South Coast AQMD

2022 AIR QUALITY MANAGEMENT PLAN

Final Socioeconomic Report
Comments and Responses to Comments

December 2022

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COMMENTS AND RESPONSES TO COMMENTS

2022 AQMP SOCIOECONOMIC REPORT

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SECTION 1:

COMMENTS AND RESPONSES TO COMMENTS RECEIVED ON DRAFT SOCIOECONOMIC REPORT

Comment Letter #1

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November 2, 2022

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Re: AHRI Comments to South Coast Air Quality Management District on Socioeconomic Analysis of 2022 Air Quality Management Plan

Dear SCAQMD Staff:

This letter is submitted in response to the South Coast Air Quality Management District's (SCAQMD) Socioeconomic Analysis of 2022 Air Quality Management Plan (AQMP).

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) represents 332 air-conditioning, heating, and refrigeration equipment manufacturers. In North America, the annual output of the heating, ventilation, air-conditioning and refrigeration (HVACR) and water heating industry is worth more than $44 billion. In the United States, the HVACR and water heating industry supports 1.3 million jobs and $256 billion in economic activity annually. AHRI represents the vast majority of the furnace manufacturers selling products in the United States. 1-1

Overview

AHRI acknowledges and appreciates the hard work of the SCAQMD to develop and publish this report. In reviewing this document AHRI found several areas of concern detailed more fully below. As a threshold matter, however, one of the more startling findings is the AQMP's undervaluing of the total number of foregone jobs that could result if the AQMP is adopted in its current form. Table ES-3shows that over the 14-year implementation period the AQMP would prevent the creation of approximately half of a million jobs in the regional economy,[1] which would disproportionately impact middle income workers in the building trades, utility, pipefitter, and plumbing professions. AHRI does not believe that a 3.7% loss in these professions, among other local employment impacts, which is approximately equivalent to the size of the entire education sector of the state, is insignificant.[2]

[1] The overall impact of the worst-case scenario is 29,000 jobs foregone annually from 2023 to 2037, which will result in over 400,000 cumulative jobs foregone in the district due to the AQMP.
[2] These numbers are based on the potential for 29,000 annual foregone jobs over a 14 year implementation period in population with 11 million jobs, which exceeds the 276,979 jobs in the education services sector shown in table 4-1, page 4-4 of the AQMP.

Analysis of Stationary Source Equipment

SCAQMD's analysis states that 80% of the overall expected emission reductions will come from mobile sources, which in turn make up approximately 57% of the AQMP's cost. Correspondingly, reduction of stationary source emissions will make up only 20% of the overall emission reductions but will comprise almost half of the cost.[3] Accordingly, the AQMP plans to shift a disproportionate share of the costs of compliance to stationary source measures, which are only approximately 25% as cost effective compared to the control of mobile sources. AHRI is concerned that by including both mobile source emission and stationary source emissions into the same cost benefit analysis, the AQMP artificially skews the perceived public health benefits and cost-effectiveness from a zero-NOx standard for stationary source equipment. 1-2

True Impact on Low-to-Moderate Income Communities

Consistent with its observations on the AQMP analysis above, AHRI strongly recommends that SCAQMD more fully consider consumer equity impacts to its zero-NOx space and water heating requirements. Policies and regulations dependent upon building electrification as the primary mechanism to reducing NO_x and particulate emissions, if not carefully executed, will disproportionately affect low-to-moderate income households.

As SCAQMD knows, HVACR and water heating equipment is often replaced on a 24-hour emergency basis when equipment has failed beyond repair. Asking families to go without heat or hot water for extended periods is untenable and, in certain circumstances, could be detrimental to public health. To require only the installation of electric heat pump space and water heating solutions will have a disproportionate impact on low-to-moderate income households. In either installation, these families may find themselves unable to install a replacement of their current fossil-fuel fired equipment in a timely manner due to several factors including, but not limited to, first cost of the equipment; expensive upgrades to their current electrical panel; and potential material changes to homes to accommodate the electric heat pump system. These services will need to be scheduled several days in advance due to permitting and inspection obligations. As a result, in the best-case scenario vulnerable residents could be without heat or hot water for days. In easily foreseeable worst-case scenarios, where residents are unable to afford the significant upfront costs of zero-NOx equipment and additional electric and structural home upgrades, residents may be forced to endure long periods without heat or hot water. 1-3

SCAQMD's socioeconomic analysis makes clear that government incentives are an important factor in this implementation plan.[4] AHRI agrees that incentives are a useful – and critical – tool to achieve market transformation, especially when incentive dollars are given directly to the

[3] SCAQMD, Draft Socioeconomic Report, page ES-2.
[4] SCAQMD projects approximately 10% of the cost of this implementation to come from incentive programs, socioeconomic analysis, page ES-3.

consumers. AHRI is unaware, however, of any direct to consumer or contractor incentives that SCAQMD is authorized to issue or administer. AHRI is also not aware of any incentives from other state or federal agencies that are so likely to materialize that SCAQMD's assumption of incentives is reasonable. Finally, if the AQMP were implemented, SCAQMD would essentially be eliminating the basis of any incentive program by mandating what would have been the incentivized product. This in turn will reduce the amount of available money to the residents of the District to afford such a switch.

Highlighting the insufficiency of existing incentive programs, the California Energy Commission and California Public Utilities Commission (CPUC) have recognized that updating electrical panels to support the adoption of heat pumps for space and water heating may cost an individual household or small business owner thousands of dollars on top of the first cost of the equipment.[5] The CPUC is working to address this issues with their Self-Generation Incentive Program, which consists of $80 million to incentivize the installation of heat pump water heaters by providing low-income customers with up to $4,885 to offset the cost of a heat pump and the associated panel upgrades. This program, however, will only be able to help approximately 20,000 customers across California afford this transition, meaning that relatively few residents in the District will benefit.[6] This will be a heavy burden for families that may have little or no savings and can least afford these changes.

1-3

Cont.

By assuming that approximately 10% of the anticipated costs of the AQMP will be covered by incentives that do not currently exist and which it has no legal ability to unilaterally bring into existence, SCAQMD's socioeconomic drastically underestimates the true cost of the AQMP to individual households.

Assessment of Heat Pumps with Gas Backup Heat

AHRI strongly recommends that SCAQMD assess the costs and benefits of an exemption to a zero-NOx standard for heat pumps that use natural gas as a backup source, also known as "hybrid" or "dual fuel" heat pumps. While conventional heat pumps use a highly inefficient electric resistance coil for backup heat, hybrid heat pump configurations replace the electric resistance coil with a combustion element for backup heat. In either configuration, the backup heating component is used only when the heat pump cannot meet the heating load, which for most buildings in Southern California will represent only a limited number of hours per year.

1-4

Allowing the use of gas combustion for backup heating only will help overcome many of the barriers identified above, such as the need for an electric panel upgrade, while also helping to maintain grid reliability and reduce source NOx emissions from natural gas peaker plants. These

[5] Average panel upgrades cost $1,475 but can cost up to $4,000. See Home Guide, "How Much Does It Cost to Repair Or Replace An Electrical Panel?" https://homeguide.com/costs/cost-to-replace-electrical-panel.

[6] CPUC Provides Additional Incentives and Framework for Electrical Heat Pump Water Heater Program, (Apr. 7, 2022), https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-provides-additional-incentives-and-framework-for-electric-heat-pump-water-heater-program

benefits should be assessed against the costs resulting from the limited NOx emissions attributable to the use of gas combustion as a backup heating source for heat pumps. 1-4 Cont.

Impact of Health Benefits

AHRI sent a letter to SCAQMD requesting a meeting to better understand the analysis performed to quantify the monetary benefit attributed to the anticipated health benefits. As written, it is difficult to understand and validate the assumptions in the AQMP. Areas such as "School Loss Days, All Cause," "Minor Restricted Activity Days," and "Work Loss Days" account for the largest projected benefits from a zero-NOx standard, however, it is unclear how SCAQMD accounted for and validated these numbers. Given the impact they have on the overall claimed benefit of the plan, it is important that these numbers are accurate and thoroughly explained as a small discrepancy would have substantial consequences on the anticipated effectiveness of this plan. 1-5

Impact on the Electric Grid

It is unclear if, or how, SCAQMD analyzed the potential costs associated with the upgrades to electricity generation, transmission, and distribution that would be required as a direct result of the proposed zero-NOx standard proposed by the AQMP. Further, it is unclear if SCAQMD assumes that all gas heated buildings in the District will install heat pumps under a zero-NOx standard, or if some buildings will install electric resistance technologies, such as electric furnaces, electric boilers, and baseboard electric heaters. 1-6

The scaled replacement of gas combustion heating with electric resistance options – both as a primary heating source or as a backup to heat pumps – has the potential to significantly alter the electric demand profile and create new winter electric peaks that occur in the late evening and/or early morning. Realistic technology adoption rates and resulting electric load scenarios should be modeled, and the costs of grid infrastructure upgrades accounted for, to accurately reflect the potential costs and benefits of a zero-NOx standard for space heating equipment.

Timing

There is currently a high volume of state and federal regulatory activity happening that directly affects manufacturers of space and water heating equipment.[7] The California Air Resource 1-7

[7] Building code changes in states like Washington that are requiring heat pump water heating; new U.S. EPA Energy Star specification that is looking to set a max tech requirement for gas-storage water heaters; U.S. EPA has granted more than ten petitions related to refrigerants and polyurethane foam blowing agents and is promulgating regulations that will limit the use of currently used chemicals under the American Innovation and Manufacturing (AIM) Act, which will require the re-design of water heaters, especially heat pump water heaters, with respect to the new refrigerants and insulation; The AIM act is also requiring many design changes to comply with the switch to low-GWP refrigerants; and New York and other states have scoping plans that propose to require transitions to heat pump water heaters and propose drastic cuts in the options of refrigerants and foam blowing agents.

Board (CARB) State Implementation Plan (SIP) is poised to examine low-NOx and Zero NOx standards that could go into effect for space and water heating in 2030.[8] Additionally, jurisdictions such as Los Angeles are in the process of banning the use of natural gas in new construction. Given the high level of regulatory burden currently being placed on the HVACR industry, harmonization between California agencies is important to limit unnecessary impacts and to reduce costs to California consumers. Further, from a state and jurisdictional level, it is important that there is consistency in requirements to allow for manufacturers to have business certainty and the ability to properly plan and prepare for such regulations. As such, AHRI requests that SCAQMD align its effective dates for any zero-NOx standards for space and water heating equipment with the 2030 proposed date outlined in the CARB SIP. 1-7 Cont.

AHRI appreciates the opportunity to provide these comments. If you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

Kyle Bergeron
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Air-Conditioning, Heating, and Refrigeration Institute (AHRI)
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Responses to Comment Letter #1

Response to Comment 1-1

The Draft Socioeconomic Report for the Revised Draft 2022 AQMP projected that, by considering potential job impacts associated with incremental costs only and without taking into account potential impacts associated with public health benefits, the 2022 AQMP would result in approximately 29,000 jobs foregone annually between 2023 and 2037 in an economy with more than 10 million jobs. However, these annual jobs foregone are not additive, and do not result in a cumulative loss of 400,000 jobs over the analysis horizon. Therefore, the claim that 3.7% of jobs will be lost is inaccurate.

The regional macroeconomic model used to calculate job impacts, REMI, is a recursive model that simulates policy impacts year by year. The number of jobs foregone or added for a particular year is the result of a comparison between the job counts in the baseline economy (i.e., baseline scenario, or scenario without a particular policy) and the job counts in an alternative economy where a policy would take effect (i.e., policy scenario). For example, consider a scenario where the only policy-induced job

impact is that five construction jobs that are projected to be added to the baseline economy in 2025 would end up not being created under the policy scenario simulation. And as the policy impact continues, these same five jobs still will not be created under the policy scenario in 2026, 2027, and so on. As it is those same five jobs that are not being created, it would be incorrect to claim that there will be 15 jobs foregone after three years in 2027; instead, the total policy-induced job impact stays at five jobs foregone in 2027. Moreover, as noted in the Final Socioeconomic Report, the term "jobs foregone" refers to either losses of existing jobs or forecasted jobs not created. Please refer to Chapter 4 of the Report for a detailed description.

Response to Comment 1-2

The South Coast AQMD and CARB recognize the need for emission reductions from local, state and federal sources. Staff acknowledges that many stationary sources are already tightly controlled. However, it is important to recognize the responsibility of the South Coast AQMD to ensure attainment of the federal and state air quality standards in a timely manner and our agency's obligation to pursue all feasible measures under our authority, including over stationary sources, that could assist in meeting those required deadlines. Further, emission reductions will be needed across all sectors, including stationary sources, to achieve the magnitude of emission reductions needed to attain the 2015 ozone standard.

The South Coast AQMD further recognizes that the majority of emissions that cause ozone in the region are from mobile sources, and that substantial emission reductions will be needed from the sources subject to federal authority (e.g., ships, planes, locomotives, etc.) in order to meet federal air quality standards. Staff are committed to working with U.S. EPA and other entities in the federal government to urge that they take action to reduce emissions from these sources.

Finally, while the Final 2022 AQMP anticipates a pivot to zero emission technologies across all sectors, feasibility of such technologies is an important consideration. During the rulemaking to implement specific control measures staff would consider alternative lower NOx technologies when zero emissions units are deemed infeasible. For details, please see Response to Comment 1-4 below.

Response to Comment 1-3

Staff recognizes the concern for cost challenges for end users. The total costs associated with widespread adoption of zero emission appliances will be significant, and substantial incentive funds and programs will be needed to implement these measures. The comment also indicates that incentives and regulations will not be compatible with each other. However new regulations and incentives are proposed (e.g., R-CMB-01, -02, etc.), and these new programs will consider how incentives and regulations can work together. Please also refer to the general response to Cost of Zero Emission Technology in Residential and Commercial Building Appliances in the 2022 Final AQMP Comments and Responses to Comments document.

Response to Comment 1-4

Staff understands that a dual-fuel heat pump works in conjunction with a gas furnace, and has evaluated its application for space heating. The primary advantage of pairing the heat pump with a gas furnace is for energy savings, when the outdoor temperature is below 35°F, and the heat pump backup resistance heating would not be required. During the previous rulemaking process for residential space heating

implementing the operation of 14 ng/J furnaces, some stakeholders did not support the dual-fuel system pairing with 40 ng/J furnaces, because it would undercut development and commercialization of compliant newer technologies. In addition, there was no need to pair heat pumps with 40 ng/J furnaces since dual fuel systems can operate by pairing with 14 ng/J furnaces and achieve the same result. While the control measures for building appliances focus on a transition to zero emission technologies, feasibility of those technologies is an important consideration. Alternative lower NOx technologies will therefore be considered when zero emissions units are deemed infeasible. During the upcoming rulemaking process, staff will work with stakeholders to identify the applications when dual-fuel systems could potentially supplement zero emission technologies, and resolve certain challenges for the dual-fuel system applications such as concerns regarding enforceability.

Response to Comment 1-5

Staff agrees that the assumptions underlying the calculation of monetized benefits is of crucial importance. The analysis conducted to estimate health benefits is sophisticated, and thoroughly documented in the Socioeconomic Report and its appendices. After the commenter requested a meeting, staff reached out and asked the commenter to reach out directly to staff to discuss. As of the date of this response, staff has not heard back from the commenter, but is still available to meet.

In brief, the health benefits analysis was conducted using U.S. EPA's Environmental Benefits Mapping and Analysis Program - Community Edition (BenMAP-CE), which is an open-source program used nationwide and globally. This is the same model used by U.S. EPA to evaluate health benefits of national air quality regulations. It is a sophisticated model that incorporates air quality data, demographic information, economic data, and epidemiological data to assess the health benefits associated with improvement in air quality and the monetized value of those health benefits.

The underlying epidemiological data[1] used to estimate public health benefits as well as the health incidence valuations used to estimate monetize public health benefits in the Socioeconomic Report were based on recommendations put forth by expert consultants at IEc. The basis of IEc recommendations was a thorough literature review using study selection criteria presented to and reviewed by the 2022 AQMP Scientific, Technical & Modeling Peer Review (STMPR) Advisory Group. The literature review was conducted on published, peer-reviewed, and widely circulated and cited studies and reports. More detailed information on the assumptions underlying the calculation of health incidence impacts and the associated monetized health benefits, including for the health endpoints referenced in the comment letter, can be found in the appendices to Chapter 3 of the Final 2022 AQMP Socioeconomic Report.

Response to Comment 1-6

Staff recognizes the potentially large costs resulting from upgrading the existing electrical transmission grid. Determining the enhancements necessary and the associated costs is a difficult undertaking and is currently being evaluated by multiple regulatory agencies within the state, including the South Coast

[1] Concentration-response (C-R) functions derived from various epidemiological studies are utilized in the analysis. C-R functions are mathematical equations that relate concentrations of air pollution to health impacts based on empirical data and observations.

AQMD. Please refer to the general response to Zero Emission Infrastructure in the 2022 Final AQMP Comments and Responses to Comments document.

Response to Comment 1-7

Proposed control measures R-CMB-01, R-CMB-02, C-CMB-01, and C-CMB-02 are designed to work in conjunction with CARB's proposed Zero-Emission Standard for Space and Water Heaters measure. Staff acknowledges the importance of coordination and consistency in regulatory requirements affecting the same emission sources. South Coast AQMD is mandated by State laws to make findings that any proposed rule or rule amendment is consistent and non-duplicative with state or federal regulations. Staff is committed to continuing to work with CARB to align regulatory requirements while also ensuring that all feasible measures are taken to attain air quality standards.

Comment Letter #2

From: McGivney, Daniel
Sent: Wednesday, November 2, 2022 4:32 PM
To: SocioEcon
Cc: Barker, Kevin M; Lorenz, Megan; Hamilton, Priscilla R
Subject: SoCalGas Comments regarding draft 2022 AQMP Socioeconomic Report

Dear Dr. Shen,

Thank you for the opportunity to comment on the Draft 2022 Socioeconomic Report. The Draft 2022 Socioeconomic Report does not seem to account for the costs associated with the upgrades needed to the electric grid, specifically generation/transmission/distribution costs. In meetings, staff has cited a lack of data as the reason for not including these costs. We respectfully suggest using the California Independent System Operator (CAISO) "2022 Final Participating Transmission Owner Per Unit Cost Guides". These guides provide interconnection unit costs by categories for different Investor-Owned Utilities (IOUs). A link to the publicly available data can be found at 2022 Final Participating Transmission Owner Per Unit Cost Guides Posted (caiso.com). 2-1

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Responses to Comment Letter #2

Response to Comment 2-1

Staff recognizes the potentially large costs resulting from upgrading the existing electrical transmission grid. Determining the enhancements necessary and the associated costs is a difficult undertaking and is currently being evaluated by multiple regulatory agencies at the state level with the expertise to develop the requested estimates. The reference included in this comment also only includes a portion of costs needed for zero emissions infrastructure (e.g., it does not include any 'soft costs' described in Chapter 2 of the Socioeconomic Report). Further the detailed level of analysis needed to determine what kinds of improvements to the electrical grid would be required is too speculative with information currently available. For example, local distribution system upgrades can vary widely depending on where depot or public chargers are specifically located, whether electricity or hydrogen is used as a fuel, etc. As zero emissions vehicles are still less than 5% of vehicle stock (and <<1% of heavy duty vehicles), it is unclear how the market will proceed at the level of detail needed to conduct the kind of analysis suggested by the commenter. Nonetheless, South Coast AQMD staff will actively continue to provide input and feedback to assist in the process, and when feasible, also quantify the related costs based on best practices and available information during future rulemaking. Please also refer to the general

response to Zero Emission Infrastructure in the 2022 Final AQMP Comments and Responses to Comments document.

Comment Letter #3

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November 2, 2022

VIA EMAIL

Sarah Rees, Ph.D., Deputy Executive Officer
Dr. Sang-Mi Lee, Planning & Rules Manager
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Diamond Bar, CA 91765

Re: Western States Petroleum Association Comments on the South Coast Air Quality Management District ("SCAQMD") 2022 Draft Air Quality Management Plan Socioeconomic Report

Dear Dr. Rees:

Thank you for the opportunity to submit these comments on the South Coast Air Quality Management District's 2022 Air Quality Management Plan Draft Socioeconomic Report (the "Draft Socioeconomic Report") on behalf of the Western States Petroleum Association ("WSPA"). WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport, and market petroleum, petroleum products, natural gas, and other energy supplies in five western states, including California. WSPA has been an active participant in air quality planning issues for more than 35 years. WSPA sincerely appreciate the efforts of the District staff during this AQMP process. 3-1

The Draft Socioeconomic Report highlights the significant costs the 2022 AQMP will have on southern California residents and businesses. The reported incremental costs are over double the costs presented under the 2016 AQMP with incentives accounting for just 10% of those costs (compared to 93% of the incremental costs in the 2016 AQMP). Further, as we summarize below, we believe the Draft Socioeconomic Report vastly understates the actual cost burdens on southern California residents and businesses. The staggering price tag of the 2022 AQMP and accompanying jobs foregone are particularly concerning given the District's recent proposal to effectively remove tiered cost-effectiveness analysis in future rulemakings through the adoption of an unvetted $325,000 per ton "health based threshold" for stationary sources.

The Draft Socioeconomic Report and 2022 AQMP also fail to appropriately recognize the significant investments that have been made and will be made as facilities transition from the NO_X RECLAIM program. Since the adoption of the 2016 AQMP and the transition from RECLAIM, WSPA members alone have incurred many millions of dollars in costs, and collectively, will likely

be required to invest several billion more over the next two decades. Both the current transition and the 2022 AQMP will also result in significant stranded asset costs, which are not reflected in the Draft Socioeconomic Report.

WSPA members are proud of their investments in air quality and their contributions to the overall health of the Southern California economy. Stationary sources continue to bear the brunt of costs associated with SCAQMD rulemakings, and we are concerned that the Draft Socioeconomic Report fails to fully acknowledge the costs that this AQMP would place on these sources. This flawed analysis renders the AQMP lacking as an appropriately vetted planning document, and inadequate in its function to guide the Governing Board and future rulemakings. Our specific concerns are summarized below.[1]

3-1

Cont.

A Transition to a "Health Benefit-Based Cost-Effectiveness Threshold" Fails to Minimize the Identified Adverse Economic Impacts Set Forth in the Draft Socioeconomic Report. This is Inconsistent with the intent of the Health & Safety Code.

The Draft Socioeconomic Report references Health & Safety Code Section 40728.5, noting its requirement that "efforts shall be made to minimize any adverse impact."[2] More specifically, Section 40728.5 requires air districts to prepare an "assessment of the socioeconomic impacts" whenever the District intends to amend a rule or regulation, and to "make a good faith effort to minimize adverse socioeconomic impacts" of any amendment.[3] While the Draft Socioeconomic Report recognizes the affirmative obligations to minimize adverse socioeconomic impacts in rulemakings, the 2022 Draft AQMP proposes an approach to analyzing cost-effectiveness, incremental cost-effectiveness, and socioeconomic impact in future rulemakings that would almost certainly render these rulemakings deficient under Health & Safety Code Section 40728.5.

3-2

Since 2003, the District has employed a tiered analysis associated with cost-effectiveness thresholds that trigger "more rigorous" cost-effectiveness, incremental cost-effectiveness, and socioeconomic impact analysis. When triggered, these more rigorous analyses have provided the regulated community with an appropriately robust process to educate the District and the public on the economic impacts of the regulation, and have allowed the District to fulfill its obligations to "minimize" such impacts.

In the September 2022 Draft AQMP, the District proposed, for the first time, a transition from the control measure-based threshold to a "health benefit-based threshold" for stationary sources. If ultimately adopted, this approach would not only undermine the Health & Safety Code-required analytical rigor for technological feasibility, cost-effectiveness, and incremental cost-effectiveness going forward,[4] but will also produce rulemaking outcomes that fail to "minimize adverse socioeconomic impacts" and result in lost productivity, lost jobs, and lost growth. The

[1] WSPA incorporates its prior comments on the AQMP into this document by reference.

[2] South Coast Air Quality Management District, Draft Socioeconomic Report for Proposed 2022 Air Quality Management Plan 1-4 (October 2022), *hereinafter* Draft Socioeconomic Report.

[3] Health & Safety Code § 40728.5.

[4] *See, e.g.*, Health & Safety Code § 40920.6.

risks are enhanced by the staggering projected costs (e.g. $2.85 billion of average annual incremental cost) of the 2022 AQMP summarized in the Draft Socioeconomic Report.[5]

The tiered cost-effectiveness analysis based on control measure costs has been a staple in District rulemakings since 2003, helping ensure that rulemakings comply with the Health & Safety Code requirements. And given the economic and employment risk of further burdening stationary sources, we have continuously advocated that the cost-effectiveness threshold should function as a hard cap in rulemaking.

The Health & Safety Code also requires the District to adopt control measures which, among other things, "are efficient and cost-effective."[6] The Code states that:

> In adopting any regulation, the district shall consider, pursuant to Section 40922 [cost-effectiveness assessment], and make . . . public, its findings related to the cost-effectiveness of a control measure . . . . A district shall make ***reasonable efforts***, to the extent feasible within existing budget constraints, to make specific reference to the direct costs expected to be incurred by regulated parties, including businesses and individuals.[7]

3-2

Cont.

The Health & Safety Code's requirements reflect a clear legislative intent: that the District considers cost-effectiveness and seeks to minimize socioeconomic impacts as objectives of its planning and rulemaking authority. The proposed transition to the health benefit-based cost-effectiveness threshold runs counter to this intent.

By considering the shift to this untested and unvetted health benefit-based threshold so late in the AQMP cycle, the District is placing the regulated community in the extremely difficult position of facing significant uncertainty in future rulemaking. The alternative approach will establish a screening threshold approximately 6.5 times that of the 2016 AQMP, and 25 times the screening threshold of the 2003 AQMP.

Without the benefit of an AQMP-established tiered cost-effectiveness analysis at a reasonable per ton cost, we anticipate future rulemakings could impose technologically infeasible and economically untenable control limits on stationary sources in violation of Health & Safety Code §§ 40406 (economic impacts should be taken into account) and 40920.6 (setting forth specific requirements for cost-effectiveness and incremental cost-effectiveness analyses).

Stated affirmatively, the District will not be making a "reasonable effort" in future rulemakings if it abandons a control measure-based cost-effectiveness approach. The proposed health benefit-based cost-effectiveness threshold will not minimize adverse socioeconomic

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[5] Draft Socioeconomic Report, *supra* note 2, at 4-2.

[6] Health & Safety Code § 40440(c).

[7] Health & Safety Code § 40703 (emphasis added); *see also* § 40440.8 (requiring the SCAQMD to examine "[t]he availability and cost-effectiveness of alternatives to the rule or regulation" by considering the socioeconomic impacts of proposed rules and regulations.).

impacts. And the District will also fail to appropriately or adequately examine the availability and cost-effectiveness of alternatives through meaningful socioeconomic analysis. 3-2 Cont.

The Draft Socioeconomic Report Vastly Understates the Costs the 2022 AQMP Will Impose on the Regulated Community and the Associated Job Losses.

The Draft Socioeconomic Report recognizes that the rulemakings associated with the 2022 AQMP will result in significant economic impacts, particularly for industrial sources and job seekers. Specifically:

- "The total amortized annual average of incremental costs from defined South Coast AQMD control measures in the Revised Draft 2022 AQMP is estimated to be about $1.16 billion per year between 2023 and 2037."[8]
- "The ***present value of all such incremental costs is estimated to be $34.3 billion*** when all costs are discounted to the current year of 2022."[9]
- "South Coast AQMD control measures have the largest cost impact in the industrial sector with nearly 59 percent of the total incremental cost at $20.1 billion in present value."[10] 3-3
- "Overall, the incremental costs from implementation of the Revised Draft 2022 AQMP are projected to result in, on average, about ***29,000 jobs foregone per year*** during the period from 2023 to 2037."[11]

Further, we believe the Draft Socioeconomic Report vastly ***understates*** the costs to southern California residents and businesses and associated job losses in multiple ways: (1) it does not appropriately consider potential impacts on small businesses; (2) it does not analyze the likely billions of dollars in so-called "soft costs" which would be caused by measures that effectively require electrification; and (3) it thereby understates the costs of certain control measures. The analysis runs afoul of the intent of the Health & Safety Code.[12]

1. The Draft Socioeconomic Report must analyze the potential impacts on small businesses.

WSPA members support thousands of small businesses throughout the South Coast Basin, and the District's election to punt the analysis of the potential socioeconomic impacts of the 2022 AQMP on small businesses to rulemakings is extremely problematic.

The Health & Safety Code contains a number of provisions aimed at assisting small businesses affected by SCAQMD rules and regulations. For example, the Legislature has stated

[8] Draft Socioeconomic Report, *supra* note 2, at 2-2.

[9] *Id.* (emphasis added).

[10] *Id.* at 2-4.

[11] *Id.* at 4-3 (emphasis added).

[12] *See, e.g.*, Health & Safety Code §§ 40922 (providing that "[e]ach plan prepared pursuant to this chapter shall include an assessment of the cost effectiveness of available and proposed control measures and shall contain a list which ranks the control measures from the least cost-effective to the most cost-effective") and 40913 ("[e]ach district plan shall be based upon a determination by the district board that the plan is a cost-effective strategy to achieve attainment of the state standards by the earliest practicable date.").

that "[i]t is necessary to increase the availability of financial assistance to small businesses which are subject to the rules and regulations of the south coast district, in order to minimize economic dislocation and adverse socioeconomic impacts."[13] These provisions reflect the Legislature's intent that the SCAQMD consider alternative means of achieving lower emissions, cost-effectiveness, socioeconomic impacts, ***and impacts on small businesses***.

In light of this, the Draft Socioeconomic Report is inadequate as a planning document to inform the Governing Board and future rulemakings, by stating only that "[s]mall business impacts will be assessed in further detail during the rulemaking process, when more facility-specific data will be available."[14]

But the District is able to ascertain this information now, and should include such analysis to inform the planning document and disclose the costs and socioeconomic impacts on the estimated hundreds of thousands of small businesses that the 2022 AQMP will impact.[15] Indeed, California courts have recognized that the SCAQMD is required "to utilize existing data available to it in order to make its projections."[16] The punting of this analysis is even more concerning given the proposed effective removal of tiered analysis for cost-effectiveness, incremental cost-effectiveness, and socioeconomic impacts (discussed above). This important procedural safeguard is particularly important for small businesses. The idea that $325,000 per ton would be "cost-effective" for a small business is per se unreasonable and likely could result in rulemakings that violate the Health & Safety Code.[17] 3-3 Cont.

2. *The general failure to include so-called "soft costs" caused by zero emission measures represents a fatal flaw in the analysis that could lead to misinformed decision-making by the Governing Board.*

The Draft Socioeconomic Report recognizes that "'soft' costs can present a significant hurdle to each project and further research is needed to determine how these costs for each project can be considered broadly when zero emissions technologies are deployed at the scale needed to meet air quality standards."[18] 3-4

> These 'soft costs' include factors such as land use costs (site acquisition, existing site re-designs, easements, etc.), opportunity costs (permitting delays, etc.), marketing, employee training, future-proofing (e.g., overbuilding electrical infrastructure for potential future changes), and stranded asset costs (e.g., equipment

[13] Health & Safety Code § 40448.6(a); *see also*, §§ 40448 and 40448.8 (requiring the SCAQMD to provide assistance to small businesses).

