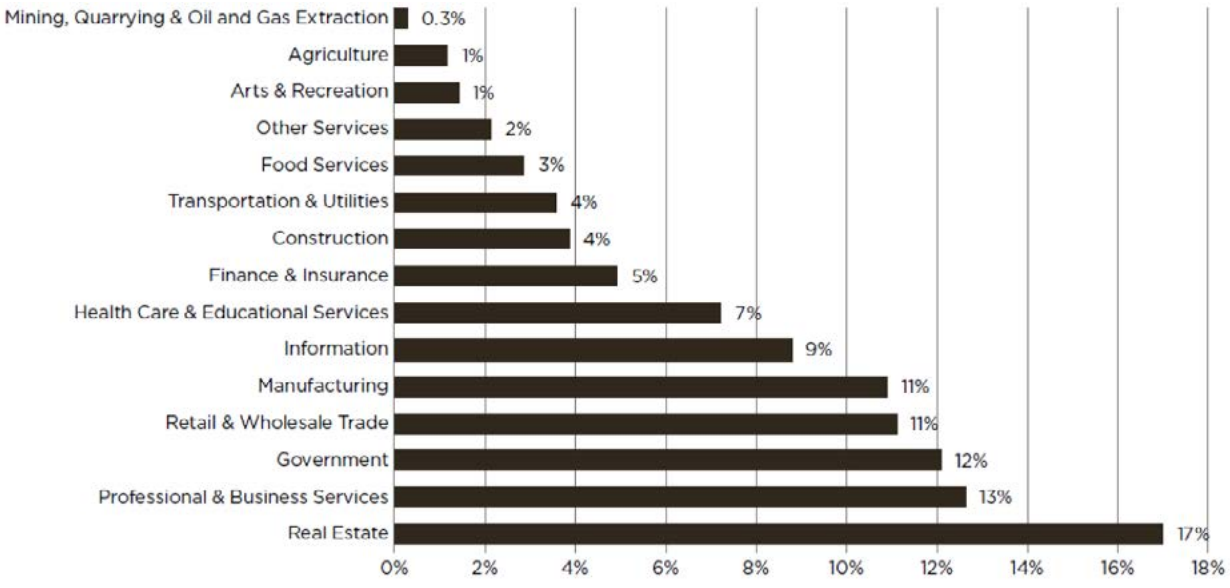
A Just Transition away from Oil and Gas Extraction will Benefit our Economy

The enormous political power wielded by the oil industry in California is disproportionate to its contribution to employment or gross domestic product (GDP). Oil production in California is in long-term decline (Figure 1). Oil production and refining represents less than 1 percent of state GDP, and less than 0.2 percent of employment (Figures 2 and 3).

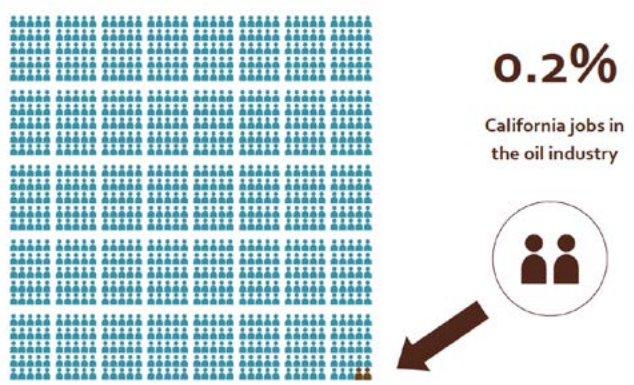
▾ Figure 1: California Oil Production, 1981-2017. *Source: Ackerman, Frank et al. (2018) at 3. (Exhibit D).*



▾ Figure 2: Share of California GDP by Industry Sector, 3rd Quarter of 2017. *Source: Trout et al. (2018) at 21. (Exhibit C).*



▼ Figure 3: Share of California Jobs in the Oil Industry.



Source: Ackerman, Frank et al. (2018) at 6. (Exhibit D).

