CSPA®
Representing Household & Institutional Products
Aerosol - Air Care - Cleaners - Polishes
Automotive Care - Antimicrobial - Pest Management

July 6, 2016 *via* electronic transmission

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, California 95814
http://www.arb.ca.gov/lispub/comm/bclist.php

Subject: California Air Resources Board Proposed 2016 State Strategy for the State Implementation Plan for Federal Ozone and $PM_{2.5}$ Standards (May 17, 2016) [1]

Dear Sir or Madam:

The Consumer Specialty Products Association (CSPA)[2] appreciates the opportunity to offer comments on the California Air Resources Board (ARB) Proposed 2016 State Strategy for the State Implementation Plan (SIP) for Federal Ozone and $PM_{2.5}$ Standards (hereinafter referred to as the "Proposed 2016 State Strategy"). We will also comment on the Economic Analysis and Draft Environmental Analysis for the Proposed 2016 State Strategy. We understand that ARB intends to adopt a final 2016 State Strategy at the Board Meeting scheduled to begin on September 22, 2016, in Sacramento, and in conjunction with plans being developed by various air districts, will submit it to the U.S. Environmental Protection Agency (EPA) in January, 2017, as an update to the California SIP for Ozone and $PM_{2.5}$.

CSPA has participated as an active stakeholder representing the consumer products industry in all of the California ozone SIP updates since the 1980s, and has worked cooperatively with ARB in the implementation of SIP measures seeking to reduce the emissions of volatile organic compounds (VOCs) from the use of consumer products in the state. Those efforts have resulted in more than 50% reduction in VOC emissions from consumer products during the past 25 years, which has contributed to the improvement in air quality throughout California.[3]

---

[1] The full text of this document is posted on the ARB website at: http://www.arb.ca.gov/planning/sip/2016sip/2016statesip.pdf.

[2] CSPA is a voluntary, non-profit national trade association representing approximately 250 companies engaged in the manufacture, formulation, distribution, and sale of products for household, institutional, commercial and industrial use. CSPA member companies' wide range of products includes home, lawn and garden pesticides, antimicrobial products, air care products, automotive specialty products, detergents and cleaning products, polishes and floor maintenance products, and various types of aerosol products. Through its product stewardship program Product Care®, and scientific and business-to-business endeavors, CSPA provides its members a platform to effectively address issues regarding the health, safety, sustainability and environmental impacts of their products.

[3] ARB regulations have set VOC limits for 129 broad categories of consumer product; when fully effective, these regulations will reduce VOC emissions by about 50 percent compared to 1990 levels. *See* "Staff Report: Initial Statement of Reasons for Proposed Rulemaking Proposed Amendments to the Antiperspirants and Deodorants Regulation, the Consumer Products Regulation, the Aerosol Coating Products

The Proposed 2016 State Strategy relies primarily on NOx reductions to be obtained primarily through measures outlined in ARB's Mobile Source Strategy released for comment on May 16. CSPA strongly supports this aspect of the State Strategy as consistent with compelling scientific evidence that NOx reductions are the best strategy, indeed the only strategy that can provide significant further reductions in ambient ozone, ambient $PM_{2.5}$, and greenhouse gas (GHG) emissions in California. In all, the Mobile Source Strategy seeks to obtain 80% reduction in ozone and PM precursors (NOx and VOCs), 45% reduction in GHG emissions, 50% reduction in petroleum usage, and 45% reduction in diesel PM emissions.[4]

The Proposed 2016 State Strategy also includes a single control measure to further reduce VOCs from consumer products. The measure is described as follows:

> Finally, the State SIP Strategy contains a measure to address Reactive Organic Gas (ROG) emissions from consumer products, the largest source of ROG emissions in the State. As part of this measure staff will explore mechanisms to continue to reduce the reactivity of these products and market mechanisms to encourage the development of cleaner products.[5]

While CSPA recognizes the need to consider all emission sources, including consumer product VOCs, and recognizes that both reactivity reduction and market mechanisms have played a useful role in reducing air quality impacts, we will express serious concerns in these comments regarding the scientific and legal basis for some aspects of this consumer products measure, and the economic and environmental analyses related to it.

I. Overview of Consumer Products Program Proposed Measure

The proposed Consumer Products Program measure would be scheduled for regulatory action in 2019-2021, with rule implementation beginning in 2020.[6] The measure targets reductions of 5 tons per day of VOC emissions in the South Coast district and 10 tons per day statewide by 2031, although some "not yet quantified" reductions could occur by 2023.[7] These reductions represent 8.3% of the total VOC emission reductions proposed in South Coast, and 11.5% of the total VOC emissions reductions proposed statewide. It is important to note that the Consumer Products measure is the only VOC reduction measure that is not also associated with NOx reductions.