[14] Draft Socioeconomic Report, *supra* note 2, at 2-10.

[15] *See id.* at Table 2-3.

[16] *Sherwin-Williams Co. v. S. Coast Air Quality Mgmt. Dist.*, 86 Cal.App.4th 1258, 1275 (2001) *as modified* (Feb. 15, 2001).

[17] *See, e.g.*, Health & Safety Code §§ 40728.5, 40440.8, 40910, 40913, and 40922.

[18] Draft Socioeconomic Report, *supra* note 2, at 2-15.

that is turned over before its useful life due to subsequent advances in technology).[19]

We acknowledge that certain "soft costs" may be difficult to estimate and carry a larger uncertainty than other values, but planning-level estimates are doable, and an effort must be made at the planning stage to properly assess cost-effectiveness pursuant to Health & Safety Code § 40922 (providing that "[e]ach plan prepared pursuant to this chapter shall include an assessment of the cost-effectiveness of available and proposed control measures and shall contain a list which ranks the control measures from the least cost-effective to the most cost-effective").[20] It is also necessary to inform the Governing Board of the potential impacts of the 2022 AQMP and meet the intent of the Legislature when it comes to air quality rulemakings. As the California Court of Appeal has stated, "[o]nly when it can be shown the needed data were available but not used in the study or when the SCAQMD failed to even attempt a study of socioeconomic effects can [the requirements of Health & Safety Code § 40728.5] bar adoption of a rule or program designed to reduce pollution."[21]

3-4

Cont.

A review of academic literature confirms that soft costs can play an oversized role in energy deployment, and also demonstrates that they can be estimated at the planning stage. For example, one researcher of soft costs reported that soft costs accounted for 52%-72% of the total cost of technology installations, such as solar photovoltaic systems, and accounted for 21% of total costs for wind farms.[22] For sustainable transportation infrastructure projects, the California Strategic Growth Council recognized soft costs can reach up to 30% of project costs.[23] The Fuels Institute Electric Vehicle Council noted that charging station installation soft costs could me "three to five times more than the costs of the hardware for a project."[24] The Southwest Energy Efficiency Project found that the soft costs associated with retrofitting a 10-space parking lot with two charging stations would inflate the installation cost to $3,710 per station, versus a cost of $920 per charger when installed during new construction.[25]

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[19] *Id.* at Appendix 2-C-10.

[20] *See also* Health & Safety Code § 40913 ("[e]ach district plan shall be based upon a determination by the district board that the plan is a cost-effective strategy to achieve attainment of the state standards by the earliest practicable date.").

[21] *All. of Small Emitters/Metals Indus. v. S. Coast Air Quality Mgmt. Dist.*, 60 Cal.App.4th 55, 64 (1997).

[22] Nazirah Zainul Abidin and Nurul Zahirah Mokhtar Azizi, *Soft Cost Elements: Exploring Management Components of Project Costs in Green Building Projects*, 87 ENVIRONMENTAL IMPACT ASSESSMENT REVIEW (March 2021), available at https://www.sciencedirect.com/science/article/abs/pii/S0195925520308234.

[23] California Strategic Growth Council, *Transformative Climate Communities Program: FY 2016-2017 Final Program Guidelines* Appendix D-2 (August 2017), available at https://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/08242017-TCCFINALGUIDELINES-Revised82317.pdf.

[24] Fuels Institute Electric Vehicle Council, *A Best Practice Guide for Installing and Operating Public Electric Vehicle Charging Infrastructure* 14 (August 2021), available at https://www.fuelsinstitute.org/Research/Reports/Installing-and-Operating-Public-Electric-Vehicle-C/EVC-Site-Host-Tool.pdf.

[25] David Farnsworth, et. al., *Beneficial Electrification of Transportation*, REGULATORY ASSISTANCE PROJECT 59 (Jan 2019), available at https://www.raponline.org/wp-content/uploads/2019/01/rap-farnsworth-shipley-sliger-lazar-beneficial-electrification-transportation-2019-january-final.pdf.

Make no mistake, soft costs could result in **billions** of dollars in additional economic impacts on southern California residents and businesses, and thousands of additional jobs foregone. As demonstrated, soft costs can be estimated, ad the Draft Socioeconomic Report's failure to undertake any quantification arguably renders the document legally defective. 3-4 Cont.

3. *The 2022 AQMP Socioeconomic Report underestimates the costs of FUG-01 and L-CMB-07, and, in turn, underestimates the costs more broadly across the oil and gas and manufacturing sectors*.

The Draft Socioeconomic Report estimates annual incremental costs of $7.6 million a year for L-CMB-07, and $4.4 million for FUG-01.[26] This underestimates the impacts of these proposed control measures.

The costs in proposed control measure L-CMB-07 are based on installation of next generational ULNB products.[27] The District reviewed these technologies during the recently concluded Rule 1109.1 rulemaking, and presented information showing that the technologies are not commercially available, and manufacturers have not demonstrated lower emission rates when burning refinery fuel gas. The District is suggesting that these technologies be added to equipment that is currently being modified to meet the emission limits of Rule 1109.1. In doing so, the District would be circumventing their obligation to address incremental cost-effectiveness as part of the rulemaking process. Aside from commercial availability, Staff has not considered the technical feasibility of retrofitting those technologies into existing process heaters, or the full costs of doing so. This may include the imposition of stranded costs where such burner products cannot be physically or economically retrofit into existing equipment. All of this existing equipment is currently undergoing BARCT compliance actions pursuant to Rule 1109.1. 3-5

FUG-01 proposes reductions of VOC emissions from implementation of an enhanced leak detection and repair (LDAR) program.[28] SCAQMD is currently in the process of amending Rule 1178 (PAR 1178), Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities, and has proposed both engineering controls, as well as enhanced monitoring through the use of optical gas imaging (OGI) to control fugitive emissions from storage tanks. The PAR 1178 rulemaking, which is expected to have a public hearing in Q1 2023, raises questions on the inclusion of FUG-01 in the 2022 AQMP, as the VOC emissions that FUG-01 purports to control will likely already be addressed under the current PAR 1178 rulemaking. With the emission reductions achieved under PAR 1178, the cost-effectiveness for implementation of FUG-01 will increase exponentially, likely resulting in a rule that is not cost-effective.

The underestimated costs will compromise the Governing Board's ability to make an informed policy decision. We strongly encourage the District to update the cost estimates for FUG-01, and remove proposed L-CMB-07 from the AQMP. The AQMP should acknowledge the significant anticipated emission reductions associated with the implementation of Rule 1109.1.

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[26] Draft Socioeconomic Report, *supra* note 2, at Table 2-1A.

[27] South Coast Air Quality Management District, Revised Draft 2022 Air Quality Management Plan 4-21 to 4-22 (2022).

[28] *Id.* at 4-23.

Recently adopted Rule 1109.1 represents the most comprehensive and stringent air quality regulation in the nation. The Rule calls for billions of dollars of investment for southern California refineries, and will result in dramatic reductions in NOx emissions. Implementation will require a monumental effort to engineer, permit, procure, and construct new emission control equipment, and this monumental effort should not be derailed by new rulemakings driven by L-CMB-07.

Conclusion

The Health & Safety Code's requirements reflect a clear legislative intent: that the District consider cost-effectiveness and seek to minimize socioeconomic impacts as objectives of its planning and rulemaking authority. WSPA appreciates the District's preparation of the Draft Socioeconomic Report to inform future rulemakings, but as detailed above, we are extremely concerned that it sets a false sense of security by including approaches that will obscure the true socioeconomic impacts of proposed rules and regulations going forward.

3-5

Cont.

Under any circumstances, the potential socioeconomic impacts are very real, very significant, and require very careful consideration and minimization during this planning process and in future rulemaking. To address these concerns, we strongly encourage the District to reestablish a cost-effectiveness threshold based on control measures costs in the 2022 AQMP, include an analysis of costs to small businesses and soft costs in the Draft Socioeconomic Report, update the cost estimates for FUG-01 in the Draft Socioeconomic Report, and remove proposed L-CMB-07 from the 2022 AQMP.

Thank you for your attention to these comments. If you would like to discuss our concerns, please contact me on (714) 755-8105, or by email at michael.carroll@lw.com.

Sincerely,

s/ Michael J. Carroll

Michael J. Carroll
of LATHAM & WATKINS LLP

cc: Ramine Cromartie, WSPA
Patty Senecal, WSPA
John C. Heintz, Latham & Watkins

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Responses to Comment Letter #3

Response to Comment 3-1

The South Coast AQMD recognizes and appreciates the significant efforts the refining sector has made during previous rulemakings, including most recently for Rule 1109.1. The South Coast AQMD and CARB recognize the need for emission reductions from local, state and federal sources. Staff also acknowledges that many stationary sources are already tightly controlled. However, it is important to recognize the responsibility of the South Coast AQMD to ensure attainment of the federal and state standards in a timely manner and our agency's obligation to pursue all feasible measures under our authority, including over stationary sources, that could assist in meeting those required deadlines.

The significant costs quantified for stationary and area source measures are dominated by today's costs of zero emission technologies in these sectors for selected measures where such technologies are deemed feasible. To be conservative, the report does not account for the likely decline of zero emission technology costs in the future as economies of scale are achieved in producing this technology. For the same reason, the report conservatively assumes incentives would only amount to 10% of the total quantified costs across all proposed measures; however, the report also recognizes approved and potential federal and state funding that is not accounted for in the analysis. In the meantime, the report recognizes several challenges in quantifying the costs of the supporting zero emission infrastructure (including "soft costs") and acknowledges the emerging literature that provides important, although partial, information and data that will eventually enable South Coast AQMD and other regulatory agencies to comprehensively assess the cost impacts and attribute the costs appropriately to individual rules and regulations. In addition, staff acknowledges the considerable economic costs associated with any stranded assets, and therefore, staff have made best efforts to take into full consideration any potential stranded asset during the rulemaking process and will continue to do so.

More detailed responses to specific comments can be found below. Several of the ensuing comments claim or imply that the Draft Socioeconomic Report is inconsistent with H&SC requirements or its intent. Staff disagrees with these assertions. Specifically, Chapter 1 of the Report (p. 1-4) states:

> *Both the South Coast AQMD Governing Board and the California Health & Safety Code require preparation of a socioeconomic analysis whenever the South Coast AQMD adopts or amends emission reduction rules or regulations. Although these requirements do not apply to preparation of the AQMP, the South Coast AQMD nonetheless elects to perform a separate socioeconomic analysis of the AQMP in order to further inform public discussions and the decision-making process associated with adoption of the Plan.*
>
> *(Note: underline added for emphasis)*

Response to Comment 3-2

Please refer to the general response to Cost-effectiveness Calculation and Threshold in the 2022 Final AQMP Comments and Responses to Comments document.

The assertion that future South Coast AQMD rulemakings would be in violation of the Health and Safety Code as a result of a health -based cost-effectiveness screening threshold is speculative and unfounded.

The current screening threshold used in South Coast AQMD rulemakings is not a limit, as it only requires additional public processes if the estimated cost-effectiveness exceeds $50,000 per ton. Future rulemakings will continue to consider all socioeconomic impacts consistent with South Coast AQMD's current practice. Cost-effectiveness analyses and incremental cost-effectiveness analyses will be conducted for all Best Available Retrofit Control Technology (BARCT) rules in addition to the legally required socioeconomic impact assessments.

Response to Comment 3-3

Staff acknowledges the significant costs and the associated potential job impacts resulting from the implementation of 2022 AQMP control measures. Meantime, significant health benefits would be also realized, which have their own job-creation impacts.

The Small Business analysis in Chapter 2 of the Final Socioeconomic Report provides information on the potential impacts on small businesses in each affected industry from implementation of the Final 2022 AQMP. The scope of the analysis was limited due to data limitations. Staff is committed to performing additional refined small business impact analyses during the rulemaking process when more facility specific data will be available. In order to broaden the scope and to conduct a more in-depth analysis, staff would appreciate any assistance from stakeholders to obtain additional industry- and facility-specific data and information on the potentially affected small businesses.

South Coast AQMD staff will continue to be sensitive to the financial and other constraints that are faced by small business owners and operators, and their affordability and competitiveness concerns will be carefully considered during rule and program development. The proposed health-based cost-effectiveness screening threshold does not remove the obligation for staff to conduct socioeconomic impact assessments "[w]henever the south coast district intends to propose the adoption, amendment, or repeal of a rule or regulation that will significantly affect air quality or emissions limitations […]" (H&SC Section 40440.8).

Response to Comment 3-4

Regarding the challenges in systematically and comprehensively quantifying of the "soft costs" of zero emission infrastructure and the assertion that the Draft Socioeconomic Report is legally defective for not including "soft costs" in the cost estimates, please refer to Responses to Comments 2-1 and 3-1. It is important to note that this transition to zero emissions technology is occurring regardless of whether it is included in the AQMP or not. State and federal policies and indeed many corporate sustainability goals focus on accelerating zero emissions controls broadly across all sectors. Regardless, staff concurs that "soft costs" could be substantial and has the potential of adding billions of dollars of costs to implementing zero emissions controls, whether or not the costs are attributable to the AQMP. Because of the importance of this issue, the 2022 AQMP includes a specific discussion of this issue in Chapter 2 of the Socioeconomic Report as well as a specific control measure (MOB-15) that lays out strategies that South Coast AQMD would take to assess zero emission infrastructure needs.

With regards to the estimates put forward by the comment, staff agrees that there is potentially a wide range in "soft costs". Just from the estimates in the comment letter, "soft costs" can range from about 20% to 300% of other onsite costs. It is too speculative to rely on such a wide range of potential costs for an as yet largely undeveloped market, including the potentially wide range of applications of zero

emission infrastructure that go beyond the examples in the comment letter. Because of this uncertainty, staff will continue to engage in efforts to refine these costs estimates as more data becomes available, and pursue approaches and policies that can lower these costs when feasible. In particular, individual rulemakings will evaluate in greater detail the "soft costs" that may be expected for each particular regulated sector.

Response to Comment 3-5

Regarding the comment on L-CMB-07, please see the Responses to Comments 41-1 and 41-3 in the Final 2022 AQMP Comments and Responses to Comments document.

South Coast AQMD staff is committed to reanalyzing the costs associated FUG-01 and Rule 1178 in future rulemakings. A complete cost-effectiveness analysis will be conducted during any future rulemakings that relies on the most current and relevant data on compliance costs available. Staff agrees that is imperative that the Governing Board is presented with a complete and accurate cost information when considering the passage of any proposed rule.

Comment Letter #4

November 2, 2022

To: SocioEcon@aqmd.gov
Cc: Elaine Shen <eshen@aqmd.gov>, Brian Vlasich <bvlasich@aqmd.gov>, Ian MacMillan <imacmillan@aqmd.gov>, Sang-Mi Lee <slee@aqmd.gov>, Nichole Quick <nquick@aqmd.gov>;
From: James E. Enstrom <jenstrom@ucla.edu>

Re: Enstrom Comment on 2022 SCAQMD AQMP Draft Socioeconomic Report

The October 1, 2022 Draft Socioeconomic Report (Draft SES Report) for the 2022 SCAQMD AQMP was written by two SCAQMD Officials (I. Elaine Shen, PhD, Planning and Rules Manager, and Brian Vlasich, Air Quality Specialist), Industrial Economics, Inc. (IEc) staff, and Regional Economic Models, Inc. (REMI) staff. There was no input from the SCAQMD Health Effects Officer, because the position has been vacant this year. Thus, no epidemiologic expertise from SCAQMD was used in the preparation of this report and objective epidemiologic expertise is required because epidemiologic studies provide the primary evidence for the adverse health effects of PM2.5 and ozone.

Numerous important epidemiologic findings showing no California deaths due to PM2.5 and ozone deaths have been omitted from both the main body of 2022 AQMP and the Draft SES Report. The critical comments that I have submitted regarding the 2016 AQMP, the 2012 AQMP, and the 2007 AQMP have been systematically ignored and my publications are not cited in the main text of these AQMPs. In additions, the findings and publications of many other critics are not cited. 4-1

As direct evidence of the flaws in the Draft SES Report, I describe eight items below.

1. The Draft SES Report Table 3-3 shows 1619 "Premature Deaths Avoided, All Cause" in 2032 [page 3-7]. The text states "the adult all-cause mortality effects associated with long-term PM2.5 exposure were estimated based on pooling C-R [concentration-response] functions estimated in Jerrett et al. (2005), Jerrett et al. (2013), and the kriging and land use regression results from Krewski et al. (2009) . . . It should be noted that the health effect estimation does not use a concentration threshold below which the affected population would stop benefiting from further reduced exposure to ambient air pollution." [page 3-8]. However, I challenge the validity of this premature death claim and the text that is used to justify this claim. There are no premature deaths due to PM2.5 and ozone in California and current levels of air pollution are below the threshold that is associated with these alleged deaths, as explained in the next paragraph.

2. The Draft SES Report ignores the overwhelming epidemiologic evidence of NO relationship [relative risk (RR) = 1.00] between PM2.5 and total mortality in California. The weighted average of the most recent results from six different California cohorts show RR = 0.999 (0.988-1.010), which means there are NO premature deaths caused by PM2.5 in California. An appended table summarizing this null California evidence was included in my January 30, 2017 comment to then SCAQMD Health Effects Officer Jo Kay Chan Ghosh, PhD. This evidence was also presented in my attached March 28, 2017 Dose-Response Article "Fine Particulate Matter and Total Mortality in Cancer Prevention Study Cohort Reanalysis" (DOI: 10.1177/1559325817693345). My null findings invalidate the positive nationwide relationship between PM2.5 and total mortality published in the seminal Pope 1995 paper, which is 4-2

based on the American Cancer Society Cancer Prevention Study II (CPS II) cohort. Also, my null CPS II cohort findings raise serious doubts about validity of the positive CPS II cohort findings in Jerrett 2005, Jerrett 2009, and Jerrett 2013. 4-2 Cont.

3. There is independent evidence supporting flaws in these three Jerrett studies used in the Draft SES Report. On November 11, 2016 I made a US Office of Research Integrity allegation that Jerrett 2013 falsified and exaggerated the relationship between PM2.5 and total mortality in California. On December 21, 2016 an ORI Investigator stated regarding the Jerrett 2013 results "it appears that the relative risks reported do not seem to rise to the level of clinical significance and do not provide evidence that air pollution is directly responsible for mortality." My US ORI allegation and a table showing NO PM2.5-mortality relationship in California are appended. 4-3

4. The Draft SES Report is not based on personal exposure to PM2.5, ozone, and NOx in the SCAB. The personal exposures to these pollutants are much lower than the ambient levels recorded at SCAQMD monitors and the average human exposures are well below the level of measurable health effects for these air pollutants. SCAQMD Board Members and SCAB residents must be informed of their actual exposures to pollutants. Furthermore, they must be informed that these levels are well below the corresponding US EPA NAAQS. Typical personal exposure levels are PM2.5 < 5 ug/m3 and ozone < 20 ppb. These levels are far below the level of known health effects. Detailed evidence is provide in the attached 2022 comments that I have made to the EPA CASAC PM2.5 Review Panel and the EPA CASAC Ozone Review Panel. 4-4

5. The Draft SES Report provides no context regarding the impact of air pollution and other risk factors on the overall health of SCAB residents. An appended table shows low 2014 age-adjusted death rates from all causes, all cancer, and all respiratory disease in California and the SCAB. These death rates are among the lowest in the United States and the World. Another appended table shows similiar low 2019 age-adjusted total death rates, particularly for Los Angeles Hispanics. 4-5

6. The Draft SES Report DOES NOT comply with California Health and Safety Code Section 40471 (b). Instead of satisfying the requirement "the south coast district board, in conjunction with a public health organization or agency, shall prepare a report on the health impacts of particulate matter air pollution in the South Coast Air Basin." Instead of satisfying the requirement to prepare Health Effects Appendix I "in conjunction with a public health organization or agency," you instead prepared it in conjunction with aggressive regulatory agencies: US EPA and CalEPA (OEHHA and CARB). Instead of satisfying the requirement that the "south coast district board shall hold public hearings concerning the report and the peer review," four October 2022 public hearings were conducted without the SCAQMD Board. 4-6

7. The attached April 15, 2022 SCAQMD Notice of Intent to Sue EPA because of Federal Sources of air pollution provides strong evidence that the 2022 AQMP is completely impractical with regarding to achieving the existing PM2.5 and ozone NAAQS. (see pages xx-yy) 4-7

8. An additional factor complicating the implementation of the 2022 AQMP is the June 30, 2022 SCOTUS decision regarding West Virginia v. EPA. This decision found that Congress, not EPA, has the ultimate authority regarding costly environmental regulations as per the "major questions" doctrine. 4-8

The Draft SES Report must be modified to include a presentation based on NO premature deaths. This presentation needs to be compared with the existing presentation in a way that is understandable to the SCAQMD Board. The monetized public health benefits from avoided premature deaths and reduced morbidity conditions due to the emission reductions resulting from implementation of the 2022 AQMP are estimated to be $20 billion in 2032. The public health benefits from allegedly avoiding 1,619 premature deaths are $19.3 billion in 2032 and the remaining benefits coming from reduced incidence of morbidity conditions. However, the public health benefits are only $0.7 billion in 2032 if there are NO premature deaths and these benefits are far less than the economic costs of $2.85 billion in 2032.

4-9

I can make a strong case that the 2022 AQMP should not be implemented because it is NOT justified on a scientific or public health basis. Also, I plan to make a strong case to business and taxpayer groups in Southern California that the 2022 AQMP is socioeconomically unjustified and should not be implemented.

Thank you for fully addressing these comments and modifying the Draft SES Report appropriately.

Sincerely yours,

James E. Enstrom, PhD, MPH, FFACE
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Attachment A to Comment Letter #4

Original Article

Dose-Response:
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January-March 2017:1-12

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SAGE

Fine Particulate Matter and Total Mortality in Cancer Prevention Study Cohort Reanalysis

James E. Enstrom[1]

Abstract

Background: In 1997 the US Environmental Protection Agency (EPA) established the National Ambient Air Quality Standard (NAAQS) for fine particulate matter ($PM_{2.5}$), largely because of its positive relationship to total mortality in the 1982 American Cancer Society Cancer Prevention Study (CPS II) cohort. Subsequently, EPA has used this relationship as the primary justification for many costly regulations, most recently the Clean Power Plan. An independent analysis of the CPS II data was conducted in order to test the validity of this relationship.

Methods: The original CPS II questionnaire data, including 1982 to 1988 mortality follow-up, were analyzed using Cox proportional hazards regression. Results were obtained for 292 277 participants in 85 counties with 1979-1983 EPA Inhalable Particulate Network $PM_{2.5}$ measurements, as well as for 212 370 participants in the 50 counties used in the original 1995 analysis.

Results: The 1982 to 1988 relative risk (RR) of death from all causes and 95% confidence interval adjusted for age, sex, race, education, and smoking status was 1.023 (0.997-1.049) for a 10 $\mu g/m^3$ increase in $PM_{2.5}$ in 85 counties and 1.025 (0.990-1.061) in the 50 original counties. The fully adjusted RR was null in the western and eastern portions of the United States, including in areas with somewhat higher $PM_{2.5}$ levels, particularly 5 Ohio Valley states and California.

Conclusion: No significant relationship between $PM_{2.5}$ and total mortality in the CPS II cohort was found when the best available $PM_{2.5}$ data were used. The original 1995 analysis found a positive relationship by selective use of CPS II and $PM_{2.5}$ data. This independent analysis of underlying data raises serious doubts about the CPS II epidemiologic evidence supporting the $PM_{2.5}$ NAAQS. These findings provide strong justification for further independent analysis of the CPS II data.

Keywords
epidemiology, $PM_{2.5}$, deaths, CPS II, reanalysis

Introduction

In 1997 the US Environmental Protection Agency (EPA) established the National Ambient Air Quality Standard (NAAQS) for fine particulate matter ($PM_{2.5}$), largely because of its positive relationship to total mortality in the 1982 American Cancer Society (ACS) Cancer Prevention Study (CPS II) cohort, as published in 1995 by Pope et al.[1] The EPA uses this positive relationship to claim that $PM_{2.5}$ *causes* premature deaths. However, the validity of this finding was immediately challenged with detailed and well-reasoned criticism.[2-4] The relationship still remains contested and much of the original criticism has never been properly addressed, particularly the need for truly independent analysis of the CPS II data.

The EPA claim that $PM_{2.5}$ *causes* premature deaths is implausible because no etiologic mechanism has ever been established and because it involves the lifetime inhalation of only about 5 g of particles that are less than 2.5 μm in diameter.[5] The $PM_{2.5}$ mortality relationship has been further challenged because the small increased risk could be due to well-known epidemiological biases, such as, the ecological fallacy, inaccurate exposure measurements, and confounding variables like copollutants. In addition, there is extensive evidence of spatial and temporal variation in $PM_{2.5}$ mortality risk (MR) that does not support 1 national standard for $PM_{2.5}$.

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In spite of these serious problems, EPA and the major $PM_{2.5}$ investigators continue to assert that their positive findings are sufficient proof that $PM_{2.5}$ *causes* premature deaths. Their premature death claim has been used to justify many costly EPA regulations, most recently, the Clean Power Plan.[6] Indeed, 85% of the total estimated benefits of all EPA regulations have been attributed to reductions in $PM_{2.5}$-related premature deaths. With the assumed benefits of $PM_{2.5}$ reductions playing such a major role in EPA regulatory policy, it is essential that the relationship of $PM_{2.5}$ to mortality be independently verified with transparent data and reproducible findings.

In 1998, the Health Effects Institute (HEI) in Boston was commissioned to conduct a detailed reanalysis of the original Pope 1995 findings. The July 2000 HEI Reanalysis Report (HEI 2000) included "PART I: REPLICATION AND VALIDATION" and "PART II: SENSITIVITY ANALYSES."[7] The HEI Reanalysis Team lead by Daniel Krewski successfully replicated and validated the 1995 CPS II findings, but they did not analyze the CPS II data in ways that would determine whether the original results remained robust using different sources of air pollution data. For instance, none of their models used the best available $PM_{2.5}$ measurements as of 1995.

Particularly troubling is the fact that EPA and the major $PM_{2.5}$ investigators have ignored multiple null findings on the relationship between $PM_{2.5}$ and mortality in California. These null findings include my 2005 paper,[8] 2006 clarification,[9] 2012 American Statistical Society Joint Statistical Meeting Proceedings paper,[10] and 2015 International Conference on Climate Change presentation about the Clean Power Plan and $PM_{2.5}$-related cobenefits.[6] There is now overwhelming evidence of a null $PM_{2.5}$ mortality relationship in California dating back to 2000. The problems with the $PM_{2.5}$ mortality relationship have generated substantial scientific and political concern.

During 2011 to 2013, the US House Science, Space, and Technology Committee (HSSTC) repeatedly requested that EPA provide access to the underlying CPS II data, particularly since substantial Federal funding has been used for CPS II $PM_{2.5}$ mortality research and publications. On July 22, 2013, the HSSTC made a particularly detailed request to EPA that included 49 pages of letters dating back to September 22, 2011.[11] When EPA failed to provide the requested data, the HSSTC issued an August 1, 2013 subpoena to EPA for the CPS II data.[12] The ACS refused to comply with the HSSTC subpoena, as explained in an August 19, 2013 letter to EPA by Chief Medical Officer Otis W. Brawley.[13] Then, following the subpoena, ACS has refused to work with me and 3 other highly qualified investigators regarding collaborative analysis of the CPS II data.[14] Finally, HEI has refused to conduct my proposed CPS II analyses.[15] However, my recent acquisition of an original version of the CPS II data has made possible this first truly independent analysis.

Methods

Computer files containing the original 1982 ACS CPS II deidentified questionnaire data and 6-year follow-up data on deaths from September 1, 1982 through August 31, 1988, along with detailed documentation, were obtained from a source with appropriate access to these data, as explained in the "Acknowledgments." This article presents my initial analysis of the CPS II cohort and it is subject to the limitations of data and documentation that is not as complete and current as the data and documentation possessed by ACS.

The research described below is exempt from human participants or ethics approval because it involved only statistical analysis of existing deidentified data. Human participants' approval was obtained by ACS in 1982 when each individual enrolled in CPS II. Because of the epidemiologic importance of this analysis, an effort will be made to post on my Scientific Integrity Institute website a version of the CPS II data that fully preserves the confidentiality of all of participants and that contains enough information to verify my findings.

Of the 1.2 million total CPS II participants, analysis has been done on 297 592 participants residing in 85 counties in the continental United States with 1979 to 1983 EPA Inhalable Particulate Network (IPN) $PM_{2.5}$ measurements.[16,17] Among these participants, there were 18 612 total deaths from September 1, 1982 through August 31, 1988; 17 329 of these deaths (93.1%) had a known date of death. Of the 297 592 participants, 292 277 had age at entry of 30 to 99 years and sex of male [1] or female [2]. Of the 292 277 participants, 269 766 had race of white [1,2,5] or black [3,4]; education level of no or some high school [1,2], high school graduate [3], some college [4,5], college graduate [6], or graduate school [7]; and smoking status of never [1], former [5-8 for males and 3 for females], or current [2-4 for males and 2 for females]. Those participants reported to be dead [D, G, K] but without an exact date of death have been assumed to be alive in this analysis. The unconfirmed deaths were randomly distributed and did not impact relative comparisons of death in a systematic way. The computer codes for the above variables are shown in brackets.

CPS II participants were entered into the master data file geographically. Since this deidentified data file does not contain home addresses, the Division number and Unit number assigned by ACS to each CPS II participant have been used to define their county of residence. For instance, ACS Division 39 represents the state of Ohio and its Unit 041 represents Jefferson County, which includes the city of Steubenville, where the IPN $PM_{2.5}$ measurements were made. In other words, most of the 575 participants in Unit 041 lived in Jefferson County as of September 1, 1982. The IPN $PM_{2.5}$ value of 29.6739 $\mu g/m^3$, based on measurements made in Steubenville, was assigned to all CPS II participants in Unit 041. This $PM_{2.5}$ value is a weighted average of 53 measurements (mean of 33.9260 $\mu g/m^3$) and 31 measurements (mean of 29.4884 $\mu g/m^3$) made during 1979 to 1982[16] and 53 measurements (mean of 27.2473 $\mu g/m^3$) and 54 measurements (mean of 28.0676 $\mu g/m^3$) made during 1983.[17] The IPN $PM_{2.5}$ data were collected only during 1979 to 1983, although some other IPN air pollution data were collected through 1984. The values for each county that includes a city with CPS II participants and IPN $PM_{2.5}$ measurements are shown in Appendix Table A1.

Table 1. Summary Characteristics of CPS II Participants in (1) Pope 1995 Table 1,[1] (2) HEI 2000 Table 24,[7] and (3) Current Analysis Based on CPS II Participants in 50 and 85 Counties.

