



8 March 2020

California Department of Conservation
Geologic Energy Management Division
David Shabazian, Director
CalGEM
Department of Conservation
801 K Street, MS-24-02,
Sacramento, CA 95814
ATTN: Public Health Near Oil and Gas Rulemaking
calgemregulations@conservation.ca.gov

RE: Neighborhood Air Near Petroleum Sources

Dear Board Members:

Sequoia ForestKeeper[®] has previously submitted comments on impacts to the environment and disadvantaged communities, of airborne toxins, including methane. See [Comment letter with suggestions to the California Air Resources Board Environmental Justice Advisory Committee, which contains links to past documents.](#)

The California Supreme Court has written, “the Legislature declared its intention that all public agencies responsible for regulating activities affecting the environment give prime consideration to preventing environmental damage when carrying out their duties.” California courts have ruled, “the greater the existing environmental problems are, the lower the threshold should be for treating a project’s contribution to cumulative impacts as significant.”

The California Air Resources Board (CARB) has an opportunity and an obligation to remedy the egregious and life-threatening pollution condition that affects the health of many residents local to the source of the pollution. CARB should include strong policies and performance standards on the effectiveness of the 2,500-foot setback of oil wells that will help to clean dirty air for local residents.

On 20 February 2020, I gave brief oral comments at the local community meeting in Bakersfield. Even knowing that the oil industry can slant drill from 2,500-feet away to continue resource

extraction, I supported the adoption of a 2,500-foot setback and supported the comments of others regarding the health impacts to humans from oil and gas wastes in the vicinity of homes and businesses. I also spoke of Sequoia ForestKeeper's concern for the health of trees in the forests above the San Joaquin Valley where airborne toxic pollutants rise and impact forest and foothill trees, including 3,000+-year old sequoias. I admonished the Board to consider the impacts from a distance, of airborne toxins to these ancient trees, in addition to considering the impacts of airborne toxins to people within 2,500-feet of oil and gas facilities.

Also making impassioned presentations at the 20 February 2020 meeting in Bakersfield held by California Department of Conservation Geologic Energy Management Division, were biased representatives from the oil industry and its employees, who financially benefit from the oil industry, as well as others, many of whom denied, as the industry has done for years, that the industry causes harms to air, water, or the environment, denied that there is any proof or connection between the use of fossil fuels and environmental health hazards or the climate crisis.

CARB is charged with deciding if these impacted residents will be given this small bit of relief to breathe cleaner air in their neighborhoods. If CARB grants these impacted local residents space to breathe by implementing the 2,500-foot setback, the employees of the industry will retain their jobs when the facilities are moved to their new locations 2,500-feet away, and the local residents will experience less exposure to particulate matter, NOx, H2S, CO, and other pollutants known to cause asthma and other lung diseases.

I hope that CARB will read and appreciate the words below, which are relevant to the larger, global view of the underlying causes *of the issues we are facing, words that were excerpted from A World to Live in - An Ecologists Vision for a Plundered Planet (2016)*, authored by George M. Woodwell, Founder, President, and Director Emeritus of the Woods Hole Research Center, Woods Hole, Massachusetts. Woodwell is a member of the National Academy of Sciences, a former president of the Ecological Society of America, a founding trustee and Vice Chairman of the Natural Resources Defense Council, and the author of *Forests in a Full World, The Nature of House: Building a World That Works, and other books*.

In the decades following World War II. Agriculture had been expanding as an industrial enterprise for decades following the demands of rising population. Industrial agriculture depended increasingly on simple, inexpensive, broadly effective, persistent chemicals of low human toxicity. From that standpoint DDT seemed a perfect insecticide and was relied on heavily. [DDT insecticide (*dichloro-diphenyl-trichloroethane*) was developed as the first of the modern synthetic insecticides in the 1940s.]

DDT was being sprayed from the air on the forests of Maine and the Province of New Brunswick. The spraying was insurance. It was to protect the trees, especially the Balm fir (*Abies balsamea*) and white spruce (*Picea glauca*), both successional and widely used for pulp, from ravages of the spruce budworm (*Dionea chloristoneura*), an indigenous pest.

Although, spraying saved the trees annually and reduced the budworm populations, the small cluster of survivors emerged in the spring into a new crop of rich green leaves and the population exploded to threaten the forest once again, unless sprayed. It was a perfect system with both the budworm and sprayers enjoying success. Losers were all the other organisms affected.