In describing the Consumer Products source category, it is stated that:

> Consumer products are the largest source of ROG emissions in the South Coast, and the fourth largest source statewide**.** The magnitude of emissions from this sector indicates that additional approaches to reduce emissions from this sector

Regulation, the Tables of MIR Values, Test Method 310, and Proposed Repeal of the Hairspray Credit Program" (August 7, 2013) at Executive Summary–2.

[4] Proposed 2016 State Strategy, page 2.

[5] *Ibid*, page 5.

[6] *Ibid*, page 19.

[7] *Ibid*, pages 25 and 29.

> remain important, even though the average photochemical reactivity of ROG emissions from the consumer product sector has decreased.[8]

It is important to note that the primary reason Consumer Products are identified as one of the larger sources is that all of the broad categories of consumer products are inventoried together. It is therefore an artifact of the manner in which the emissions inventory is maintained. If Consumer Products were subdivided into household care; personal care; automotive care; adhesives and sealants; health care; institutional care; commercial; industrial, and other such source categories, as other area, mobile and stationary sources are, the various consumer product sources would not appear so prominent. This artifact should not be used in and of itself to justify the need for additional reductions. We appreciate the recognition that the average reactivity of consumer products VOCs has decreased, but it is even more important to note that consumer products VOCs have always been relatively low in photochemical reactivity as compared to virtually all mobile sources and many other stationary and area sources of VOCs. We will present further information on this important factor later in these comments.

The Consumer Products Program measure describes the actions being proposed as follows:

> Staff would evaluate the 2013-2015 data reported to the Consumer Products Program to identify strategies to achieve emission reductions from consumer products. (…) In order to achieve further ROG reductions, ARB staff may consider reducing existing ROG limits in product categories, setting limits for other categories and revisiting chemical-specific exemptions in existing product categories. Staff may investigate opportunities to establish alternative compliance options to provide flexibility to industry to comply with regulations, such as an emission "bubble" or cap to reduce ROG emissions from consumer products. Other approaches, including a multi-media labeling program or other incentive programs, would also be evaluated. Staff will work with stakeholders to explore mechanisms that would encourage the development, distribution, and sale of cleaner, very low, or zero-emitting products.[9]

CSPA must express concern regarding some aspects of this specific description of the proposed measure. Although we do not object to the use of the new 2013-2015 Survey data (once it has been fully corrected to create an accurate and reliable emissions inventory by removing non-volatiles and VOCs and LVP-VOCs that have alternative non-air environmental fates), we are concerned about the following:

- ARB should not target product categories that have already been regulated (sometimes two or three times) for further reductions by lowering existing VOC limits. Such actions would generally present a higher cost (and lower cost-effectiveness) and a higher risk of setting standards that would prove not to be technologically and commercially feasible as required by state law.[10]

- CSPA strongly objects to any plan to revisit chemical-specific exemptions in existing product categories. All of the exemptions and exclusions related to regulated product

[8] Proposed 2016 State Strategy, page 108.

[9] *Ibid*, pages 108 and 110.

[10] Cal. Health & Safety Code § 41712(b)(2).

categories were created because they are essential to the feasibility of these stringent regulatory standards. As with other changes to existing standards, such actions would generally present a higher cost (and lower cost-effectiveness) and a higher risk of setting standards that would prove not to be technologically and commercially feasible.

- While we strongly support investigating alternative compliance options to provide flexibility (as explained later in these comments), CSPA does not support the use of mandatory emission caps to further reduce emissions.

- CSPA would strongly oppose any mandatory labeling program. Most consumer products are marketed nationwide, and state-specific labeling requirements are extremely difficult to comply with and impose a significant impediment to interstate commerce.

II. ARB Statutory Authority for Regulating Consumer Products

The Consumer Products Program measure provides the following overview of the statutory authority to regulate consumer products:

> As part of the State's effort to reduce air pollutants, in 1988 the Legislature added section 41712 to the California Clean Air Act (Act) in the Health and Safety Code. Along with subsequent amendments, this section requires ARB to adopt regulations to achieve the maximum feasible reduction in ROG emissions from consumer products. Prior to adopting regulations, the Board must determine that adequate data exist to establish that the regulations are necessary to attain State and federal ambient air quality standards. Commercial and technological feasibility of the regulations must also be demonstrated. The Act further stipulates that regulations adopted must not eliminate any product form, and that recommendations from health professionals must be considered when developing ROG control measures for health benefit products.[11]