Characteristics	Pope 1995 Table 1	HEI 2000 Table 24	Current CPS II Analysis		
			n = 50 HEI $PM_{2.5}$	n = 50 IPN $PM_{2.5}$	n = 85 IPN $PM_{2.5}$
Number of metro areas	50	50			
Number of counties	Not stated	Not stated	50	50	85
Age–sex-adjusted participants			212 370	212 370	292 277
Fully adjusted participants	295 223	298 817	195 215	195 215	269 766
Age–sex-adjusted deaths			12 518	12 518	17 231
Fully adjusted deaths	20 765	23 093	11 221	11 221	15 593
Values below are for participants in fully adjusted results					
Age at enrollment, mean years	56.6	56.6	56.66	56.66	56.64
Sex (% females)	55.9	56.4	56.72	56.72	56.61
Race (% white)	94.0	94.0	94.58	94.58	95.09
Less than high school education, %	11.3	11.3	11.71	11.71	11.71
Never smoked regularly, %			41.69	41.69	41.57
Former smoker, %			33.25	33.25	33.67
Former cigarette smoker, %	29.4	30.2	30.43	30.43	30.81
Current smoker, %			25.06	25.06	24.76
Current cigarette smoker, %	21.6	21.4	21.01	21.01	20.76
Fine particles, $\mu g/m^3$					
Average	18.2	18.2	17.99	21.37	21.16
SD	5.1	4.4	4.52	5.30	5.98
Range	9.0-33.5	9.0-33.4	9.0-33.4	10.77-29.67	10.63-42.01

Abbreviations: CPS, Cancer Prevention Study; HEI, Health Effects Institute; IPN, Inhalable Particulate Network; $PM_{2.5}$, fine particulate matter.

To make the best possible comparison with Pope 1995 and HEI 2000 results, the HEI $PM_{2.5}$ value of 23.1 $\mu g/m^3$ for Steubenville was assigned to all participants in Unit 041. This value is the median of $PM_{2.5}$ measurements made in Steubenville and is shown in HEI 2000 Appendix D "Alternative Air Pollution Data in the ACS Study."[7] Analyses were done for the 50 counties containing the original 50 cities with CPS II participants and HEI $PM_{2.5}$ values used in Pope 1995 and HEI 2000. Additional analyses were done for all 85 counties containing cities with both CPS II participants and IPN $PM_{2.5}$ data. Without explanation, Pope 1995 and HEI 2000 omitted from their analyses, 35 cities with CPS II participants and IPN $PM_{2.5}$ data. To be clear, these analyses are based on the CPS II participants assigned to each Unit (county) that included a city with IPN $PM_{2.5}$ data. The original Pope 1995 and HEI 2000 analyses were based on the CPS II participants assigned to each metropolitan area (MA) that included a city with HEI $PM_{2.5}$ data, as defined in HEI 2000 Appendix F "Definition of Metropolitan Areas in the ACS Study."[7] The MA, which was equivalent to the US Census Bureau Standard Metropolitan Statistical Area (SMSA), always included the county containing the city with the HEI $PM_{2.5}$ data and often included 1 or more additional counties.

The SAS 9.4 procedure PHREG was used to conduct Cox proportional hazards regression.[18] Relative risks (RRs) for death from all causes and 95% confidence intervals (CI) were calculated using age–sex adjustment and full adjustment (age, sex, race, education, and smoking status, as defined above). Each of the 5 adjustment variables had a strong relationship to total mortality. Race, education, and smoking status were the 3 adjustment variables that had the greatest impact on the age–sex-adjusted RR. The Pope 1995 and HEI 2000 analyses used 4 additional adjustment variables that had a lesser impact on the age–sex-adjusted RR.

In addition, county-level ecological analyses were done by comparing IPN $PM_{2.5}$ and HEI $PM_{2.5}$ values to 1980 age-adjusted white total death rates (DRs) determined by the Centers for Disease Control and Prevention (CDC) WONDER[19] and mortality risks (MRs) as shown in Figures 5 and 21 of HEI 2000.[7] Death rates are age adjusted to the 2000 US Standard Population and are expressed as annual deaths per 100 000 persons. The SAS 9.4 procedure REGRESSION was used to conduct linear regression of $PM_{2.5}$ values with DRs and MRs.

Appendix Table A1 lists the 50 original cities used in Pope 1995 and HEI 2000 and includes city, county, state, ACS Division and Unit numbers, Federal Information Processing Standards (FIPS) code, IPN average $PM_{2.5}$ level, HEI median $PM_{2.5}$ level, 1980 DR, and HEI MR. Appendix Table A1 also lists similar information for the 35 additional cities with CPS II participants and IPN $PM_{2.5}$ data. However, HEI $PM_{2.5}$ and HEI MR data are not available for these 35 cities.

Results

Table 1 shows basic demographic characteristics for the CPS II participants, as stated in Pope 1995,[1] HEI 2000,[7] and this current analysis. There is excellent agreement on age, sex, race, education, and smoking status. However, the IPN $PM_{2.5}$ averages are generally about 20% higher than the HEI $PM_{2.5}$ medians, although the differences range from +78% to −28%.

Table 2. Age–Sex-Adjusted and Fully Adjusted Relative Risk of Death From All Causes (RR and 95% CI) From September 1, 1982 Through August 31, 1988 Associated With Change of 10 μg/m^3 Increase in $PM_{2.5}$ for CPS II Participants Residing in 50 and 85 Counties in the Continental United States With 1979 to 1983 IPN $PM_{2.5}$ Measurements.[a]

$PM_{2.5}$ Years and Source	Number of Counties	Number of Participants	Number of Deaths	RR	95% CI Lower Upper	Average $PM_{2.5}$
Age–sex adjusted RR for the continental United States						
1979-1983 IPN	85	292 277	17 321	1.038	(1.014-1.063)	21.16
1979-1983 IPN	50	212 370	12 518	1.046	(1.013-1.081)	21.36
1979-1983 HEI	50	212 370	12 518	1.121	(1.078-1.166)	17.99
Fully adjusted RR for the continental United States						
1979-1983 IPN	85	269 766	15 593	1.023	(0.997-1.049)	21.15
1979-1983 IPN	50	195 215	11 221	1.025	(0.990-1.061)	21.36
1979-1983 HEI	50	195 215	11 221	1.082	(1.039-1.128)	17.99
Age–sex adjusted RR for Ohio Valley States (IN, KY, OH, PA, WV)						
1979-1983 IPN	17	56 979	3649	1.126	(1.011-1.255)	25.51
1979-1983 IPN	12	45 303	2942	1.079	(0.951-1.225)	25.76
1979-1983 HEI	12	45 303	2942	1.153	(1.027-1.296)	22.02
Fully adjusted RR for Ohio Valley states (IN, KY, OH, PA, WV)						
1979-1983 IPN	17	53 026	3293	1.096	(0.978-1.228)	25.51
1979-1983 IPN	12	42 174	2652	1.050	(0.918-1.201)	25.75
1979-1983 HEI	12	42 174	2652	1.111	(0.983-1.256)	22.02
Age–sex adjusted RR for states other than the Ohio Valley states						
1979-1983 IPN	68	235 298	13 672	0.999	(0.973-1.027)	20.11
1979-1983 IPN	38	167 067	9576	0.983	(0.946-1.021)	20.18
1979-1983 HEI	38	167 067	9576	1.045	(0.997-1.096)	16.90
Fully adjusted RR for states other than the Ohio Valley states						
1979-1983 IPN	68	216 740	12 300	0.994	(0.967-1.023)	20.09
1979-1983 IPN	38	153 041	8569	0.975	(0.936-1.015)	20.15
1979-1983 HEI	38	153 041	8569	1.025	(0.975-1.078)	16.89

Abbreviations: CI, confidence interval; CPS, Cancer Prevention Study; HEI, Health Effects Institute; IPN, Inhalable Particulate Network; $PM_{2.5}$, particulate matter.
[a]Analysis includes continental United States, 5 Ohio Valley states, and remainder of the states. Appendix Table A1 lists the 85 cities and counties with $PM_{2.5}$ measurements.

Table 2 shows that during 1982 to 1988, there was no significant relationship between IPN $PM_{2.5}$ and total mortality in the entire United States. The fully adjusted RR and 95% CI was 1.023 (0.997-1.049) for a 10 μg/m^3 increase in $PM_{2.5}$ in all 85 counties and 1.025 (0.990-1.061) in the 50 original counties. Indeed, the fully adjusted RR was not significant in any area of the United States, such as, the states west of the Mississippi River, the states east of the Mississippi River, the 5 Ohio Valley states (Indiana, Kentucky, Ohio, Pennsylvania, and West Virginia), and the states other than the Ohio Valley states. The age–sex-adjusted and fully adjusted RRs in the states other than the Ohio Valley states are all consistent with no relationship and most are very close to 1.00. The slightly positive age–sex-adjusted RRs for the entire United States and the Ohio Valley states became statistically consistent with no relationship after controlling for the 3 confounding variables of race, education, and smoking status.

However, the fully adjusted RR for the entire United States was 1.082 (1.039-1.128) when based on the HEI $PM_{2.5}$ values in 50 counties. This RR agrees quite well with the fully adjusted RR of 1.067 (1.037-1.099) for 1982 to 1989, which is shown in Table 34 of the June 2009 HEI Extended Follow-up Research Report (HEI 2009).[20] Thus, the positive nationwide RRs in the CPS II cohort depend upon the use of HEI $PM_{2.5}$ values. The nationwide RRs are consistent with no effect when based on IPN $PM_{2.5}$ values. The findings in Table 2 clearly demonstrate the large influence of $PM_{2.5}$ values and geography on the RRs.

Table 3 shows that the fully adjusted RR in California was 0.992 (0.954-1.032) when based on IPN $PM_{2.5}$ values in all 11 California counties. This null finding is consistent with the 15 other findings of a null relationship in California, all of which are shown in Appendix Table B1. However, when the RR is based on the 4 California counties used in Pope 1995 and HEI 2000, there is a significant inverse relationship. The fully adjusted RR is 0.879 (0.805-0.960) when based on the IPN $PM_{2.5}$ values and is 0.870 (0.788-0.960) when based on the HEI $PM_{2.5}$ values. This significant inverse relationship is in exact agreement with the finding of a special analysis of the CPS II cohort done for HEI by Krewski in 2010, which yielded a fully adjusted RR of 0.872 (0.805-0.944) during 1982 to 1989 in California when based on HEI $PM_{2.5}$ values.[21] In this instance, the California RRs are clearly dependent upon the number of counties used.

Table 4 shows that the ecological analysis based on linear regression is quite consistent with the proportional hazard regression results in Tables 2 and 3, in spite of the fact that the regression results are not fully adjusted. Using 1980 age-adjusted white total DRs versus HEI $PM_{2.5}$ values in 50 counties, linear regression yielded a regression coefficient of 6.96 (standard error [SE] = 1.85) that was statistically significant at the 95% confidence level. Pope 1995 reported a significant regression coefficient for 50 cities of 8.0 (SE = 1.4). However, this positive coefficient is

Table 3. Age–Sex-Adjusted and Fully Adjusted Relative Risk of Death From All Causes (RR and 95% CI) From September 1, 1982 Through August 31, 1988 Associated With 10 μg/m^3 Increase in $PM_{2.5}$ for California CPS II Participants Living in 4 and 11 Counties With 1979 to 1983 IPN $PM_{2.5}$ Measurements.[a]

$PM_{2.5}$ Years and Source	Number of Counties	Number of Participants	Number of Deaths	RR	95% CI of RR Lower Upper	Average $PM_{2.5}$
Age–sex adjusted RR for California during 1982 to 1988						
1979-1983 IPN	11	66 615	3856	1.005	(0.968-1.043)	24.08
1979-1983 IPN	4	40 527	2146	0.904	(0.831-0.983)	24.90
1979-1983 HEI	4	40 527	2146	0.894	(0.817-0.986)	18.83
Fully adjusted (age, sex, race, education, and smoking status) RR for California during 1982 to 1988						
1979-1983 IPN	11	60 521	3512	0.992	(0.954-1.032)	24.11
1979-1983 IPN	4	36 201	1939	0.879	(0.805-0.960)	25.01
1979-1983 HEI	4	36 201	1939	0.870	(0.788-0.960)	18.91
Fully adjusted (44 confounders) RR for California during 1982 to 1989 as per Krewski[21]						
"Same" Standard Cox Model 1979-1983 HEI	4	40 408		0.872	(0.805-0.944)	~19
"Different" Standard Cox Model 1979-1983 HEI	4	38 925		0.893	(0.823-0.969)	~19

Abbreviations: CI, confidence interval; CPS, Cancer Prevention Study; HEI, Health Effects Institute; IPN, Inhalable Particulate Network; $PM_{2.5}$, particulate matter.
[a]Also, fully adjusted RR for California participants in 4 counties from September 1, 1982 through December 31, 1989 as calculated by Krewski.[21]

Table 4. Linear Regression Results for 1979 to 1983 IPN $PM_{2.5}$ and 1979 to 1983 HEI $PM_{2.5}$ Versus 1980 Age-Adjusted White Total Death Rate (DR) for 85 Counties With IPN $PM_{2.5}$ Data and for 50 HEI 2000 Counties With IPN $PM_{2.5}$ and HEI $PM_{2.5}$ data.

DR or MR, $PM_{2.5}$ Years and Source	Number of Counties	DR or MR Intercept	DR or MR Slope	95% CI of DR or MR Slope Lower	Upper	*P* Value
Entire continental United States						
DR and 1979-1983 IPN	85	892.68	6.8331	3.8483	9.8180	0.0000
DR and 1979-1983 HEI	50	910.92	6.9557	3.2452	10.6662	0.0004
MR and 1979-1983 IPN	50	0.6821	0.0102	0.0044	0.0160	0.0009
MR and 1979-1983 HEI	50	0.6754	0.0121	0.0068	0.0173	0.0000
Ohio Valley states (IN, KY, OH, PA, and WV)						
DR and 1979-1983 IPN	17	941.77	6.0705	−0.0730	12.2139	0.0524
DR and 1979-1983 HEI	12	1067.29	1.3235	−7.3460	9.9930	0.7408
MR and 1979-1983 IPN	12	0.8153	0.0077	−0.0054	0.0208	0.2202
MR and 1979-1983 HEI	12	0.9628	0.0020	−0.0080	0.0121	0.6608
States other than the Ohio Valley states						
DR and 1979-1983 IPN	68	921.45	4.8639	0.9093	8.8186	0.0167
DR and 1979-1983 HEI	38	934.66	4.8940	−0.4337	10.2218	0.0706
MR and 1979-1983 IPN	38	0.8111	0.0020	−0.0054	0.0094	0.5891
MR and 1979-1983 HEI	38	0.7334	0.0072	0.0000	0.0144	0.0491
States west of the Mississippi river						
DR and 1979-1983 IPN	36	920.10	4.0155	−0.9396	8.9706	0.1088
DR and 1979-1983 HEI	22	930.11	4.1726	−5.2015	13.5468	0.3642
MR and 1979-1983 IPN	22	0.8663	−0.0025	−0.0162	0.0112	0.7067
MR and 1979-1983 HEI	22	0.6413	0.0134	−0.0018	0.0285	0.0807
California						
DR and 1979-1983 IPN	11	921.71	3.6516	−1.8230	9.1262	0.1656
DR and 1979-1983 HEI	4	992.50	1.9664	−46.6929	50.6256	0.8780
MR and 1979-1983 IPN	4	0.9529	−0.0074	−0.0600	0.0453	0.6072
MR and 1979-1983 HEI	4	0.8336	−0.0021	−0.0618	0.0576	0.8935

Abbreviations: CI, confidence interval; HEI, Health Effects Institute; IPN, Inhalable Particulate Network; MR, mortality risk; $PM_{2.5}$, particulate matter.
[a]Linear regression results are also shown for 1979 to 1983 IPN $PM_{2.5}$ and 1979 to 1983 HEI $PM_{2.5}$ versus MR for the 50 "cities" (metropolitan areas) in figures 5 and 21 in HEI 2000.

misleading because both DRs and $PM_{2.5}$ levels are higher in the East than in the West. Regional regression analyses did not generally yield significant regression coefficients. Specifically, there were no significant regression coefficients for California, the 5 Ohio Valley states, or all states west of the Mississippi River. These findings reinforce the CPS II cohort evidence of statistically insignificant $PM_{2.5}$ MR throughout the United States.

Conclusion

This independent analysis of the CPS II cohort found that there was no significant relationship between $PM_{2.5}$ and death from all causes during 1982 to 1988, when the best available $PM_{2.5}$ measurements were used for the 50 original counties and for all 85 counties with $PM_{2.5}$ data and CPS II participants. However, a positive relationship was found when the HEI $PM_{2.5}$ measurements were used for the 50 original counties, consistent with the findings in Pope 1995 and HEI 2000. This null and positive evidence demonstrates that the $PM_{2.5}$ mortality relationship is not robust and is quite sensitive to the $PM_{2.5}$ data and CPS II participants used in the analysis.

Furthermore, the following statement on page 80 of HEI 2000 raises serious doubts about the quality of the air pollution data used in Pope 1995 and HEI 2000: "AUDIT OF AIR QUALITY DATA. The ACS study was not originally designed as an air pollution study. The air quality monitoring data used for the ACS analyses came from various sources, some of which are now technologically difficult to access. Documentation of the statistical reduction procedures has been lost. Summary statistics for different groups of standard metropolitan statistical areas had been derived by different investigators. These data sources do not indicate whether the tabulated values refer to all or a subset of monitors in a region or whether they represent means or medians."[7]

The Pope 1995 and HEI 2000 analyses were based on 50 median $PM_{2.5}$ values shown in Appendix A of the 1988 Brookhaven National Laboratory Report 52122 by Lipfert et al.[22] These analyses did not use or cite the high quality and widely known EPA IPN $PM_{2.5}$ data in spite of the fact that these data have been available in 2 detailed EPA reports since 1986.[16,17] Lipfert informed HEI about the IPN data in 1998: "During the early stages of the Reanalysis Project, I notified HEI and the reanalysis contractors of the availability of an updated version of the IPN data from EPA, which they apparently obtained. This version includes more locations and a slightly longer period of time. It does not appear that the newer IPN data are listed in Appendix G, and it is thus not possible to confirm if SMSA assignments were made properly."[23]

Thus, the HEI Reanalysis Team failed to properly "evaluate the sensitivity of the original findings to the indicators of exposure to fine particle air pollution used by the Original Investigators" and failed to select "all participants who lived within each MA for which data on sulfate or fine particle pollution were available."[7] Furthermore, HEI 2009 did not use these data even though the investigators were aware of my 2005 null $PM_{2.5}$ mortality findings in California,[8] which were based on the IPN data for 11 California counties, instead of the 4 California counties used in Pope 1995 and HEI 2000. Indeed, HEI 2009 did not cite my 2005 findings, in spite of my personal discussion of these findings with Pope, Jerrett, and Burnett on July 11, 2008.[24] Finally, HEI 2009 did not acknowledge or address my 2006 concerns about the geographic variation in $PM_{2.5}$ MR clearly shown in HEI 2000 Figure 21,[7] which is included here as Appendix Figure C1. HEI 2009 entirely avoided the issue of geographic variation in $PM_{2.5}$ MR and omitted the equivalent to HEI 2000 Figure 21.

Since 2002, HEI has repeatedly refused to provide the city-specific $PM_{2.5}$-related MR for the 50 cities included in HEI 2000 Figure 21.[15] I estimated these MRs in 2010 based on visual measurements of HEI 2000 Figure 5, and my estimates are shown in Appendix Table A1.[25] Figure 21 and its MRs represented early evidence that there was no $PM_{2.5}$-related MR in California. Appendix Table B1 shows the now overwhelming 2000 to 2016 evidence from 6 different cohorts that there is no relationship between $PM_{2.5}$ and total mortality in California. Indeed, the weighted average RR of the latest results from the 6 California cohorts is RR = 0.999 (0.988-1.010).[26]

The authors of the CPS II $PM_{2.5}$ mortality publications, which began with Pope 1995, have faced original criticism,[2-4] my criticism,[6-10,14,15] and the criticism of the HSSTC and its subpoena.[11-13] Now, my null findings represent a direct challenge to the positive findings of Pope 1995. All of this criticism is relevant to the EPA claim that $PM_{2.5}$ has a *causal* relationship to total mortality. The authors of Pope 1995, HEI 2000, and HEI 2009 need to promptly address my findings, as well as the earlier criticism. Then, they need to cooperate with critics on transparent air pollution epidemiology analyses of the CPS II cohort data.

Also, major scientific journals like the *New England Journal of Medicine* (*NEJM*) and *Science,* which have consistently written about the positive relationship between $PM_{2.5}$ and total mortality, need to publish evidence of no relationship when strong null evidence is submitted to them. In 2015, *Science* immediately rejected without peer reviewing 3 versions of strong evidence that $PM_{2.5}$ does not *cause* premature deaths.[5] In 2016, *Science* immediately rejected without peer reviewing this article. Indeed, this article was rejected by *NEJM*, *Science*, and 5 other major journals, as described in a detailed compilation of relevant correspondence.[27] Most troubling is the rejection by the *American Journal of Respiratory and Clinical Care Medicine*, which has published Pope 1995 and several other $PM_{2.5}$ mortality articles based on the CPS II cohort data.

In summary, the null CPS II $PM_{2.5}$ mortality findings in this article directly challenge the original positive Pope 1995 findings, and they raise serious doubts about the CPS II epidemiologic evidence supporting the $PM_{2.5}$ NAAQS. These findings demonstrate the importance of independent and transparent analysis of underlying data. Finally, these findings provide strong justification for further independent analysis of CPS II cohort data.

Appendix A

Table A1. List of the 85 Counties Containing the 50 Cities Used in Pope 1995, HEI 2000, and This Analysis, as well as the 35 Additional Cities Used Only in This Analysis.[a]

State	ACS Div-Unit	FIPS Code	IPN/HEI County Containing IPN/HEI City	IPN/HEI City With $PM_{2.5}$ Measurements	1979-1983 IPN $PM_{2.5}$, $\mu g/m^3$, (Weighted Average)	1979-1983 HEI $PM_{2.5}$, $\mu g/m^3$ (Median)	1980 Age-Adj White Death Rate (DR)	HEI Figure 5 Mortality Risk (MR)
AL	01037	01073	Jefferson	Birmingham	25.6016	24.5	1025.3	0.760
AL	01049	01097	Mobile	Mobile	22.0296	20.9	1067.2	0.950
AZ	03700	04013	Maricopa	Phoenix	15.7790	15.2	953.0	0.855
AR	04071	05119	Pulaski	Little Rock	20.5773	17.8	1059.4	0.870
CA	06001	06001	Alameda	Livermore	14.3882		1016.6	
CA	06002	06007	Butte	Chico	15.4525		962.5	
CA	06003	06013	Contra Costa	Richmond	13.9197		937.1	
CA	06004	06019	Fresno	Fresno	18.3731	10.3	1001.4	0.680
CA	06008	06029	Kern	Bakersfield	30.8628		1119.3	
CA	06051	06037	Los Angeles	Los Angeles	28.2239	21.8	1035.1	0.760
CA	06019	06065	Riverside	Rubidoux	42.0117		1013.9	
CA	06020	06073	San Diego	San Diego	18.9189		943.7	
CA	06021	06075	San Francisco	San Francisco	16.3522	12.2	1123.1	0.890
CA	06025	06083	Santa Barbara	Lompoc	10.6277		892.8	
CA	06026	06085	Santa Clara	San Jose	17.7884	12.4	921.9	0.885
CO	07004	08031	Denver	Denver	10.7675	16.1	967.3	0.925
CO	07047	08069	Larimer	Fort Collins	11.1226		810.5	
CO	07008	08101	Pueblo	Pueblo	10.9155		1024.1	
CT	08001	09003	Hartford	Hartford	18.3949	14.8	952.0	0.845
CT	08004	09005	Litchfield	Litchfield	11.6502		941.5	
DE	09002	10001	Kent	Dover	19.5280		959.4	
DE	09004	10003	New Castle	Wilmington	20.3743		1053.7	
DC	10001	11001	Dist Columbia	Washington	25.9289	22.5	993.2	0.850
FL	11044	12057	Hillsborough	Tampa	13.7337	11.4	1021.8	0.845
GA	12027	13051	Chatham	Savannah	17.8127		1029.6	
GA	12062	13121	Fulton	Atlanta	22.5688	20.3	1063.5	0.840
ID	13001	16001	ADA	Boise	18.0052	12.1	892.6	0.600
IL	14089	17031	Cook	Chicago	25.1019	21.0	1076.3	0.945
IL	14098	17197	Will	Braidwood	17.1851		1054.0	
IN	15045	18089	Lake	Gary	27.4759	25.2	1129.8	0.995
IN	15049	18097	Marion	Indianapolis	23.0925	21.1	1041.2	0.970
KS	17287	20173	Sedgwick	Wichita	15.0222	13.6	953.4	0.890
KS	17289	20177	Shawnee	Topeka	11.7518	10.3	933.7	0.830
KY	18010	21019	Boyd	Ashland	37.7700		1184.6	
KY	18055	21111	Jefferson	Louisville	24.2134		1095.7	
MD	21106	24510	Baltimore City	Baltimore	21.6922		1237.8	
MD	21101	24031	Montgomery	Rockville	20.2009		881.9	
MA	22105	25013	Hampden	Springfield	17.5682		1025.3	
MA	22136	25027	Worcester	Worcester	16.2641		1014.6	
MN	25001	27053	Hennepin	Minneapolis	15.5172	13.7	905.3	0.815
MN	25150	27123	Ramsey	St Paul	15.5823		935.7	
MS	26086	28049	Hinds	Jackson	18.1339	15.7	1087.4	0.930
MO	27001	29095	Jackson	Kansas City	17.8488		1090.3	
MT	28009	30063	Missoula	Missoula	17.6212		938.0	
MT	28011	30093	Silver Bow	Butte	16.0405		1299.5	
NE	30028	31055	Douglas	Omaha	15.2760	13.1	991.0	0.880
NV	31101	32031	Washoe	Reno	13.1184	11.8	1049.5	0.670
NJ	33004	34007	Camden	Camden	20.9523		1146.9	
NJ	33007	34013	Essex	Livingston	16.4775		1072.7	
NJ	33009	34017	Hudson	Jersey City	19.9121	17.3	1172.6	0.810
NM	34201	35001	Bernalillo	Albuquerque	12.8865	9.0	1014.7	0.710
NY	36014	36029	Erie	Buffalo	25.1623	23.5	1085.6	0.960
NY	35001	36061	New York	New York City	23.9064		1090.4	
NC	37033	37063	Durham	Durham	19.4092	16.8	1039.2	1.000

(continued)

Table A1. (continued)

State	ACS Div-Unit	FIPS Code	IPN/HEI County Containing IPN/HEI City	IPN/HEI City With $PM_{2.5}$ Measurements	1979-1983 IPN $PM_{2.5}$, $\mu g/m^3$, (Weighted Average)	1979-1983 HEI $PM_{2.5}$, $\mu g/m^3$ (Median)	1980 Age-Adj White Death Rate (DR)	HEI Figure 5 Mortality Risk (MR)
NC	37064	37119	Mecklenburg	Charlotte	24.1214	22.6	932.8	0.835
OH	39009	39017	Butler	Middletown	25.1789		1108.3	
OH	39018	39035	Cuyahoga	Cleveland	28.4120	24.6	1089.1	0.980
OH	39031	39061	Hamilton	Cincinnati	24.9979	23.1	1095.2	0.980
OH	39041	39081	Jefferson	Steubenville	29.6739	23.1	1058.6	1.145
OH	39050	39099	Mahoning	Youngstown	22.9404	20.2	1058.4	1.060
OH	39057	39113	Montgomery	Dayton	20.8120	18.8	1039.5	0.980
OH	39077	39153	Summit	Akron	25.9864	24.6	1064.0	1.060
OK	40055	40109	Oklahoma	Oklahoma City	14.9767	15.9	1050.4	0.985
OR	41019	41039	Lane	Eugene	17.1653		885.5	
OR	41026	41051	Multnomah	Portland	16.3537	14.7	1060.8	0.830
PA	42101	42003	Allegheny	Pittsburgh	29.1043	17.9	1115.6	1.005
PA	42443	42095	Northampton	Bethlehem	19.5265		998.6	
PA	43002	42101	Philadelphia	Philadelphia	24.0704	21.4	1211.0	0.910
RI	45001	44007	Providence	Providence	14.2341	12.9	1006.1	0.890
SC	46016	45019	Charleston	Charleston	16.1635		1023.5	
TN	51019	47037	Davidson	Nashville	21.8944	20.5	981.9	0.845
TN	51088	47065	Hamilton	Chattanooga	18.2433	16.6	1087.9	0.840
TX	52811	48113	Dallas	Dallas	18.7594	16.5	1024.9	0.850
TX	52859	48141	El Paso	El Paso	16.9021	15.7	903.5	0.910
TX	52882	48201	Harris	Houston	18.0421	13.4	1025.7	0.700
UT	53024	49035	Salt Lake	Salt Lake City	16.6590	15.4	954.3	1.025
VA	55024	51059	Fairfax	Fairfax	19.5425		925.7	
VA	55002	51710	Norfolk City	Norfolk	19.5500	16.9	1139.3	0.910
WA	56017	53033	King	Seattle	14.9121	11.9	943.6	0.780
WA	56032	53063	Spokane	Spokane	13.5200	9.4	959.2	0.810
WV	58130	54029	Hancock	Weirton	25.9181		1094.8	
WV	58207	54039	Kanawha	Charleston	21.9511	20.1	1149.5	1.005
WV	58117	54069	Ohio	Wheeling	23.9840	33.4	1117.5	1.020
WI	59005	55009	Brown	Green Bay	20.5462		931.0	
WI	59052	55105	Rock	Beloit	19.8584		1019.4	

[a]Each location includes State, ACS Division Unit number, Federal Information Processing Standards (FIPS) code, IPN/HEI county, IPN/HEI city with $PM_{2.5}$ measurements, 1979-1983 IPN average $PM_{2.5}$ level, 1979-1983 HEI median $PM_{2.5}$ level, 1980 age-adjusted white county total death rate (annual deaths per 100 000), and HEI 2000 figure 5 mortality risk for HEI city (metropolitan area). List also includes 35 additional counties containing cities with IPN $PM_{2.5}$ data used in this analysis. These 35 counties do not have HEI $PM_{2.5}$ data.

Appendix B

Table B1. Epidemiologic Cohort Studies of $PM_{2.5}$ and Total Mortality in California, 2000 to 2016: Relative Risk of Death From All Causes (RR and 95% CI) Associated With Increase of 10 $\mu g/m^3$ in $PM_{2.5}$ (http://scientificintegrityinstitute.org/NoPMDeaths081516.pdf).

