



December 10, 2018

Clerk of the Board
California Air Resources Board
1001 I Street, Sacramento, CA 95814

Re: Proposed Regulation for the Reporting of Criteria Air Pollutants and Toxic Air Contaminants

On behalf of the 190+ members of the statewide Californians for Pesticide Reform coalition, I am writing to offer our comments about the proposed Regulation for Reporting of Criteria Air Pollutants and Toxic Air Contaminants.

We are very concerned that, despite our previous input offered via comment letters and meetings with CARB staff, the proposal offered to the Board for consideration continues to omit a significant source of emissions in rural communities: pesticides and chemical fertilizers applied to agricultural fields. We urge you to revise the proposal to incorporate area source emissions from agricultural applications of pesticides and fertilizers into CARB's emissions inventories.

It is our understanding that CARB is considering utilizing the CEIDARS database to estimate emissions of pesticides from chemical manufacturing and formulation facilities. While this is a good first step, emissions from pesticide manufacture and formulation in California are dwarfed by emissions from pesticide and fertilizer use in the state's vast agricultural sector.

We urge you to use the Department of Pesticide Regulation (DPR) database to estimate fumigant emissions from structural, commodity and agricultural field fumigations. For field fumigations in the five regions that are classified as out of compliance with federal air quality standards, the application method must be included in soil fumigation pesticide use reports.ⁱ DPR has established percent emission ratingsⁱⁱ for each allowable application method for 1,3 dichloropropene, chloropicrin, metam sodium and metam potassium (as well as methyl bromide, which is no longer used for soil fumigation). For the record, while we believe these application method factors are a good starting point for estimating field fumigation emissions, we have concerns that they may underestimate emissions.

DPR's pesticide use database also includes commodity and structural fumigant use reports, reported at the county level. Emission estimates for commodity fumigation (methyl bromide, phosphine, aluminum phosphide, magnesium phosphide) and structural fumigation (sulfuryl fluoride) should be derived from DPR exposure assessment and risk characterization documents.

CARB should also explore estimating emissions of other heavily used, high-volatility non-fumigant pesticides and fertilizers, particularly those that are classified as Toxic Air Contaminants.

Here is some relevant information in support of our request to CARB to incorporate emissions from pesticides and fertilizers into the Board's emissions inventory work:

- Several of the United States' worst air quality districts are in rural regions of California.ⁱⁱⁱ
- There are 46 pesticide listed as Toxic Air Contaminants in California^{iv} (soon to be 47 with the expected addition of chlorpyrifos). Among these 46 TACs are gaseous fumigant pesticides, which

are carcinogenic and extremely drift-prone, and have been linked to developmental problems. More than 40 million pounds of fumigants are applied to California fields every year.^v A number of them trigger the release of nitrous oxide (N₂O), a greenhouse gas nearly 300 times more potent than carbon dioxide.^{vi} One study alone reported a 700% increase in N₂O emissions following a chloropicrin fumigation.^{vii}

- Fumigant TACS are also ozone-contributing Volatile Organic Compounds (VOCs), among the top 10 VOC sources in the San Joaquin Valley.^{viii}

- Recent studies have documented fumigant TACS' contribution to secondary organic aerosols, a major component of PM_{2.5}^{ix}, the dominant cause of criteria air pollutant health impacts, including lung and heart problems, that disproportionately affect environmental justice communities. Recent lab tests from UC Riverside found that MITC, the main breakdown product of metam fumigants (12.5 million pounds of which are applied each year in California), increased secondary organic aerosol formation 12-fold.^x

- In addition to pesticides, synthetic fertilizers cause a host of health problems in local rural communities and are a significant source of greenhouse gas emissions. According to a new study led by UC Davis, agricultural fields contribute between 25 and 41 percent of the nitrogen oxide (NO_x) emissions in California, a criteria pollutant and key component of ozone.^{xi} The peer-reviewed study traces the emissions to fertilized soils in the Central Valley region. Excess nitrogen from synthetic fertilizers can pollute groundwater and air, impacts human health and the environment, and contributes to climate change. Eleven percent of nitrogen from crop land and livestock is lost as air pollution, contributing to the formation of ozone and ammonia, a component of particulate matter.^{xii} Well-established scientific evidence links ozone and particulate matter to poor respiratory and heart health. The over-use of fertilizer, in turn, can be linked, in part, to the fact that soils exposed to pesticides are damaged and less able to fix nitrogen in the soil for the benefit of plants, "necessitating" the addition of fertilizer.^{xiii}

Emissions from agricultural use of pesticides and synthetic fertilizers are a matter of significant concern to residents of impacted agricultural communities. We urge CARB to develop a plan to incorporate these emissions into your reporting plans.

Thank you for the opportunity to comment on this issue.

Sincerely,



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ⁱ https://www.cdpr.ca.gov/docs/emon/vocs/vocproj/factshts/voc_pur.pdf

ⁱⁱ https://www.cdpr.ca.gov/docs/emon/vocs/vocproj/ffm_code-table.pdf

ⁱⁱⁱ Almarez, M., Bai, E., Wang, C., Trousdell, J., Conley, S., Faloona, I., Houlton, B., "Agriculture is a major source of NO_x pollution in California," Science Advances, Vol. 4, No. 1, January 2018.
<http://advances.sciencemag.org/content/4/1/eaao3477.full>

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- iv Summary of Pesticide Use Report Data – 2016. California Department of Pesticide Regulation. Table 11. <https://www.cdpr.ca.gov/docs/pur/pur16rep/tables/table11.pdf>
- v Summary of Pesticide Use Report Data – 2016. California Department of Pesticide Regulation. Table 13. <https://www.cdpr.ca.gov/docs/pur/pur16rep/tables/table13.pdf>
- vi Greenhouse Gas Emissions: Overview of Greenhouse Gases – Nitrous Oxide Emissions. <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>
- vii Spokas, K., Wang, D. “Stimulation of nitrous oxide production resulted from soil fumigation with chloropicrin.” *Atmospheric Environment* 37 (2003) 3501-3507. <https://www.ars.usda.gov/ARSUserFiles/41695/reprints/ae2003.pdf>
- viii Spurlock, F. “Estimating Volatile Organic Compound emissions from pesticides using PUR data.” California Department of Pesticide Regulation. 2006. http://agis.ucdavis.edu/PUR/pdf/Frank_Final_Mar_06_VOC_presentation.pdf
- ix Secondary Organic Aerosols (SOAs) Research, US EPA. <https://www.epa.gov/air-research/secondary-organic-aerosol-soas-research>
- x Yee, L.D., Warren, B.A., Cocker III, D.R. “Secondary Organic Aerosol (SOA) and ozone formation from agricultural pesticides.” *University of California Riverside Undergraduate Research Journal*. Volume II (2008) 67-74. <https://ssp.ucr.edu/files/V2-2008.pdf>
- xi Almarez, M., et al. *Op. cit.*
- xii Kerlin, K. “California nitrogen assessment shows the state of the science on nitrogen use and pollution: California paves the way for reconciling agriculture and the environment,” *Food and Agriculture News*, 9 Aug 2016. <https://www.ucdavis.edu/news/first-state-level-nitrogen-assessment-shows-state-science-nitrogen-use-and-pollution/>
- xiii Martinez-Toledo, M.V., Salmeron, V., Rodelas, B., Pozo, C., Gonzalez-Lopez, J. “Effects of the fungicide Captan on some functional groups of soil microflora.” *Applied Soil Ecology* 7:245-255; <https://vdocuments.site/effects-of-the-fungicide-captan-on-some-functional-groups-of-soil-microflora.html>