This is a good overview of the regulatory authority that ARB has to implement this proposed measure. The one caveat is that the description implies that the adequate data provision only relates to establishing that the regulations are necessary to attain state and federal ambient air quality standards. This implication is incorrect. Under applicable state law, the "necessary" requirement also applies to ARB's statutory mandate to adopt regulations for consumer products that are "commercially and technologically feasible." [12]

The ARB's authority to implement the Consumer Products Program measure is premised on a determination that the measure meets the two-pronged test established by state law. Absent adequate data to demonstrate necessity, ARB would not have legal authority to implement the Consumer Products Program measure. Section 110 of the federal Clean Air Act clearly requires states to provide assurances that, among other things, the state has adequate legal authority law to implement the plan.[13] Since the Proposed 2016 State Strategy fails to adequately demonstrate that ARB met both elements of the applicable statutory provision, the ARB would lack the

[11] Proposed 2016 State Strategy, page 110.

[12] Cal. Health & Safety Code §§ 41712(b)(1) and (2).

[13] 42 U.S.C. § 7410(a)(2)(E).

requisite authority to implement the measure. Therefore, a Consumer Products Program measure with a specific reduction goal should not be included in the SIP unless it can be demonstrated to be necessary.

Fortunately, the same computer modeling used to demonstrate attainment in this SIP can also be used to assess the necessity of the measure to meet the federal ozone standard. All that is needed is to run the attainment demonstration again with the 10 tons per day VOC emissions (or 5 tons per day in the South Coast region) added back to determine whether that causes nonattainment with the ozone standard to occur. This type of modeling is sometimes called a sensitivity run (or source sensitivity modeling) because it is used to evaluate the ozone sensitivity of (*i.e.*, the level of ozone change resulting from) a specific emission. The most common use in SIP planning is to determine the sensitivity to overall NOx and overall VOC reductions, which provide the data for ozone isopleth charts used in attainment planning.

CSPA therefore believes that it is legally incumbent on ARB to assure that any further VOC reduction commitment for consumer products included in this SIP Strategy meets the statutory requirement as "necessary to attain state and federal ambient air quality standards."[14] If the reduction cannot be shown to be necessary, no specific reduction goal can be adopted in the measure.

III. Scientific and Technical Basis for Further Regulating Consumer Product VOCs

During past California SIP revisions, CSPA (often in conjunction with other industry partners) has conducted studies to investigate the impact of consumer product VOC emissions on ambient ozone levels in California. These studies have demonstrated that the impacts of consumer product VOC emissions were very low even 25 years ago, and have been reduced in the years since. This is primarily due to the reductions in ambient NOx that have been needed to meet NOx standards, and reduce the formation of ozone and secondary particulate matter. Essentially, as NOx emissions are reduced, regions become more "NOx-limited" and only NOx reductions significantly reduce ozone production. Under those conditions, the low-reactivity VOCs in consumer products have no measurable impact on ambient ozone levels.

In the following sections, we will review some of the scientific studies that suggest that further VOC reductions for consumer products are unlikely to be necessary for attaining future standards.

1. The 2016 AQMP White Paper on VOC Controls Shows that Only Limited VOC Controls Are Needed in South Coast.

The South Coast Air Quality Management District (AQMD) completed its 2016 AQMP White Paper on VOC Control in September 2015.[15] The conclusions of the experts who developed the White Paper were summarized as follows:

---

[14] Cal. Health & Safety Code § 41712(b)(1).

[15] The VOC Controls 2016 AQMP White Paper is available at http://www.aqmd.gov/docs/default-source/Agendas/aqmp/white-paper-working-groups/wp-voc-final.pdf?sfvrsn=2.

> While air quality has improved considerably in the [South Coast Air Basin] over the past few decades, further emission reductions must be made to attain the federal standards for ozone and $PM_{2.5}$. The analysis herein indicates that a NOx-heavy strategy accompanied by more modest VOC reductions will help to avoid temporary increases in ozone concentrations in the western side of the Basin. This finding reaffirms the previous NOx-heavy State Implementation Plan (SIP) strategies to meet both $PM_{2.5}$ and ozone standards, but recognizes that VOC reductions can be given a lower priority. To this end, a strategic VOC control program is recommended for the 2016 AQMP to first maximize co-benefits of NOx, GHG, and air toxic controls, followed by controls that could create a win-win, "business case" for the affected entities, incentives for super-compliant products, while ensuring and capturing benefits from implementation of existing rules. When additional VOC controls are still needed, it is recommended to prioritize controls that will produce co-benefits for air toxics and GHGs, with a focus on VOC species that are most reactive in ozone and/or $PM_{2.5}$ formation.[16]