Krewski 2000 and 2010[a,b]	CA CPS II Cohort	N = 40 408	RR = 0.872 (0.805-0.944)	1982-1989
(N = [18 000 M + 22 408 F]; 4 MSAs; 1979-1983 $PM_{2.5}$; 44 covariates)				
McDonnell 2000[c]	CA AHSMOG Cohort	N ~ 3800	RR ~ 1.00 (0.95-1.05)	1977-1992
(N ~ [1347 M + 2422 F]; SC&SD&SF AB; M RR = 1.09 (0.98-1.21) & F RR ~ 0.98 (0.92-1.03))				
Jerrett 2005[d]	CPS II Cohort in LA Basin	N = 22 905	RR = 1.11 (0.99-1.25)	1982-2000
(N = 22 905 M and F; 267 zip code areas; 1999-2000 $PM_{2.5}$; 44 cov + max confounders)				
Enstrom 2005[e]	CA CPS I Cohort	N = 35 783	RR = 1.039 (1.010-1.069)	1973-1982
(N = [15 573 M + 20 210 F]; 11 counties; 1979-1983 $PM_{2.5}$)			RR = 0.997 (0.978-1.016)	1983-2002
Enstrom 2006[f]	CA CPS I Cohort	N = 35 783	RR = 1.061 (1.017-1.106)	1973-1982
(N = [15 573 M + 20 210 F]; 11 counties; 1979-1983 and 1999-2001 $PM_{2.5}$)			RR = 0.995 (0.968-1.024)	1983-2002
Zeger 2008[g]	MCAPS Cohort "West"	N = 3 100 000	RR = 0.989 (0.970-1.008)	2000-2005
(N = [1.5 M M + 1.6 M F]; Medicare enrollees in CA + OR + WA (CA = 73%); 2000-2005 $PM_{2.5}$)				

(continued)

Table B1. (continued)

Jerrett 2010[h]	CA CPS II Cohort	N = 77 767	RR ~ 0.994 (0.965-1.025)	1982-2000
(N = [34 367 M + 43 400 F]; 54 counties; 2000 $PM_{2.5}$; KRG ZIP; 20 ind cov + 7 eco var; slide 12)				
Krewski 2010[b] (2009)	CA CPS II Cohort			
(4 MSAs; 1979-1983 $PM_{2.5}$; 44 cov)		N = 40 408	RR = 0.960 (0.920-1.002)	1982-2000
(7 MSAs; 1999-2000 $PM_{2.5}$; 44 cov)		N = 50 930	RR = 0.968 (0.916-1.022)	1982-2000
Jerrett 2011[i]	CA CPS II Cohort	N = 73 609	RR = 0.994 (0.965-1.024)	1982-2000
(N = [32 509 M + 41 100 F]; 54 counties; 2000 $PM_{2.5}$; KRG ZIP Model; 20 ind cov + 7 eco var; Table 28)				
Jerrett 2011[i]	CA CPS II Cohort	N = 73 609	RR = 1.002 (0.992-1.012)	1982-2000
(N = [32 509 M + 41 100 F]; 54 counties; 2000 $PM_{2.5}$; Nine Model Ave; 20 ic + 7 ev; Figure 22 and Tables 27-32)				
Lipsett 2011[j]	CA Teachers Cohort	N = 73 489	RR = 1.01 (0.95-1.09)	2000-2005
(N = [73 489 F]; 2000-2005 $PM_{2.5}$)				
Ostro 2011[k]	CA Teachers Cohort	N = 43 220	RR = 1.06 (0.96-1.16)	2002-2007
(N = [43 220 F]; 2002-2007 $PM_{2.5}$)				
Jerrett 2013[l]	CA CPS II Cohort	N = 73 711	RR = 1.060 (1.003-1.120)	1982-2000
(N = [~32 550 M + ~41 161 F]; 54 counties; 2000 $PM_{2.5}$; LUR Conurb Model; 42 ind cov + 7 eco var + 5 metro; Table 6)				
Jerrett 2013[l]	CA CPS II Cohort	N = 73 711	RR = 1.028 (0.957-1.104)	1982-2000
(Same parameters and model as above, except including co-pollutants NO_2 and Ozone; Table 5)				
Ostro 2015[m]	CA Teachers Cohort	N = 101 884	RR = 1.01 (0.98-1.05)	2001-2007
(N = [101 881 F]; 2002-2007 $PM_{2.5}$) (all natural causes of death)				
Thurston 2016[n]	CA NIH-AARP Cohort	N = 160 209	RR = 1.02 (0.99-1.04)	2000-2009
(N = [~95 965 M + ~64 245 F]; full baseline model: $PM_{2.5}$ by zip code; Table 3) (all natural causes of death)				
Enstrom 2016 unpublished	CA NIH-AARP Cohort	N = 160 368	RR = 1.001 (0.949-1.055)	2000-2009
(N = [~96 059 M + ~64 309 F]; full baseline model: 2000 $PM_{2.5}$ by county)				

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Appendix C

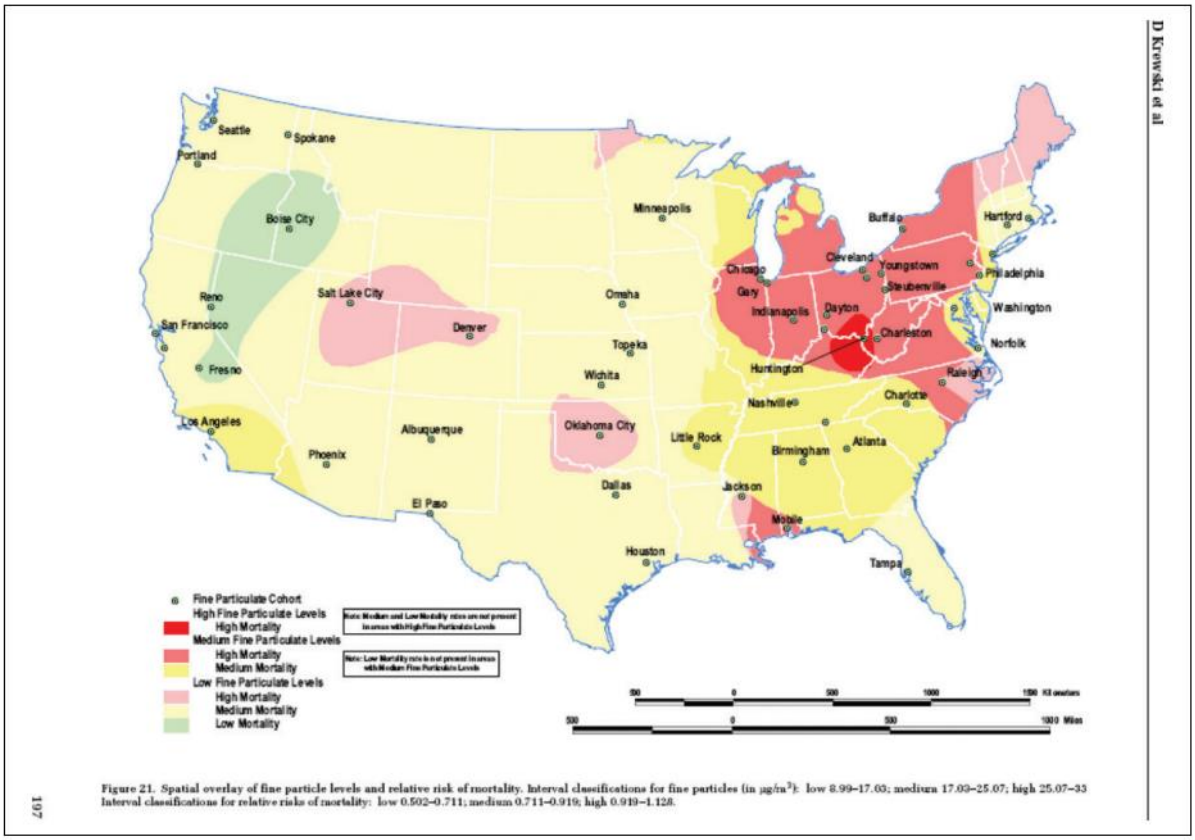

Figure C1. 1982 to 1989 $PM_{2.5}$ mortality risk (MR) in 50 cities (metropolitan areas) shown in Figure 21 on page 197 of HEI 2000[7,9] and listed in Appendix Table B1. Figure 21. Spatial overlay of fine particle levels and relative risk of mortality. Interval classifications for fine particles (in g/m^3): low 8.99 to 17.03: medium 17.03 to 25.07; high 25.07 to 33. Interval classifications for relative risks of mortality: low 0.052 to 0.711; medium 0.711 to 0.919; high 0.919 to 1.128.

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Supplemental Material

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Attachment B to Comment Letter #4

August 29, 2022

US EPA CASAC Ozone Review Panel Regarding Ozone NAAQS Reconsideration
https://casac.epa.gov/ords/sab/f?p=113:19:17031850757072:::RP,19:P19_ID:976
https://youtu.be/UkmVujyGsq0 (minutes 18-24)
http://scientificintegrityinstitute.org/OzonePanel082922.pdf

Dr. James Enstrom's Verbal Comment to EPA CASAC Ozone Review Panel

I am Dr. James Enstrom. I have had a long career as an epidemiologist at UCLA and I have made significant contributions to air pollution epidemiology, particularly regarding the importance of transparency and reproducibility. I have made oral public comments to CASAC on November 17, 2021 (http://scientificintegrityinstitute.org/PMpanel121021.pdf), February 25, 2022 (http://scientificintegrityinstitute.org/PMpanel022522.pdf), and June 8, 2022 (http://scientificintegrityinstitute.org/Ozonepanel060822.pdf) and I have submitted detailed written criticism based on these comments. My criticism is highly relevant to the PM2.5 and Ozone NAAQS. Thus far, the criticism by me and numerous other public speakers has been totally ignored by CASAC. This lack of response represents disrespect for objective science by CASAC.

I described this disrespect in my August 16, 2022 DDP talk "Politicized EPA Promotes Anti-American Pseudoscience" (https://rumble.com/v1gvnuf-politicized-epa-promotes-anti-american-pseudoscience.html). I pointed out that the January 20, 2021 Presidential Order Protecting Public Health directed immediate review and action to "address the promulgation of Federal regulations and other actions during the last 4 years" (https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/). This order challenged the validity of all Federal regulations during the Trump Administration and lead to the unjustified creation of the current CASAC. This order is a prime example of how regulatory science in America has become highly politicized. An ongoing Federal Lawsuit makes a strong case that the current CASAC is illegally constituted because it violates the Federal Advisory Committee Act requirements of viewpoint diversity and no conflicts of interest (https://junkscience.com/2021/10/former-casac-chair-added-as-plaintiff-in-young-v-epa/).

In addition, CASAC refuses to address the evidence that current average levels of human exposure to PM2.5 and ozone in the US are below the levels of known human health effects. In my office in the supposedly polluted city of Los Angeles, my ozone monitor reads about 10 parts per billion (ppb) and my PM2.5 monitor reads about 3 $\mu g/m^3$. These levels are far below the current NAAQS (https://www.epa.gov/criteria-air-pollutants/naaqs-table).

Also, CASAC refuses to acknowledge the extreme publication bias against null air pollution health effects findings that I documented in my earlier comments. The 2021 EPA Policy Assessment for PM2.5 ignored at least 60 authors, including me, who have published null findings or criticized the PM2.5 NAAQS (http://scientificintegrityinstitute.org/PMpanel121021.pdf). Similar publication bias exists regarding the Ozone NAAQS, but even with this bias the April 2022 EPA Ozone Policy Assessment Reconsideration recommended leaving the Ozone NAAQS unchanged (draft 2022 policy assessment).

Also, CASAC refuses to support the fundamental principle of the scientific method that air pollution health effects must be based on findings that are transparent and reproducible. My 2017 and 2018 reanalysis of the ACS CPS II cohort found serious flaws in the seminal Pope 1995 article and the 2000 HEI Reanalysis and demonstrated the importance of access to underlying data (http://scientificintegrityinstitute.org/DRPM25JEEPope052918.pdf). However, on April 18 *Science* Editor-in-Chief Holden Thorp reinforced his strong bias against EPA transparency by personally writing to me that he will not publish any article, letter, or electronic letter that I submit to *Science* that supports "Strengthening Transparency in Regulatory Science" (http://scientificintegrityinstitute.org/ThorpJEE041822.pdf).

As my final evidence of anti-science bias, CASAC Member Christina Fuller gave a misleading presentation in the June 26 HEI Webinar "Setting Ambient Air Quality Standards—What's Science Got to Do With It?" (https://www.youtube.com/watch?v=XAcrlTxeiXA). Furthermore, she has not addressed my June 30 evidence that science has nothing to do with the current NAAQS (http://scientificintegrityinstitute.org/JEEFuller081822.pdf). Even worse, the HEI Board of Directors Chair Richard Meserve rejected my June 30 request to initiate an independent investigation of misconduct by HEI and my July 6 request to arrange a debate on whether particulates cause premature death (http://scientificintegrityinstitute.org/JEEMeserve072222.pdf). These developments challenge the scientific integrity of HEI.

In conclusion, CASAC must address the extensive evidence that Americans are not being harmed by their current personal exposure to PM2.5 and ozone, but are being harmed by the regulations that are due to scientifically flawed PM2.5 and ozone NAAQS. However, regardless of what CASAC does, this evidence is being presented to the American people.

Thank you very much.

James E. Enstrom, PhD, MPH, FFACE
Retired UCLA Research Professor (Epidemiology)
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Attachment C to Comment Letter #4

February 25, 2022
US EPA CASAC PM Panel Webcast re PM2.5 NAAQS based on 2021 PM ISA Supp & PM PA
(https://www.youtube.com/watch?v=ZkMsBXwyenw)
(https://casac.epa.gov/ords/sab/f?p=113:19:22380851460992:::RP,19:P19_ID:966)

Dr. James Enstrom's Verbal Comment to EPA CASAC PM Panel re PM2.5 NAAQS

I have 50 years of experience in conducting epidemiologic cohort studies and I have published important peer-reviewed PM2.5 death findings based on ACS CPS I and CPS II cohort data. The February 4 PM Panel letters do not address the detailed public criticism of the 2021 PM ISA Supplement and PM PA. The EPA staff has made NO changes in these documents in response to this criticism. In particular, they ignored Richard Smith's evidence of NO PM2.5 deaths below 12 μg/m³ and my 36 pages of evidence that PM2.5 DOES NOT *cause* premature deaths in the US (http://scientificintegrityinstitute.org/pmpanel121021.pdf).

The recommendations of the PM Panel and EPA staff to tighten the PM2.5 NAAQS are based on a deliberately falsified research record regarding PM2.5-related deaths. Falsification is serious scientific misconduct as defined in the January 11 White House OSTP Scientific Integrity Task Force Report. Thus, I request that Jennifer Peel, with a PhD in Epidemiology, confirm that the PM PA is "a robust and comprehensive evaluation of the epidemiologic literature" and that public comments like mine do not alter her evaluation.

There is NO scientific or public health justification for tightening the PM2.5 NAAQS because there is no etiologic mechanism by which inhaling about 100 μg of PM2.5 per day can cause death and the US already has a very low average PM2.5 level of 7 μg/m³ whereas our competitor China has a very high level of 48 μg/m³. Indeed, there are adverse public health, welfare, social, economic, and energy effects associated with tightening the PM2.5 NAAQS. This tightening will hurt America at a time when it is facing military and economic dangers from Russia and China, as well as rapidly increasing energy costs. Finally, I strongly support the ongoing Young and Cox v. EPA lawsuit because the Biden CASAC and its PM Panel are illegally constituted and in gross violation of the Federal Advisory Committee Act. The current misguided effort to tighten the PM2.5 NAAQS must be stopped.

Thank you.

James E. Enstrom, PhD, MPH, FFACE
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Attachment D to Comment Letter #4

January 30, 2017

Jo Kay Chan Ghosh, Ph.D.
Health Effects Officer
South Coast Air Quality Management District
jghosh@aqmd.gov

Dear Dr. Ghosh,

I am writing to express my extreme disappointment with your December 8, 2016 Final Draft 2016 AQMP Appendix I Health Effects. Your January 3, 2017 198-page document, Responses to Comments on Appendix I, DOES NOT address the numerous critical comments that I submitted to you on January 11, 2016 and July 26, 2016 and August 15, 2016. Below I describe six major problems with the final version of Appendix I.

1. Appendix I DOES NOT comply with California Health and Safety Code Section 40471 (b). Instead of satisfying the requirement "the south coast district board, in conjunction with a public health organization or agency, shall prepare a report on the health impacts of particulate matter air pollution in the South Coast Air Basin," you stated on page 188 of your Responses document "it is not the intention of this Appendix to assess whether there is or is not an effect of a specific air pollutant on any particular health endpoint . . . ." Instead of satisfying the requirement to prepare Appendix I "in conjunction with a public health organization or agency," you instead prepared it in conjunction with two aggressive regulatory agencies within CalEPA: OEHHA and CARB. Instead of satisfying the requirement that the "south coast district board shall hold public hearings concerning the report and the peer review," you held four November 2016 public hearings which were conducted without the SCAQMD Board Members

2. Appendix I and your Responses document DO NOT describe the overwhelming evidence of NO relationship [relative risk (RR) = 1.00] between $PM_{2.5}$ and total mortality in California. The weighted average of the most recent results from six different California cohorts show RR = 0.999 (0.988-1.010), which means there are NO premature deaths caused by $PM_{2.5}$ in California. An appended table shows this null California evidence. This table, which is page 5 of my August 15, 2016 comments, was deliberately omitted from your Responses document.

3. Appendix I and your Responses document completely ignore this statement in my August 15, 2016 comments: "I have now submitted for publication a manuscript with null findings that invalidate the positive nationwide relationship between $PM_{2.5}$ and total mortality published in the seminal Pope 1995 paper, which is based on the American Cancer Society Cancer Prevention Study II (CPS II) cohort. My null CPS II cohort findings raise serious doubts about validity of the positive CPS II cohort findings in Jerrett 2005, Jerrett 2009, and Jerrett 2013, which have been used as the basis for the $PM_{2.5}$ premature death claims in the PPTs of Drs. Oliver and Shen." My manuscript, entitled "Fine Particulate Matter and Total Mortality in Cancer Prevention Study II Reanalysis," is now in press in a PubMed recognized scientific journal and should appear online in February 2017. This paper provides important new evidence that $PM_{2.5}$ does not cause premature deaths anywhere in the United States, including California.

4. Appendix I and the 2016 AQMP SES Report rely heavily the $PM_{2.5}$-mortality publications by Dr. Michael Jerrett and his co-authors. You have co-authored with Jerrett seven air pollution related publications during 2011-2016. This co-authorship raises serious doubts about your objectivity, particularly since you have ignored null $PM_{2.5}$-mortality results and have ignored my challenges to the validity of the Jerrett publications. On November 11, 2016 I made a US Office of Research Integrity allegation that Jerrett 2013 falsified and exaggerated the relationship between $PM_{2.5}$ and total mortality in California. An ORI Investigator agreed that the Jerrett 2013 results "do not provide evidence that air pollution is directly responsible for mortality." My US ORI allegation and a table showing NO $PM_{2.5}$-mortality relationship in California are appended.

5. Appendix I does not describe the ACTUAL human exposures to $PM_{2.5}$, ozone, and NOx in the SCAB. The human exposures to these pollutants are much lower than the ambient levels recorded at SCAQMD monitors and the average human exposures are well below the level of measurable health effects for these air pollutants. SCAQMD Board Members and SCAB residents must be informed of their actual exposures to pollutants. Furthermore, they must be informed that these levels are well below the corresponding US EPA NAAQS.

6. Appendix I provides no context regarding the impact of air pollution and other risk factors on the overall health of SCAB residents. An appended table shows low 2014 age-adjusted death rates from all causes, all cancer, and all respiratory disease in California and the SCAB. These death rates are among the lowest in the United States and the World. This table, which is page 6 of my August 15, 2016 comments, was deliberately omitted from your Responses document.

If the 2016 AQMP is approved by the SCAQMD Board on February 3, 2017, I will make a strong case to the new US EPA Administrator, the US House Science Committee, the US House Energy Committee, and the US Senate Environment Committee that the AQMP should not be implemented because it is NOT justified on a scientific or public health basis. Also, I will make a strong case to business and taxpayer groups in Southern California that the 2016 AQMP is scientifically unjustified and should not be funded. Many concerned scientists like myself are doing everything we can to stop SCAQMD from implementing new unjustified environmental regulations in Southern California, as part of a national effort to reduce unjustified regulations.

Finally, I am sending this email letter to all UCLA School of Public Health faculty members who have been involved with SCAQMD and/or with your 2011 Ph.D. in Epidemiology. I request that these faculty members assess my above comments and inform SCAQMD whether they believe the 2016 AQMP is justified on a public health basis. These faculty members are directly responsible for your training as an environmental epidemiologist and you, as a prominent public health official, are a direct reflection of the values and integrity of the School of Public Health.

Thank you for taking this message seriously, because it is a VERY SERIOUS message.

Sincerely yours,

James E. Enstrom, Ph.D., M.P.H.
UCLA and Scientific Integrity Institute
http://climateconferences.heartland.org/james-enstrom-iccc10-panel-8/
http://climateconferences.heartland.org/iccc-12/
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Summary Table. Epidemiologic cohort studies of $PM_{2.5}$ and total mortality in California, 2000-2016
Relative risk of death from all causes (RR and 95% CI) associated with increase of 10 µg/m³ in PM2.5
(http://scientificintegrityinstitute.org/NoPMDeaths112215.pdf)

Krewski 2000 & 2010 CA CPS II Cohort N=40,408 RR = 0.872 (0.805-0.944) 1982-1989
(N=[18,000 M + 22,408 F]; 4 MSAs; 1979-1983 PM2.5; 44 covariates)

McDonnell 2000 CA AHSMOG Cohort N~3,800 RR ~ 1.00 (0.95 – 1.05) 1977-1992
(N~[1,347 M + 2,422 F]; SC&SD&SF AB; M RR=1.09(0.98-1.21) & F RR~0.98(0.92-1.03))

Jerrett 2005 CPS II Cohort in LA Basin N=22,905 RR = 1.11 (0.99 - 1.25) 1982-2000
(N=22,905 M & F; 267 zip code areas; 1999-2000 PM2.5; 44 cov + max confounders)

Enstrom 2005 CA CPS I Cohort N=35,783 RR = 1.039 (1.010-1.069) 1973-1982
(N=[15,573 M + 20,210 F]; 11 counties; 1979-1983 PM2.5) RR = 0.997 (0.978-1.016) 1983-2002

Enstrom 2006 CA CPS I Cohort N=35,783 RR = 1.061 (1.017-1.106) 1973-1982
(11 counties; 1979-1983 & 1999-2001 PM2.5) RR = 0.995 (0.968-1.024) 1983-2002

Zeger 2008 MCAPS Cohort "West" N=3,100,000 RR = 0.989 (0.970-1.008) 2000-2005
(N=[1.5 M M + 1.6 M F]; Medicare enrollees in CA+OR+WA (CA=73%); 2000-2005 PM2.5)

Jerrett 2010 CA CPS II Cohort N=77,767 RR ~ 0.994 (0.965-1.025) 1982-2000
(N=[34,367 M + 43,400 F]; 54 counties; 2000 PM2.5; KRG ZIP; 20 ind cov+7 eco var; Slide 12)

Krewski 2010 (2009) CA CPS II Cohort
(4 MSAs; 1979-1983 PM2.5; 44 cov) N=40,408 RR = 0.960 (0.920-1.002) 1982-2000
(7 MSAs; 1999-2000 PM2.5; 44 cov) N=50,930 RR = 0.968 (0.916-1.022) 1982-2000

Jerrett 2011 CA CPS II Cohort N=73,609 RR = 0.994 (0.965-1.024) 1982-2000
(N=[32,509 M + 41,100 F]; 54 counties; 2000 PM2.5; KRG ZIP Model; 20 ind cov+7 eco var; Table 28)

Jerrett 2011 CA CPS II Cohort N=73,609 RR = 1.002 (0.992-1.012) 1982-2000
(N=[32,509 M + 41,100 F]; 54 counties; 2000 PM2.5; Nine Model Ave; 20 ic+7 ev; Fig 22 & Tab 27-32)

Lipsett 2011 CA Teachers Cohort N=73,489 RR = 1.01 (0.95 – 1.09) 2000-2005
(N=[73,489 F]; 2000-2005 PM2.5)

Ostro 2011 CA Teachers Cohort N=43,220 RR = 1.06 (0.96 – 1.16) 2002-2007
(N=[43,220 F]; 2002-2007 PM2.5)

Jerrett 2013 CA CPS II Cohort N=73,711 RR = 1.060 (1.003–1.120) 1982-2000
(N=[~32,550 M + ~41,161 F]; 54 counties; 2000 PM2.5; LUR Conurb Model; 42 ind cov+7 eco var+5 metro; Table 6)

Jerrett 2013 CA CPS II Cohort N=73,711 RR = 1.028 (0.957-1.104) 1982-2000
(same parameters and model as above, except including co-pollutants NO2 and Ozone; Table 5)

Ostro 2015 CA Teachers Cohort N=101,884 RR = 1.01 (0.98 -1.05) 2001-2007
(N=[101,881 F]; 2002-2007 PM2.5) (all natural causes of death)

Thurston 2016 CA NIH-AARP Cohort N=160,209 RR = 1.02 (0.99 -1.04) 2000-2009
(N=[~95,965 M + ~64,245 F]; full baseline model: PM2.5 by zip code; Table 3) (all natural causes of death)

Enstrom 2016 unpub CA NIH-AARP Cohort N=160,368 RR = 1.001 (0.949-1.055) 2000-2009
(N=[~96,059 M + ~64,309 F]; full baseline model: 2000 PM2.5 by county)

Attachment E to Comment Letter #4

Allegation of Research Misconduct by Dr. Michael Jerrett and Co-Authors

James E. Enstrom, Ph.D., M.P.H.
UCLA and Scientific Integrity Institute
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November 11, 2016

I allege research misconduct (falsification) by UCLA Professor Michael Jerrett, Ph.D., and his primary co-authors C. Arden Pope, Ph.D., Daniel Krewski, Ph.D., George Thurston, Sc.D., Richard T. Burnett, Ph.D., Michael J. Thun, M.D., and Susan P. Gapstur, Ph.D., regarding their attached September 1, 2013 *AJRCCM* paper "Spatial Analysis of Air Pollution and Mortality in California" (http://www.atsjournals.org/doi/abs/10.1164/rccm.201303-0609OC). The authors received a portion of their funding for this research from NIEHS and CDC within DHHS. While claiming that fine particulate matter ($PM_{2.5}$) was associated with mortality from all causes (total mortality) in their study, the authors omitted their own null findings and the null findings of others. These omitted findings clearly show NO association. Thus, they have engaged in falsification as defined by DHHS and the Public Health Service: "omitting data or results such that the research is not accurately represented in the research record" (Section 93.103(b) of 42 CFR 93) (http://ori.hhs.gov/sites/default/files/42_cfr_parts_50_and_93_2005.pdf).

The *AJRCCM* paper claims there is a positive relationship between $PM_{2.5}$ and mortality from all causes in California because their "conurbation" land use regression (LUR) model yielded a slightly positive relative risk of RR=1.060 (1.003-1.120), as shown in Table 6. However, complete study results are in the October 28, 2011 Jerrett CARB Final Report "Spatiotemporal Analysis of Air Pollution and Mortality in California Based on the American Cancer Society Cohort: Final Report" (http://www.arb.ca.gov/research/apr/past/06-332.pdf). The eight entirely null models, shown in the attached Report Table 22, were omitted from the paper. The results for all nine models are shown in my Summary Table on the next page. The weighted average relative risk for all nine models is RR=1.002 (0.992-1.012), which means NO relationship.

Furthermore, the *AJRCCM* paper does not cite any of the null California $PM_{2.5}$-mortality results from other papers and reports dating back to 2000, including earlier findings by Dr. Jerrett. These results are shown on the next page, as well as on the attached August 15, 2016 Summary Table that I presented to SCAQMD (http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/Draft2016AQMP/2016-aqmp-appendix-i-comment-letter (letter #7). The weighted average relative risk for the most recent result from each of the six different California cohorts is RR=0.999 (0.988-1.010), which means NO relationship.

I contend that the falsification in the paper was deliberate because it was done after extensive criticism of the June 9, 2011 Draft Report and the October 28, 2011 Final Report. This criticism was presented to the authors via CARB by myself, William M. Briggs, Ph.D., John D. Dunn, M.D., S. Stanley Young, Ph.D., Gordon Fulks, Ph.D., and Frederick W. Lipfert, Ph.D. A compilation of all criticism of the 2011 Report is attached (http://www.scientificintegrityinstitute.org/JerrettCriticism102811.pdf). Detailed criticism of the *AJRCCM* paper, including its misrepresentation of the results contained in the CARB Report, was given by Dr. Briggs in his statistical blogs of August 6, 2013 (http://wmbriggs.com/blog/?p=8720), September 11, 2013 (http://wmbriggs.com/blog/?p=8990), and September 25, 2013 (http://wmbriggs.com/blog/?p=9241).

In conclusion, Dr. Jerrett and his co-authors falsified the relationship between $PM_{2.5}$ and total mortality in California in their *AJRCCM* paper by deliberately omitting their own null evidence and the null evidence of others. This is quite disturbing because $PM_{2.5}$-mortality claims in the paper are being used as public health justification for the very costly SCAQMD 2016 Air Quality Management Plan (http://www.aqmd.gov/).

Summary Table. Epidemiologic cohort studies of PM2.5 and total mortality in California, 2000-2016
Relative risk of death from all causes (RR and 95% CI) associated with increase of 10 μg/m³ (IQR=10) in $PM_{2.5}$

Study (Year)	Cohort	RR	95% CI	F-U Years
Jerrett 2013 (*AJRCCM* Table 6 Model)	CA CPS II	1.060	(1.003–1.120)	1982-2000
Jerrett 2011 (CARB Report Figure 22)	CA CPS II			
KRG IND Model (Table 30, IQR=8.52902→10.0)		0.992	(0.965-1.020)	1982-2000
KRG ZIP Model (Table 28, IQR=8.4735→10.0)		0.993	(0.964-1.023)	1982-2000
KRG IND+O3 Model (Figure 22 extrapolated, IQR=10.0)		1.020	(0.980-1.060)	1982-2000
IDW IND Model (Table 29, IQR=8.74→10.0)		1.003	(0.978-1.028)	1982-2000
IDW ZIP Model (Table 27, IQR=9.37→10.0)		0.995	(0.967-1.025)	1982-2000
BME IND Model (Figure 22 extrapolated, IQR=10.0)		1.000	(0.975-1.025)	1982-2000
LUR IND Model (Table 31, IQR=5.35→10.0)		1.009	(0.980-1.039)	1982-2000
LUR IND+5 Metro Model (Abstract Table 1, IQR=10.0) [Jerrett 2013 Model]		1.080	(1.000-1.150)	1982-2000
RS IND Model (Table 32, IQR= 5.39→10.0)		0.998	(0.968-1.029)	1982-2000
Weighted Average of All Nine Models		1.002	(0.992-1.012)	1982-2000
Other Results by Jerrett and Other Investigators				
Krewski Jerrett 2000 (RR for CA 2010)	CA CPS II	0.872	(0.805-0.944)	1982-1989
McDonnell 2000 *	CA AHSMOG	~ 1.00	(0.95 – 1.05)	1977-1992
Jerrett 2005	CPS II (LA Basin Only)	1.11	(0.99 - 1.25)	1982-2000
Enstrom 2005 *	CA CPS I	0.997	(0.978-1.016)	1983-2002
Zeger 2008 *	MCAPS "West=CA+OR+WA"	0.989	(0.970-1.008)	2000-2005
Jerrett 2010	CA CPS II	~ 0.994	(0.965-1.025)	1982-2000
Krewski Jerrett 2009 (RR for CA 2010)*	CA CPS II	0.968	(0.916-1.022)	1982-2000
Lipsett Jerrett 2011	CA Teachers	1.01	(0.95 – 1.09)	2000-2005
Ostro 2011	CA Teachers	1.06	(0.96 – 1.16)	2002-2007
Ostro 2015 *	CA Teachers	1.01	(0.98 - 1.05)	2001-2007
Thurston 2016 *	CA NIH-AARP	1.02	(0.99 - 1.04)	2000-2009
Weighted Average of Latest Results (*) from Six California Cohorts		0.999	(0.988-1.010)	

From: Hohmann, Ann (HHS/OASH) <Ann.Hohmann@hhs.gov>
Sent: Wednesday, December 21, 2016 10:46 AM
To: jenstrom@ucla.edu
Cc: Garfinkel, Susan J (HHS/OASH) <Susan.Garfinkel@hhs.gov>; Trenkle, William (OS/OASH) <William.Trenkle@hhs.gov>
Subject: DIO 6351

Dear Dr. Enstrom,

As the ORI expert in biostatistics and public health, Dr. Garfinkel gave me the materials that ORI has regarding your November 7 conversation with Dr. Trenkle about the Jerrett et al. 2013 paper and your emailed materials to AskORI on November 11, 2016. I have read and reviewed all of the materials. I understand your concern about the way the data were presented in the paper and used elsewhere. Though I have no clinical training, it appears that the relative risks reported do not seem to rise to the level of clinical significance and do not provide evidence that air pollution is directly responsible for mortality. Presenting this data as such, may be a question only of bad science.

