



March 16, 2018

To: Meredith Cowart, Concur, and Richard Sinkoff, Port of Oakland

From: James Fine, Ph.D

Re: Responses to Concur's MAQIP Meeting Follow-Up Questions

Staff at Concur contacted me for clarification on my public comments. I provide that clarification in this memo.

Meredith Cowart, Concur, noted my comment and wrote:

“the group would benefit from seeing explicit descriptions of the relative uncertainty associated with the various potential emissions control measures.” She posed this question: “In terms of the relative uncertainty, could you specify what this should look like -- e.g. the range of possible outcomes and likelihood of those outcomes?” As well, she noted that I asked “how emissions associated with electricity use are treated” and that “Till Stoeckenius responded that these are not included in the inventory.”

My response:

Thank you for asking for clarification. The answer is not simple, but is worth taking a few sentences to explain. My first response is that the MAQIP working group should dedicate time to discussion of uncertainty, and how it relates to risk assessment in this context.

The most important uncertainty to watch out for pertains to ensuring the health of the community since that is the reason for the MAQIP emissions reduction goals. Emissions “inventories” are input into computer models that simulate atmospheric processes and output estimates of air pollution exposures and consequent health impacts. Therefore, it is critical to both examine and communicate to stakeholders the uncertainty in each step of health risk assessment. An estimate of emissions estimate (aka, “inventory”) is a foundational part of any air quality health risk assessment.

Steps of Health Risk Assessment (see <https://www.epa.gov/risk/human-health-risk-assessment>):

Step 1 - Hazard Identification

Examines whether a stressor has the potential to cause harm to humans and/or ecological systems, and if so, under what circumstances.

Step 2 - Dose-Response Assessment

Examines the numerical relationship between exposure and effects.

Step 3 - Exposure Assessment

Examines what is known about the frequency, timing, and levels of contact with a stressor.

Step 4 - Risk Characterization

Examines how well the data support conclusions about the nature and extent of the risk from exposure to environmental stressors.

The MAQIP Emissions Inventory is an input into Steps 3 and therefore step 4 (which combines outputs from Steps 2 and 3). Therefore, the emissions inventory uncertainties should be communicated to the working group in a way that is understandable and provided in the context of the risk characterization.

The community deserves an opportunity to understand both what emissions are being estimated, and what might be missed. That is, what are the uncertainties in the emissions inventory and how do those uncertainties lead to uncertainty in the Exposure Assessment and consequent Risk Characterization? The same is true for historic performance of emissions mitigation measures, and expected benefits of future mitigation measures.

In addition to uncertainty about the science of emissions and health impacts, there is uncertainty about implementation. Will the actors (including Port administration and tenants) execute the plan as planned? The MAQIP process should put in place a plan that is expected to be successful. Where there is significant uncertainty about plan success, then the Port needs to develop a plan to mitigate those risks.

Taking this step to consider uncertainty can also point us to new solutions. For example, the emissions inventory currently ignores the emissions associated with generating electricity used in and near the Port. This is a significant uncertainty that merits careful consideration for several reasons. First, there is a fuel-oil power plant in West Oakland that contributes air pollution when used. Second, increased electrification is a stated mitigation strategy for cargo handling and other vehicles in or near the Port. Third, there are opportunities to reduce emissions associated with electricity usage beyond the Port borders, including, for example, the conversion of natural gas stoves and water heaters to electric power, and electrification generation and EV-charging potential in and near the Port.

Emissions Inventory Uncertainty References

For Till and his team, for the estimate of emissions, there is a well-developed literature on emissions inventory uncertainty, such as:

1. <https://www3.epa.gov/ttnchie1/conference/ei16/session5/frey.pdf>
2. <https://www3.epa.gov/ttnchie1/conference/ei11/qa/pulles.pdf>
3. <https://www3.epa.gov/ttnchie1/conference/ei19/session3/shires.pdf>

Also, see *Air Emission Inventories in North America: A Critical Assessment*, C. Andrew Miller et al., U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory Research Triangle Park, NC,

With these resources at your fingertips, I request that the Port (and its' consultants) conduct a health risk assessment, including explicitly analysis of how uncertainties in the emissions inventory and proposed mitigation plan translate into uncertainties about the conclusion that the MAQIP will be successful in protecting the health of people at the Port and nearby.

It stands to reason that uncertainties in the emissions inventory translate into uncertainties about health effects from Port-related activities and mitigation measures. I'm asking the Port to be transparent and explicit about these uncertainties so we can use them to make BETTER risk management decisions. Once done correctly, we will be able to make probabilistic statements about the likelihood of meeting the MAQIP goals, which I think is the most useful and honest way to achieve consensus on the next MAQIP. As well, we will be able to get one step further in our community conversation about solutions that we can all rally behind.