One of the specific recommendations of the White Paper was to "prioritize emission reductions of the VOC species that are most reactive for ozone and/or $PM_{2.5}$ formation and that produce concurrent air toxics or GHG benefits." The White Paper explained this recommendation as follows:

> The California Air Resources Board has an active reactivity program to investigate the scientific and policy implications of reactivity-based regulations. Reducing emissions of the most reactive species, considering ozone and $PM_{2.5}$ formation along with enforceability, toxicity, and climate impacts, may be an efficient method to reduce ambient ozone and $PM_{2.5}$ concentrations, achieve multiple environmental and health benefits, while minimizing market disruptions. For example, for VOC controls that are equally cost-effective in terms of cost per unit of emissions reduced, controls for higher reactivity VOCs would be more cost-effective in terms of costs per unit of ozone reduced.[17]

This AQMP White Paper clearly supports the conclusion that only limited VOC reductions are needed for South Coast attainment, and priority should be given to high-reactivity VOC sources and measures with concurrent air toxics or greenhouse gas reduction benefits. Consumer products VOCs are low reactivity and have low ozone impact. Therefore, consumer products should not be a priority for further reductions.

The White Paper also includes ozone isopleths from the initial South Coast attainment demonstrations[18] that clearly demonstrate the NOx-limited status of the region at 75 ppb ozone attainment. These data clearly show that the region will have minimal ozone sensitivity to VOC emissions in the low-NOx conditions needed for ozone attainment.

---

[16] SCAQMD 2016 AQMP White Paper, page 15.

[17] *Ibid* at page 13.

[18] *Ibid* at pages 6-10.

2. The Low Reactivity of VOCs in Consumer Products Likely Makes Further Reductions Unnecessary.

The low reactivity and low ozone impact of the VOC emissions from consumer products may make it *unnecessary* to further reduce the VOC content of consumer products to attain the federal ozone standard in the South Coast air basin. Therefore, for reasons detailed below, we believe that the 2016 California SIP update should not include a VOC reduction commitment in the VOC emissions for consumer products.

a. There are very significant differences between the relative ozone impacts of equal amounts of VOC emissions from various sources.

Scientific studies funded by the consumer products industry strongly suggest that a mass-based inventory approach overestimates the actual impact of consumer product VOC emissions on ozone attainment in the South Coast and other areas of California. In 2002, Sierra Research, Inc. conducted a research project to create a reactivity-weighted VOC emissions inventory for the South Coast.[19] Sierra Research used the official emissions inventory for South Coast in 2000 and the official speciated emissions profiles, as well as the official ARB estimates for "maximum incremental reactivity" (MIR) for each species of VOC emission, to create an estimate of the maximum ozone formation potential attributable to each major category of anthropogenic emissions of organic gases in the region. This type of MIR-weighted inventory provides a more scientifically accurate assessment of the relative ozone impact of various emissions sources than any mass-based VOC emissions inventory.

The results of that MIR-weighted VOC inventory project found significant differences between the total mass emissions and the ozone formation potential of those emissions, and these differences are due solely to the differing weighted MIR for the species of VOCs that make up the specific source emission. Some emissions sources therefore have a much higher ozone formation potential than their mass emissions suggest, while other emissions categories have a much lower ozone formation potential than suggested by their mass emissions. Consumer products are among the emissions categories with below average reactivity, and therefore lower ozone impact than would be expected based on mass of emissions alone.

The MIR scale provides an estimate of the maximum amount of ozone potentially formed from a VOC emission under the tropospheric conditions where ozone is most sensitive to VOCs. The conditions in the ozone attainment run are far less sensitive to VOC emissions. However, although absolute VOC reactivity will decrease significantly as regions move toward low-NOx conditions and ozone attainment, the relative reactivity differences between various VOCs will remain relevant.

VOCs from consumer products had a weighted-average MIR of 1.5, well below the average for all emissions sources. Aerosol consumer products exhibit especially low reactivity, since aerosol propellants tend to be among the least reactive of all VOCs in the emissions inventory. Many mobile sources of VOCs had very high reactivity, including Aircraft (6.8); Farm Equipment (5.4);

[19] The complete data from this 2002 Sierra Research project documenting the relative reactivity of various VOC sources in the South Coast in 2000 are available upon request.

