July 12, 2018

Governor Edmund G. Brown
c/o State Capitol, Suite 1173
Sacramento, CA 95814

Dear Governor Brown,

We, the undersigned scientists, strongly support the request of more than 800 organizations that you halt the approval of new fossil fuel projects in California and commit to a plan to phase out California's oil and gas extraction, while providing a just transition for the communities and workers most impacted. These actions are grounded in science and are necessary to avoid the worst damages from climate change. We urge you to lead the world forward by announcing, before the Global Climate Action Summit in September, that California will confront its own oil and gas production as a critical part of its overall climate policy.

An end to new fossil fuel projects in California is urgently needed to meet the Paris Agreement goals to limit global average temperature rise to well below 2 degrees Celsius and strive to limit temperature rise below 1.5 degrees Celsius above pre-industrial levels. As you know, limiting temperature rise to below 1.5 degrees Celsius and reducing atmospheric $CO_2$ levels to below 350 ppm as quickly as possible is critical for avoiding the most dangerous harms from climate change.[1]

There is more than enough carbon in the world's already developed, operating oil, gas, and coal fields globally to exceed 2°C.[2] Thus, there is simply no room in the carbon budget for any new fossil fuel extraction.[3] Moreover, in order to limit warming to 1.5°C, most of these fields must be shut down before they are fully depleted, even assuming that no new fossil fuel development is approved.[4]

Climate policies in any jurisdiction that address only demand for fossil fuels will not succeed unless the production of fossil fuels is also limited in line with what the carbon budget demands. We cannot afford to wait any longer to place science-based limits on fossil fuel extraction. While we appreciate the significant political challenges inherent in championing any climate policy, allowing continued unabated fossil fuel extraction will prevent the world from meeting the Paris climate targets.

California is both one of the nation's top oil-producing states and one of the world's largest and most prosperous economies. California has both the ability and the moral imperative to address fossil fuel extraction.

California's crude oil is among the dirtiest and most carbon intensive in the world. Crude oil from California's largest oil fields has higher lifecycle greenhouse gas emissions than most other U.S. and global crudes.[5] Three-quarters of the oil produced in California is at least as carbon-intensive as Canada's tar sands crude.[6]

However, California has no plan in place to phase out the state's oil and gas production, and currently approves thousands of new wells per year.[7] New approvals of fossil fuel infrastructure projects such as pipelines, marine and rail import/export terminals, and refinery expansions further exacerbate "carbon lock-in" because such projects require upfront investment, incentivizing continued operation for decades into the future.[8] Ending the approval of new fossil fuel projects would avoid the lock-in of decades' worth of fossil fuel production and associated emissions.

Phasing out California's oil and gas production would also provide critically needed public health benefits. Scientific research shows that living near oil and gas wells is associated with a higher risk for developing some forms of cancer,[9] increased asthma attacks and more upper respiratory problems,[10] higher hospitalization rates,[11] birth defects,[12] premature births and high-risk pregnancies,[13] and low-birthweight babies.[14] And the health harms increase the closer one lives to oil and gas wells.[15] The independent California Council on Science and Technology review panel recommended that California institute health and safety setbacks around oil and gas wells.[16]

In California, 8,500 active oil and gas wells are within 2,500 feet of homes, schools, and hospitals.[17] These wells are disproportionately located in low income and communities of color which already suffer an unfair pollution burden.[18] The state should focus first on shutting these wells down as quickly as possible. California must also move to 100 percent clean energy through a just transition that supports the communities and workers most impacted by the fossil fuel industry.

In California, ending new fossil fuel extraction, combined with the phase-out of the 8,500 wells near homes, schools, and hospitals, would avoid the emission of an estimated 425 million metric tons of $CO_2$ between 2019 and 2030[19] — an amount similar to California's annual economy-wide emissions in 2015.[20]

For these reasons, we endorse the request submitted to you in April by more than 800 organizations. We urge you to heed the science and lead the world forward by announcing a phase out plan for California's oil and gas extraction prior to the Global Climate Action Summit in September.

Sincerely,

Steven C. Amstrup, PhD, Chief Scientist, Polar Bears International, formerly United States Geological Survey, Alaska Science Center

Andreas Andersson, PhD, Associate Professor, University of California, San Diego

John Bruno, PhD, Professor, Department of Biology, University of North Carolina, Chapel Hill

Ken Caldeira, PhD, Climate Scientist, Carnegie Institution for Science and Professor, Stanford University

F. Stuart Chapin III, Professor Emeritus of Ecology, University of Alaska, Fairbanks

Giovanna Di Chiro, PhD, Professor of Environmental Studies, Swarthmore College

Paul Ehrlich, PhD, President, Center for Conservation Biology, Bing Professor of Population Studies, Stanford University