However, "bad" or sloppy science is not the same as research misconduct. ORI's regulation (42 CFR 93.103) defines research misconduct, as you know, as "fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results." While it is true that Dr. Jerrell and colleagues did not cite all the research showing that the relative risk is very, very close to 1 and only emphasized specific numbers, they did not, as far as I can tell, change their data to get a statistically and clinically significant result. The weak results are there for all to see. Thus, there does not appear to be falsification.

To overinterpret one's data is certainly inappropriate, but would be a matter to raise with the reviewers and the journal editors, who apparently did not insist that the authors tone down their conclusions. ORI is aware that the research on the effects of air pollution is certainly not the only area of science where there is open controversy. Just this morning, *The Scientist* ran an article on the controversy regarding the effects of sugar intake (http://www.the-scientist.com/?articles.view/articleNo/47819/title/Industry-Funded-Sugar-Study--Don-t-Trust-Other-Sugar-Studies/&utm_campaign=NEWSLETTER_TS_The-Scientist-Daily_2016&utm_source=hs_email&utm_medium=email&utm_content=39616948&_hsenc=p2ANqtz-8Q5JhLgCWe4CJboPROHvuwP0x1fr3XLwxkrNXixW4tqdO_29UCNh4fj6q1IwpolH0ferca7iYMwC0oyjX7kTTvwmW8mA&_hsmi=39616948). Unfortunately, we all are aware that science loses when research is influenced by special interest groups.

The Public Health Service (PHS) regulation, under which ORI acts, is not meant to be a way to put the brakes on controversial science. The mission of our Office is to protect PHS research funds from researchers who knowingly and intentionally make up data or change them to serve their purposes. In the documents you provided, there does not appear to be evidence that Dr. Jerrell and his colleagues have done that. Without clear evidence of fabrication and/or falsification of data (and not just failing to cite contrary data), ORI is unable to further pursue your allegations. What you do and have been doing for decades – promoting your own research results – in scientific and other venues may be the best way to combat opposing viewpoints. Good luck in the future.

Ann A. Hohmann, Ph.D., MPH
Division of Investigative Oversight
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2014 Age-Adjusted Death Rates by State and County and Ethnicity

Deaths per 1,000 persons (age-adjusted using 2000 U.S. Standard Population)
with 95% Confidence Interval shown in parentheses
(http://wonder.cdc.gov/ucd-icd10.html)

September 8, 2016

Location	2014 Age-Adjusted Death Rate (95% Confidence Interval)		
	All Causes	All Cancer	All Respiratory
	ICD-10=All Codes	ICD-10=C00-D48	ICD-10=J00-J98
United States (50 States + DC)	7.25 (7.24-7.26)	1.66 (1.65-1.66)	0.71 (0.71-0.71)
California (2nd lowest State)	6.06 (6.03-6.08)	1.48 (1.46-1.49)	0.57 (0.56-0.57)
South Coast Air Basin (SCAB = Los Angeles, Orange, Riverside, and San Bernardino Counties)	5.93	1.46	0.55
Hawaii (Lowest State)	5.89 (5.77-6.00)	1.44 (1.38-1.49)	0.53 (0.50-0.56)
Los Angeles County	5.71 (5.66-5.75)	1.42 (1.40-1.44)	0.53 (0.52-0.55)
Orange County	5.48 (5.40-5.56)	1.38 (1.34-1.42)	0.47 (0.45-0.49)
California Hispanics	5.02 (4.97-5.07)	1.18 (1.16-1.20)	0.39 (0.38-0.41)
SCAB Hispanics	4.96	1.19	0.39

2019 Age-Adjusted Death Rates by State and County

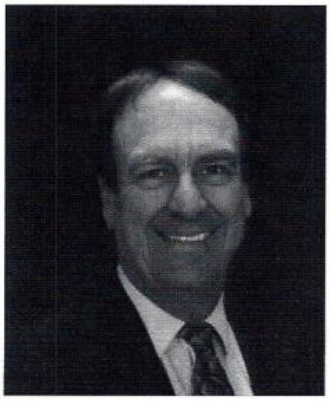
Deaths per 1,000 persons (age-adjusted using 2000 U.S. Standard Population)
with 95% Confidence Interval shown in parentheses
(http://wonder.cdc.gov/ucd-icd10.html)

James E. Enstrom, PhD, MPH
UCLA and Scientific Integrity Institute
jenstrom@ucla.edu

November 9, 2021

Location	2019 Age-Adjusted Death Rate (95% Confidence Interval)	
	All Causes	State/US Ratio
	ICD-10=All Codes	
West Virginia	9.45 (9.33-9.58)	1.3217
Mississippi	9.45 (9.35-9.56)	
Kentucky	9.11 (9.03-9.19)	
Alabama	8.98 (8.90-9.06)	
United States (50 States + DC)	7.15 (7.14-7.16)	1.0000
California (2nd lowest State)	6.02 (6.00-6.04)	
Los Angeles County	5.75 (5.70-5.79)	0.8042
Hawaii (Lowest State)	5.73 (5.62-5.84)	
California Hispanics	5.23 (5.18-5.27)	
Los Angeles Hispanics	5.07 (4.99-5.14)	0.7091

Guest Speaker: James E. Enstrom, Ph.D., M.P.H.



Dr. Enstrom is a native Californian who has lived most of his life in Los Angeles County. In 1965 He graduated co-valedictorian of his class at Harvey Mudd College in Claremont, CA, where he obtained a B.S. in physics. In 1970 Dr. Enstrom obtained his Ph.D. in experimental elementary particle physics at Stanford University from Nobel Laureate Melvin Schwartz. During 1971-1973 he worked as a physicist at the Lawrence Berkeley Laboratory in research group of Nobel Laureate Luis Alvarez. He then came to the UCLA School of Public Health as a postdoctoral fellow in cancer epidemiology and received an M.P.H. and postdoctoral certificate in 1976 from renowned public health epidemiologist Dr. Lester Breslow.

He then joined the UCLA School of Public Health faculty as a Research Professor / Researcher and he held that position for 36 years until June 2012. He currently retains a similar affiliation with UCLA, although he is now drawing retirement. He has been a Fellow of the American College of Epidemiology since 1981, he has been listed in Who's Who in America since 1990, and he has been President of the Scientific Integrity Institute in Los Angeles since 2005.

During his long career, he has explored many important epidemiological issues, particularly focusing on California. A major theme of his research has been identifying healthy lifestyles. He has shown that it is possible to reduce mortality risk from cancer and heart disease by 70% in the middle age range and to increase longevity by as much as 10 years. Examples of healthy populations that he has examined include religiously active California Mormons, California Cancer Prevention Study subjects, California PREVENTION Magazine Readers, and California and national samples of adults adhering to good health practices.

He has also examined the influence of environmental factors on mortality. In December 2005 he published a major paper on fine particulate matter and mortality in California and he has numerous other fm. Since then he has conclusively documented that fine particulate matter does not cause premature death in California. Since 2013, following the lead of the US House Science Committee, he has been involved with efforts to obtain the access to the "secret science" data that EPA has used to justify its fine particulate and ozone air pollution regulations in California and the United States. These efforts include the August 1, 2013 House subpoena of EPA, as well as the Secret Science Reform Acts of 2014 and 2015.

He is currently conducting important new air pollution epidemiology research that is relevant to the EPA, CARB, and SCAQMD regulations. More information can be found at his Scientific Integrity Institute website (http://www.scientificintegrityinstitute.org/).

Attachment F to Comment Letter #4

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

Office of the General Counsel
P.O. Box 4940
Diamond Bar, CA 91765-0940
909-396-3535/Fax: 909-396-2691

April 15, 2022

The Honorable Michael S. Regan, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W. (Mail Code 1101A)
Washington, D.C. 20460
Sent via certified mail, return receipt requested

RE: Notice of Intent to Sue Pursuant to Section 304(b)(2) of the Clean Air Act; State Implementation Plan Submissions from California; South Coast Air Quality Management District

Dear Administrator Regan:

I am writing on behalf of South Coast Air Quality Management District (South Coast AQMD) to notify you of ongoing violations of the federal Clean Air Act by the U.S. Environmental Protection Agency (EPA) for failing to timely act on a State Implementation Plan (SIP) submittal on contingency measures submitted by the South Coast AQMD on December 31, 2019. EPA action on this SIP submittal is due according to the mandatory deadlines assigned by Section 110(k)(2) of the Clean Air Act (CAA), 42 U.S.C. § 7410(k)(2). More specifically, EPA has failed to timely act on a contingency measures plan adopted December 6, 2019 that was submitted through the California Air Resources Board (CARB) on December 31, 2019 for EPA approval in addressing the provisions of CAA Section 182(e)(5). EPA was required to act on the plan by June 30, 2021. Section 110(k)(2) directs action in accordance with Section 110(k)(3) on "Full and partial approval and disapproval," but in this case, EPA must under Section 110(k)(3) only approve, and not disapprove, this SIP submittal. Congress intended for EPA to regulate federal sources[1] as necessary to allow all areas, and in particular the South Coast Air Basin, to attain the air quality standards. Any action to disapprove the SIP on the basis that it relies on the federal government to take actions would be subject to challenge because the South Coast region simply cannot attain without massive reductions from federal sources. Accordingly, we submit

[1] Federal sources, as used in this notice, refers to federally regulated sources for which neither South Coast AQMD nor the State (i.e., CARB) can set emission standards. EPA has previously employed this terminology, for example, in recognizing EPA's need to deliver "fair share reductions of federal sources" to South Coast. *See, e.g.,* 64 Fed. Reg. 39923, 39924 (July 23, 1999).

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that the SIP must be approved, and EPA must develop a regulatory strategy and find sufficient funding to reduce federal emissions to meet the health-based National Ambient Air Quality Standards.

The South Coast AQMD intends to file a lawsuit seeking to address EPA's failure to timely act as required by 42 U.S.C. § 7410(k)(2) and (3), 60 days from the date of this letter under CAA Section 304, 42 U.S.C. § 7604. This notice is submitted in accordance with 40 C.F.R Section 54.3. The following case information supports our position.

I. The South Coast Air Basin Cannot Attain the 1997 Eight-Hour Ozone Standard Without Massive Emission Reductions From Federally Regulated Sources

The South Coast Air Basin cannot attain the 1997 8-hour ozone standard without massive emission reductions from federal sources. Even considering only emissions from ships, locomotives, and aircraft, the region needs an additional 46 tons per day (tpd) of NOx reductions by 2023 to attain the standard in a timely manner.[2] When also considering the emissions from on-road heavy-duty trucks that are subject to federal authority, the region needs a total of 67-69 tpd of NOx reductions from federal sources.[3]

Unfortunately, the federal government does not currently have plans to secure these reductions as specific commitments and a regulatory agenda were noticeably absent in the Fiscal Year 2022-2026 EPA Strategic Plan released on March 28, 2022. While total NOx emissions in the South Coast Air Basin will have been reduced by almost 50% between 2012 and 2023, almost all these reductions will come from sources under CARB or South Coast AQMD authority. For example, over this time, NOx emissions from light duty vehicles will have been reduced by over 70%. CARB and the South Coast AQMD are doing our part. In contrast, NOx emissions from aircraft, locomotives, and ocean-going vessels will *increase* by almost 10% over the same period.[4]

It would be impossible to attain the standard without the required reductions from these federal sources. Reaching attainment solely with emission reductions from South Coast AQMD and CARB regulated sources would require eliminating all emissions from *virtually all* such sources. According to the CARB 2018 updates to the California SIP, baseline emissions of NOx in 2023 in the South Coast Air Basin will total 269 tpd. *See* Summary Table for 2023 NOx Emissions, appended to this letter. To attain the 1997 ozone standard, these emissions must be reduced to a

[2] Revised Proposed 2016 State Strategy for the State Implementation Plan (March 7, 2017), p.32. *available at* https://ww3.arb.ca.gov/planning/sip/2016sip/rev2016statesip.pdf.
[3] Final Contingency Measure Plan, December 2019, Table 2-1, p. 39, *available at* https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/1997-ozone-contingency-measure-plan/1997-8-hour-ozone-draft-contingency-measure-plan---120619.pdf?sfvrsn=10.
[4] Final Contingency Measure Plan, December 2019, p. 58.

carrying capacity of 141 tons per day by 2023.[5] Thus, the region must reduce expected 2023 emissions by 128 tpd (the difference between the baseline of 269 tpd and the carrying capacity of 141 tpd). If no further reductions come from federal sources, all 128 tons of reductions would need to come from state and locally regulated sources. This would mean, for example, completely eliminating all emissions from stationary and area sources (49 tpd), all emissions from California-regulated on-road vehicles (69 tpd), and 10 tpd of California-regulated off-road sources such as larger farm and construction equipment (about 20% of the total of off road sources).

It is not yet possible to completely eliminate all emissions from on-road, stationary, and area sources of NOx in the South Coast Air Basin. Nor is it realistic to expect that all such sources would be entirely zero-emissions in the near future. Therefore, it is imperative that significant emission reductions come from federal sources. And it would be manifestly unfair to penalize the South Coast AQMD and the State by disapproving the Contingency Measure Plan and triggering sanctions based on emissions under federal control.

II. The Legislative History Demonstrates that Congress Intended EPA to Regulate Federal Sources as Needed to Enable All Areas of the Nation to Attain the National Ambient Air Quality Standards

In the 1990 Amendments to the CAA, Congress preempted the states from establishing emission standards for locomotives, farm and construction equipment, and other nonroad engines, which includes marine vessels. CAA Section 209(e).[6] And for decades, states have been preempted from regulating new motor vehicles, with California allowed to adopt its own standards with a waiver from EPA. CAA Section 209(a) and (b); 42 U.S.C. §§ 7543(a), (b).

As Congress debated the 1990 Amendments, Members of Congress from California stated that unless EPA regulates these sources, the South Coast region would be prevented from attaining the ozone standards. Representative Carlos Moorhead (R-CA) stated that it will be impossible for Los Angeles to attain the NAAQS if EPA fails to regulate federal sources.[7] Senator Pete Wilson (R-CA) also explained that if federal sources are not controlled, California will not be able to comply.[8] In response to these concerns, Senator John Chafee (R-RI), the lead co-sponsor of the Senate Bill, assured the California delegation that Congress intended that EPA would regulate federal sources as necessary so that all areas could attain the standards. In response to a question from Senator Wilson regarding the Amendments, Senator Chafee explained that "EPA has the obligation…to adopt control measure[s] for sources which it exclusively controls when these

[5] Final Contingency Measure Plan, December 2019, p. 2.
[6] 42 U.S.C. § 7453(e). The CAA also preempts state and local governments from setting emission standards for aircraft. CAA Section 233; 42 U.S.C. § 7573.
[7] Congressional Research Service, A Legislative History of the Clean Air Act Amendments of 1990, (Leg. History), p. 2613.
[8] Leg. History, p. 1125-26.

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controls are necessary to attain national [ambient air quality] standards."[9] Finally, when Congress enacted section 213 of the CAA, 42 U.S.C. § 7547, which obligated EPA to regulate nonroad sources, it stated in the Conference Report: "We expect EPA to carry out this mandate in a fashion which assures that states which are preempted will not suffer any additional [e]missions beyond what they themselves would have allowed."[10] This Conference Report reflects the views of the Members from both the House and Senate. Thus, Congress intended for EPA to regulate federal sources as necessary to allow all areas to attain the standards.

III. EPA Has Previously Recognized the Need for Significant Reductions From Federal Sources and Approved the 1994 South Coast Ozone SIP Which Relied on Such Reductions and EPA Must Do So Again

As demonstrated above, under the CAA, EPA has the responsibility to regulate federal sources where necessary to allow all areas to attain the standards. EPA itself has recognized that responsibility in the past. In approving the 1994 1-hour ozone SIP for the South Coast Air Basin, EPA recognized that "massive further reductions are needed for attainment in the South Coast and that attainment may be either very costly and disruptive or impossible if further reductions are not achieved from national or international sources."[11] While EPA noted it did not think states have authority to assign responsibilities to the Federal Government under the Clean Air Act, it also said it believed EPA should help speed cleaning the air in California and nationally.[12] Accordingly, EPA made an "enforceable commitment" to adopt federal measures that it determined were EPA's responsibility.[13] On this basis, EPA was able to approve a SIP submittal that relied on federal measures. Therefore, EPA has established precedent of doing the right thing and approving a plan that relies on federal measures, recognizing the federal responsibility to regulate where necessary to allow the region to attain the standard.[14] EPA must take a similar approach to acting on the 2019 Contingency Measure Plan, since as discussed below, a disapproval, which inevitably triggers sanctions, would be unlawful.

IV. Disapproval of the Contingency Measure Plan Would Lead to Sanctions that Congress Did Not Intend

If EPA were to disapprove the contingency measure plan on the basis that it relies on federal measures, such disapproval would trigger sanctions. The sanctions include greatly increasing the cost and difficulty of issuing permits as well as cutting off federal highway funds. CAA Section 179; 42 U.S.C. Section 7509. Sanctions can be avoided if the basis for the disapproval is corrected. *Id.* However, in this case it is not possible to eliminate the plan's reliance on federal

[9] Leg. History, p. 1127.
[10] Leg. History, p. 1021
[11] Approval and Promulgation of Implementation Plans; California—Ozone, 62 Fed. Reg. 1150, 1152 col.3---1153 col. 1 (Jan. 8, 1997).
[12] 62 Fed. Reg. 1150, 1151 col. 2.
[13] 62 Fed. Reg. 1150, 1154 col. 1.
[14] *See* 40 CFR § 52.238 ("Commitment to undertake rulemaking").

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measures, because CARB and South Coast AQMD lack adequate authority to obtain necessary emission reductions from federal sources. Therefore, the region has no ability to avoid sanctions. But Congress did not intend sanctions to be imposed where the area being sanctioned does not have adequate authority to correct the alleged deficiency.

The legislative history of the 1990 Amendments to the Clean Air Act shows that Congress did not intend sanctions to be imposed where the state and local governments lack sufficient authority to remedy the deficiency, which in this case is because the CAA preempts state and local governments from setting emission standards for federal sources. On May 23, 1990, during the House debate on the CAA, Representative Norm Mineta (D-CA) stated that "Under the sanctions provisions, the EPA Administrator is required to establish criteria for exercising his or her authority to impose sanctions on political subdivisions that have adequate authority to correct an air quality deficiency."[15] In this case, the South Coast AQMD does not have adequate authority to correct the supposed deficiency, since it is impossible to devise a plan that does not rely on emission reductions from federal sources for which EPA has the authority to set emission standards. This principle was repeated during the House debate on the Conference Report on October 26, 1990. Representative Glenn Anderson (D-CA) stated: "This provision will ensure that available sanctions are applied to the geographical areas under the control of the government agency principally responsible for failure to comply with the Clean Air Act and with the authority to remedy the deficiency."[16] While this discussion pertains directly to CAA Section 110(m), which prohibits statewide sanctions for 24 months if the failure is primarily due to a political subdivision, it clearly shows that Congress did not intend for sanctions to be imposed on an area that may be unable to correct the deficiency.

Moreover, Congress did not intend for a state to be penalized where an inability to demonstrate attainment is due to emissions from federal sources. The Clean Air Act recognizes that such a result would be highly unfair. Section 179B of the CAA [42 U.S.C. § 7509a] requires EPA to approve an attainment demonstration where the state shows it would attain the standard "but for emissions emanating from outside of the United States." The legislative history of this section makes it clear that it was adopted precisely because it would be unfair to hold a state responsible for emissions over which it has no control. The amendment was sponsored by Senator Phil Gramm (R-TX), who explained: "it is unfair to hold El Paso accountable for pollution that is generated in a foreign country that they have no control over."[17] Senator Max Baucus (D-MT), the sponsor of the Senate bill, spoke in support of the provision, noting that border areas "do not have control of their own destiny themselves."[18] Thus, Congress did not intend to penalize areas that have no control over the sources causing nonattainment. By the same token, Congress would not have intended to penalize areas where nonattainment is due to federal sources. Congress did not see a need to specifically discuss this possibility because it had already made it clear that

[15] Congressional Research Service, *A Legislative History of the Clean Air Act Amendments of 1990,* (Leg. History) Committee Print, p. 2658
[16] Leg. History, p. 1200.
[17] Leg. History, p. 5741.
[18] Leg. History, p. 5742.

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EPA was expected to regulate federal sources as needed to allow all areas, and specifically the South Coast Air Basin, to attain the standards, as discussed in Part III above. Therefore, Congress did not anticipate that areas would fail to attain due to emissions from federal sources.

V. EPA Action to Disapprove the South Coast 2019 Contingency Measure Plan Would Violate the Doctrines of Impossibility and Absurd Results

As discussed in Part I above, it is impossible for the South Coast Air Basin to attain the 1997 8-hour ozone standard without massive further emissions reductions from federal sources. Therefore, if EPA were to disapprove the 2019 Contingency Measure plan because it relies on federal action, it would be impossible for the South Coast AQMD to submit a plan that eliminated that reliance. Thus, the South Coast AQMD would never be able to correct the alleged deficiency in the plan and would be subject to sanctions which it has no ability to avoid. These sanctions would likely lead to the South Coast AQMD being unable to issue permits for new or modified major stationary sources, because the 2-to-1 offset ratio would require offsets that simply are not available in the region. Moreover, the sanction of withholding highway transportation funds would likely affect billions of dollars in economic activity as infrastructure projects are waylaid creating ramifications for the largest container Ports complex in the nation with no way to ever correct the deficiency and have the transportation sanctions lifted. Since disapproval of the 2019 Contingency Measure Plan would lead to a requirement that the South Coast AQMD do the impossible, it would be unlawful. "The law does not require impossibilities of any person, natural or artificial…" *Dist. of Columbia v. Woodbury,* 136 U.S. 450, 464 (1890). And as stated in California Civil Code Section 3531, "[t]he law never requires impossibilities." So EPA cannot by a disapproval require the South Coast and California to do the impossible.

In addition, the doctrine of "absurd results" prevents EPA from disapproving the Plan. Any action which would impose sanctions on a region for a failure caused by sources over which it has no control would create absurd results. The Supreme Court has long held that when the literal language of a statute "has led to absurd or futile results…this Court has looked beyond the words to the purpose of the act. Frequently, however, even when the plain meaning did not produce absurd results but merely an unreasonable one plainly at variance with the policy of the legislation as a whole this Court has followed that purpose rather than the literal words." *U.S. v. American Trucking Ass'ns.,* 310 U.S. 534, 543 (1940) (cleaned up). The Supreme Court reiterated this language in *Perry v. Commerce Loan Co.,* 383 U.S. 392, 400 (1966). Penalizing the South Coast with an action that causes sanctions because of emissions over which the state and local agencies lack the ability to set emission standards creates absurd results and is plainly at variance with the purpose of the statute as a whole, which is not to penalize states for sources outside their control.

VI. Imposing Sanctions on An Area that Cannot Attain the Standard Because of Emissions from Federal Sources Would Violate the 10th Amendment and Principles of the Spending Clause

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In 2012, the U.S. Supreme Court struck down provisions of the Affordable Care Act on the ground that the conditions placed on the receipt of federal funds were so coercive as to violate the limits of the Spending Power. *Nat'l Federation of Independent Business v. Sibelius,* 567 U.S. 519 (2012). Since the 1990 Amendments, certain states have challenged the CAA as violating the 10th Amendment and the Spending Clause of the U.S. Constitution. These cases have been unsuccessful, based on the conclusion that the CAA sanctions were not so coercive that the state had no choice but to comply with the Act's demands. *Mississippi Commission on Environmental Quality v. EPA*, 790 F. 3d. 138 (D.C. Cir. 2015); *Com. of Virginia v. Browner,* 80 F. 3d 869 (4th Cir. 1996). However, in the present case, an action that results in sanctions would violate the 10th Amendment and the Spending Clause, because the state and local government have no choice, and no ability, to avoid sanctions.

The principles under which the Supreme Court has upheld exercises of the Spending Power depends on the element of choice. Congress may "offer States the choice of regulating the activity according to federal standards or having state law preempted by federal regulation." *New York v. U.S.,* 505 U.S. 144 167 (1992). Moreover, a valid exercise of the Spending Power requires that the state have a choice whether to regulate as the federal law directs or to lose federal funding. *See New York,* 505 U.S. at 173. Here, the state and South Coast AQMD have no choice whether to lose federal funding or suffer other sanctions because they lack the ability to set emission standards for federal sources, and thus no ability to comply with what would be required if EPA disapproves the Plan. Thus, an action to disapprove the Plan, which triggers sanctions the region has no ability to avoid, would violate the 10th Amendment and the Spending Clause.

VII. Notice of Intent to Sue

A. Failure to Perform Nondiscretionary Duties

The contingency measure plan submitted to meet CAA Section 182(e)(5) is subject to the SIP processing requirements of CAA Section 110. *See* 42 U.S.C. §§ 7410, 7511a(e)(5). The Clean Air Act further requires the Administrator to fully or partially approve or disapprove a plan submission within twelve (12) months after such submission has been deemed complete, either by the Administrator or as a matter of law. *See* 42 U.S.C. Section 7410(k)(2). If the EPA does not make a completeness finding, plan submissions are deemed complete by operation of law six (6) months after submission. *See* 42 U.S.C. Section 7410(k)(1)(B). Therefore, at most, EPA had eighteen (18) months within which to take final action to approve, disapprove, or partially approve the plan submission. As of the date of this letter, EPA has failed to fully or partially approve or disapprove the SIP submittal. As explained, in this case, the only lawful exercise of the Administrator's duties would be to approve the SIP submittal in acting under 42 U.S.C. § 7410(k)(3). Because EPA has failed to take required action by the statutory deadline, EPA is now in violation of CAA Section 110(k)(2) and (3); 42 U.S.C. § 7410(k)(2) and (3). After the expiration of sixty (60) days from the date of this notice of intent to sue, South Coast AQMD intends to file suit against EPA in federal court for the failure to act in accordance with, or fulfill, the duties described in this letter.

Michael S. Regan, Administrator
United States Environmental Protection Agency
April 15, 2022

B. **Identity of Persons Giving Notice and Their Counsel**

As required by 40 C.F.R Section 54.3, the name and address of South Coast AQMD, the noticing party, is as follows:

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765
Tel: 909-396-3535

Legal contacts and counsel representing South Coast AQMD on this matter will include the following:

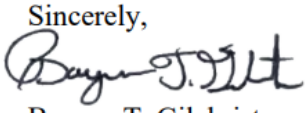
Bayron T. Gilchrist, General Counsel
Barbara Baird, Chief Deputy Counsel
Brian Tomasovic, Principal Deputy District Counsel
Tel: 909.396.3400
Fax: 909.396.2961
Email: bgilchrist@aqmd.gov; bbaird@aqmd.gov; btomasovic@aqmd.gov

C. **Offer to Negotiate**

During the sixty (60) day notice period, South Coast AQMD is willing to discuss effective measures to correct EPA's failure to comply with nondiscretionary duties and to discuss any information bearing upon this notice. We sincerely hope that we can engage in productive and meaningful discussions with EPA that results in a regulatory strategy and finds sufficient funding to reduce federal emissions to meet the health-based National Ambient Air Quality Standards. We do not, however, intend to delay the filing of a complaint in federal court if the discussions fail to resolve these matters within the sixty (60) day notice period, and intend to seek all appropriate relief, including injunctive relief and all costs of litigation, including, but not limited to, attorneys fees, expert witness fees, and other costs. We believe this notice provides information sufficient for EPA to determine the mandatory duty we allege it has failed to perform. If, however, there are any questions, please feel free to contact us for clarification.

We look forward to working with you on this important issue.

Sincerely,



Bayron T. Gilchrist
General Counsel

BTG/lal

Michael S. Regan, Administrator
United States Environmental Protection Agency
April 15, 2022

Appendix.
Summary Table for 2023 NOx Emissions.

Source Category	2023 NOx Emissions	References
Stationary and Area Sources	49 tpd	2018 SIP Update https://ww3.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.203433616.1202062696.1609860434-773042855.1578434161
CA Vehicles (on-road)	68.5 tpd	2018 SIP Update https://ww3.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.203433616.1202062696.1609860434-773042855.1578434161 EMFAC 2014 https://arb.ca.gov/emfac/2014/
CA off-road mobile	54.2 tpd	2018 SIP Update https://ww3.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.203433616.1202062696.1609860434-773042855.1578434161 California Emission Projection Analysis Model (CEPAM) Version 1.05 https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php
Federal Vehicles (on-road)	20.3 tpd	2018 SIP Update https://ww3.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.203433616.1202062696.1609860434-773042855.1578434161 EMFAC 2014 https://arb.ca.gov/emfac/2014/
Federal off-road	7.2 tpd	2018 SIP Update https://ww3.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.203433616.1202062696.1609860434-773042855.1578434161 California Emission Projection Analysis Model (CEPAM) Version 1.05 https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php
Federal planes trains and ships	69.7 tpd	2018 SIP Update https://ww3.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.203433616.1202062696.1609860434-773042855.1578434161
TOTAL	269 tpd	

Responses to Comment Letter #4

Response to Comment 4-1

The senior staff at IEc leading the health benefits and EJ analyses included in the Draft Socioeconomic Report hold advanced degrees from Harvard and Boston University Schools of Public Health, coursework for which includes epidemiological training. Collectively, they have over 30 years of experience reviewing, evaluating, and applying epidemiological studies used to estimate public health impacts of air pollution. Their recommendations are backed by other epidemiologists as well. For example, the studies that form the basis of the PM-related mortality estimates in the 2022 AQMP Socioeconomic Assessment are unchanged from those recommended by IEc in 2016, a recommendation reviewed and confirmed at the time by Dr. George Thurston of the New York University School of Medicine. Other recommendations of high quality studies for the 2022 AQMP analysis are similarly backed by epidemiologists working for U.S. EPA in their most recent Integrated Science Assessments for PM and ozone. Although the Health Effects Officer position at the South Coast AQMD has been vacant, staff works closely with Dr. Nichole Quick, M.D., who serves as Health Effects Consultant in the interim and has extensive experience in public health matters. Dr. Quick has also been involved in staff's discussion with the commenter.

