

# MARAMA

Mid-Atlantic  
Regional Air  
Management  
Association, Inc.



Allegheny County Health Dept., Air Quality Program, Pittsburgh, PA.  
District of Columbia Dept. of the Environment, Air Quality Division  
Delaware Dept. of Natural Resources & Environmental Control, Air Quality Mgmt. Section  
Maryland Dept. of the Environment, Air & Radiation Management Admin.  
New Jersey Dept. of Environmental Protection, Division of Air Quality  
North Carolina Dept. of Environment & Natural Resources, Division of Air Quality  
Philadelphia Dept. of Public Health, Air Management Services  
Pennsylvania Dept. of Environmental Protection, Bureau of Air Quality  
Virginia Dept. of Environmental Quality, Air Division  
West Virginia Dept. of Environmental Protection, Division of Air Quality

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## Request for Proposals Concerning Possible Emissions Inventory Projects for the Mid-Atlantic/Northeast Visibility Union (MANE-VU).

### A. Background and Project Description

The Mid-Atlantic Regional Air Management Association, Inc. (MARAMA) invites you to submit a preliminary, short proposal so that we can gauge the cost and availability of resources to contract for assistance with the following potential projects regarding the Economic Growth and Analysis System (EGAS) model, ammonia emissions estimations, and condensable PM<sub>2.5</sub> emissions. Projects would be conducted in the next year. Data from Projects 1 and 3 are needed in the next three to six months to support modeling.

#### 1. Modified use of Economic Growth and Analysis System model (EGAS)

Regional haze is currently dominated by sulfate pollution, and the principle sources of SO<sub>2</sub> emissions contributing to this sulfate are the large coal fired installations in and near the region, including electric generating units (EGUs), industrial boilers, and other large coal-fired installations such as cement plants. Forecasting future emissions from these large sources entails a number of uncertainties related to the models used in forecasting EGU and other industrial emissions, principally the Economic Growth and Analysis System or EGAS model. EGAS is used to estimate the growth or decrease in emissions based on projected changes in economic activity. The current approach used to forecast emission trends begins with a base year and grows according to the growth in various indicators. EGAS uses predictions of GDP, VMT, energy consumption, and population to predict future emissions.

The U.S. Environmental Protection Agency (EPA) has found that EGAS has consistently over predicted emissions. For long-term forecasts, the result is a very significant over prediction of future emissions. Future emissions have tracked downward since 1970 while all the indicators used by EGAS have tracked upward.

In the MANE VU inventory, industrial growth is predominantly predicted using EGAS. As a result, the growth of emissions from industrial sources may be over predicted. For far future years, such as 2018, over prediction may become serious. Linda Chappell of USEPA is heading up a project to revise EGAS. She expects that the revised EGAS factors will be available by mid-2008. Once information is available from EPA it can be used to improve future inventory forecasts.

Task a. When the USEPA revision of EGAS factors becomes available, the contractor will revise the MANE VU future year inventory predictions to develop an alternate emission

estimation for relevant sources. A zero growth scenario, comparable to the USEPA current approach, will also be prepared by the contractor. These alternate future year estimates will be compared with the current estimation to develop a range of possible future industrial and area source emissions.

Task b. This work will be documented in a technical memorandum that will include an analysis of the differences from the Version 3 MANE VU inventory.

Task c. Data files will be provided to allow the development of input files for modeled sensitivity runs that will determine the effect of these changes on downwind visibility. These files should be both the in NIF and IDA format. In addition the contractor should provide MARAMA with the database files used to make calculations including the base year and factors used to grow or control the base year factors.

## 2. Ammonia Emissions Estimation

To form sulfates, ambient SO<sub>2</sub> combines with ammonium, which derives from emissions of ammonia. Relative to other pollutants, ammonia emissions are poorly characterized. The ammonia emissions inventory is dominated by agricultural sources.

Agricultural ammonia emissions vary widely depending on a number of factors including type and age of animal, conditions under which the animal is kept, time of year, temperature and humidity. In addition, the emission factors for agricultural ammonia that existed at the time that the MANE VU inventory was prepared were widely variable. Because of the level of detailed information required to estimate emissions and the variability of emission factors, agricultural ammonia data introduce a great deal of uncertainty into the inventory.

In 2000-2001 MARAMA and NESCAUM sponsored the development of a framework for the collection of the underlying information needed to calculate ammonia emissions spatially and temporally. The work was done by Carnegie Mellon University and provides a template for organizing new and improved information.

In the past five years much has been done to improve the science of ammonia emission estimation from agricultural sources. UC Davis has developed a process based model that has been used by LADCO to develop temporal emissions for model farms for improved CMAQ results for fine particulate. This is the type of model that was recommended by the National Research Council of the National Academies to replace the formerly used USEPA emission factor approach. Because the model runs very slowly, LADCO used a modified version of the UC Davis model. They ran the model on 10 farms and used the temporal profiles from those 10 farms to characterize the rest of the inventory. No poultry farms were characterized. LADCO has a contract underway to recode the model for more speed.

