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Via Email: dedwards@arb.gov
csmrprod@arb.ca.gov

David Edwards, Ph.D.
AQPSD Implementation Section
Air Resources Board
1001 I Street
Sacramento, CA 95812

Re: Consumer Products Down-the-Drain Adjustments and Company Reporting by Category

Dear Dr. Edwards:

The American Cleaning Institute® (ACI) appreciates the opportunity to provide comments on the California Air Resources Board (ARB) Consumer Products Down-the-Drain Adjustments. The use of accurate and relevant data to establish more precise adjustment factors for products is the goal of both ARB and industry. To that end, ACI recommends the following:

- Revise the emissions discount adjustment factors to more accurately account for VOC and lvp emissions from down-the-drain products
- Review the consumer products survey to ensure that all down-the-drain products are accurately represented and correctly categorized into Fate Categories as outlined in the spreadsheet

General Comments

ACI recommends that the down-the-drain adjustment factors be refined to more accurately portray volatile organic compounds (VOC) and low vapor pressure-VOC (lvp) emissions from consumer down-the-drain products. While ACI agrees with ARB's approach of considering actual emissions from products to inform any State Implementation Plans (SIP), the adjustments described in the report, *Environmental Fate of Low Vapor Pressure – Volatile Organic Compounds from Consumer Products: A Modeling Approach* (Report), and used as the emissions discount adjustment factor in the spreadsheet, are insufficiently supported by other measured and modeled data. In fact, the numbers are contrary to the scientific studies that have been conducted, and ignoring those studies is inconsistent with ARB's stated approach. The report inappropriately assumes only two emission modes – direct outdoor air emission and indoor down-the-drain wastewater emission. However, the down-the-drain product categories would have much less air emission than currently apportioned (90%). Assigning the same adjustment factors for combustion products whose VOC and lvp are directly released into outdoor air through outdoor use or expelled through vents or chimneys and products whose uses are largely indoors, contained in aqueous solution, and whose fate is down-the-drain is inexplicable. The report correctly recognizes the importance of determining the fraction of volatilization of these products when used by consumers, but this aspect is not accounted for by the adjustment factors. Results of studies of actual or modeled environmental fate of VOC and lvp in down-the-drain products should be the basis in determining the adjustment factors for these products. Appropriate emission estimates to outdoor air of down-the-drain products, and therefore realistic impacts to ozone

The American Cleaning Institute® (ACI) is the trade association representing the \$30 billion U.S. cleaning products market. Our members include the formulators of soaps, detergents and general cleaning products used in household, commercial, industrial and institutional settings; companies that supply ingredients and finished packaging for these products; and oleochemical producers. ACI and its members are dedicated to improving health and the quality of life through sustainable cleaning products and practices. ACI's mission is to support the sustainability of the cleaning products industry through research, education, outreach and science-based advocacy. Since 1926, ACI has promoted health through personal hygiene and effective cleaning. More information about ACI can be found at www.cleaninginstitute.org.

levels, would serve the State better for determining SIP for ozone attainment planning and regulatory control strategies.

Specific Comments

Categories and Adjustment Scenarios

Categories of down-the-drain products are missing from the spreadsheet. Rinse-off personal care products such as hand, body and facial cleaners and soaps are represented, but rinse-off cleaning products such as hard surface and all-purpose cleaning products are not listed. ACI recommends the spreadsheet be amended to include these product categories as down-the-drain products.

“Dish Detergent/Soap (manual)” is erroneously categorized in the table. These products should be assigned Adjustment Scenario “B – Open System”.

Adjustment Scenarios and VOC vs. lvp-VOC Adjustments

The scenarios described are not representative of all down-the-drain products surveyed by CARB. As stated above, a scenario does not appear for rinse-off hard surface and all-purpose cleaners. ACI recommends that CARB work with industry to put forward an appropriate adjustment factor for rinse-off cleaning products with down-the-drain fate.

ACI recommends that CARB use measured or modeled emission data for ingredients. As example, release factors have been established for ethanol by Wooley et al. (1990) and are supported by modeling approaches (SDA, 2007). Wooley et al. (1990) reported that with the highest release conditions of ethanol, the percentage released from liquid laundry detergent and hand dish detergent at the point of use into indoor air is 1.4% and 6.6%, respectfully, far below the 90% alcohol adjustment factor for both Open and Closed Systems to the outdoors. Wooley et al. (1990) estimated that the release of ethanol from liquid laundry and hand dish washing detergents to be about one percent based on release rates measured under typical use conditions. The results from these studies more accurately describe the release of VOC and should be considered in the calculation of the adjustment factor for VOC in the down-the-drain scenarios. As CARB is using alcohols as the VOC threshold, where data do not exist for ingredients, a most conservative emission (high volatility) can be applied.

ACI is particularly troubled that lvp has the same adjustment factor as VOC. The gas/liquid partition coefficient is the most important chemical property parameter for calculating emissions for these compounds, and this scientific principle has been totally ignored in the adjustment. As stated in the report, “Many LVP-COCs do not volatilize quickly enough to be emitted into the atmosphere under normal conditions of consumer product use” (Bennet, 2015). The study currently being conducted by Dr. Cocker at UC Riverside which may improve estimates of the emission rates of lvp and their impacts on air quality should be taken into consideration when determining an appropriate adjustment factor. ACI recommends that the adjustment factors for lvp be recalculated to reflect real-world scenarios.

Bennett, D.H., H. Shin, T. E. McKone. 2015. Environmental Fate of Low-Vapor Pressure-Volatile Organic Compounds for Consumer Products: A Modeling Approach. Report – The California Air Resources Board and the California Environmental Protection Agency.

Wooley, J., W.W. Nazaroff, A.T. Hodgson. 1990. Release of ethanol to the atmosphere during use of consumer cleaning products. The Journal of Air and Waste Management Association. 40: 1114-1120.

Card, T.R. 2007. Calculation of Component Chemical Air Emission Factors for Hand Dishwashing Detergents, Liquid Laundry Detergents, Liquid Fabric Softener. Part I – Emissions at Point of Use. Report – The Soap and Detergent Association.

Summary

ACI appreciates the opportunity to provide comments on the proposed down-the-drain scenarios and adjustment factors. ACI and its members will continue to offer our technical expertise in order to develop accurate and relevant data to establish more precise adjustment factors for consumer products so that the State can put forward efforts in areas that will produce meaningful ozone attainment planning and regulatory control strategies. We look forward to continuing to work with ARB staff towards regulations that, based on accurate emissions and appropriate adjustment factors, improves air quality in California.

Respectfully submitted,

Kathleen Stanton
Director, Technical & Regulatory Affairs

cc: Ravi Ramalingam, Chief, AQPSD Consumer Products & Air Quality Assessment Branch
Nicholas Berger, Air Pollution Specialist, AQPSD
Robert Barrera, Air Pollution Specialist, AQPSD
Jose Gomez, AQPSD Technical Development Section
Irina Malkina, Staff Lead, AQPSD