The questions raised by this commenter are focused on the fundamental relationships of whether air pollution causes a particular health effect. This line of inquiry is more appropriately directed to U.S. EPA as they conduct and compile the basic research that reflects the broad consensus of the scientific community about the impact of air pollution on public health. South Coast AQMD relies on U.S. EPA's findings, and applies them to our specific region, and does not have the expertise or mandate to conduct the epidemiological and toxicological studies questioned by the commenter. More detailed response to a similar comment raised by this comment on the 2016 AQMP Socioeconomic Report can be found in Response to Comment 12-1, as included in the 2016 AQMP Socioeconomic Report: Comments and Responses to Comments document (https://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/final/rtcfinal_02212017.pdf, pp. 73-75). In general, the concerns raised by this comment are contrary to the broad consensus of the scientific community. Appendix I to the AQMP provides a detailed summary of the latest scientific consensus on the effect of air pollution on public health, including EPA's and CARB's summaries and conclusions. In addition, in November 2022 CARB recently updated and reaffirmed its conclusions on the linkage between air pollution and public health, including the link between particulate matter exposure and premature death and other health endpoints (https://ww2.arb.ca.gov/sites/default/files/2022-11/California%20Air%20Resources%20Board%20Updated%20Health%20Endpoints%20Bulletin%20-%20Edited%20Nov%202022_0.pdf).

The Socioeconomic Report provides an analysis of the socioeconomic impacts of the Final 2022 AQMP in order to further inform public discussions and the decision-making process associated with the adoption of the 2022 AQMP. The public health benefits analysis relied on the most recent relevant literature, included best available data and information, and used a widely adopted and appropriate method, including the use of U.S. EPA's BenMAP-CE Tool. The analysis has also been reviewed through a rigorous public process, including discussion at multiple Scientific, Technical and Modeling Peer Review Advisory Group meetings and the 2022 AQMP Regional Workshops and Hearings. Similar comments from the

Commenter were previously submitted to U.S. EPA and CARB regarding their public documents that contain health effects discussion and/or analysis. Both agencies have provided published responses and stated their disagreements with the claims made in those comments. As cited in the 2016 AQMP Socioeconomic Report: Comments and Responses to Comments document, specifically in its Response to Comment 12-1, the U.S. EPA described in its Response to Comments on the 2012 PM Rule how the scientific literature across disciplines supported its causal determination:

> *[…] in the broader evaluation of the evidence from many epidemiological studies, and subsequently during the process of forming causality determinations, the EPA has emphasized the pattern of results across epidemiological studies for drawing conclusions on the relationship between PM2.5 and health outcomes, and whether the effects observed are coherent across the scientific disciplines. Thus, in making causality determinations, the EPA did not limit its focus or consideration to just studies that reported positive associations or where the results were statistically significant.*

CARB, during its 2010 rulemaking process, also explained how the bulk of the scientific literature supports the finding of a causal relationship between PM and mortality and notes the strength of the Krewski et al. (2009) study, which was also used in the Final Socioeconomic Report for the 2022 AQMP:

We have carefully reviewed all studies that have been performed in the United States on the relationship between long-term PM2.5 exposure and mortality, as has the U.S. EPA in its recent review of the NAAQS for particulate matter. There are a few studies that do not find a relationship between long-term PM2.5 exposure and all-cause mortality, but the majority of studies do report a statistically significant relationship. In addition, U.S. EPA and we have also critically evaluated the methods used in each study so that we can place the most weight on the studies that have used the strongest methodologies. The effect estimate we have used from Krewski et al. (2009) comes from the largest and most rigorously and publicly evaluated study in existence. The effect estimate for the relationship between long-term PM2.5 exposure and mortality from this study is being used by multiple agencies worldwide. The Krewski et al. (2009) estimate, though not the lowest in the literature, is toward the lower end of the range of results from American studies.

Response to Comment 4-2

Please refer to Response to Comment 4-1.

Response to Comment 4-3

Please refer to Response to Comment 4-1.

Response to Comment 4-4

The epidemiological studies measuring the health effects of air pollution exposure and included in the Draft Socioeconomic Report's analysis generally examines the relationship between ambient concentrations of air pollution and population-wide health risk, consistent with standard practice across the nation.

As discussed in Appendix 3-B of the Report, "[a]nnual health impacts for all endpoints are estimated with no threshold effects for all types of pollutant exposure" based on IEc recommendation that there lacks sufficient evidence suggesting that the causal relationship of air pollution and health risk would

cease to exist below the National Ambient Air Quality Standards (NAAQS). Moreover, "[t]his practice is […] based on the latest scientific evidence, including those summarized in the Integrated Science Assessments (U.S. EPA 2019; U.S. EPA 2020)." (p. 3-B-8)

Response to Comment 4-5

Please refer to Response to Comment 4-1. It is worth noting that the federal NAAQS are set to be health protective for all U.S. residents, regardless of their residence location, race/ethnicity, or other demographic characteristics.

Response to Comment 4-6

South Coast AQMD complies with its obligations under California Health & Safety Code section 40471(b) by preparing Appendix 1 – Health Effects. That document has been prepared in conjunction with a public health organization (the California Office of Environmental Health Hazard Assessment) and it has been peer reviewed through the South Coast AQMD Advisory Council. The South Coast AQMD complies with its obligation to hold a public hearing when the Governing Board holds a public hearing to discuss and decide upon the AQMP, as well as by holding regional hearings conducted by staff.

Response to Comment 4-7

Staff disagrees with the assertion that South Coast AQMD's Notice of Intent to Sue submitted to U.S. EPA in April 2022 provides evidence that the 2022 AQMP is insufficient to attain the 2015 NAAQS standard. South Coast AQMD staff recognizes the crucial role that emissions reductions from local, state, and federally regulated sources to reach attainment of the NAAQS standards, and that reductions from sources subject to federal regulatory authority are essential to be able to meet the standard. The 2022 AQMP does rely on significant emission reductions from sources regulated by the state and federal government, including both stationary and mobile sources.

Response to Comment 4-8

Thank you for the comment. The 2022 AQMP, if adopted by both South Coast AQMD Governing Board and CARB, will be eventually submitted to the U.S. EPA in accordance with the federal Clean Air Act requirements.

Response to Comment 4-9

See Response to Comment 4-1 and Response to Comment 104-1 in the 2022 Final AQMP Comments and Responses to Comments document.

SECTION 2:

COMMENTS AND RESPONSES TO COMMENTS RECEIVED BEFORE RELEASE OF DRAFT SOCIOECONOMIC REPORT

Comment Letter #5

From: Stan Young <genetree@bellsouth.net>
Sent on: Wednesday, May 18, 2022 8:00:45 PM
To: bbenoit@cityofwildomar.org
CC: Elaine Shen <eshen@aqmd.gov>
Subject: Representative: Southern California Air Quality Management District
Attachments: Young Short Bio 2022.pdf (107.25 KB)

Dear Honorable Ben J. Benoit:

I am an applied statistician. See attached short bio. I was on the EPA SAB until recently. I have studied air quality and health effects in general and in California in particular.

I am looking at the 367 page 2022 Draft Air Quality Management Plan. There is literature that they appear not to be taking into account. Given that the report has a large number of authors, contributors, and political overseers, it is not clear to me where I should direct my comments, both non-technical and technical. 5-1

As the issues are political as well as technical, I would like to keep you in the loop.

Stan Young

Short Bio 2022

Dr. S. Stanley Young is currently the CEO of CGStat and previously worked at Eli Lilly, GlaxoSmithKline and the National Institute of Statistical Sciences on questions of applied statistics. His current interest is studying methods used in the evaluation of observational studies. He also works on bioinformatics problems.

Dr. Young graduated from North Carolina State University, BS, MES and a PhD in Statistics and Genetics. He worked in the pharmaceutical industry on all phases of pre-clinical research. He has authored or co-authored over 70 papers including six "best paper" awards, and a highly cited book, *Resampling-Based Multiple Testing*. He has three issued patents. He is interested in all aspects of applied statistics. He conducts research in data mining.

Dr. Young is a Fellow of the American Statistical Association and the American Association for the Advancement of Science. He is an adjunct professor of statistics at North Carolina State University, the University of Waterloo, and the University of British Columbia where he has co-directed thesis work. He is also an adjunct professor of biostatistics in the Jiann-Ping Hsu College of Public Health at Georgia Southern University. Dr. Young served on the Scientific Advisory Board of the U.S. Environmental Protection Agency.

From: Stan Young <genetree@bellsouth.net>
Sent on: Thursday, May 19, 2022 8:24:31 PM
To: bbenoit@cityofwildomar.org
CC: Elaine Shen <eshen@aqmd.gov>
Subject: Re: Representative: Southern California Air Quality Management District
Attachments: Young 2021 Shifting_Sands NAS.pdf (7.6 MB)

Dear Honorable Ben J. Benoit:
I attach a technical report that should be of interest to you and others responsible for oversight of air quality and health effects. The report is written to be accessible to non-technical people. There are appendices that expand on aspects of the problem. I am happy to answer any questions you may have.
Stan Young

5-1

Cont.

[Full report included in the attachment can be accessed at: https://www.nas.org/reports/shifting-sands-report-i/full-report]

From: Stan Young <genetree@bellsouth.net>
Sent on: Tuesday, May 31, 2022 12:24:14 PM
To: Elaine Shen <eshen@aqmd.gov>
Subject: [EXTERNAL]South Coast air quality meeting
Attachments: 05 31 2022 SCAQMD.pdf (72.75 KB)

Dear Dr. Elaine Shen:

I plan to attend the 05 31 2022 South Coast meeting via zoom and comment on item 4.

Please place into the record the attached item.

Thank you,

Stan Young

5-1

Cont.

05 31 2022 ASAQMD
Specific ozone references: Chronological order
S. Stanley Young, PhD, FASA, FAAAS

Smith RL, Xu B, P Switzer P. **2009**. Reassessing the relationship between ozone and short-term mortality in US urban communities. Inhalation Toxicology, 21, 37-61.

[Comment: "...ozone-mortality associations, based on time-series epidemiologic analyses of daily data from multiple cities, reveal still-unexplained inconsistencies and show sensitivity to modeling choices and data selection, that contribute to serious uncertainties.."]

Mustafic H, Jabre P, Caussin C, Murad MH, Escolano S, Tafflet M, Périer M-C, Marijon E, Vernerey D, Empana J-P, Jouven X. **2012**. Main air pollutants and myocardial infarction: A systematic review and meta-analysis. Journal of the American Medical Association 307, 7:713-21. https://doi.org/10.1001/jama.2012.126.

[COMMENT: This paper specifically says ozone is not causing heart attacks.]

Milojevic A, Wilkinson P, Armstrong B, Bhaskaran K, Smeeth L, Hajat S. **2014**. Short-term effects of air pollution on a range of cardiovascular events in England and Wales: Case-crossover analysis of the MINAP database, hospital admissions and mortality. Heart (British Cardiac Society) 100, 14: 1093-98. https://doi.org/10.1136/heartjnl-2013-304963.

[COMMENT: No effect of air components, including ozone, on heart attacks.]

Young SS, Smith RL, Lopiano KK. **2017**. Air quality and acute deaths in California, 2000-2012. Regulatory Toxicology and Pharmacology 88:173-84. https://doi.org/10.1016/j.yrtph.2017.06.003.

[COMMENT: No effect of PM2.5 or ozone on deaths in California. Data public 2015.]

You C, Lin DJK, Young SS. **2018**. PM2.5 and ozone, indicators of air quality, and acute deaths in California, 2004–2007. Regulatory Toxicology and Pharmacology 96:190-196.

[COMMENT: No effect of PM2.5 or ozone on deaths in California.]

You C, Lin DKJ, Young SS. **2018**. Time series smoother for effect detection. PLoS ONE 13(4): e0195360. https://doi.org/10.1371/journal.pone.0195360

[COMMENT: Any effect of ozone on deaths in California is very sensitive to the analysis method. See also Smith et al. 2009.]

Orellano P, Reynoso J, Quaranta N, Bardach A, Ciapponi A. **2020**. Short-term exposure to particulate matter (PM10 and PM2.5), nitrogen dioxide (NO2), and ozone (O3) and all-cause and cause-specific mortality: Systematic review and meta-analysis. Environment International 142:105676. https://doi.org/10.1016/j.envint.2020.105876.

[COMMENT: This paper estimates the risk ration for PM2.5 at 1.0065, essentially no risk.]
[COMMENT: This paper estimates the risk ration for ozone at 1.0043, essentially no risk.]

From: Stan Young <genetree@bellsouth.net>
Sent on: Tuesday, May 31, 2022 5:21:13 PM
To: Elaine Shen <eshen@aqmd.gov>
CC: "James E. Enstrom" <jenstrom@ucla.edu>
Subject: Re: [EXTERNAL]South Coast air quality meeting
Attachments: South coast words.docx (13.3 KB)

Dear Dr. Shen:
I am located in remote Virginia and the internet is in and out. I attach my verbal comments on Item 4. Please let Dr. James Enstrom read my comments if I do not link in.
Stan

5-1

Cont.

South coast words
Words: 306
My name is Stan Young. Years ago, I got a PhD in Statistics and Genetics. I am a Fellow of the American Statistical Association and triple A S. I worked for over 25 years in pharmaceutical companies where my job included oversight on research projects. I helped ensure that researchers designed and ran sound experiments. That they did not fool themselves or the company. The company wanted sound science. I have published on statistical methods, and I have published on environmental epidemiology.
I am now retired from corporate science. I continue to look at environmental epidemiology and follow research in that area. Some of my work is funded, currently by the National Association of Scholars, but most is pro bono.
Ozone is the topic today. I have submitted Specific ozone references to the South Coast AMQD. It is worth a read. Anyone can examine the seven references.
In short, ozone is not causing heart attacks and not killing anyone. There are many fewer deaths in the summertime when ozone is at it highest. Slight changes in how analysis is done can profoundly change the analysis results.
The WHO contracted an air quality and health effects “Systematic Review and Meta-analysis” that was published in 2020. A risk ratio of 1.000 is no risk. Orellano et al. estimated the risk ratio for ozone all-cause deaths at 1.0043, essentially no risk.
I am considered an expert, but you do not have to trust me as an authority. You can read a non-technical book by Steve Malloy, Scare Pollution. You can read a NAS research report, Shifting Sands, which was written for any intelligent reader. Having done your homework you should demand that the data set used in a research paper relied upon by the EPA or CARB be publicly available or in the hands of a trusted 3rd party.

From: Stan Young <genetree@bellsouth.net>
Sent on: Wednesday, June 1, 2022 7:02:02 PM
To: har@indecon.com; wraich@indecon.com
CC: Elaine Shen <eshen@aqmd.gov>; Ian MacMillan <imacmillan@aqmd.gov>
Subject: Additional environmental epidemiology information
Attachments: Young 2017 CA data RTP.pdf (2.95 MB), Young 2021 Shifting_Sands NAS.pdf (7.6 MB)

Dear Henry Roman and William Raich:
I attach a report on PM2.5 that includes some information on ozone. I also include a paper that uses California data. I had access to 2M e death certificates and used 1M that included the most populated air basins. In Young 2017 we found no effect of PM2.5 or ozone on all-cause, cardiovascular or respiratory deaths. We made our data set public in 2015 and so far no one has disputed our results.
I am happy to answer any questions you might have.
Stan

5-1

Cont.

[Report provided in attachment 1 can be accessed at: http://www.scientificintegrityinstitute.org/RTPPM25TSYoung072517.pdf]

[Report provided in attachment 2 is the same report provided in comment letter 5-2, and can be accessed at: https://www.nas.org/reports/shifting-sands-report-i/full-report]

Responses to Comment Letter #5

South Coast AQMD staff appreciate the commenter's input and participation in the development of the Draft Socioeconomic Report for the 2022 AQMP. Staff has received and reviewed the submitted technical documents and references. Please refer to Response to Comment 4-1 and Response to Comment 104-1 in the 2022 Final AQMP Comments and Responses to Comments document.

Comment Letter #6

From: JAMES ENSTROM <jenstrom@ucla.edu>
Sent on: Tuesday, May 31, 2022 3:20:24 PM
To: Elaine Shen <eshen@aqmd.gov>
CC: Henry Roman <HRoman@indecon.com>; Will Raich <WRaich@indecon.com>
Subject: Re: *Agenda, Presentation and Minutes Available* Socioeconomic STMPR Advisory Group Meeting

Dear Elaine,

I appreciate your quick response. I will be commenting on the SERIOUS FLAWS in the Agenda Item 4 Presentation by Henry Roman of IEc, who made a similar December 10, 2015 presentation regarding the 2016 AQMP. These FLAWS are explained in my January 11, 2016 Enstrom Email to IEc President Schwarz regarding the 2016 SCAQMD AQMP (http://www.scientificintegrityinstitute.org/Schwarz011116.pdf). I have VERY STRONG evidence that there are NO deaths due to PM2.5 and Ozone in the SCAB and that the actual human exposure to PM2.5 and ozone in the SCAB is VERY LOW. Thus, I am contesting the alleged Public Health Benefits of the 2022 AQMP that will be presented today. 6-1

Thank you for your consideration.

James Enstrom

cc:
Henry Roman <HRoman@indecon.com>
Will Raich <WRaich@indecon.com>
617-354-0074

From: JAMES ENSTROM <jenstrom@ucla.edu>
Sent on: Tuesday, June 7, 2022 10:15:38 PM
To: Ian MacMillan <imacmillan@aqmd.gov>
CC: Nichole Quick <nquick@aqmd.gov>; Elaine Shen <eshen@aqmd.gov>
Subject: June 8 at 8 AM Public Meeting of EPA CASAC Ozone Panel
Attachments: EPA CASAC 2022 Ozone PA Recon List of Public Speakers 060822.pdf (101.74 KB)

June 7, 2022

Dear Ian,

Thank you very much for arranging the STMPR Zoom today. I look forward to working with you, Dr. Quick, and Elaine Shen on the 2022 AQMP Health Effects. In a separate email I will send you my assessment of the health effects of air pollution as previously submitted to SCAQMD and US EPA. This is the link to the June 8 at 8 AM PT Public Meeting of the EPA Clean Air Scientific Advisory Committee Ozone Panel: https://casac.epa.gov/ords/sab/f?p=113:19:7128367149623:::RP,19:P19_ID:972 . Attached is a list of Public Speakers, which includes Bill LaMarr and me. 6-2

Best regards,

Jim
James E. Enstrom, PhD, MPH, FACE
Retired UCLA Research Professor (Epidemiology)
President, Scientific Integrity Institute
http://scientificintegrityinstitute.org/
jenstrom@ucla.edu
(310) 472-4274

List of Registered Public Speakers

U.S. Environmental Protection Agency
Clean Air Scientific Advisory Committee (CASAC)
Ozone Review Panel
Public Meeting
June 8, 2022

	Name	Affiliation
1.	Chad Whiteman	U.S. Chamber of Commerce
2.	Omobola Mudasiru	American Petroleum Institute
3.	James Enstrom	UCLA and Scientific Integrity Institute
4.	Joshua Berman	Sierra Club
5.	Georgia Murray	Appalachian Mountain Club
6.	Leonardo Tresande	New York University
7.	David Grantz	University of California at Riverside
8.	Seth Johnson	Earthjustice
9.	Gary Ewart	American Thoracic Society
10.	Alison Lee	Mount Sinai
11.	John Balmes	University of California at San Francisco
12.	Jack Harkema	Michigan State University
13.	George Thurston	North American Chapter of the International Society of Environmental Epidemiology
14.	Jay Lehr	International Climate Science Coalition
15.	Albert Rizzo	American Lung Association
16.	Brian Moench	Utah Physicians for a Healthy Environment
17.	Laura van Winkle	University of California at Davis
18.	Bill LaMarr	California Alliance of Small Business Associations
19.	Kathleen Wells	The Naked Truth Report
20.	Matthew Malkan	University of California at Los Angeles
21.	Vincent Martin	Original United Citizens of Southwest Detroit
22.	Lena Moffitt	Evergreen Action
23.	Daren Bakst	Heritage Foundation
24.	Aruni Bhatnagar	American Heart Association
25.	Gilbert Benitez	Los Angeles General Contractor
26.	Matthew Davis	League of Conservation Voters

From: JAMES ENSTROM <jenstrom@ucla.edu>

Sent on: Monday, June 13, 2022 5:00:19 PM
To: Ian MacMillan <imacmillan@aqmd.gov>
CC: Nichole Quick <nquick@aqmd.gov>; Elaine Shen <eshen@aqmd.gov>
Subject: June 7 STMPR Zoom & June 8 EPA CASAC Ozone Comment
Attachments: Enstrom Comment to EPA CASAC Ozone Panel HR 060822.pdf (231 KB), CA Open Letter to CARB on Climate Policy Impacts 060822.pdf (817.04 KB), CA Auditor Report 2020-114 on CARB & Climate Goals 022321.pdf (1.64 MB)

June 13, 2022

Dear Ian,

As a follow-up to our June 7 STMPR Zoom Meeting, I request that you read my attached June 8 Comment to the EPA CASAC Ozone Review Panel and the twelve weblinks that it contains. The six major points in my comment are highly relevant to the 2022 AQMP. I have substantial evidence that personal exposure to ozone and PM2.5 for most people in the SCAB is well below the NAAQS for ozone (70 ppb) and PM2.5 (12 ug/m3). If instance, at my home near UCLA my ozone meter consistantly shows an indoor level of about 10 ppb and a maximum outdoor level of 30 ppb. You must measure ozone and PM2.5 levels in your AQMD offices for comparison with my levels and the levels stated in the AQMP. 6-3

In addition, I have attached the June 8 CA Open Letter to CARB opposing the proposed CARB Climate Change Scoping Plan. I have substantial evidence that this Scoping Plan is scientifically unjustified, economically devastating, and in many ways illegal. Finally, I have attached the February 2021 CA Auditor Report on CARB, which documents that CARB has not demonstrated the effectiveness of its programs in reducing GHG emissions and providing Socioeconomic Benefits to Californians. 6-4

I look forward to working with you and using my epidemiologic expertise to improve the 2022 AQMP.

Thank you very much for your interest and consideration.

Best regards,

Jim
James E. Enstrom, PhD, MPH, FFACE
Retired UCLA Research Professor (Epidemiology)
http://scientificintegrityinstitute.org/

jenstrom@ucla.edu
(310) 472-4274

June 8, 2022

US EPA CASAC Ozone Review Panel Regarding Ozone NAAQS Reconsideration
https://casac.epa.gov/ords/sab/f?p=113:19:8532987399969:::19:P19_ID:972
https://youtu.be/5Qsqhqb5_F0 (minutes 20-26)
http://scientificintegrityinstitute.org/OzonePanel060822.pdf

Dr. James Enstrom's Verbal Comment to EPA CASAC Ozone Review Panel

I am Dr. James Enstrom. I have had a long career as an epidemiologist at UCLA and I have made significant contributions to air pollution epidemiology, particularly regarding the importance of transparency and reproducibility. The 2000 EPA CASAC, the 2000 EPA Administrator, and the April 2022 EPA Ozone Policy Assessment Reconsideration all recommended that the ozone NAAQS remain unchanged at 70 ppb. Thus, the Ozone Panel should not reconsider the ozone NAAQS at this time, but should reconsider it later during the regular 5-year review cycle. Instead, the Ozone Panel should assess six fundamental aspects of the science underlying the NAAQS.

1. Assess the extensive criticism of the linear no-threshold (LNT) model and estimate the threshold below which ozone has no adverse human health effects. U Massachusetts Professor Edward Calabrese published a May 17, 2022 "LNTGate" critique of LNT (https://doi.org/10.1016/j.cbi.2022.109979). It illustrates how acceptance of the LNT dose-response model was unethically advocated and advanced in the 1950s by key scientists and by *Science*, America's leading science journal. Unfortunately, *Science* will not acknowledge errors in four historical articles that are cornerstones in acceptance of the LNT model.

2. Assess the human health effects of ozone based on actual human exposure to ozone, not on the readings of ambient air monitors (https://doi.org/10.1016/j.envint.2018.07.012). There is extensive published evidence that most Americans are personally exposed to less than 20 ppb of 8-hour ozone because they spend up to 90% of their time indoors (https://doi.org/10.1111/ina.12942). In addition, the average seasonal 8-hour maximum ozone concentration in 2019 in the US was 43 ppb (https://www.stateofglobalair.org/air/ozone). The average indoor and outdoor ozone levels are both far below the current ozone NAAQS of 70 ppb (1.0 ppb~2.0 $\mu g/m^3$). Thus, most Americans are not exposed to unhealthy levels of ozone.

3. Assess the extreme publication bias against null air pollution health effects findings by examining key null findings that have been ignored by EPA. My December 10, 2021 CASAC PM Panel comment (http://scientificintegrityinstitute.org/PMpanel121021.pdf) and my February 25, 2022 CASAC PM Panel comment (http://scientificintegrityinstitute.org/PMpanel022522.pdf) document that the 2021 PM ISA and PA ignored at least 60 authors, including me, who have published null findings or criticized the PM2.5 NAAQS. Similar publication bias exists regarding the ozone NAAQS.

4. Assess the evidence that ozone health effects must be based on findings that are transparent and reproducible. My 2017 and 2018 reanalyzes of the ACS CPS II cohort found serious flaws in the seminal Pope 1995 article and the 2000 HEI Reanalysis and demonstrated the importance of access to underlying data (http://scientificintegrityinstitute.org/DRPM25JEEPope052918.pdf). However, *Science* Editor-in-Chief Holden Thorp recently demonstrated his strong bias against EPA transparency by personally stating to me that he will not publish any evidence that I submit to *Science* that supports "Strengthening Transparency in Regulatory Science" (http://scientificintegrityinstitute.org/ThorpJEE041822.pdf).

OPEN LETTER TO CARB ON UPCOMING CLIMATE POLICY REGULATIONS

California Air Resources Chair Liane M. Randolph and Board Members
1001 I Street
Sacramento, CA 95814

Dear Board Members,

As California businesses begin to emerge out of the devastating COVID-19 pandemic that impacted every facet of our lives, we are now facing another major challenge - unprecedented energy costs. Some of these higher energy costs are certainly the result of the Russian invasion of Ukraine. However, the premium Californians pay for all forms of energy is also unquestionably the result of California's energy and climate policy design.

Governor Newsom and Legislators have proposed immediate action to get money directly into the pockets of Californians facing higher energy costs. At the same time, this Board is on track to adopt major regulations over the next few months that have the potential to drive businesses out of California, resulting in job losses, increase cost of living – including food, utilities, and housing costs – and major declines in economic activity.

We collectively have deep concerns with the direct negative impacts from the Climate Change Scoping Plan to meet the AB 32 emissions mandate and the Advanced Clean Cars Rule (ACC II), both of which you will be considering over the course of the coming months.

The decisions made and the path chosen will have a profound impact on all Californians, dictating how they must run their businesses, what cars they can drive, where they can live, and what stove they can cook with. Life as we know it in California will be altered going forward.

ACC II and the Scoping Plan will have major implications for businesses and individuals in California, including:

- **Higher utility costs** disproportionately impacting inland and rural communities
- **Eliminating consumer choice** by mandating all electric vehicles, appliances, residential and commercial buildings
- **Worsening our electric grid reliability** by pushing electrification without the infrastructure in place, thus increasing the likelihood of power outages
- **Increasing costs to businesses,** especially agricultural and goods movement sectors

To lessen the impacts on those that can least afford it, climate policies must be cost-effective, technology-neutral and most protective of the state's skilled and trained workforce. We

California Air Resources Board

Improved Program Measurement Would Help California Work More Strategically to Meet Its Climate Change Goals

February 2021

REPORT 2020-114

[Full report accessible at: http://auditor.ca.gov/pdfs/reports/2020-114.pdf]

Responses to Comment Letter #6

Response to Comment 6-1

South Coast AQMD staff appreciates the commenter's input and participation in the development of the Draft Socioeconomic Report for the 2022 AQMP. Staff has received and reviewed the submitted technical documents and references. Please refer to Response to Comment 4-1 and Response to Comment 104-1 in the 2022 Final AQMP Comments and Responses to Comments document.

Response to Comment 6-2

Please refer to Response to Comment Letter #81—which is the same as Comment 6-2—in the Comments and Responses to Comments on the Appendix I of Draft 2022 AQMP document.

Response to Comment 6-3

Please refer to Responses to Comments 4-1 and 4-4.

Response to Comment 6-4

South Coast AQMD staff encourages the commenter to discuss his comments directly with CARB. The 2022 AQMP is a blueprint for the South Coast Air Basin and the Coachella Valley to attain the 2015 8-hour ozone standard. While the proposed control measures may generate co-benefits of greenhouse gas emission reductions, the primary strategy is to significantly reduce NOx emissions, with strategic VOC reductions.

SECTION 3:

COMMENTS AND RESPONSES TO COMMENTS RECEIVED ON REVISED DRAFT 2022 AQMP RELATED TO DRAFT SOCIOECONOMIC REPORT

Preface

This section includes two comment letters (and selected responses) submitted to the Revised Draft 2022 AQMP. Both of these comment letters included two comments that were directly related to the Draft Socioeconomic Report. Responses to the comments on the Draft Socioeconomic Report (94-4, 94-5, 101-4, and 101-5) are included here. Responses to the remaining comments in these two letters can be found in the Final 2022 AQMP Comments and Responses to Comments document.

Comment Letter #94

Los Angeles County Business Federation
Strengthening the Voice of Business Since 2008

10.18.22

Mr. Ian MacMillan
Assistant Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Via email

Re: BizFed Comments on the SCAQMD Revised Draft 2022 Air Quality Management Plan

Dear Mr. MacMillan:

We are contacting you on behalf of BizFed, the Los Angeles County Business Federation. We are an alliance of over 220 business organizations who represent over 410,000 employers in Los Angeles County, including large and small businesses from a wide range of industries throughout the South Coast Air Basin (SCAB). We are writing to comment on the appendices to the South Coast Air Quality Management District (SCAQMD or District) Draft 2022 Air Quality Management Plan (AQMP or Plan). Many of the businesses we represent have or will be writing their own individual comment letters that specifically address the impacts to their industries. Our comments address the impacts to the business community as a whole and include overarching concerns of our diverse membership.