Catherine Gautier, PhD, Professor Emerita, Department of Geography, University of California, Santa Barbara

Alex Hall, PhD, Professor, Department of Atmospheric and Oceanic Sciences, University of California, Los Angeles

John Harte, PhD, Professor of Ecosystem Sciences, University of California, Berkeley

Karen Holl, PhD, Professor of Environmental Studies, University of California, Santa Cruz

Robert W. Howarth, PhD, Professor of Ecology and Environmental Biology, Cornell University

Anthony R. Ingraffea, PhD, Dwight C. Baum Professor of Engineering Emeritus, Cornell University

David W. Inouye, PhD, Professor Emeritus, Department of Biology, University of Maryland

Michael C. MacCracken, PhD, Chief Scientist for Climate Change Programs, Climate Institute, Washington DC, formerly Division Leader for Atmospheric and Geophysical Sciences, Lawrence Livermore National Laboratory

Harold Mooney, PhD, Professor of Biology Emeritus, Stanford University

Sarah E. Myhre, PhD, Research Associate, School of Oceanography, University of Washington

Naomi Oreskes, PhD, Professor, Harvard University

Peter H. Raven, PhD, President Emeritus, Missouri Botanical Garden

Carl Safina, PhD, President, The Safina Center at Stony Brook University

Carl-Friedrich Schleussner, PhD, Research Group Leader, Integrative Research Institute on Transformations of Human-Environment Systems, Humboldt University, Berlin

Richard C. J. Somerville, PhD, Distinguished Professor Emeritus, Scripps Institution of Oceanography, University of California, San Diego

Andrew Szasz, PhD, Professor of Environmental Studies, University of California, Santa Cruz

Aradhna Tripati, PhD, Professor, Institute of the Environment and Sustainability, University of California, Los Angeles

Shaye Wolf, PhD, Climate Science Director, Center for Biological Diversity

Erika Zavaleta, PhD, Professor, Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

[1] IPCC [Intergovernmental Panel on Climate Change], 2014, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, at 65, Box 2.4, Figure 2.5, https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf; Schleussner, C-F. et al. 2016, Differential climate impacts for policy-relevant limits to global warming: the case of 1.5°C and 2°C, Earth System Dynamics 7: 327-351

[2] Oil Change International, 2016, The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production (September 2016), at 5, http://priceofoil.org/content/uploads/2016/09/OCI_the_skys_limit_2016_FINAL_2.pdf

[3] Global fossil fuel reserves, not including the larger pool of recoverable resources, if extracted and burned, would exceed the allowable carbon budget for a 1.5 or 2°C limit many times over. The IPCC estimates that global fossil fuel reserves exceed the remaining carbon budget (from 2011 onward) for staying below 2°C by 4 to 7 times, and exceed the remaining carbon budget (from 2011 onward) for staying below 1.5°C by 9 to 18 times. IPCC [Intergovernmental Panel on Climate Change], 2014, Climate Change 2014: Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)], IPCC, Geneva, Switzerland, at 63-64 & Table 2.2, https://www.ipcc.ch/report/ar5/syr/; Bruckner Thomas et al., 2014, Energy Systems, *in* Climate Change 2014: Mitigation of Climate Change, Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, at Table 7.2, http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter7.pdf

[4] According to the 2016 OCI analysis, to stay within the carbon budget for a 50% probability of limiting temperature rise below 1.5°C, "significant closures" of existing fields and mines will be needed. Oil Change International, 2016, The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production (September 2016), at 5 and Figure 2, http://priceofoil.org/content/uploads/2016/09/OCI_the_skys_limit_2016_FINAL_2.pdf

[5] Lifecycle greenhouse gas emissions (including upstream production, midstream refining, and downstream end use of refined products) of crude oil from three of California's largest oil fields (Midway-Sunset, South Belridge, and Wilmington) ranked among the highest of the 75 global crudes evaluated by experts at the Carnegie Endowment for International Peace: Gordon, Deborah and Samuel Wojcicki, 2017, Need to Know: the Case for Oil Transparency in California, Carnegie Endowment for International Peace (March 15, 2017), http://carnegieendowment.org/2017/03/15/need-to-know-case-for-oil-transparency-in-california-pub-68166; Carnegie Endowment for International Peace, 2017, Oil-Climate Index, Total Estimated GHG Emissions and Production Volumes for 75 OCI Test Oils, http://oci.carnegieendowment.org/#supply-chain; Gordon, Deborah and Samuel Wojcicki, 2017, Drilling Down on Oil: The Case of California's Complex Midway Sunset Field, Carnegie Endowment for International Peace (March 15, 2017), http://carnegieendowment.org/2017/03/15/drilling-down-on-oil-case-of-california-s-complex-midway-sunset-field-pub-68210