East of New York City, DDT was being routinely sprayed from the air to control the salt marsh mosquito. DDT had seemed the obvious cure to a persistent plague, but doubts were emerging. Avian carnivore populations such as the peregrine falcon (*Falco peregrinus*) and Osprey (*Pandion haliaetus*), widely separated by habitat, had been declining without obvious cause.

The local osprey population on Fisher's Island was not reproducing and the population had by 1965 crashed to near extinction.

The studies in Maine and New Brunswick ultimately showed that DDT residues had mean residence time in soil of a decade or more. ([Persistence of DDT in soils of heavily sprayed forest stands](#) GM Woodwell, FT Martin - Science, 1964) It took little imagination to realize that the high-pressure spraying of DDT dissolved in oil inevitably produces small droplets that evaporate, leaving a DDT residue, a small crystal, that can be carried far and wide on air currents before being washed out or precipitated on land or in water. DDT is virtually insoluble in water, DDT is, however, highly soluble in fats. On the basis of solubility alone, plants that contain oils (such as algae) and animals accumulate DDT from contaminated water. There is no mystery, then, in how mountain lakes came to have DDT residues and why almost all animals, including people, by the mid-1960's carried residues in their fatty tissue. ([Residues in fish, wildlife and estuaries](#) PA Butler - Pestic. Monitor. J, 1973)

Human activities now affect the chemistry of life globally—all life. Worse, each individual carries a personal burden of exotic chemicals never considered appropriate in food. The number of these exotic chemicals is large, and frighteningly so. No one is above the fray. No one escapes.

Governments, including elected officials, nominally the custodians of human rights and public welfare, had not only allowed the invasions but also joined actively in causing them and in many instances continue to do so. Once the programs gained momentum, they became commercial, self-sustaining, financially *profitable, and approved or at least tolerated by government*, difficult to deflect. Recognition of the scale of the intrusions of these *programs into biospheric cycles as well as human health and welfare came slowly, delayed by* both corporate reluctance to accept the reality of the problem and governmental intransigence. It came as the information gradually *filtered from science into the public realm and interest* was aroused.

The convenient initial assumption made—or at least promoted—for decades about *chemical wastes in air and water has been that the world is large and capable* of rendering

virtually any contamination safe through dilution and decay. It is a convenient assumption, obviously dangerous in a biosphere.

When these issues became clear to the public . . . many began to realize that the *model of the world being advanced by economic interests was inverted, false* at the core. Gradually the public interest was redefined in the eye of a growing fraction of the public as the protection of the purity of the air, water, land, and the opportunity for life—all common interests and common property.

These qualities were a human birthright, *not property to be claimed for commercial profit or political advantage. The free-market economic model was eating those very common property resources that governments exist to protect, not to commit to progressive commercial corruption.*

The insight that small concentrations of persistent substances can be concentrated to *dangerous levels by several mechanisms was foreign to many who do not realize that the energy of the whale is solar energy, captured by algae, largely single-celled plants of the sea, and passed up food webs ultimately to appear as those giant animals and propel them on their missions.*

The approach of the pesticide industry *was direct through control of money for their “research” in universities*, but it was also political through pressure on members of Congress and connections in the U.S. Department of Agriculture.

The DDT story . . . should have established a new set of standards in avoiding poisonous excursions in environmental chemistry . . . it should have by now fired a blazing *effort in government, governmental agencies, and science* in general to define and protect the integrity of biospheric chemistry simply to assure *human safety as well as the continuity of a wholesome, secure human habitat.*

Neither government nor the scientific establishment, including the National Academy of Sciences, was prepared for such a challenge. The corporate bias *was pervasive, and despite obvious threats to global issues* of human safety and security, dominates to this day.

The noose is tightening year by year as additional research *shows how seriously vulnerable humans are to protracted low exposures to common municipal air pollution.* One channel is the human endocrine system, *which is vulnerable to disruption by small exposures to a wide range of pollutants common in the industrial world.* ([Our Stolen Future: Are We Threatening Our Fertility, Intelligence and Survival?--a Scientific Detective Story](#) T Colborn, D Dumanoski, [JP Myers](#) – 1996) Even more distressing is the evidence accumulating *that in utero exposures that occur through mothers breathing the common air of modern cities cause subnormal development of the embryo and the individual as a youth.* ([Prenatal exposure to air pollution, maternal psychological distress, and child behavior](#) FP Perera, S Wang, [V Rauh](#), H Zhou, L Stigter, D Camann, et.al. - Pediatrics, 2013)

The change in the basic chemistry of the environment that the expanding industrial system *has been imposing on the world is one of the conspicuous chronic disturbances* contributing to the march of biotic impoverishment.