Comment 94-1

We would like to thank the District for its tireless work improving air quality in the SCAB. Like you, we desire to see continued emissions reduction while maintaining the region's economic vitality. We appreciate the staff and Board's diligence in bringing diverse groups to the table to map out the most effective AQMP as possible.

The 2022 AQMP is a regional blueprint for achieving the 2015 national ambient air quality standards (NAAQS) for ground level ozone of 70 parts per billion (ppb).[1] The District faces unique challenges in achieving the 2015 NAAQS for ground level ozone, including unique topography and meteorology, as well as sources of significant ozone pollution for which the District has limited control authority, such as mobile source emissions. Additionally, climate change is playing a significant role in ozone production. Higher temperatures produce more biogenic and evaporative VOC emissions and result in greater risk of wildfire emissions that contribute to ozone formation. Additionally, climate change is resulting in higher temperatures in spring and fall, resulting in longer ozone formation seasons. The 2022 AQMP projected emissions must consider the increased ozone resulting from climate change.

Comment 94-2

On September 2, 2022, the District released the Revised Draft 2022 AQMP.[2] The Draft Socioeconomic Report for the Revised Draft AQMP (Socioeconomic Report) was subsequently released on October 1, 2022.[3] The 2022 AQMP relies on a significant transition to zero emission (ZE) technologies. BizFed notes that historically, SCAQMD has remained neutral on fuel and technology in rulemakings to allow compliance flexibility and achievement of emission reductions at a more reasonable cost. BizFed strongly recommends that the 2022 AQMP include a technology and fuel neutral policy.

[1] 2015 Revision to 2008 Ozone NAAQS. Available at: https://www.federalregister.gov/documents/2015/10/26/2015-26594/national-ambient-air-quality-standards-for-ozone.
[2] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.
[3] 2022 Draft AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

BizFed offers the following comments on the Revised Draft 2022 AQMP.

1. **SCAQMD is proposing a number of control measures which require electrification of equipment. SCAQMD must evaluate whether the electrical grid will have the infrastructure and grid capacity needed to support this widespread electrification proposal.**

The focus of the majority of the 2022 AQMP control measures is on deployment of ZE technologies, most of which would involve electrification.[4] Given this policy dependence on electrification, stakeholders expect that policy makers will have some basis for anticipating that widespread electrification will be a viable pathway. But neither SCAQMD or the California Air Resources Board (CARB) has actually considered whether our electric grid will have sufficient generation, transmission or distribution infrastructure to support the numerous proposed control measures which would depend on ready and abundant access to electricity.

Over the past few years, California has experienced multiple electricity outages. In the Preliminary Root Cause Analysis on the electricity outages caused by the 2020 heatwave, the California Independent System Operator (CAISO), California Public Utilities Commission (CPUC), and the California Energy Commission (CEC) concluded…[5]

In transitioning to a reliable, clean, and affordable resource mix resource planning targets have not kept pace to lead to sufficient resources that can meet demand.

The 2021 Proclamation of a State of Emergency ordered that all energy agencies act immediately to achieve energy stability, including accelerated plans for construction, procurement, and deployment of new clean energy and storage projects to mitigate the risk of capacity shortages.[6] The proclamation stated:

…there is insufficient time or supply to install new energy storage or zero-carbon energy projects to address the immediate shortfall of up to 3,500 megawatts during extreme weather events that is now projected for this summer… it is already too late, under normal procedures, to bring additional sources of energy online in time to address the previously unforeseen shortfall of up to 5,000 megawatts that is now projected for the summer of 2022.

As discussed in our letter dated July 22, 2022, California energy officials now estimate a continuing gap between energy demand and supply as follows:

Comment 94-3

[4] SCAQMD 2022 Revised Draft AQMP, Appendix IV, Stationary and Mobile Source Control Measures. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-appendix-iv-a.pdf?sfvrsn=6.
[5] CAISO, CPUC, CEC Preliminary Root Cause Analysis, Mid-August 2020 Heat Storm. Available at: http://www.caiso.com/Documents/Preliminary-Root-Cause-Analysis-Rotating-Outages-August-2020.pdf.
[6] State of California Proclamation of A State of Emergency, July 30, 2021. Available at: https://www.gov.ca.gov/wp-content/uploads/2021/07/Energy-Emergency-Proc-7-30-21.pdf.

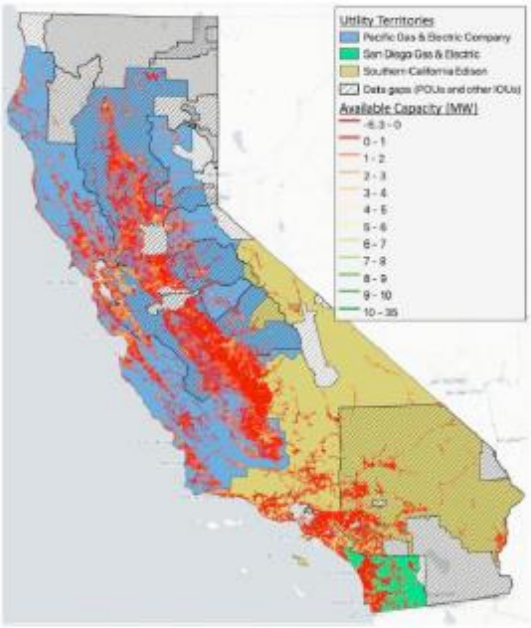
Table 1. Potential Energy Shortfall [7]

Year	California Potential Energy Shortfall (MW)
2022	3,500
2023	600
2024	2,700
2025	3,300

Along with generation capacity, the transmission and distribution infrastructure must also be considered. The CEC recently produced an analysis of locations in need of infrastructure upgrade based on capacity deficit as shown in Figure 1.[8,9]

Comment 94-3 Con't

Figure 1. Capacity Analysis from CEC's EDGE Tool (note: dark red indicates no available additional capacity)

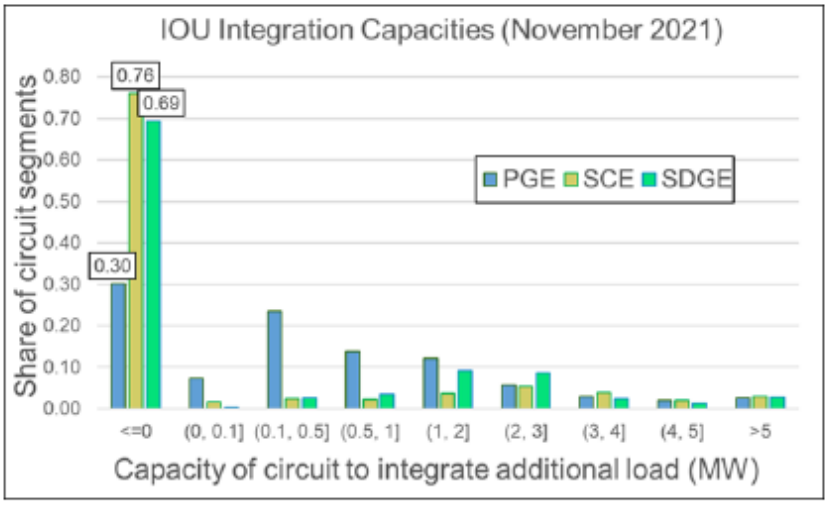


As shown in Figure 1, the California grid seemingly has little to no capacity to add electrical load on most circuits at this time.[10] CARB recently presented similar data suggesting that

[7] California Faces Summer Blackouts from Climate Extremes, Scientific American, May 23, 2022. Available at: https://www.scientificamerican.com/article/california-faces-summer-blackouts-from-climate-extremes/.
[8] CARB Advanced Clean Cars II Draft Environmental Analysis. Available at: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/appe1.pdf.
[9] Ibid.
[10] Ibid.

30% to 76% of circuit segments for the investor owned utilities (IOUs) have no capacity to integrate additional load (Figure 2).[11]

Figure 2: Additional Load Integration Capacity



SCAQMD has noted that the estimates of statewide ZE infrastructure needs developed by the CEC and CARB are…[12]

… largely based on a transition to ZE vehicles for on-road transportation sources, and ***do not fully address the adoption of ZE technologies by other sources, such as stationary, locomotives, and off-road equipment****. These preliminary estimates will need to be further developed to include the ZE infrastructure needs of all sources and address the unique needs of the South Coast and Coachella Valley Air Basins.* [Emphasis Added]

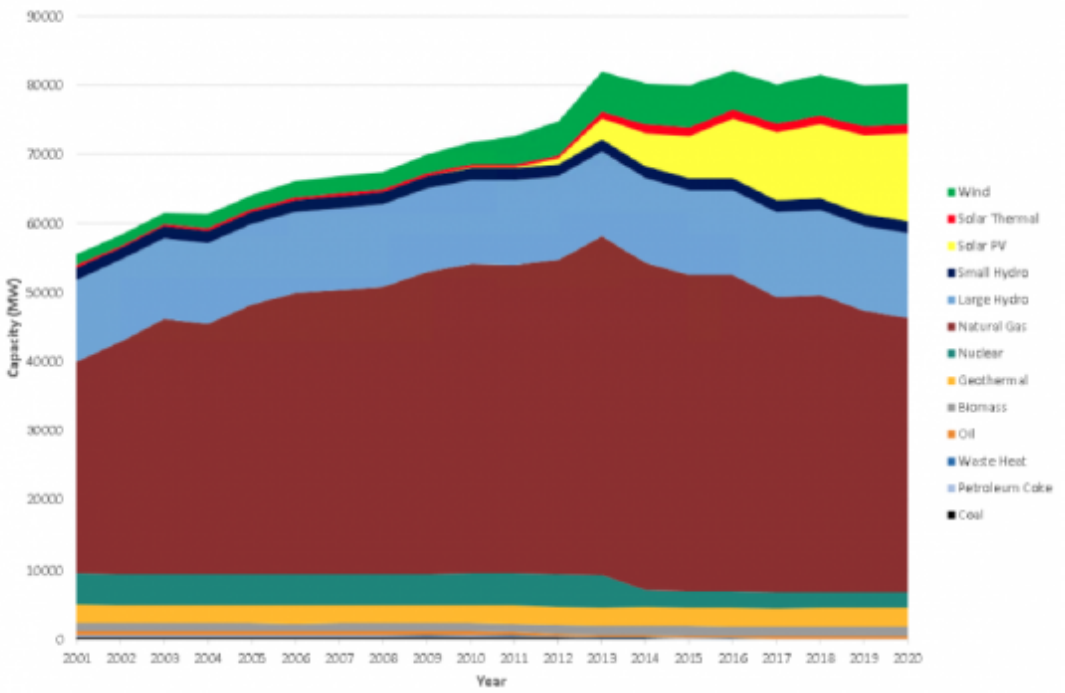
While SCAQMD has noted this important data gap, the 2022 Revised Draft AQMP makes no attempt to fill it even though senior executives have acknowledged the scale of these grid challenges. SCAQMD Executive Officer Wayne Nastri has recently noted that California will need to build 7 giga-watts (GW) of power per year for the next 40 years to meet projected demand.[13] To date, California has struggled to add much more than 1.2 GW in a year. Meanwhile, installed in-state electric generation capacity stopped growing over the past few years.

Figure 3 shows the installed in-state electric generation capacity by fuel type.[14] In-state electric generation capacity actually decreased between 2016 and 2020.

Comment 94-3 Con't

[11] CARB Virtual Medium and Heavy-Duty Infrastructure Workgroup Meeting - 01/12/22. Available at: https://www.youtube.com/watch?v=_mr0TmwxGZQ.
[12] SCAQMD 2022 AQMP Policy Brief, Infrastructure – Energy Outlook. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-infrastructure---energy-outlook.pdf?sfvrsn=8.
[13] SCAQMD Legislative Committee Meeting, September 9, 2022. Meeting recording available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=1jo6esFRYug.
[14] California Energy Commission Electric Generation Capacity and Energy. Available at: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/electric-generation-capacity-and-energy.

Figure 3. Installed In-state Electric Generation Capacity by Fuel Type



Given these recent trends, how is it possible that the grid will accommodate significantly greater transmission and distribution needs? Where and how soon will the additional generation capacity be developed? SCAQMD simply must consider electrical grid impacts prior to advancing an AQMP that depends on a wide-scale electrification of residences, industry, and businesses. To help address the gap between the availability of widescale ZE infrastructure and expected needs, SCAQMD must work with state agencies to enable more expeditious planning and build-out of grid infrastructure.

Comment 94-3 Con't

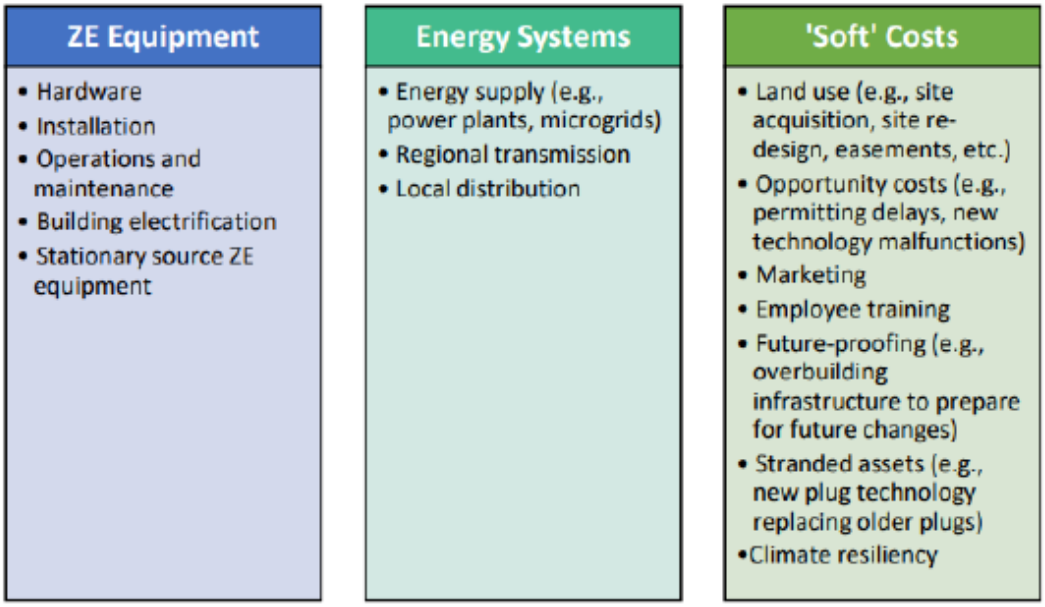
2. **The Socioeconomic Report omits costs related to installation of ZE infrastructure, especially those costs related to the electric grid. Planning level costs should be included so that the Socioeconomic Report analysis presents a more complete view of the implementation costs for the 2022 AQMP.**

Comment 94-4

The Socioeconomic Report outlines following three categories of expenditures related to installation of future ZE infrastructure[15]:

[15] 2022 Draft AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

Figure 4: Three Categories of Costs for Zero Emission Infrastructure



Comment 94-4 Con't

The Socioeconomic Report notes the challenges in quantifying the costs for ZE infrastructure, noting uncertainty in scale and distribution, with the lowest level of uncertainty for ZE Equipment and the highest level for 'soft' costs. Due to the uncertainty in costs, SCAQMD does not include 'soft' costs in the Socioeconomic Report analysis of costs related to implementation of the 2022 AQMP, stating[16]:

...further research is needed to determine how these costs for each project can be considered broadly when zero emission technologies are deployed at the scale needed to meet air quality standards.

But the AQMP is a planning document, and it is reasonable for stakeholders to expect at least planning-level estimates to have been conducted. Economy-wide electrification costs for infrastructure will be enormous. One estimate for a statewide on-road ZE fleet in California estimated cost to be $2.1 to $3.3 trillion between 2020-2050.[17] This estimate was related solely to on-road fleet transition and did not include electrical infrastructure costs related to stationary and off-road equipment. Just the same, it gives a sense of the scale for these types of infrastructure costs.

By completely omitting electrical infrastructure costs, the 2022 vastly understates the cost of the 2022 AQMP. Governing Board Member Carlos Rodriguez recently said as much when he expressed concern that the Socioeconomic Report excludes these grid infrastructure

[16] Ibid.
[17] Transportation Electrification Infrastructure Costs in California: A Meta-Study of Published Literature. Available at: https://www.arb.ca.gov/lists/com-attach/80-sp22-concepts-ws-AmNWJVA2VFgEM1Bn.pdf.

costs.[18] SCAQMD should use all available data to incorporate planning level estimates of infrastructure development costs in the 2022 AQMP.

3. **The cost to implement the 2022 AQMP is considerable, even in comparison to the 2016 AQMP. SCAQMD should consider the burden these costs place on business owners and residents who will be forced to shoulder the costs.**

The Socioeconomic Report presents the total incremental costs and quantified public health benefits of the control measures presented in the 2022 AQMP.[19] The Socioeconomic Report also presents estimates of impacts to jobs. The 2022 AQMP is significantly more costly than the 2016 AQMP and is projected to cause a staggering number of Jobs Foregone, where Jobs Foregone is defined as follows:

Comment 94-5

Jobs Foregone = Loss of Existing Jobs + Forecasted Jobs Not Created

Table 2 presents a cost and jobs foregone comparison between the 2016 and 2022 AQMPs[20, 21].

Table 2: 2022 AQMP Comparison to 2016 AQMP

	2016 AQMP Socioeconomic Report	**2022 AQMP Socioeconomic Report**
Total Incremental Cost	$15.7 billion	$34.3 billion
Average Annual Incremental Cost	$0.85 billion	$2.85 billion
Contribution to Total Annualized Cost - Stationary and Area Sources	36%	43.5%
Contribution to Total Annualized Cost - Mobile Sources	64%	56.5%
Incentives	93% of total incremental cost	10% of annual incremental cost
Jobs Impact - Best-Case Scenario	**29,000 jobs gained**	17,000 jobs foregone
Jobs Impact - Worst-Case Scenario	9,000 jobs foregone	**29,000 jobs foregone**

[18] SCAQMD Governing Board Meeting, October 7, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=mQOlxYZ-Cm4.
[19] 2022 Draft AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.
[20] Ibid.
[21] 2016 Final Socieconomic Report, 2016 AQMP. Available at: https://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/final/sociofinal_030817.pdf?sfvrsn=2.

And as stated above, this is not even a complete assessment. The costs presented in Table 2 do not include costs related to expansion of grid infrastructure, which could easily dwarf the costs that were included. The job impacts in the Socioeconomic Report are likely overly optimistic. SCAQMD should include costs of electric grid development in the Socioeconomic Report, as these costs will be borne both by the stationary sources and the population of the South Coast Air Basin.

Comment 94-5 Con't

4. SCAQMD must derive reasonable cost-effectiveness thresholds.

SCAQMD has proposed two options for cost-effectiveness thresholds in the 2022 revised Draft AQMP. The first option reflects the approach used in previous AQMPs and adjusting for inflation. This option results in a cost effectiveness threshold of $59,000 per ton of NOx reduced. The second option is a health benefit cost-effectiveness threshold of 325,000/ton derived from a two-part analysis. SCAQMD staff first used EPA's "Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors, and Ozone Precursors from 21 Sectors", which uses the Benefits Mapping and Analysis Program Community Edition (BenMAP-CE v.1.5) to derive a cost effectiveness of $307,636/ton NOx reduced. Staff further used the 2016 socioeconomic report, which relies on the same BenMAP model and resulted in a cost-effectiveness of 342,000 per ton of NOx reduced. SCAQMD averaged these two results to arrive at the proposed cost-effectiveness threshold of $325,000/ton.

Comment 94-6

If SCAQMD wants to include all the societal benefit in estimating cost-effectiveness, then it should also include all the societal costs. Other economic costs, such as stranded assets, job losses, and consumer prices should also be factored in. SCAQMD Governing Board Member Carlos Rodriguez recently agreed, stating that in evaluating cost-effectiveness thresholds, SCAQMD should not only rely on health benefits, but also include other economic costs. [22] SCAQMD must consider what is reasonable to ensure that facilities are able to continue conducting business in the south coast air basin.

Conclusion

The District has made significant strides in air reductions during the past 30 years, despite a significant population increase, and it should be proud of its accomplishments. Those reductions were accomplished in collaboration with many stakeholders, in particular the business community. We respect that SCAQMD is placed in a uniquely challenging situation to demonstrate attainment of the 2015 ozone NAAQS, and the business community stands ready to help the District achieve all practicable reductions as soon as possible.

Comment 94-7

We look forward to continuing our work with the District to see progress made in a way that is equitable and lasting.

Thank you for your consideration of our letter. If you have any questions, please contact BizFed's Director of Policy and Advocacy Sarah Wiltfong at sarah.wiltfong@bizfed.org.

Brissa Sotelo-Vargas
BizFed Chair

David Fleming
BizFed Founding Chair

Tracy Hernandez
BizFed Founding CEO

David Englin
BizFed President

[22] SCAQMD Mobile Source Committee Meeting, September 16, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=zSMKn4miXuk

BizFed Association Members

7-11 Franchise Owners Association for SoCal
Action Apartment Association
Alhambra Chamber
American Beverage Association
Antelope Valley Chamber formerly Lancaster Chamber of Commerce
Apartment Association of Greater Los Angeles
Apartment Association, CA Southern Cities, Inc .
Arcadia Association of Realtors
AREAA North Los Angeles SFV SCV
Armenian Trade & Labor Association
Arts District Los Angeles
Associated Builders & Contractors SoCal (ABC SoCal)
Association of Club Executives
Association of Independent Commercial Producers
AV Edge California
Azusa Chamber
Beverly Hills Bar Association
Beverly Hills Chamber
BioCom
Black Business Association
BNI4SUCCESS
Bowling Centers of SoCal
Boyle Heights Chamber of Commerce
Building Industry Association - LA/Ventura Counties
Building Industry Association of Southern California
Building Industry Association- Baldyview
Building Owners & Managers Association of Greater Los Angeles
Burbank Association of Realtors
Burbank Chamber of Commerce
Business and Industry Council for Emergency Planning and Preparedness
Business Resource Group
CABIA California Business and Industrial Alliance
Calabasas Chamber of Commerce
CalAsian Chamber
CalChamber
California Apartment Association- Los Angeles
California Asphalt Pavement Association
California Bankers Association
California Business Properties
California Business Roundtable
California Cannabis Industry Association
California Cleaners Association
California Contract Cities Association
California Fashion Association
California Gaming Association
California Grocers Association
California Hispanic Chamber
California Hotel & Lodging Association
California Independent Oil Marketers Association (CIOMA)
California Independent Petroleum Association
California Life Sciences Association
California Manufacturers & Technology Association
California Metals Coalition
California Natural Gas Producers Association
California Restaurant Association
California Retailers Association
California Self Storage Association
California Small Business Alliance
California Society of CPAs - Los Angeles Chapter
California Trucking Association
Carson Chamber of Commerce
Carson Dominguez Employers Alliance
Central City Association
Century City Chamber of Commerce
Cerritos Regional Chamber of Commerce
Chatsworth Porter Ranch Chamber of Commerce
Citrus Valley Association of Realtors
Claremont Chamber of Commerce
Commercial Industrial Council/Chamber of Commerce
Compton Chamber of Commerce
Construction Industry Air Quality Coalition
Construction Industry Coalition on Water Quality
Council on Infill Builders
Covina Chamber
Crenshaw Chamber of Commerce
Culver City Chamber of Commerce
Downey Association of REALTORS
Downey Chamber of Commerce
Downtown Alhambra Business Association
Downtown Center Business Improvement District
Downtown Long Beach Alliance
El Monte/South El Monte Chamber
El Segundo Chamber of Commerce
Employers Group
Encino Chamber of Commerce
Energy Independence Now EIN
Engineering Contractor's Association
EXP Future
FastLink DTLA
Filipino American Chamber of Commerce
Friends of Hollywood Central Park
FuturePorts
Gardena Valley Chamber
Gateway to LA
Glendale Association of Realtors
Glendale Chamber
Glendora Chamber
Greater Antelope Valley AOR
Greater Bakersfield Chamber of Commerce
Greater Lakewood Chamber of Commerce
Greater Leimert Park Crenshaw Corridor BID
Greater Los Angeles African American Chamber
Greater Los Angeles Association of Realtors
Greater Los Angeles New Car Dealers Association
Greater San Fernando Valley Chamber
Harbor Association of Industry and Commerce
Harbor Trucking Association
Historic Core BID of Downtown Los Angeles
Hollywood Chamber
Hong Kong Trade Development Council
Hospital Association of Southern California
Hotel Association of Los Angeles
Huntington Park Area Chamber of Commerce
ICBWA- International Cannabis Women Business Association
Independent Cities Association
Industrial Environmental Association
Industry Business Council
Inglewood Board of Real Estate
Inland Empire Economic Partnership
International Franchise Association
Irwindale Chamber of Commerce
La Cañada Flintridge Chamber
LA Coalition
LA Fashion District BID
LA South Chamber of Commerce
Larchmont Boulevard Association
Latin Business Association
Latino Food Industry Association
Latino Restaurant Association
LAX Coastal Area Chamber
League of California Cities
Long Beach Area Chamber
Long Beach Economic Partnership
Los Angeles Area Chamber
Los Angeles County Board of Real Estate
Los Angeles County Waste Management Association
Los Angeles Economic Development Center
Los Angeles Gateway Chamber of Commerce
Los Angeles LGBTQ Chamber of Commerce
Los Angeles Latino Chamber
Los Angeles Parking Association
Los Angeles World Affairs Council/Town Hall Los Angeles
MADIA
Malibu Chamber of Commerce
Manhattan Beach Chamber of Commerce
Marketplace Industry Association
Monrovia Chamber
Motion Picture Association of America, Inc.
MoveLA
MultiCultural Business Alliance
NAIOP Southern California Chapter
NAREIT
National Association of Minority Contractors
National Association of Tobacco Outlets
National Association of Women Business Owners
National Association of Women Business Owners - LA
National Association of Women Business Owners- California
National Federation of Independent Business Owners California
National Hookah
National Latina Business Women's Association
Orange County Business Council
Orange County Hispanic Chamber of Commerce
Pacific Merchant Shipping Association
Panorama City Chamber of Commerce
Paramount Chamber of Commerce
Pasadena Chamber
Pasadena Foothills Association of Realtors
PGA
PhRMA
Pico Rivera Chamber of Commerce
Planned Parenthood Affiliates of California
Pomona Chamber
Rancho Southeast REALTORS
ReadyNation California
Recording Industry Association of America
Regional CAL Black Chamber, SVF
Regional Hispanic Chambers
San Dimas Chamber of Commerce
San Gabriel Chamber of Commerce
San Gabriel Valley Economic Partnership
San Pedro Peninsula Chamber
Santa Clarita Valley Chamber
Santa Clarita Valley Economic Development Corp.
Santa Monica Chamber of Commerce
Sherman Oaks Chamber
South Bay Association of Chambers
South Bay Association of Realtors
South Gate Chamber of Commerce
South Pasadena Chamber of Commerce
Southern California Contractors Association
Southern California Golf Association
Southern California Grantmakers
Southern California Leadership Council
Southern California Minority Suppliers Development Council Inc.
Southern California Water Coalition
Southland Regional Association of Realtors
Sportfishing Association of California
Sunland/Tujunga Chamber
Sunset Strip Business Improvement District
Torrance Area Chamber
Tri-Counties Association of Realtors
United Cannabis Business Association
United Chambers – San Fernando Valley & Region
United States-Mexico Chamber
Unmanned Autonomous Vehicle Systems Association
US Green Building Council
US Resiliency Council
Valley Economic Alliance, The
Valley Industry & Commerce Association
Venice Chamber of Commerce
Vermont Slauson Economic Development Corporation
Vietnamese American Chamber
Warner Center Association
West Hollywood Chamber
West Hollywood Design District
West Los Angeles Chamber
West San Gabriel Valley Association of Realtors
West Valley/Warner Center Chamber
Western Electrical Contractors Association
Western Manufactured Housing Association
Western States Petroleum Association
Westside Council of Chambers
Whittier Chamber of Commerce
Wilmington Chamber
Women's Business Enterprise Council
World Trade Center

Responses to Comments 94-4 and 94-5

Response to Comment 94-4

Please refer to relevant portions in Responses to Comments 1-6, 2-1, and 3-1. Moreover, staff disagrees with the assertion that the Draft Socioeconomic Report completely omits electrical infrastructure costs. To the extent data are available, staff includes costs related to zero emission equipment as well as other "behind-the-meter" costs such as residential panel upgrades. However, full cost estimates are not possible given the current state of knowledge about how zero emissions infrastructure will be built out. For example, the Public Utilities Commission only recently set significant new policy direction on Transportation Electrification from November 17, 2022 (Decision on Transportation Electrification Policy and Investment, https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M499/K005/499005805.PDF), sets significant new policy direction and describes several factors that are still unresolved that are crucial to determine total costs. These includes not having "sufficient detail on where [Transportation Electrification] infrastructure is most needed and what role the [Investor-Owned Utilities] should take", not knowing what the electrical rates will be beyond 2025 as PUC only just determined to re-evaluate them on a five-year cycle, how electrical rates may vary depending how vehicle-grid integration occurs (e.g., at what level will vehicle batteries power the grid), etc. While PUC is taking a leading role with transportation electrification policymaking for Investor-Owned Utilities, these policies do not apply to publicly-owned utilities who set their own policies that may result in different costs. Examples include the pace of buildout, whether electrification programs can be securitized, age of each utility's existing infrastructure, etc.

Staff is committed to continuing to keep abreast of state-level and other assessments of energy system costs and provide necessary input in developing those assessments. In future rulemakings, staff will also make best efforts in evaluating site- and project-specific "soft costs" related to zero emission infrastructure installation.

The analysis cited in the comment that estimates total costs of $2.1 to $3.3 trillion through 2050 is not appropriate for use in the 2022 AQMP Socioeconomic Report for several reasons. For example, it includes full statewide costs (not just South Coast AQMD), most of the costs in that analysis occur due to changes after the 2037 attainment year, and it includes total costs rather than net costs (e.g., in the underlying analysis, the difference between a high electrification scenario and base case scenario in 2035 is $70 billion, but total cost is $770 billion). The underlying analysis the commenter cites also shows a considerable range in estimates of incremental costs, including scenarios with net savings of $2 billion/year to costs of $17 billion/year in 2030 (with a base case of $9 billion/year). Regardless, the cost to transition to zero emission will be expensive, and additional research is needed by many agencies and stakeholders to estimate what the final costs will be, and how to minimize those costs.

Response to Comment 94-5

Staff acknowledges the considerable increase in costs of implementing the 2022 AQMP as compared to the 2016 AQMP. Please refer to Response to Comment 3-1 related to the key factors driving the increase, as well as the report's conservative assumptions related to future zero emission technology costs and the amount of incentives considered for the analysis. As noted in both the 2016 and 2022 Socioeconomic Report, the projected job impacts include both loss of existing jobs and forecast jobs not created; overall,

however, the projected job impacts in the range of ± 29,000 jobs would not alter the region's positive job growth trajectory in a regional economy with more than 10 million jobs.