Heavy Duty Diesel Urban Buses (5.5); Heavy Duty Diesel Trucks (5.5); Light Duty Diesel Trucks (5.5); Medium Duty Diesel Trucks (5.5); Ships and Commercial Boats (5.3), and Trains (5.5). VOC emissions from these sources therefore can be expected to cause three to five times as much ozone formation pound-per-pound as consumer product VOCs. The VOC sources with the largest potential ozone impacts in 2000 also exhibited very high reactivity profiles, including Light Duty Passenger Cars (3.7), Light Duty Trucks (3.8), and Off-Road Equipment (4.6).
In the time since this study was conducted, it is unlikely that the speciation profiles have changed sufficiently to modify this result. Indeed, the continued implementation of mass-based and reactivity-based standards for consumer products make it very likely that consumer product VOC reactivity is even lower now than it was in 2000. The data from this study therefore provide important evidence that very significant differences exist between the relative ozone impacts of equal amounts of VOC emissions from various sources. Generally speaking, mobile source VOC emissions create three to five times as much ozone as equal amounts of VOC emissions from most stationary and area sources, including consumer products. These significant differences in relative photochemical reactivity of various VOC sources must be taken into account in choosing and implementing effective, workable and cost-effective ozone attainment strategies in the 2016 SIP Strategy.

b. Scientific modeling studies also document the fact that the low-reactivity of VOCs used in consumer products have negligible impacts on peak ozone levels.

Other past studies also have clearly demonstrated the minimal impact of consumer product VOCs on ozone non-attainment in California. Subsequent to the statewide revision of the California SIP in 1994, CSPA and another trade association funded an air quality modeling study to determine the specific role of consumer products in ozone attainment in both South Coast and Sacramento regions. That study on "Impact of Consumer Products on California's Air Quality" [20] used the exact Urban Airshed Model (UAM), inventories and meteorology utilized in the attainment demonstrations for the 1994 SIP.

The study compared UAM outputs for two scenarios in the South Coast Air Basin:

- The attainment demonstration in the SIP, which included an 85 percent reduction in the VOC emissions from consumer products, and demonstrated attainment with the one-hour ozone standard in 2010; and,

- The exact same modeling run with only a 30 percent reduction in consumer products VOC emissions (the reduction already obtained by ARB regulations adopted prior to 1994).

The results showed that both scenarios demonstrated attainment of the one-hour ozone standard of 0.12 ppm in both South Coast and Sacramento. In both geographic areas, the additional consumer product emissions, despite their very significant mass, had such small impacts on peak ozone formation that insufficient ozone was formed to cause non-attainment. This result was

[20] Sierra Research Report No. SR97-07-01 (July 1997) and addendum Report No. SR98-03-01 (March, 1998). A copy of this research report is available upon request.

attributed to both the low reactivity of the consumer product emissions, and the geographic distribution of those emissions that lessened impacts on peak ozone levels.

During the 2007 California SIP revision, another modeling study was conducted by our industry to assess the necessity of further reductions of consumer product emissions for ozone attainment. The 1997 attainment remodeling study was conducted under 2010 attainment conditions that remained sensitive to overall VOC emissions. Therefore, the results of the study demonstrated that even under highly VOC-limited conditions where ozone formation was sensitive to overall VOC levels, ozone formation was *not* sensitive to consumer product VOC emissions. The attainment demonstration modeling for the 2007 SIP was under atmospheric conditions that were far more NOx-limited, and far less sensitive to overall VOC emissions than in 1997.

We therefore had reason to expect that consumer product VOC emissions should have even less relative impact on ozone attainment in the 2023 attainment scenario. To determine whether this was indeed the case, CSPA contracted in 2007 with Sierra Research, Inc. and Environ to conduct a remodeling study, co-funded by CSPA and eight other national consumer product industry associations, to determine the ozone sensitivity of consumer product VOC emissions in the South Coast Air Basin in 2023, and determine what level of emission reductions might actually be necessary. The remodeling study was completed after the adoption of the 2007 AQMP, but prior to the adoption of the 2007 California SIP. The final report from the study, "Assessment of the Need for Long-Term Reduction in Consumer Product Emissions in the South Coast Air Basin,"[21] was submitted as part of the record for the 2007 SIP adoption.

The results of the 2007 Sierra Research, Inc. study clearly demonstrated that ozone attainment status in the South Coast Air Basin would not be impacted in 2023 if no further reductions in consumer product VOC emissions are made after 2014. The data show that the 50 tons per day of additional statewide consumer products VOC emissions reductions included in the South Coast AQMP would have no impact on ozone attainment anywhere in the South Coast Air Basin. These VOC emission reductions would cost the consumer products industry approximately $1 billion despite not being necessary for ozone attainment. Clearly those control measures would be neither effective nor cost-effective.