Such a study of effects, however, has been completed *recently testing the effects of the increase in nitrogen, usually as nitrate, in the runoff water feeding a salt marsh on Plum Island of the New England shore. The increase in nitrogen has several sources including nitrogen fixed by the high temperatures in all internal combustion engines (especially diesel engines in cars and trucks), runoff from agricultural and lawn fertilizers, and drainage from septic sewage systems. In the marsh the nitrogen is a fertilizer, and as in gardens and lawns, favors the growth of vigorous plant tops at the expense of roots. The fertilization of the marsh [for the study], continued over ten years with an artificial supplement to speed the process, produced drastic changes in the marsh quite consistent with that experience: the plant tops were stimulated in growth at the expense of the root systems. Yet it is the roots that hold the marsh in place against the tidal flows. As the root systems began to fail, the sediments in the marsh were washed away, and the marsh began to resemble not a marsh but rather a series of ponds.* ([Susceptibility of salt marshes to nutrient enrichment and predator removal](#) LA Deegan, JL Bowen, D Drake... - Ecological ..., 2007)

Despite broad experience with the range of toxic substances *produced by the current fossil-fuel-powered industrial society, the US government has been led away from the strict control that scientists might advocate. The European Union, in contrast, regulates on the assumption that wastes are hazardous unless proven safe.* (Congressional Research Service Report 2013 RS22673 Chemical Regulation in the European Union <https://www.everycrsreport.com/reports/RS22673.html>) Instead of close control, Americans assume a loosely permissive stance that favors *industrial release of frequently untested chemicals* into the public realm. The process in effect transfers a liability *from industry to the public without a charge to industry*, to the detriment of all. Tacit acceptance of the liability by the public . . . is granting a public subsidy to industry. Without that subsidy, industry would incur a potentially burdensome expense. Instead, industry gains a *well-focused financial advantage. The public shares the cost in decrements of health and finance, and in struggles to restore water supplies, the quality of air, and the purity of food.*

We live now in a world in which the global environment is not simply at risk; it is eroding rapidly. And the erosion is . . . in the far more comprehensive global changes in climate and environmental chemistry now sweeping the earth.

The world can no longer offer industries the opportunity of turning segments of the biosphere into sacrificial zones.

The fossil fuel industry may be large and powerful, but its business success is a double-edged sword.

At a larger scale, avoiding a global collapse requires a revision of purpose to the recognition that human rights to clean air and water and a place to live are vulnerable to personal and corporate greed. Developing new rules defining essential common interests and protecting them is both necessary and possible. But they will emerge only if cultured and defined, celebrated and respected, by an aware public willing to defend essential birthrights as unassailable civil rights. Those civil rights, protected, assure the physical, chemical, and biotic integrity of the biosphere, the *sine qua non* of the continued success of civilization. They must be recovered from, or replace, the corporate greed that has stolen them, and given us all a world poisoned into instability and sliding into chaos. The enormity of the threats is giving rise to new perspectives on science, public interests, morality, and human rights. They reach as well into corporate power and purpose, which must extend not simply to profits but also to public service in the world.

Is it too much to ask that in a shrinking world all business and commerce operate within rules consistent with restoring and protecting the physical, chemical, and biotic integrity of the earthly habitat and with respect for the civil rights of all members of present and future generations?

Industries commonly work to avoid powerful proof of the invasion of human rights and health by contamination of resources shared by all. The general assumption is that the commons are open, fair game for all unless protected by public irruption and action by a large, powerful government.

Commercial purveyors of pollutants . . . all enjoy a public subsidy in the form of irresponsible release into the general environment without cost or, in many cases, even accounting . . . and rights to sell and profit from . . . chemicals and other substances, is considered unique, and if environmentally hazardous or threatening, must be proven-so to be contained. The whole series of corporate arguments is a routine, repeated for every new commercial venture that gains from the sale of hazardous wastes that ultimately drift into a public trough.

In today's world, an appropriate transition will require immediate accommodation of changes already existing, and those certain to come, as well abruptly reducing emissions and reconstituting every conceivable sink for carbon.

Instead, *we continued to offer the largest and wealthiest corporations* in the world the largest subsidy ever advanced: the right to poison the biosphere, the entire human environment, indefinitely for private profit. *Government after government* around the world *has also succumbed, paralyzed, trapped* in an open-ended mission of *adapting to current* climatic changes, *offering words favoring* mitigation of the problem, but in fact, by delaying or offering only token changes, speeding the catastrophe.