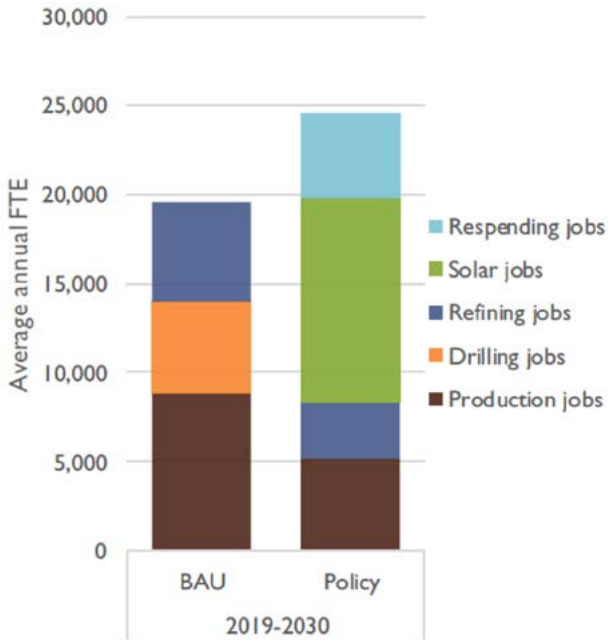
In recent years, workers in Kern County in particular have been thrown out of work by oil companies seeking to maximize their profits, and these workers have not received the benefit of a just transition plan for social support. Jobs in the oil and gas sector in Kern County declined by nearly 40 percent between 2014 and 2017 as the result of industry restructuring and efforts to cut operating costs.[1] These job losses had nothing to do with environmental regulation or a clean energy transition: to the contrary, the oil industry benefited financially from a lack of regulatory enforcement during this time period that was devastating to our air, water, health and climate.

Study after study and recent experience have shown that we can do better. Investing in a just transition to a clean energy economy will benefit workers and our economy. For example, one major national study has shown that every million dollars shifted from fossil fuels to renewable energy will yield a net increase of about 5 jobs.[2]

California-specific research yields similar results. One recent study compared two scenarios: business-as-usual which assumed the continued gradual decline in California oil production, and no new policies, against a policy scenario that assumed that no permits for new oil wells would be issued and that ongoing oil production within 2,500 feet of homes, schools, and hospitals would be phased out.[3] The policy scenario also assumed new construction of solar power, sufficient to replace the oil cutbacks, and use of the increased solar energy to fuel electric vehicles.

As shown below, the state as a whole would gain about 5,000 full-time equivalent (FTE) jobs per year from the policy scenario.

▼ Figure 4: Average Annual Employment Changes for BAU and Policy Cases, State-wide, 2019-2030.



Source: Ackerman, Frank et al. (2018) at 2. (Exhibit D).

Analysis of instituting a 2,500 foot health and safety buffer zone in the City of Los Angeles similarly found that such an ordinance would lead not only to healthier communities, but also to economic benefits and increased job creation.[4] This study reviews multiple case studies demonstrating the enormous benefits of instituting the health and safety buffer.

NOTES

1 Trout, Kelly et al. The Sky's Limit California: Why the Paris Climate Goals Demand That California Lead in a Managed Decline of Oil Extraction. Oil Change International (2018) at p. 28. (Attached as Exhibit C).

2 Garrett-Peltier, Heidi. Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input output model, 61 Economic Modeling (2017).

3 Ackerman, Frank et al., Synapse Energy Economics, Inc., Can Clean Energy Replace California Oil Production? Petroleum cutbacks and the California economy. (2018)(Attached as Exhibit D).

4 Liberty Hill Foundation, Transitioning to a Greener Los Angeles, The Potential for Repurposing Oil and Gas Drilling Sites (2018) (Attached as Exhibit E). *See also*, Liberty Hill Foundation, Drilling Down: The Community Consequences of Expanded Oil Development in Los Angeles (2015).

Photo: Gary Kavanaugh

SECTION V

Division of Oil, Gas and Geothermal Resources: Summary of Regulatory Failures

Background: The Division of Oil, Gas and Geothermal Resources (DOGGR) oversees oil and gas extraction in California. DOGGR has a statutory duty to "prevent, as far as possible, damage to life, health, property, and natural resources;…and damage to underground and surface waters suitable for irrigation or domestic purposes..."[1] DOGGR has ignored this mandate, instead prioritizing its secondary function, to supervise drilling and encourage "wise development" of oil and gas resources."[2] Misunderstanding its mandate, DOGGR has failed to enforce fundamental environmental and public health laws. DOGGR's most notorious regulatory failures fall in six major categories described below.