Comment Letter #101

Ramine Cromartie
Senior Manager, Southern California Region

October 18, 2022

Dr. Sang-Mi Lee
Planning & Rules Manager
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Via e-mail at: AQMPteam@aqmd.gov

Re: WSPA Comments on SCAQMD Revised Draft 2022 Air Quality Management Plan

Dear Dr. Lee,

Western States Petroleum Association (WSPA) appreciates the opportunity to participate in the working group and workshops for the South Coast Air Quality Management District's (SCAQMD or District) 2022 Air Quality Management Plan (AQMP or Plan). The AQMP is a regional blueprint for achieving the national ambient air quality standards (NAAQS). On October 1, 2015, the U.S. Environmental Protection Agency (EPA) strengthened the National Ambient Air Quality Standards (NAAQS) for ground-level ozone, lowering the primary and secondary ozone standard levels to 70 parts per billion (ppb).[1] The 2022 AQMP is being developed to address the requirements for meeting this standard through proposed control measures.

WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport, and market petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies in five western states including California. WSPA has been an active participant in air quality planning issues for over 30 years. WSPA-member companies operate petroleum refineries and other facilities in the South Coast Air Basin (SCAB) that are regulated by the SCAQMD and will be impacted by the 2022 AQMP.

Comment 101-1

We understand the challenges that the District faces in attaining the NAAQS. The region's unique topography and meteorology combined with mobile source emissions continues to produce significant ozone pollution for which the District has limited control authority. And as cost-effective controls have been implemented, it has become increasingly difficult to identify and implement additional control measures that are cost-effective. On September 2, 2022, SCAQMD released the Revised Draft 2022 AQMP.[2] On October 1, 2022, SCAQMD released the Draft Socioeconomic Report for the Revised Draft 2022 AQMP.[3] WSPA offers the following comments.

[1] 2015 Revision to 2008 Ozone NAAQS. Available at: https://www.federalregister.gov/documents/2015/10/26/2015-26594/national-ambient-air-quality-standards-for-ozone.
[2] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.
[3] 2022 Draft AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

1. **SCAQMD should reaffirm their commitment to a technology and fuel neutral policy consistent with historical air quality management plan and rulemaking development.**

   In previous AQMPs and rulemakings, SCAQMD has taken a position of technology and fuel neutrality. In the 2016 AQMP, SCAQMD stated:[4]

   > *Air quality regulatory agencies have traditionally set policies and requirements that are performance-based, and thus technology- and fuel-neutral.* ***This is a policy that the SCAQMD intends to continue.*** *[Emphasis added]*

   To realize the emission reductions required by the 2022 AQMP, SCAQMD has stated that widespread deployment of zero emission (ZE) technology must be implemented over all sectors. The 2022 AQMP Policy Brief on Infrastructure and Energy Outlook states[5]:

   > *The only pathway to attainment requires widespread deployment of ZE technologies* at scale.

   However, by shifting to a singular technology/fuel approach, SCAQMD would limit the flexibility of industries and technology manufacturers to develop emission reduction strategies at lower costs. SCAQMD's objectives for air quality improvement would be further advanced by allowing competition among more technologies and fuels. SCAQMD's long-held technology neutral policy should be applied to the 2022 AQMP.

Comment 101-2

2. **The 2022 Draft AQMP includes numerous control measures which would require electrification of different types of equipment. California's electric grid infrastructure is already strained, and SCAQMD representatives have acknowledged the infrastructure will take years to develop. Yet the Draft AQMP does not consider the time or cost constraints electrification would impose. Before advancing such measures, SCAQMD should consider whether (or when) the region will be able to accommodate additional electric grid demands.**

   In the 2022 AQMP, electric technology options have been proposed for residential and commercial water heating, space heating, and cooking devices, as well as for non-emergency internal combustion engines, large turbines, electrical generation facilities, and petroleum refineries.[6] SCAQMD staff have acknowledged that the existing infrastructure is not sufficient for widespread adoption of ZE technologies and will take many years to develop.[7,8] SCAQMD also notes that the preliminary estimates of statewide ZE infrastructure needs developed by the California Energy Commission (CEC) and California Air Resources Board (CARB) "are largely based on a transition to ZE vehicles for on-road transportation sources, and do not fully address the adoption of ZE technologies by other emission sources, including stationary, locomotives, and off-road equipment."[9]

Comment 101-3

[4] SCAQMD Final 2016 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.
[5] 2022 AQMP Policy Brief on Infrastructure – Energy Outlook. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-infrastructure---energy-outlook.pdf?sfvrsn=8.
[6] 2022 AQMP Control Measures Workshop, Agenda Item 5, South Coast AQMDs Proposed Draft VOC Stationary Source and Other Measures, Slides 7-34. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/am-pres-agenda-item-5-nox-measures-110621.pdf?sfvrsn=6.
[7] 2022 AQMP Control Measures Workshop, Agenda Item 3, South Coast AQMDs Proposed Draft VOC Stationary Source and Other Measures, Slide 13. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/am-pres-agenda-item-3-zero-emission-technology-110621.pdf?sfvrsn=6
[8] August 2, 2021 letter to environmental organizations from Wayne Nastri, SCAQMD Executive Officer.
[9] SCAQMD 2022 AQMP Policy Brief, Infrastructure – Energy Outlook. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-infrastructure---energy-outlook.pdf?sfvrsn=8.

During a recent SCAQMD Legislative Committee meeting, Mayor Michael Cacciotti, Committee Chair and SCAQMD Governing Board Member, questioned whether the region in general, and certain utilities in particular, will be able to accommodate the new electric demands, and whether there is money being put into the updated grid.[10] In response, Wayne Nastri, SCAQMD Executive Officer, stated that California will need to build 7 gigawatts (GW) of power per year for the next 40 years to meet projected demand, and the most power California has built in a year thus far has been 1.2 GW. He stated that the question on everyone's mind is: If we have never met that level of increase in power, what makes us think we are going to be able to get the needed increases? Mr. Nastri continued, stating that it is going to be very difficult to get the required infrastructure we need to deploy to a fully zero-emission society.[11]

Comment 101-3 Con't

California faces significant and unresolved grid infrastructure and reliability concerns that would only be exacerbated by the electrification requirements in the proposed AQMP control measures. SCAQMD has not considered or analyzed any of the generation, transmission, or distribution constraints in its proposals. SCAQMD notes repeatedly in their responses to comments that control measure MOB-15, ZE Infrastructure for mobile sources, is a commitment to engage with stakeholders involved with the transition to ZE fueling with the goal of identifying potential shortfalls in technologies and energy availability while assisting in an effort to address these concerns.[12] However, assistance in planning does not provide a guarantee that the infrastructure will be in place to support the transition to ZE and near ZE technologies. SCAQMD must consider electrical infrastructure development and availability of reliable electrical power in the rulemaking process.

3. **The 2022 AQMP Draft Socioeconomic Report omits expenditures related to ZE infrastructure, making it an incomplete analysis of the impacts to residents in the South Coast Air Basin.**

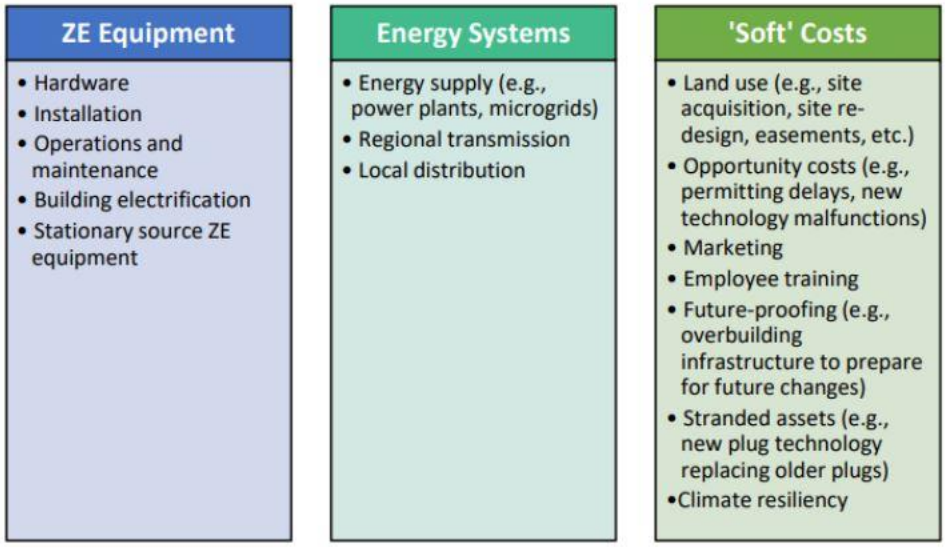
The 2022 AQMP Draft Socioeconomic Report (Socioeconomic Report) states that the impact of implementing ZE and fuel-cell technologies on the existing infrastructure "presents challenges in quantifying cost and determining the level of uncertainty in scale and distribution."[13]

Comment 101-4

SCAQMD has stated that three categories of expenditures are expected for installation of future ZE infrastructure, as presented in Figure 1.[14]

[10] SCAQMD Legislative Committee Meeting, September 9, 2022. Meeting recording available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=1jo6esFRYug.
[11] Ibid.
[12] 2022 Revised Draft AQMP Comments and Responses to Comments. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[13] 2022 AQMP Draft Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.
[14] SCAQMD 2022 AQMP Draft Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

Figure 1: Three Categories of Costs for Zero Emissions Infrastructure.



The Socioeconomic Report notes the uncertainties in each of the above categories, stating that the level of uncertainty is the least for ZE equipment, and highest for soft costs, noting that:

> *…further research is needed to determine how these costs for each project can be considered broadly when zero emission technologies are deployed at the scale needed to meet air quality standards.*

SCAQMD further states that "'soft' costs are generally not included in current estimates." Additionally, the Socioeconomic Report states, "Due to high uncertainty, these speculative future energy system costs are not considered in the socioeconomic analysis…." But in fact, the scale of these costs is not impossible to estimate.

For example, a 2021 study of published literature on transportation electrification infrastructure costs in California estimated the cumulative costs from 2020-2050 for generation, transmission, distribution, maintenance, and electric vehicle chargers to achieve a statewide on-road zero emission vehicle (ZEV) fleet to be $2.1 to $3.3 trillion.[15] This cost estimate did not include:

- Infrastructure upgrade costs for generation, transmission, and supply of renewable hydrogen that is needed for operating fuel cell electric vehicles;
- Additional costs associated with upgrades to the electric grid to address grid reliability issues that could arise from increased use of renewables, public safety power shutoffs (PSPS) to avoid wildfires, and/or aging infrastructure;
- Potential stranded asset costs, if any, arising from policies implemented to achieve a statewide on-road ZEV fleet and zero-carbon electricity supply in 2050.

Comment 101-4 Con't

[15] Transportation Electrification Infrastructure Costs in California: A Meta-Study of Published Literature. Available at: https://www.arb.ca.gov/lists/com-attach/80-sp22-concepts-ws-AmNWJVA2VFgEM1Bn.pdf.

The above estimate was solely considering transportation electrification impacts and would not include costs for upgrading the grid for residential electrical use or other stationary source control measures as proposed in the 2022 Revised Draft AQMP. But this example suggests that those costs would be quite considerable. By failing to provide even planning-level costs for electrical infrastructure costs, the Socioeconomic Report vastly understates the cost of the Revised Draft AQMP.

SCAQMD should revise the cost analysis to include cost estimates for electrical infrastructure development and include them in the Socioeconomic Report.

Comment 101-4 Con't

4. **Implementation of the 2022 AQMP will be considerably more costly compared to the 2016 AQMP. This cost will be largely carried by residents of the SCAB. In addition, there are considerable job losses expected from implementation of the 2022 AQMP. As the District's costs and job loss estimates do not account for electrical infrastructure costs, those estimates are almost certainly understated.**

The 2016 AQMP proposed NOx reductions at an amortized cost of $0.85 billion, with over 90% of that cost attributed to publicly funded incentive programs.[16] Additionally, the net job impacts in the 2016 AQMP were between 9,000 jobs lost for a worst-case scenario and 29,000 jobs gained in a best-case scenario.

The Draft 2022 AQMP Socioeconomic Report states that the Revised Draft 2022 AQMP would be projected to result in an amortized cost of $2.85 billion more than business-as-usual (BAU); a cost that is 3.3 times higher than the 2016 AQMP. Costs are divided as follows:[17]

> *Nearly 57 percent or about $1.61 billion of the annual incremental cost is related to mobile source control strategies, and these strategies are expected to lead to about 80 percent of the emission reductions needed to attain the 8- hour ozone standard by 2037. The remaining 43 percent of the annual amortized average cost, or $1.24 billion, is associated with reducing stationary and area source emissions in the Basin which account for about 20 percent of the necessary emission reductions for regional air quality attainment.*

Comment 101-5

The Socioeconomic Report states that only 10% of the total incremental cost is attributed to incentive programs that can be used to offset the purchase of cleaner technologies. The large reduction in available incentives will likely result in costs being passed on to consumers.

The 2022 AQMP will also impact employment. The Socioeconomic Report defines Jobs Foregone as follows:

> *Jobs Foregone = Loss of Existing Jobs + Forecasted Jobs Not Created*

The Socioeconomic Report estimates between 17,000 - 29,000 jobs foregone annually, or a staggering 238,800 – 406,000 jobs foregone between 2023 and 2037.

As significant as that sounds, it is incomplete because the Socioeconomic Report does not consider costs related to necessary expansion of grid infrastructure. Governing Board

[16] SCAQMD 2016 AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/final/sociofinal_030817.pdf?sfvrsn=2.
[17] SCAQMD 2022 AQMP Draft Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

Member Carlos Rodriguez recently noted that it is concerning that we do not have at least a planning level estimate for grid infrastructure development costs.[18]

Both the cost and job loss estimates presented in the Socioeconomic Report are incomplete and significantly understated. Even with these omissions, the cost and projected job loss figures are dramatically higher than the 2016 AQMP.

Comment 101-5 Con't

5. **The Revised Draft AQMP includes a health-based cost effectiveness threshold. The basis for this proposal is incomplete, and many of the assumptions are not well documented. Any threshold to consider societal health costs must also include all of the associated economic costs. This would need to include job losses, stranded asset costs, and any higher consumer prices.**

In the Revised Draft AQMP, SCAQMD has introduced a health-benefit cost-effectiveness threshold of $325,000/ton NOx-reduced. SCAQMD's analysis is based first on EPA's "Estimating the Benefit per Ton of Reducing Directly-Emitted $PM_{2.5}$, $PM_{2.5}$ Precursors, and Ozone Precursors from 21 Sectors".[19] This analysis relies on the Benefits Mapping and Analysis Program Community Edition (BenMAP-CE v.1.5) model to estimate the potential health impacts and economic values of impacts associated with the attributable ambient concentrations of primary $PM_{2.5}$, sulfate and nitrate $PM_{2.5}$, and ozone resulting from VOC or summer season NOx.[20] SCAQMD used the state level analysis for three industrial sectors to arrive at a benefits per ton of NOx estimates in California.[21]

Comment 101-6

Table 1: 2035 Benefits-Per-Ton of NOx Estimates in California (2021 Dollars)

Sector Name	NOx (tpy)	Short Term O_3 Exposure	Long Term O_3 Exposure	$PM_{2.5}$	Total
Boilers	5,706	$14,793	$119,972	$57,074	$191,839
ICE	4,121	$22,946	$180,540	$88,057	$291,543
EGU	9,403	$40,767	$313,325	$30,867	$384,959
				Benefits-per-ton (weighted by tons reduced)	**$307,636**

[18] SCAQMD Governing Board Meeting, October 7, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=mQOlxYZ-Cm4.
[19] Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors, and Ozone Precursors from 21 Sectors. Available at: https://www.epa.gov/system/files/documents/2021-10/source-apportionment-tsd-oct-2021_0.pdf.
[20] BenMAP-CE. Available at: https://www.epa.gov/benmap.
[21] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.

SCAQMD states[22]:

> *As an additional check on this estimate based on EPA analysis, a comparison can be made with estimates from the 2016 AQMP and its associated Socioeconomic Impact Assessment… Based on these analyses, Option 2 would use a screening threshold of $325,000 per ton (2021 dollars) when evaluating the cost-effectiveness of proposed rules ($325,00 is the mid-point between the estimates from the 2016 AQMP and Table 4-16).*

The 2016 Socioeconomic Report also used BenMAP to assess health benefits associated with reductions in exposure to criteria pollutants. Therefore, the use of the 2016 Socioeconomic Report results really does not provide a true "check" on the EPA document, as the model used in the evaluation is the same.

Within this analysis the cost valuation of health effects prevented relies on willingness-to-pay (WTP) methodologies, however WTP estimates (current or historical) are not available for all included health endpoints. For that reason, the AQMP employs a mixed-methods approach which utilizes WTP estimates for some health endpoints, and cost-of-illness (COI) estimates for others – or occasionally both.

WTP and COI values are derived using very different techniques – WTP being based on querying of individuals on how much they would pay to avoid experiencing (or having their family members experience) given symptoms or illnesses. As such, WTP is dependent upon a wide variety of economic and behavioral individual perspectives and is adjusted in this analysis for income elasticity. In contrast, COI is measured by summing the costs incurred by the payer (typically an insurance company) for treating the given condition, including emergency room (ER) visits, in-patient hospital stays, outpatient hospital visits, prescriptions, etc. For some conditions, these quantities are summed over multiple years (e.g., Alzheimer's disease), whereas for other conditions the cost represents a single short-term health event (e.g., bronchitis).

In other locations within the documentation of the Revised Draft AQMP, COI is alternately defined as "lost work time due to absences from work to recover or take care of ill dependents."[23] Whereas the first definition for COI above represents direct costs, this second definition represents only *indirect* costs associated with productivity lost. But these two interpretations of COI are not interchangeable. Health economic analyses can be performed from the payer perspective (including direct costs only) and/or the societal perspective (including both direct and indirect costs). For the SCAQMD analysis, it is unclear which perspective is being presented for analysis.

Valuation functions for various health endpoints are provided in the Revised Draft AQMP documents, however it is not specified which are WTP valuations and which are COI. The documentation suggests that WTP is mainly utilized for mortality endpoints and COI for morbidity, but also acknowledges that for some morbidity endpoints WTP are used.[24] While WTP estimates are not available for every health effect of interest to this analysis, combining WTP and COI methodologies introduces significant uncertainties to the results.

Appendix 3-B includes a table (Table 3B-1) with a column for "Valuation Function" in which the monetary values range broadly (e.g., $0.35 per inhaler use, $9.2 million for respiratory

Comment 101-6 Con't

[22] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.
[23] 2022 AQMP Draft Socioeconomic Report Appendices. Available at: https://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/2022-aqmp-socioeconomic-report/draft-socioeconomic-report-appendices.pdf?sfvrsn=2
[24] Ibid.

mortality, etc.). Additional details on how these numbers were incorporated into the total estimate provided are lacking and should be provided.

SCAQMD states[25]:

> *The morbidity-related health benefits were valued by a combination of COI and WTP. The directly avoided COI or the WTP for reduced risk of various morbidity symptoms were modeled as reduced consumer spending on healthcare-related goods and services and a corresponding reallocation of consumer spending from healthcare to other goods, services, and savings. The indirectly avoided COI, which was valued by the lost work time due to absences from work to recover or take care of ill dependents, were assumed to increase labor productivity for all industries.*

The health-based cost-effectiveness threshold analysis discusses how changes in the local economy resulting from avoided health costs may increase migration of new workers into the region, and provides calculations associated with economic migration.[26] The number of assumptions made in these analyses appears to be high; this in turn significantly affects uncertainty associated with the final model outcome. While it appears that outside bodies may have reviewed the methods and performed some sensitivity analyses to explore uncertainty associated with a small number of parameters, these results are also not provided in the SCAQMD's report.

Finally, if societal health costs are to be factored into cost effectiveness thresholds, they must include all the associated economic costs including but not limited to stranded assets, job losses, and possible higher consumer prices. As noted previously, these have not been factored.[27]

Comment 101-6 Con't

6. The 2022 State Strategy for the State Implementation Plan acknowledged a NOx emission reduction shortfall for SCAB. That shortfall could be addressed in part through use of low-emitting internal combustion engine technologies and fuels.

As stated in WSPA's comment letter dated July 5, 2022, CARB acknowledged in the Draft 2022 State Strategy for the State Implementation Plan an emission reduction shortfall necessary for attainment in the SCAB.[28] The State SIP strategy is therefore insufficient to attain the 70 ppb federal 8-hour ozone standard by 2037. Additionally, the State SIP Strategy and the 2022 AQMP do not address the federal Clean Air Act obligations to attain earlier ozone standards. WSPA noted that CARB is ignoring potential near term emission reductions by dismissing broader use of lower-emitting internal combustion technologies, resulting in delayed attainment in the SCAB.

Comment 101-7

In response to this comment, SCAQMD states[29]:

> *South Coast AQMD concurs that low NOx combustion technologies are critical to achieving NOx reductions in the near-term, which assists with attainment of ozone and PM2.5 standards with earlier attainment dates. Staff continues to advocate for the*

[25] Ibid.
[26] Ibid.
[27] SCAQMD Mobile Source Committee Meeting, September 16, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=zSMKn4miXuk.
[28] CARB Draft 2022 State Strategy for State Implementation Plan, January 31, 2022. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-01/Draft_2022_State_SIP_Strategy.pdf.
[29] SCAQMD Revised Draft AQMP Comments and Responses to Comments. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.

deployment of low NOx technologies in the absence of readily available zero emission technologies.

WSPA appreciates SCAQMD Staff's acknowledgement that attaining NOx reductions in the near term via low NOx technologies is critical to meeting attainment deadlines. WSPA encourages SCAQMD to consider rapid deployment of low NOx technology in the short term to achieve the necessary attainment goals not currently met through previous AQMPs.

Comment 101-7 Con't

7. **The District has proposed control measures addressing both VOC and NOx reductions. However, the District's attainment strategy has not demonstrated a need for VOC control measures.**

As discussed in WSPA's comment letter dated July 5, 2022, the District has proposed control measures addressing both VOC and NOx reductions, without showing that VOC reductions are necessary to meet ozone standards. The District's modeling provides isopleths which provide guidance for the formulation of future control strategies. The isopleths approximate the expected ozone design value for a given level of NOx and VOC emissions. As described by SCAQMD[30]:

With VOC emissions greater than 300 tons per day, the corresponding NOx emissions along the white contour are approximately 60-70 tons per day at GLEN and 70-80 tons per day at CRES. The isopleth further demonstrates that VOC reductions alone are insufficient to demonstrate attainment; ***NOx reductions are the only pathway to attainment****. [emphasis added]*

Comment 101-8

SCAQMD responded to this comment, stating that VOC reductions are necessary due to the "NOx disbenefit," which is an atmospheric phenomenon whereby decreases in NOx can lead to increases in ozone.[31] However, SCAQMD did not provide any documentation showing that the NOx disbenefit is not already accounted for in the modeling analysis. We respectfully request that SCAQMD provide that technical basis.

8. **In order to demonstrate attainment by the 2037 deadline, the next generation ultra-low NOx burners proposed by control measure L-CMB-07 must be developed and commercially available on a timeline that allows for rulemaking and facility engineering to be complete.**

Proposed Control Measure L-CMB-07 addresses NOx emissions at petroleum refineries, and specifically calls out refinery boilers and process heaters. The District suggests a transition of such equipment to ZE, near ZE, or "other technologies."

Comment 101-9

SCAQMD Rule 1109.1, Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations, was developed as a result of the 2016 AQMP control measure CMB-05, which required a transition from RECLAIM to a command and control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) level controls as soon as practicable.[32,33] As discussed in WSPA's comment letter dated July 5, 2022, the final permit actions required under R1109.1 are not due until January 1, 2031, with compliance required no later than 36 months after Permit to Construct (PTC) issuance.

[30] SCAQMD Draft 2022 AQMP, Appendix V. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-appendix-v.pdf?sfvrsn=8.
[31] SCAQMD Revised Draft AQMP Comments and Responses to Comments. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[32] SCAQMD Rule 1109.1. Available at: https://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1109-1.pdf?sfvrsn=8.
[33] SCAQMD 2016 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

Depending on permit application processing time, final compliance with Rule 1109.1 requirements for some equipment could be as late as 2034-2036.

In their response to this comment, SCAQMD acknowledged that there are a small number of units that will be subject to the above stated schedule but noted that the majority of the NOx control projects would be implemented by 2031.[34] While that may be true, adding a new refinery equipment rule while the current one (i.e., R1109.1) is still being implemented could cause capital project planning problems and potentially stranded assets.

Implementation of control measures under this AQMP would need to be in place by 2035 to be useful for the 2037 attainment demonstration. Refinery capital projects are complex affairs, requiring significant planning, engineering, and then sequencing construction with unit turnaround schedules. These projects would need to begin by 2028 in order to support this AQMP's attainment demonstration. SCAQMD has proposed to initiate rule development for L-CMB-07 between 2025 and 2027 to achieve emission reductions by 2037.[35] The SCAQMD response to WSPA comments in the July 5, 2022 letter acknowledges that the rule development process for Rule 1109.1 took approximately 3.5 years and a similar timeframe will be needed for rule development related to L-CMB-07.[36] Using that math, L-CMB-07 rulemaking would start in approximately 2025.

Comment 101-9 Con't

Additional controls and proposed reductions in L-CMB-07 are focused primarily on boilers and process heaters with a maximum rated heat input of 40 MMBtu/hr or larger. SCAQMD is proposing that all of the emission reductions for the control measure can be achieved using next generation ultra-low NOx burner technology (ULNB).[37] These technologies are still under development and are not commercially available. In order to be incorporated into the rulemaking timeline listed above, these ULNB technologies would now need to be fully developed and proven by ~2025.

At Proposed Rule 1109.1 (PR1109.1) Working Group Meeting (WGM) #17, one vendor provided a presentation on development of their core process burner. The presentation cited < 7 ppm NOx emissions for a limited number of projects involving equipment rated at 39 MMBtu/hr or less.[38] However, it was unclear if any of the projects were able to demonstrate the lower emission rate when burning refinery fuel gas, or whether any of the projects involved equipment rated at ≥40 MMBtu/hr input, as suggested in the proposed L-CMB-07 measure. SCAQMD provided information on a different burner technology at PR1109.1 WGM #12, noting that the burner system requires heat releases between 1 and 20 MMBtu/hr, and has been demonstrated to achieve approximately 5 ppm NOx using natural gas at a test facility. That vendor noted that refinery fuel gas may result in higher emissions.[39] Due to the expectation of higher emissions when burning refinery fuel gas, SCAQMD evaluated the cost-effectiveness of a 9 ppm BARCT endpoint for NOx for

[34] SCAQMD Revised Draft 2022 AQMP, Comments and Responses to Comments. Response to Comment 72-2. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[35] SCAQMD Revised Draft AQMP, Appendix IV. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-appendix-iv-a.pdf?sfvrsn=6.
[36] SCAQMD Revised Draft 2022 AQMP, Comments and Responses to Comments. Response to Comment 72-2. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[37] SCAQMD Revised Draft AQMP, Appendix IV. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-appendix-iv-a.pdf?sfvrsn=6.
[38] SCAQMD Proposed Rule 1109.1 WGM #17. ClearSign Technologies Presentation. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/clearsign-update-for-scaqmd---pr-1109-1.pdf?sfvrsn=6.
[39] SCAQMD PR1109.1 WGM #9 Presentation. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/pr1109-1-wgm_9_final.pdf?sfvrsn=12.

equipment burning refinery fuel gas. These technologies must be developed by 2025, with demonstration showing that the technology can result in desired NOx emission rates when burning refinery fuel gas.

In addition to commercial demonstrations, the equipment for the emerging technologies must be able to fit into the existing boiler or process heater footprint so as not to require complete replacement of the equipment. As noted by the November 2020 Fossil Energy Research Corporation (FERCo) report, the physical spaces around refinery heater units are typically very congested.[40] Cost considerations associated with dimensional constraints must be considered during the rulemaking process and associated cost-effectiveness analysis. These is no reason to expect that these factors/constraints have changed since R1109.1 was adopted.

Comment 101-9 Con't

9. **The District needs to provide an explanation for the change in the proposed emission reductions for L-CMB-07.**

   The Revised Draft 2022 AQMP included a new value for L-CMB-07 emissions reductions at 0.88 tons per day, increased from 0.77 tons per day provided in the Draft 2022 AQMP, a 14% increase. Given that the proposed control technologies under this measure have not changed, SCAQMD should provide further information on this change and its technical feasibility.

Comment 101-10

WSPA appreciates the opportunity to provide these comments related to the 2022 AQMP. We look forward to continued discussion of this important Plan development. If you have any questions, please contact me at (310) 808-2146 or via e-mail at rcromartie@wspa.org.

Comment 101-11

Sincerely,

Marvin Comate

Cc:
Wayne Nastri, SCAQMD
Sarah Rees, SCAQMD
Ian MacMillan, SCAQMD
Sang-Mi Lee, SCAQMD
Elaine Shen, SCAQMD
Patty Senecal, WSPA

[40] FERCo South Coast Air Quality Management District Rule 1109.1 Study Final Report (FERCo Report), page 5-3, November 2020. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/ferco-report.pdf?sfvrsn=6.

Response to Comments 101-4, 101-5, and 101-6

Response to Comment 101-4

Please refer to relevant portions in Responses to Comments 1-6, 2-1, 3-1, and 94-4.

Response to Comment 101-5

Please refer to Response to Comment 94-5.

Response to Comment 101-6

Please refer to Response to Comment 101-6 in the Final 2022 AQMP Comments and Responses to Comments document.

Regarding the methodologies used in the public health benefits valuation, willingness-to-pay (WTP) is a preferred valuation measure over cost-of-illness (COI), given that WTP is meant to be inclusive of all direct, indirect, and any additional non-market impacts.[2] The use of COI measures includes only direct cost impacts and is therefore considered to be an underestimate of the true benefits associated with a reduction in incidence for any health endpoint. For more information on the use of the WTP and COI methodologies, please refer to the U.S. EPA's *Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors and Ozone Precursors from 21 Sectors* technical document.[3] More details regarding the use of these methodologies in the socioeconomic analysis for the 2022 AQMP can be found in Chapter 3, Appendix 3-B, and Appendix 3-C of the Final 2022 Socioeconomic Report.

South Coast AQMD staff is committed to providing a detailed and accurate representation of all costs associated with all future rulemakings. Staff will account for all cost impacts resulting from equipment retrofit or replacement, including any potential stranded assets as appropriate for each rulemaking. Potential job impacts resulting from incremental costs will be explicitly accounted for in each rulemaking's associated Socioeconomic Impact Assessment. Job impacts are already included in the socioeconomic analysis of both the 2022 AQMP as well as individual rulemakings. The loss or gain of jobs is modeled as a result of the cost of air pollution control and are not given separate value. In addition, the regional macroeconomic modelling conducted for rulemakings does account for other macroeconomic impacts, including any potential impacts on consumer prices. Staff contends that these impacts are oftentimes a redistribution of incremental costs, such as via cost pass-through to consumers, and accounting for them in the total costs of the rule would result in an overestimate (double-counting) of costs.

[2] Non-market impacts refer to adverse health-related impacts experienced by individuals for which there is not a price that can be directly inferred from market exchanges.

[3] https://www.epa.gov/system/files/documents/2021-10/source-apportionment-tsd-oct-2021_0.pdf