While the transition away from coal seems an obvious first move, it has been long in coming, and despite its importance, is a small part of what must be done to gain control of

the global climate and approximately eleven billion tons of carbon released annually into the atmosphere worldwide. Procrastination remains the policy, and the costs accumulate.

The human birthright to a decent life erodes rapidly, and many governments, despite a nominal interest in protecting the public, are speeding the erosion. We adapt to the new reality, forced by circumstance to accept impoverishment. Adaptation is attractive, even contagious, when it refers simply to accommodating changed circumstance, with no attention to underlying causes, the magnitude of the costs, or what might come next.

The effects of the warming tend strongly to enhance the warming. As we saw with the oceanographers' concerns about the slowing of the oceanic circulation, as the surface water warms, the accumulation of carbon dioxide in the atmosphere is amplified and the energy available through evaporation for driving atmospheric circulation (and its storms) increases as well.

The vast store of carbon in the oceans will be released slowly if the atmospheric burden of carbon dioxide declines in response to efforts to stabilize the atmosphere at a lower concentration. The large oceanic burden makes the reversal of trends increasingly difficult the longer that current flows prevail and the more carbon we allow to be transferred to the oceans. (<http://nsidc.org/research> April 2015)

The global vegetation, including especially forests because of their large area, is engaged in annual exchanges of carbon with the atmosphere. These exchanges vary with seasons and are sufficient to change the carbon dioxide *content of the atmosphere by a few percent seasonally*. Such variations reflect the balance at any time between the absorption of atmospheric carbon dioxide through the photosynthesis of green plants, and its release through the respiration of all living tissues as well as the decay of organic matter in soils, bogs, and swamps. While photosynthesis is responsive to light, respiration is largely controlled by temperature and moisture.

Trees stressed by the new climatic regime become vulnerable to insect pests such as bark borers. In addition to these direct influences of the metabolism of the landscape, the warming climate is making the circumpolar boreal forest, the high-altitude forest of North America and Eurasia, drier and more vulnerable to fires.

Those fires, too, release additional carbon into the atmosphere—a further awkward result of continued warming.

The problems of positive feedbacks (those that intensify a process) are even greater in the Arctic. The Arctic north also contains large quantities of carbon, especially in the soil, the deep peat of the Tundra.

Soils, long frozen, have trapped the gaseous products of slow and intermittent anaerobic decay over thousands of years. Thawed, the soils release the gases, including methane and

carbon dioxide, and release as well large pools of carbon in the soils potentially vulnerable to more rapid decay in the warmer climate. (*Soil respiration and changes in Soil Carbon Stocks*, William H. Schlesinger - Biotic feedbacks in the global climatic system 1995)

The total carbon held in soils and vegetation globally is variously estimated to be approximately 60 to more than 200 percent of the approximately eight hundred billion tons of carbon currently held in the atmosphere. While there is no proof that the climatic disruption will release a substantial part or *all of that carbon*, the possibility is sufficiently great and the consequences sufficiently serious that no such risk can be acceptable. A substantial release would mean an uncontrolled and uncontrollable climatic excursion of unpredictable proportions. Adapting to such changes would be a far reach—a dream. (*The Biochemistry of Northern Peatlands and Its Possible Response to Global Warming*, by E. Gorham - Biotic feedbacks in the global climatic system: 169-187, 1995. Oxford University Press)

Reasonable analysts, including political leaders, find themselves confronting current changes in global climate and may decide that those changes must simply be accommodated as a matter of policy. That may make sense in the short term, but it is no substitute for the changes necessary in the long term.

A long-term viable future exists for New Orleans only if the sea level can almost immediately be stabilized, which is an unlikely turn for the world as a whole given current trends and the modesty of effort to reverse them.

A core of long-experienced scientists . . . see the climate disruption for what it is; a continuously cascading disaster for this civilization. The formal warnings are many, advanced over decades and repeated regularly from the highest levels of our scientific advisory agencies, including the National Academy of Sciences' National Research Council. (*Abrupt Impacts of Climate Change: Anticipated Surprises 2013*, by National Research Council, Division on Earth and Life Studies, Board on Atmospheric Sciences and Climate, Committee on Understanding and Monitoring Abrupt Climate Change and Its Impacts)

Unfortunately, as we've seen, *warming can feed further warming. Carbon dioxide warms the earth*, and the warming produces carbon dioxide. The feedbacks amplify the effects. Allowed to run its course by ineptitude or unwillingness to *check the trend, the climatic system will follow a* devastating course. Pushed to extremes, life will survive. Civilization will not.