Failure to Implement the Recommendations of the Statewide Scientific Study Required by SB4

In 2013, California's legislature passed Senate Bill No. 4 to address the lack of information about and regulation regarding well stimulation techniques, particularly hydraulic fracturing. The statute mandated the preparation of an independent scientific study to evaluate the hazards and risks that well stimulation poses to the environment and public health. The statewide study, coordinated by the California Council on Science and Technology ("CCST Study"), made five key recommendations: (1) institute a setback to protect public health from all oil and gas wells (not just stimulated wells); (2) prohibit shallow fracking that occurs close to groundwater sources unless and until significant protocols are put in place and it can be proven safe; (3) ban the use of wastewater from oil and gas extraction to irrigate crops, as current testing and treatment of produced water cannot

detect and remove many stimulation chemicals; (4) phase out the disposal of toxic fracking wastewater into open, unlined pits, which has already been achieved in every major oil-producing state except California; and (5) prevent the use of chemicals with unknown or environmentally hazardous profiles in the oil production process.[3] None of these recommendations has been adopted by DOGGR or by other agencies with jurisdiction in these areas. Fully implementing the recommendations of the CCST Study would not eliminate the harms and risks of oil and gas extraction in California, but the failure to take even these steps leaves an egregious lack of the most basic protections for our air, water, and health.

California UIC Program

In 2011, the United States Environmental Protection Agency audited DOGGR's Underground Injection Control (UIC) program, under which the state has the responsibility to regulate oil and gas injection wells. The audit exposed egregious and widespread violations of the federal Safe Drinking Water Act (SDWA).[4] Chief among the program's serious deficiencies is DOGGR's well-established, but illegal practice of allowing oil and gas wastewater injections into underground sources of drinking water—aquifers protected under the SDWA.

In 2015, DOGGR released a self-audit that documented systemic breakdowns in its UIC program. It found, among other deficiencies, failure to require Area of Review evaluations to ensure that injection sites are isolated from other sources of groundwater prior to issuing well permits; failure to conduct required annual reviews of permitted wells; missing or non-existent quality control data; and—based on only a small sample of wells—hundreds of wells that failed to meet structural integrity standards, were potential sources of pollution, or required remediation.[5]

Nonetheless, DOGGR has allowed—and continues to allow—hundreds of oil and gas wells to inject toxic-laden wastewater into protected aquifers. DOGGR refused to immediately shut down these illegal wells, continued to issue new permits to inject into supposedly protected aquifers, and continues to sanction illegal injections even beyond the agency's original self-imposed deadline of February 15, 2017.[6] Instead of safeguarding the state's groundwater, DOGGR is attempting to "exempt" these aquifers from federal SDWA protections, sacrificing California's scarce water resources to the oil industry.[7] DOGGR should immediately stop submitting applications to the Trump EPA to remove protection from protected California water supplies and should withdraw currently pending applications.

Extreme Extraction

Much of the oil remaining in California oilfields is heavy and viscous, and can only be extracted through dangerous and energy-intensive enhanced oil recovery (EOR) techniques such as steam flooding and cyclic steam injection, which heat and thin the oil to lower its viscosity and move it to the surface. Extensive use of these energy-intensive EOR techniques to extract heavy oil makes three quarters of California's oil production more climate-damaging than Canadian tar sands crude.[8]

EOR techniques are not only energy intensive but dangerous. For instance, until recently, steam injection above the fracture gradient (injecting steam at high pressure to break up the underlying geologic formation) was illegal in California, yet oil producers "routinely exceed the fracture gradient of the formation."[9] DOGGR has admitted that injection activity, in particular cyclic steam injection, "presents new public health and safety risks, especially in fields with older wells."[10]

These risks include the creation of sudden and dangerous sinkholes, subsurface oil and chemical seepage, eruptions of boiling oil and rock—as high as 100 feet into the air, and even death.[11] Despite the hazardous nature of cyclic steam injections, in February 2019, DOGGR eliminated the prohibition against EOR injections above the fracture gradient.

