



March 7, 2012

Mr. Edward Hanlon
Designated Federal Officer
Science Advisory Board Animal Feeding Operations Emission Review Panel
United States Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D. C. 20004

RE: Comments to the Animal Feeding Operations Emission Review Panel

Dear Mr. Hanlon:

On behalf of Dairy Cares, we respectfully submit the following comments on the draft documents which are under review by the Science Advisory Board's Animal Feeding Operations Emission Review Panel. Dairy Cares is a coalition of California's dairy producer and processor associations, including the state's largest producer trade associations (*Western United Dairy*, *California Dairy Campaign* and *Milk Producers Council*) and the largest milk processing companies and cooperatives (*California Dairies, Inc.*, *Dairy Farmers of America-Western Area Council*, *Hilmar Cheese Company*, *Joseph Gallo Farms*, *Producers Bar 20 Dairy* and *Land O' Lakes*). Formed in 2001, Dairy Cares promotes the long-term sustainability of California dairies by working to improve the industry's performance on environmental, animal care and quality-of-life issues.

We have reviewed the draft documents, Development of Emissions Estimating Methodologies for Lagoons and Basins at Swine and Dairy Animal Feeding Operations and Development of Emissions-Estimating Methodologies for Broiler Operations, which the panel will be evaluating. Although the Emissions-Estimating Methodologies (hereafter "EEMs") for broilers may not directly impact dairies, EPA has stated that it considers the statistical methodology used for broilers "to be the best approach for analyzing the data and intends to use this same approach to develop draft EEMs for the egg-layers, swine and dairy confinement houses." Therefore, the deliberations regarding both of these documents are of utmost importance to our member producers.

After reviewing the draft documents, Dairy Cares has some questions regarding the validity of the statistical approaches taken by EPA in analyzing the data. We are in agreement with the memorandum of February 17, 2012, from Stephen Page, Director, Office of Air Quality Planning and Standards in terms of the questions which the panel should consider in its review of the

documents. However, we wish to elaborate on those questions to ensure that all of the relevant issues and concerns are fully considered by the panel. Thus, in addition to those questions, we would like for the panel to consider and respond to the following questions:

1. In developing the Emissions-Estimating Methodologies (EEMs), EPA has relied on the same variables for all of the pollutants. However, one might expect that PM and NH₃ emissions are affected by different parameters. Is it appropriate to rely solely on the same variables for all of the pollutants?
2. Although many factors may correlate well with emissions, the reasonableness of the relationships should be a consideration as well. For lagoons, farm size, animal type and surface area are stated as the factors that have the greatest impacts on lagoon emissions. Although this may be true of the parameters that were measured in the study, it appears that many of the most relevant variables are omitted from the EEMs primarily due to lack of data. Sacrificing the quality of the EEMs to enable a higher number of data points as indicated in the document on page 5-1 does not seem wise. For example, the lack of inclusion of lagoon variables such as lagoon design, loading rates, depth of liquid, depth of sludge, is a serious concern. Further, the omission of these variables in the EEM will most likely preclude their consideration when mitigating emissions. Therefore, the only control options available to the producer will be to reduce animals, thus limiting farm and lagoon size. This would not be a reasonable or acceptable outcome, which would be driven by the EEM. We agree with EPA's statement that "a lagoon is a biological treatment system designed and operated for biodegradation of organic matter in animal manure to a more stable end product." EPA's document states that the predictor variables in Table 5-9, animal mass, temperature, relative humidity, surface area, wind speed, and solar radiation are used as surrogates for describing the differences in the lagoon liquid. However, only animal mass relates to the lagoon loadings. Surface area of a lagoon without knowledge of the design and loading of the lagoon is not an adequate predictor of emissions. Therefore, are the EEMs for lagoons valid representations of lagoon emissions?
3. The fan flow models for the broiler EEMs have a critical impact on the calculations using the data. Are the fan flow models valid and appropriate as they are applied in these analyses?
4. How appropriate is it to combine the dairy and swine data for the EEMs for lagoons? For example, the data show that the emissions from the dairy lagoons are generally less than those from the swine lagoons. There are significant differences in the animal weights as well. Do the factors in the EEMs adequately account for these and other

- differences? From a non-statistical viewpoint, is it appropriate to have one EEM for lagoons at both dairy and swine operations?
5. The document states that after the mathematical forms were chosen, the parameters were re-estimated using the full data set. Further explanation of this approach is needed. Is this an accepted statistical practice? If so, is it appropriately applied in this situation? The EPA should provide information and graphs about how well the EEMS perform using the NAEMS data and using potential scenarios.
 6. There is no explanation of the centering and scaling practices employed in the EEM development process. Does the use of centering here ensure that changes in each variable are equivalent or does it mean something else? What function do the scaling factors perform in these analyses? Are the centering and scaling practices utilized in the analyses appropriate? {See p. 5-26 of the lagoon EEM document.}
 7. In several instances the report states that 5-minute or 30-minute data are aggregated; however, it fails to state how the data are aggregated. What are the aggregation methods and are they appropriate?
 8. On page 5-14, the document states that a product of temperature and relative humidity is used in the analysis instead of dew point. What does this term really mean? Is it appropriate to use this “product” variable in conjunction with the two independent variables on which it is based?
 9. Variations in emissions from lagoons will occur based on the “natural” cover of lagoons such as crust, scum or ice, because the cover inhibits diffusion of NH₃ from the lagoon liquid to the atmosphere as noted by EPA. However, EPA did not use this as a predictor variable candidate because of limited data. Is the issue of lagoon cover addressed appropriately in the EEMs?
 10. EPA did not include the effects of rainfall incident on emissions from lagoons; however, it did include the effects of solar radiation by using surrogate variable, *jday*. The EPA states that interactions of *jday* with *ta* and *ha* should account for reduced solar radiation due to cloud cover. The inclusion and exclusion of predictor variables in the development of the EEM for lagoons is very troubling. Are these appropriate decisions regarding the variable selection?
 11. Not all dairies are the same. They are managed differently and operate under very different environmental conditions. There is variation in the design and management of the lagoons at different facilities. In California, where extensive research has been