CSPA continues to believe that the results of these types of source-sensitivity studies provide important information to support the development of effective ozone attainment strategies. It is important that the control measures in the 2016 SIP are focused on those emissions sources that play a significant role in ozone non-attainment in the South Coast and other non-attainment districts in California.

The need to carefully consider the relative ozone impacts of various emission sources is critical to this 2016 SIP Strategy. CSPA urges that ARB consider these data and only include commitments for reductions that are actually necessary for ozone attainment.

[21] Sierra Research Repot No. SR2007-09-03, September 12, 2007. A copy of this research report is available upon request.

3. California's 2012 Vision for Clear Air Provides Clear Evidence that NOx Reduction Is the Key to Clean Air in California.

In 2012, ARB developed a seminal assessment of long-term attainment of the state's clean air goals. That assessment, entitled "Vision for Clean Air: A Framework for Air Quality and Climate Planning," [22] provides much of the basis for the ozone and PM attainment strategy encompassed in this Proposed 2016 SIP Strategy. The most notable exception is the inclusion of the Consumer Products Program measure, which is the only VOC reduction measure not connected with NOx reductions.

This long-term plan, extending to 2050 and beyond, used a fundamentally different modeling tool based on the Argonne National Laboratory Vision 2011 Model, but clearly comes to the same conclusion as many other studies: NOx reductions are key to California's Clean Air future for both the South Coast and San Joaquin Valley Air Basins. VOCs are not even mentioned in the 40-page document, and the only mention of "reactive organic gases" is to confirm that the modeling tool used is able to forecast both ROGs and NOx. In contrast, the term "NOx" is mentioned a total of 72 times and the document includes extensive discussions about the reduction levels needed to achieve attainment with applicable state and federal ozone standards.[23]

The new transportation, fuel and energy sector technologies that the Vision for Clean Air projected as necessary for clean air and climate change mitigation, which now form the foundation of this Proposed 2016 SIP Strategy, would also result in significant reductions in VOCs as well as NOx from those sources. In general, these sources of VOCs have much higher photochemical reactivity than emissions from consumer products, and therefore likely will provide more than adequate VOC reductions as a side benefit to the NOx reductions needed for ozone and particulate matter standards attainment. These factors provide evidence that commitments for further VOC reductions from consumer products may not be necessary, and should not be included in the 2016 SIP.

4. The EPA's 2005 Interim Guidance on SIP Development provides clear instructions that relative reactivity and ozone formation potential should be considered in SIPs, and that alternative fates and availability also should be considered.

The EPA provided clear guidance to states in 2005 that differences in VOC reactivity should be considered in the development and implementation of SIPS. In its "Interim Guidance on Control of Volatile Organic Compounds in Ozone State Implementation Plans,"[24] the EPA "…encourages States to consider recent scientific information on the photochemical reactivity of volatile organic compounds (VOCs) in the development of State implementation plans (SIPs)

---

[22] Hereinafter referred to as "Vison for Clean Air." The document is posted on the ARB website at: http://www.arb.ca.gov/planning/vision/docs/vision_for_clean_air_public_review_draft.pdf.

[23] The 53-page appendix to Visions for Clean Air has only one mention of VOCs in relation to diesel engine after-treatment systems, on page 31. The text of this document is posted on the ARB website at: http://www.arb.ca.gov/planning/vision/docs/Vision_for_Clean_Air_Appendix_Public_Review_Draft.pdf.

[24] 70 *Fed. Reg.* 54046-51 (Sept. 13, 2005). *See* https://www.gpo.gov/fdsys/pkg/FR-2005-09-13/pdf/05-18015.pdf.

designed to meet the national ambient air quality standard (NAAQS) for ozone."[25] That guidance also states that, "By distinguishing between more reactive and less reactive VOCs, it should be possible to decrease ozone concentrations further or more efficiently than by controlling all VOCs equally."[26] The Interim Guidance goes on to provide the specific guidance regarding factors that States should consider, including the following:

- The potential for alternative (non-atmospheric) fates and limited availability for ozone-forming photochemical reactions;
- Prioritizing control measures using reactivity metrics;
- Targeting emissions of highly reactive VOCs with control measures; and
- The fate of VOC emissions and their availability for atmospheric reactions.