Environmental Review

Despite the known environmental impacts of oil and gas activities and DOGGR's mandate to regulate oil and gas wells so as to prevent damage to life, health, property, and natural resources, DOGGR conducts almost no environmental review under CEQA on its discretionary decisions to issue production, injection, or other permits. As a result, DOGGR has not undertaken any analysis of the direct, indirect and cumulative impacts on our climate, air and water of allowing thousands of oil and gas wells to be drilled. In the first 3 months of 2019, DOGGR issued more than 1,860 permits, including permits for new drilling, deepening and reworking wells, waste disposal, EOR, and other oilfield permits, and an additional 90 permits to conduct well stimulation, yet DOGGR has not prepared an environmental impact report for any of them.[12] Instead, DOGGR now claims that permits for new oil wells within existing oil fields are exempt from review, or relies on Kern County's Programmatic Environmental Impact Report which purported to analyze all the environmental impacts of oil and gas production thirty years into the future. The many legal deficiencies of that PEIR are currently being litigated.

Aliso Canyon and Gas Storage

In October 2015, SS25, a natural gas storage well in the Aliso Canyon gas storage field near the area of Porter Ranch in Los Angeles, began leaking. By the time the leak was plugged four months later, it had emitted methane equal to the emissions of over half a million passenger cars driven for a year, as well

as dangerous levels of benzene and other pollutants. The emissions required the relocation of thousands of nearby residents and school children. SS25, which was drilled in the 1950s and later repurposed for gas storage, did not have a working downhole safety valve—the safety valve had never been replaced since being removed in 1979.[13] Its age is one reason why, at certain depths, it had only one layer of pipe between the gas and surrounding rock.

These characteristics are not unique to SS25, however. In Aliso Canyon, many wells were constructed in the early 1950s, and many wells at the Playa del Rey gas storage facility date back to the 1930s. These wells were not built to last as long as they have and they do not meet modern requirements for construction and integrity. And knowledge about leaking natural gas infrastructure is nothing new. In 1990, for instance, the Los Angeles Times ran an article decrying the leaks and odors from the Playa del Rey facility.[14]

A review by the Center for Biological Diversity of the well records for the gas storage wells at the Playa del Rey gas storage field reveals that DOGGR officials have routinely waived their right to witness pressure, blowout prevention, and other tests. In addition, in instances when SoCalGas failed to perform required pressure tests or inform DOGGR it had converted wells from storage to production wells, DOGGR merely gave the company significantly more time to comply while allowing the wells to continue to operate, and in some cases granted the conversion permits retroactively.[15] Regulations—no matter how strong—are virtually meaningless if DOGGR fails in its duty as regulator to enforce them.

Environmental Justice

In California, approximately 5.4 million people in California, or 14 percent of the state's population, live within a mile of one or more oil and gas wells. One-third of these residents live in areas of the state with the highest concentrations of environmental pollution, and nearly 92 percent of Californians living in these heavily burdened neighborhoods are people of color.[16] Because of its refusal to undertake environmental review, DOGGR provides minimal (e.g., publication in a regional newspaper) or no notice to surrounding communities for most oil and gas permits.[17] DOGGR does not hold public hearings for any permits. Indeed, DOGGR has failed to incorporate environmental justice into any of its rulemaking, enforcement, or permitting decisions. For example, in response to a request to include environmental justice policy considerations—such as robust and meaningful notice and comment opportunities—in its injection wells regulations, DOGGR responded: "The Division does not see a need to codify this policy within the proposed regulations."[18] Further, despite numerous studies showing adverse health impacts to communities living near oil and gas development, DOGGR has not taken meaningful action to limit well operations and activities near homes and schools.

NOTES

1 Pub. Resources Code, § 3106(a).

2 Id., § 3106(b), (d).

3 See Excerpts from California Council on Science and Technology, An Independent Scientific Assessment of Well Stimulation in California: Volume II: Potential Environmental Impacts of Hydraulic Fracturing and Acid Stimulation (2015), available at: https://ccst.us/reports/well-stimu- lation-in-california/publications/. (Attached as Exhibit A).

4 Horsley Witten Group, Inc., California Class II Underground Injection Control Program Review (2011), available at: http://www.conservation. ca.gov/dog/Documents/DOGGR%20USEPA%20consultant%27s%20report%20on%20CA%20underground%20injection%20program.pdf.