conducted on dairy operations, the variability in lagoons and their emissions has been well documented. In California, it has been documented that the VOC emissions from dairy lagoons are less than 3% of the emissions from dairy operations. The predictor variables in Table 5-9 are not the determinants for the variation in lagoons that has been observed and documented in California. One would expect that the manure management and lagoon loading, design and operation are key variables for determining ammonia emissions as they are for determining VOC emissions. In fact, approved liquid manure mitigation measures in the San Joaquin Valley Air Pollution Control District include lagoon design, solids separation, and pH of lagoons, which would imply that these are factors which can impact the emissions from these lagoons. Yet, none of these factors are included in the EEM. How then can these EEM for lagoons be considered appropriate?

Dairy Cares notes that EPA has reviewed certain studies and materials in conjunction with the NAEMS data and that it appears that EPA has determined that most of these studies and materials are not relevant to the development of EEMs. Dairy Cares respects this opinion of EPA; however, we also plan to review the EPA conclusions and determine if we are in agreement with the Agency's conclusions. We will be providing additional comments regarding those conclusions along with supporting scientific rationale where we have a differing opinion.

Dairy Cares also notes that the characterization of the dairy industry on pages 2-1 through 2-4 is not representative and provides a gross generalization of the industry, which is not accurate. It is of concern that this view of the industry by EPA may be used inappropriately by the Agency and by others as facts and lead to further misconceptions about dairy operations. For example, the statement about tie stalls is not appropriate for California dairies as they are not used there. In California dairies, the cows are housed in freestalls with exercise pens, in open corrals or on pasture. Another example is the statement about manure being flushed from alleys or pits in a slurry or liquid system – in a slurry system, the manure is scraped or vacuumed, not flushed. Other examples are cited below:

- In California, as in other states, manure storage piles must be covered during the wet season. The document gives no recognition to the fact that not all stockpiled manure is uncovered.
- The document is correct in stating that solids separation reduces the loading to the lagoons, however, while solids separation is effective in reducing sludge buildup in the lagoon, it has little impact on capacity of the lagoon.
- Liquid slurry is seldom, if ever, mixed with dry manure.
- Cattle operations which only produce veal or heifers are not considered dairy operations.
- Often heifer calves remain in hutches for the first 120 days, not drylots.

Dairy Cares recommends that this portion of the document either be revised or deleted from the document. We are willing to work with EPA on revisions.

We would also like to make you and the panel aware that numerous concerns and questions are arising about the use of the EEMs. As EPA and the SAB panel deliberate on the EEMs, Dairy

Cares thinks that it is important to put the discussions into context about how these EEMs will be utilized. Dairy Cares represents the most regulated dairy community in the world. Our members have experienced the regulatory process from rule development through implementation and recognize that the basis for the rules must be grounded in sound science, validated by measurements in the field, and then developed in a way that is feasible to implement and which can reflect the improvements made by the producers. Therefore, we think it appropriate to raise the following to the panel:

1. The report states that the EEMs can be used in the context of the CAA, EPCRA, and CERCLA. EPA should qualify the EEMs to indicate when it would be and would not be appropriate to use the EEMs.
2. The report states that the EEMs can be used to provide daily and annual emissions estimates. Can the EPA elaborate on how these emissions are obtained from the 30-minute estimates? Are the 30-minute estimates scaled up to daily and annual values? Are the EEMs directly used to generate daily/annual emissions?
3. Will the EPA include “grades” of the EEMs for different scenarios, similar to the A to F grades included in AP-42? This would be helpful to indicate the confidence when using the EEMs for different applications (e.g., swine farms, dairy farms similar to those in NAEMS, dairy farms in California).
4. As noted in the lagoon EEM document, The National Academies of Science (NAS) recommended that EPA should use a process-based approach to determine emissions from animal feeding operations. The dairy industry has been working on developing a process-based model for some time. Are the draft EEMs an improvement over the methods evaluated by the NAS? How do these draft EEMs support a process-based approach for these operations?

Dairy Cares is very willing to make available to the panel its expertise and experience with the dairy industry. If questions arise during the panel’s discussions which we can assist in addressing, please let us know. It is very important to dairy producers that we ensure that the scientific basis for these EEMs is well accepted and validated.

Thanks again for the opportunity to provide input to the process.

Sincerely,

William C. Van Dam
Chairman, Dairy Cares coalition