Recent data have shown that not only do LVPs have limited ability to contribute to VOC emissions and ozone formation, but many VOCs also have limited availability due to alternative environmental fates. In regard to this important issue, the EPA's Interim Guidance instructs that:

> States should also consider emerging research on the actual availability of VOCs for atmospheric reaction. In estimating VOC emissions, especially from coatings, solvents, and consumer products, it is often assumed that the entire volatile fraction is emitted and available for photochemical reaction, unless captured by specific control equipment. In some situations, however, otherwise volatile compounds may be trapped in liquid or solid phases or adhere to surfaces such that they are not actually released to the atmosphere. Once emitted into the atmosphere, VOCs may also be scavenged by rain, form particles, or deposit on surfaces. Taking this behavior into account should lead to more accurate VOC emissions inventories and photochemical modeling. It may also allow States to consider volatility thresholds or other approaches designed to reflect atmospheric availability in certain types of regulatory programs.[27]

ARB staff began work this year to correct the revised consumer products VOC emissions inventory being developed based on the ARB's 2013 Consumer & Commercial Products Survey. ARB has funded two major research projects over the past few years to provide data on the potential for alternative, non-air, environmental fates for LVP-VOC and VOC ingredients used in consumer products. One of those studies, conducted by University of California, Davis scientists, was completed last year, and the other, conducted by University of California, Riverside scientists, is scheduled to be completed later this year. CSPA and allied consumer products industry members have funded additional studies, and are planning further studies to research alternative fates both outdoors and indoors.

---

[25] *Ibid* at 541046, col. 3.

[26] *Ibid* at 541047, col. 2.

[27] 70 *Fed. Reg.* 54048-49.

CSPA urges ARB to follow the 2005 Interim Guidance and consider the relative reactivity and ozone impacts and atmospheric availability of various compounds to determine which, if any, VOC control measures are considered for inclusion in any revised and updated ozone SIP. We also urge ARB to continue its work with industry scientists to create an updated VOC emissions inventory that more accurately reflects actual VOC emissions to ambient air and their availability for atmospheric photochemistry. We believe this effort will further demonstrate that additional reductions in consumer product VOC emissions are unnecessary to attain California's air quality goals.

5. A 2012 Study by ARB Scientists Demonstrated the Effectiveness of Regulating High-Reactivity Instead of Low-Reactivity VOCs.

A 2012 paper by ARB scientists provides even further evidence that further regulation of consumer products and other low-reactivity VOC sources may not be necessary.[28] That research document, authored by Jianjun Chen and Dongmin Luo, shows that the effectiveness of VOC controls can be increased by regulating predominantly high reactivity sources and emissions. The study found large differences in reactivity and ozone formation potential between various emission sources in the Southern California air basin. This was demonstrated by two approaches:

- Creating a reactivity-weighted VOC emissions inventory that is MIR adjusted; and
- Performing air quality modeling sensitivity analyses to show the differences in ozone impacts from reductions in various emissions sectors.

Both approaches demonstrated that controlling higher reactivity sources created higher ozone reductions per weight of VOC emissions reduced. For VOC controls that are equally cost-effective in terms of cost per emissions reduction, controls for higher reactivity VOCs would be more cost-effective in terms of costs per ozone reduction.

IV. Economic and Environmental Analyses for Consumer Products Proposed Measure

Appendix A provides an "Economic Analysis for the Proposed 2016 State Strategy for the State Implementation Plan." The analysis provides estimates of the total direct costs for each measure included in the 2016 Strategy, including the Consumer Products Program measure. The estimated total compliance cost through 2031 for the Consumer Products Program measure is $105 million.

Past experience with ARB regulations of consumer products have shown that costs for reducing a ton-per-day of consumer product VOC emissions statewide ranges from about $10 million to $50 million, depending on the complexity of the reformulations and testing required for specific standards and product categories. The $105 million estimate is therefore not unreasonable for

[28] Jianjun Chen and Dongmin Luo, *Ozone formation potentials of organic compounds from different emission sources in the South Coast Air Basin of California*, Atmospheric Environment, 55 (2012) 448-455. *See* https://www.researchgate.net/publication/257521883_Ozone_formation_potentials_of_organic_compounds_from_different_emission_sources_in_the_South_Coast_Air_Basin_of_California_Atmos_Environ

the 10 tons-per-day commitment included in the measure. It is also one of the lower total costs estimated for the various measures proposed.

However, it is important to note that all of the other measures have associated NOx reductions that have a significant impact on ozone and secondary PM formation. The consumer products measure likely provides little or no actual benefits in meeting the ozone or $PM_{2.5}$ standards. It is therefore very likely that the Consumer Products Program measure is the least cost-effective in terms of ozone and $PM_{2.5}$ reductions.

Appendix B provides a "Draft Environmental Analysis for the Proposed 2016 State Strategy for the State Implementation Plan." The 278-page analysis contains only one small section on the Consumer Products Program measure, and even this section provides little or no new information or analyses. Particularly noticeable is the lack of alternatives analyses in Section 7 (pages 145-152) on the Consumer Products Program measure. CSPA believe that it is incumbent upon ARB to analyze the environmental impact of simply foregoing further reductions in consumer product VOC emissions in this appendix, which could be accomplished by running the aforementioned sensitivity analysis using the computer attainment model.