5 California Division of Oil, Gas and Geothermal Resources, Underground Injection Control Program Report on Permitting and Program As- sessment, Reporting Period of Calendar Years 2011-2014 (2015), available at: ftp://ftp.consrv.ca.gov/pub/oil/Publications/SB%20855%20 Report%2010-08-2015.pdf.

6 Compilation of Correspondence Regarding Illegal Injection Wells available upon request.

7 Letter from Kenneth A. Harris Jr., State Oil and Gas Supervisor, California Division of Oil, Gas and Geothermal Resources, et al. to David Albright, United States Environmental Protection Agency—Region IX (Oct. 26, 2018), available at: https://www.conservation.ca.gov/dog/general_informa- tion/Documents/EPA-AE-Compliance-Update-2018.10.26.pdf.

8 Center for Biological Diversity, Oil Stain: How Dirty Crude Undercuts California's Climate Progress (2017), available at: https://www.biological- diversity.org/programs/climate_law_institute/energy_and_global_warming/pdfs/Oil_Stain.pdf.

9 California State Legislature, Oversight hearing of the Senate Natural Resources and Water Committee and Environmental Quality Committee: Ensuring Groundwater Protection: Is the Underground Injection Control Program Working? (Mar. 10, 2015) at p. 12, available at: https://sntr. senate.ca.gov/sites/sntr.senate.ca.gov/files/3_10_14_uic_background.pdf.

10 Mishak, Michael J., Oil worker's death renews debate on safety of extraction method, Los Angeles Times (Apr. 14, 2012), available at: https:// www.latimes.com/local/la-xpm-2012-apr-14-la-me-oil-death-20120412-story.html.

11 Ibid.

12 See California Division of Oil, Gas and Geothermal Resources, CEQA Projects, available at: https://www.conservation.ca.gov/dog/CEQA/Pag- es/CEQANotices.aspx; California Division of Oil, Gas and Geothermal Resources, 2019 Weekly Summaries, available at: ftp://ftp.consrv.ca.gov/ pub/oil/weekly_summary/2019/; and California Division of Oil, Gas and Geothermal Resources, Well Stimulation Treatment Permits, available at: https://secure.conservation.ca.gov/WSTPermit. In 2013, Senate Bill No. 4 required DOGGR to conduct a statewide Environmental Impact Report for well stimulation in the state, but DOGGR has not conducted any environmental review on the individual permits issued for new well stimulation projects.

13 Torres, Zahira, and Frank Shyong, Leaking Gas Well in Porter Ranch Area Lacked a Working Safety Valve, Los AngeLes Times (Jan. 3, 2016), available at: http://www.latimes.com/local/california/la-me-0104-gas-leak-20160104-story.html.

14 Rabin, Jeffrey, Big Stink Over Gas Storage: Playa del Rey: When natural gas was first injected underground, the only neighbors were birds. Now residents complain of leaks and odors, Los Angeles Times (Aug. 5, 1990), available at: http://articles.latimes.com/1990-08-05/news/we- 133_1_underground-natural-gas-storage.

15 For further description of the lack of oversight of gas storage wells, see Sharon McNary, Like Porter Ranch, Neighborhoods in Playa del Rey, Montebello Sit Near Aging Gas Wells, Southern California Public Radio (Feb. 24, 2016), available at: https://www.scpr.org/news/2016/02/24/57876/like-porter-ranch-playa-del-rey-montebello-and-oth/.

16 Trout, Kelly et al., Oil Change International, The Sky's Limit California: Why the Paris Climate Goals Demand that California Lead in a Managed Decline of Oil Extraction (2018) at p. 21, available at: http://priceofoil.org/content/uploads/2018/05/Skys_Limit_California_Oil_Production_R2.pdf.

17 In Senate Bill No. 4, the Legislature added notice requirements for well stimulation permits. WST permits must be posted on DOGGR's website and require neighbor notification, albeit in both cases after a well stimulation permit has been issued. See Cal. Code Regs., tit. 14, § 1783.2; Pub. Resources Code, § 3160(d)(5).

18 California Division of Oil, Gas and Geothermal Resources, Updated Underground Injection Control Regulations: Response to Public Comments (2019) at p. 7, available at: https://www.conservation.ca.gov/dog/Documents/UIC%20regulations/Public%20Comment%20Summaries%20 and%20Responses%20(October%2029%20-%20November%2014,%202018).pdf.