[6] Center for Biological Diversity, 2017, Oil Stain: How Dirty Crude Undermines California's Climate Progress (November 2017), https://www.biologicaldiversity.org/programs/climate_law_institute/energy_and_global_warming/pdfs/Oil_Stain.pdf

[7] Erickson, Peter and Michael Lazarus, 2018, How Limiting Oil Production Could Help California Meet Its Climate Goals, Stockholm Environment Institute, Discussion Brief (February 2018), https://www.sei.org/publications/limiting-oil-production-california/

[8] Davis, Steven J. and Robert H. Socolow, 2014, Commitment Accounting of $CO_2$ Emissions, Environmental Research Letters 9: 084018; Erickson, Peter et al., 2015, Assessing Carbon Lock-in, Environmental Research Letters 10: 084023; Erickson, Peter et al., 2015, Carbon Lock-in from Fossil Fuel Supply Infrastructure, Stockholm Environment Institute, Discussion Brief, https://www.researchgate.net/publication/282706125_Carbon_lock-in_from_fossil_fuel_supply_infrastructure; Seto, Karen C. et al., 2016, Carbon Lock-In: Types, Causes, and Policy Implications, Annual Review of Environmental Resources 41: 425-52; Green, Fergus and Richard Denniss, 2018, Cutting With Both Arms of the Scissors: The Economic and Political Case For Restrictive Supply-Side Climate Policies, Climatic Change https://doi.org/10.1007/s10584-018-2162-x

[9] McKenzie, Lisa M. et al., 2017, Childhood Hematologic Cancer and Residential Proximity to Oil and Gas Development, PLoS One 12: e0170423

[10] Rasmussen, Sara G. et al., 2016, Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations, JAMA Internal Medicine 176: 1334-1343; Rabinowitz, Peter M. et al., 2016, Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania, Environmental Health Perspectives 123: 21-26

[11] Jemielita, Thomas et al., 2015, Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates, PLoS ONE 10: e0131093

[12] McKenzie, Lisa M. et al, 2014, Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, Environmental Health Perspectives 122: 412-417

[13] Casey, Joan A. et al., 2016, Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA, Epidemiology 27: 163-172

[14] Stacy, Shaina L. et al., 2015, Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania, PLoS ONE 10: e0126425; Currie, Janet et al., 2017, Hydraulic fracturing and infant health: New evidence from Pennsylvania, Science Advances 3: e1603021

[15] McKenzie Lisa M. et al., 2012, Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources, Science of the Total Environment 424: 79-87; Southwest Pennsylvania Environmental Health Project (EHP), 2016, The Problem of Setback Distance for Unconventional Oil & Gas Development: an Analysis of Expert Opinions, http://www.environmentalhealthproject.org/dl/26; Haley, Marsha et al., 2016, Adequacy of Current State Setbacks For Directional High-Volume Hydraulic Fracturing in the Marcellus, Barnett, And Niobrara Shale Plays, Environmental Health Perspectives 124: 1323–1333; McKenzie, Lisa et al., 2018, Ambient Nonmethane Hydrocarbon Levels Along Colorado's Northern Front Range: Acute and Chronic Health Risks, Environmental Science and Technology 52: 4514-4525

[16] California Council on Science and Technology [CCST] and Lawrence Berkeley National Laboratory [LBNL], 2015, An Independent Scientific Assessment of Well Stimulation in California, Volume II, at 46, 375, 433, 439, http://ccst.us/projects/hydraulic_fracturing_public/SB4.php; CCST and LBNL, 2015, An Independent Scientific Assessment of Well Stimulation in California, Volume III, at 14, 259

[17] Oil Change International, The Sky's Limit California: Why the Paris Climate Goals Demand That California Lead in a Managed Decline of Oil Extraction, May 2018, http://priceofoil.org/ca-skys-limit

[18] Of the 1.8 million residents living within one mile of oil and gas development and in communities identified as most vulnerable by CalEnviroScreen 2.0, nearly 92 percent are people of color: 69 percent Hispanic/Latino, 10 percent African American, 11 percent Asian, and 2 percent Other. Srebotnjak, Tanya and Miriam Rotkin-Ellman, 2014, Drilling in California: Who's at Risk?, Natural Resources Defense Council (October 2014), https://www.nrdc.org/sites/default/files/california-fracking-risks-report.pdf; Czolowski, Eliza D. et al., 2017, Toward Consistent Methodology to Quantify Populations in Proximity to Oil and Gas Development: a National Spatial Analysis and Review, Environmental Health Perspectives 125: 086004

[19] Oil Change International, The Sky's Limit California: Why the Paris Climate Goals Demand That California Lead in a Managed Decline of Oil Extraction, May 2018, http://priceofoil.org/ca-skys-limit

[20] California Greenhouse Gas Emissions Inventory Program, https://www.arb.ca.gov/cc/inventory/inventory.htm