The biotic feedbacks *are clear, inevitable, anticipated, and defined*—and still potentially controllable, but only if we abandon the production and use of fossil fuels substantially and immediately with the purpose of reversing the trends in global climate.

Rising sea levels are already a problem in some areas. To put the issue in some perspective, a mere ten thousand years ago as glaciers melted in the Northern Hemisphere, sea level

was rising from a low that was somewhat more than three hundred feet below the present level. (*IPCC Fourth Assessment Report "Historic Variations in Sea Levels, Part 1: From the Holocene to Romans,"* <https://judithcurry.com/2011/07/12/historic-variations-in-sea-levels-part-1-from-the-holocene-to-romans/>)

Over those centuries of melting, the average rise of the sea against the land was of the order of three feet per century.

Now, again, glaciers globally are melting after a long period of relative stability and sea level is rising at an accelerating rate. There has been an eight-inch rise in the last century.

A rise of between one and four feet, by recent estimates, or if the contribution of West Antarctic melting is included, ten feet or more, is expected by the end of the century. (*National Climate Assessment, Sea Level Rise, Washington, DC: US Global Change Research Program*) <https://nca2014.globalchange.gov/report/our-changing-climate/sea-level-rise> (accessed April 2015)

Civilization has expanded over virtually all the earth. People have favored coastal zones, where great cities have been built, connected by sea travel and dependent on a diversity of interlinked marine and terrestrial resources.

The Greenland ice cap, now melting more rapidly than scientists had anticipated, contains as much as twenty feet of global increase in sea level.

The West Antarctic ice cap, also melting, contains another twenty feet.

In a world of seven to ten billion people, with populations densely settled close to the continental margins, a sea level increase of five to ten feet in decades will be awkward to the point of murderous. Anything remotely approaching one to two hundred feet, half to most of the glacial ice existing now, would substantially put this civilization below sea level.

Again, can we defend a policy of accommodation to climate disruption as it occurs? Just how? Where? Those who call for such adaptation see advantage in doing nothing. They should share the circumstances of those who live on the exposed shores of Florida, Louisiana, Mississippi, the Carolinas, New Jersey, or New York. Or try the Ganges Delta, open to the vagaries of the Bay of Bengal.

Then there are the island chains of the world.

Do we not owe island and other coastal dwellers consideration? Were they born without a birthright to life and a place to live and resources to live by? This issue is not a commercial judgment: it is a moral imperative that we demand of ourselves as owed to our fellow citizens.

Robert Repetto, writing at Yale, has provided a carefully reasoned and detailed analysis of *economic considerations in adaptation within the narrow view of domestic US interests*. *Even in such a rich and versatile nation*, adaptation to immediate changes with little attention to addressing larger causes at the local, national, and international levels becomes at first questionable, and ultimately a fool's errand. (*The climate crisis and the adaptation myth* R. Repetto - 2008 - <https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=1019&context=fes-pubs>)

A recent report from the International Rice Research Institute *in the Philippines showed that rising minimum temperatures* reduce rice yields by 10 percent per degree ([Rice yields decline with higher night temperature from global warming](#), S Peng, J Huang, JE Sheehy, et al, - 2004 - Proceedings of the National Academy Sciences)

There is no solution within the context of adapting to continuous erosion of the global biosphere. Every solution ultimately hinges on a rapid restabilization of *essential environmental resources* followed by efforts to bring human *requirements and expectations as well as corporate entities and public institutions into line with the basic laws defining biospheric safety and stability*.

If the nuclear hazard remains a threat, not yet activated, the effects of the climatic *disruption are immediate and real*. The effects are now chronic, accumulating in intensity and diversity, *and they carry forces as destructive of a viable human future as a nuclear Armageddon*. Surely confronting the underlying causes *of this actual, cascading disaster in the making* is worth an intellectual and financial investment equivalent to the threat of an unwinnable, and universally scorned nuclear war.

A World to Live in - An Ecologists Vision for a Plundered Planet (2016), authored by George M. Woodwell.

Please consider these words when you address the issue of the 2,500-foot setback and when CARB addresses every other issue before it. Developing new rules defining essential common interests and protecting them is both necessary and possible. Please seriously consider protecting the commons with every decision you make.

Respectfully submitted,

Mr. Ara Marderosian
Sequoia ForestKeeper®
P.O. Box 2134
Kernville, CA 93238
(760) 376-4434
ara@sequoiaforestkeeper.org