CSPA is also concerned that no information is included in Appendix B on the computer modeling ozone attainment demonstrations conducted for various regions of the state to show future attainment of the 75 ppb standard. We urge ARB to release to stakeholders all of the technical support documents needed to support the 2016 SIP Strategy prior to its consideration in September for approval by the Board.

V. The Need for Further Flexibility to Meet Existing Consumer Product VOC Standards

Even if little or no further reductions in consumer product VOCs are found to be necessary, there remains an on-going impact on the consumer products industry from standards already adopted. Some adopted standards have future-effective dates and remain to be fully implemented. For all other regulated categories, the specific definitions and limitations imposed can deter innovation of new and improved products that are superior in overall benefits to public health and safety and the environment. This problem was recognized early on in the development of the Consumer Products Regulation, and two important provisions were developed to provide flexibility and encourage innovative compliance:

- The Innovative Products provision[29] allows companies to demonstrate that the non-complying product would nonetheless result in less VOC emissions when compared to a representative complying product.

- The Alternative Control Plan (ACP) Regulation[30] allows companies to group products into a plan that assures that total VOC emissions for those products are less than the amount that would occur if all were compliant with their respective standards.

[29] 17 CCR § 94511.

[30] 17 CCR §§ 94540-94555.

These two provisions have provided some important opportunities for companies over the decades without compromising California's air quality goals. The ability to use the Innovative Products provision has allowed companies to develop innovative ways to make products more efficient in terms of the VOC emissions needed to accomplish a given task. The ACP program has allowed companies to maintain products critical to public health and safety by making the VOC reductions in other products where they are more technologically and commercially feasible and cost-effective.

The use of these provisions have been very limited. We believe that this is primarily due to two factors:

- Both provisions have burdensome paperwork requirements that make their use overly resource-intensive, and,

- Both provisions relate only to mass emissions, and do not take into account the wide range of VOC reactivity and potential ozone impacts between various products and formulations.

CSPA has urged ARB in recent years to engage in update of the Innovative Products and ACP provisions to make them less resource-intensive and more flexible in application. The Proposed 2016 State Strategy appears to recognize this need in the Consumer Products Program measure description, which commits ARB to "investigate opportunities to establish alternative compliance options to provide flexibility to industry."[31] We urge ARB to enhance that aspect of the measure to more specifically mention the Innovative Products and ACP provisions and ARB's commitment to enhance them.

VI. CSPA Recommendations for Revisions to the Consumer Products Measure

For reasons detailed in these comments, CSPA respectfully requests that ARB modify the Consumer Products Program measure in the following aspects:

- Remove any commitment for a specific level of VOC reductions from the measure unless that level of reduction can be shown to meet the necessity requirement as set forth in Health and Safety Code Section 41712(b).

- Provide clearer recognition that consumer products VOCs are low reactivity, have low ozone impact, and should not be high priority for further reductions.

- Recognize ongoing efforts to correct the consumer products VOC emissions inventory to reflect alternative, non-air, environmental fates and limited photochemical availability of some VOCs and LVP-VOCs used in consumer products.

- Eliminate any commitment to target further reductions from categories of consumer products that have already been regulated.

[31] Proposed 2016 State Strategy, page 110.

- Eliminate any plan to revisit chemical-specific exemptions for already-regulated categories of consumer products, or to engage in mandated consumer product labeling.

- Add more detailed commitments for ARB to revisit the ACP and Innovative Products provisions as part of its efforts to provide flexibility for industry in attaining existing standards.

VII. Summary and Conclusions

CSPA appreciates the opportunity to comment on this Proposed 2016 State Strategy for the State Implementation Plan and remains committed to working collaboratively with ARB to achieve air quality standards. In these comments we are recommending modifications to the Consumer Products Program measure, as well as asking that further information be provided for public comment relating to technical support for the 2016 SIP Strategy.

If you have any questions, please contact us at (202) 872-8110.

Respectfully submitted,

D. Douglas Fratz
Senior Science Fellow

Joseph T. Yost
Senior Director, Strategic Issues Advocacy

Kristin Power
Vice President, State Affairs

Steven Bennett, Ph.D.
Senior Director, Scientific Affairs & Sustainability

cc: Kurt Karperos, California Air Resources Board
Karen Magliano, California Air Resources Board
Ravi Ramalingam, California Air Resources Board
David Edwards, California Air Resources Board
CSPA Air Quality Committee and Task Forces