Other information will become available on the national level in the next year. As a result of a settlement with the Confined Animal Feeding Operations (CAFO) sector USEPA is in the process of monitoring emissions from on 25 facilities. In addition, another piece of information that will be available soon is the 2007 USDA agricultural animal census. USDA performs a census of

agricultural animals every five years. Census years are 2002, 2005, and 2010. It takes 18 months for the census numbers to be compiled and be available for use by the public.

Given the important role ammonia plays in the generation of fine particulate and visibility impairment and the new tools and information that is now, or will soon be available, we should position ourselves now through work that will enable us to have a much better inventory for the next round of SIP revisions.

The CMU framework along with other new information and models can be used to improve the characterization of ammonia inventories. MANE-VU believes the following tasks would be helpful, but we are open to suggestions of related work. We consider this a high priority but may need to seek additional funding to complete some tasks. Contractors with related funding are encouraged to apply.

- Task a. The contractor will conduct a review of the literature to identify the best available emission factors and methods for use throughout the region. The UC Davis agricultural model will be reviewed to identify inputs needed that will characterize farming practices. Farm modeling results generated by LADCO will be obtained. Information on the USEPA monitoring study will be reviewed.
- Task b. The contractor will seek available information on the largest sources in the region to update the UC Davis model. Available information will be collected from sources such as US Department of Agriculture, the Agricultural Extension Service, and universities, as well as state and local agricultural departments. This will allow states to be prepared to model ammonia emissions next year after the USDA 2007 census of agricultural animals is available. The information that will be collected will describe CAFOs that exist in each county.
- Task c. The contractor will seek to improve the county specific information in the CMU database to allow the calculation of spatially and temporally variable emissions throughout the MANE-VU region. With this county specific information the MANE VU states will be able to use the data collected and modeled by USEPA and LADCO to prepare more realistic input files for future modeling exercises.
- Task d. This work will be documented in a technical memorandum that will also include an analysis of the differences from the Version 3 MANE VU inventory.
- Task e. Data files will be provided to allow the development of input files for modeled sensitivity runs that will determine the effect of these changes on downwind visibility. These files should be both the in NIF and IDA format. In addition the contractor should provide MARAMA with the database files used to make calculations including the base year and factors used to grow or control the base year factors.

### 3. Condensable PM2.5 Emissions Estimates

Directly emitted PM2.5 has two components, particles that are solid regardless of stack temperature (Filterable) and gases that condense shortly after exiting the stack (Condensable).

For many sources, particularly combustion sources, condensable emissions are much greater than filterable emissions. However, there is a great deal of uncertainty about the best way to estimate condensable emissions. In addition, the measurement of condensable emissions (using the current reference method 202) is by no means considered to be reliable by experts in the field. For example, if short cuts were taken when purging the sampling train measured emission rates may be inflated. Because of this uncertainty and confusion condensable emissions were not calculated in a uniform manner across all states in the MANE-VU region. As a result there is variability in if and how condensable emissions were included in the MANE-VU 2002 inventory.

In the MANE VU inventory future years estimate (2009, 2012, and 2018) industrial point source PM2.5 emissions were calculated similarly to the base year 2002. However, EGU emissions for future years (2009, 2012, and 2018) were uniformly calculated using the output from the IPM model. IPM predicts unit utilization based on a least cost model. For PM2.5, unit utilization is then converted in a post-processing step to emissions based on AP-42 factors, SCC code and control device employed. These methods sometimes resulted in widely different estimates of future PM2.5 emissions from EGUs in comparison to 2002.

Overall, condensable emissions are underreported in the 2002 inventory. As a result, PM2.5 emissions for EGUs appear rise dramatically from 2002 to 2009 for most states in MANE-VU. This inventory inconsistency may have a bigger effect on a PM2.5 analysis and therefore should be addressed before the inventories are used in analysis.

- Task a The contractor will work with states to prepare a table showing the methods used to estimate condensable emissions from EGUs on a unit by unit basis in the 2002 inventory. This table will be prepared in consultation with state inventory experts.
- Task b The contractor will evaluate the range of possible condensable factors for EGU emissions based on documented variability in the literature. Based on this evaluation the contractor will develop potential revisions to 2018 MANE inventory to consistently reflect the best available information and calculation methods. A range of emissions will be calculated based on the range of factors reported in the literature.
- Task c This work will be documented in a technical memorandum that will also include an analysis of the differences from the Version 3 MANE VU inventory.
- Task d Data files will be provided to allow the development of input files for modeled sensitivity runs that will determine the effect of these changes on downwind visibility. These files should be both the in NIF and IDA format. In addition the contractor should provide MARAMA with the database files used to make calculations including the base year and factors used to grow or control the base year factors.



Work is expected to start as soon as possible, but varies by project. The EGAS project timing depends on EPA and may begin in June 2008 and be completed by September 2008. The Ammonia Emissions Estimation should begin immediately and under current funding must be completed by December 2008. The Condensable PM<sub>2.5</sub> emissions estimation should begin in February 2008 and be completed by April 2008.

The contractor will participate in conference calls with MARAMA, monitor the project schedule and budget, and prepare progress reports. Progress reports are required monthly with each invoice sent to MARAMA.

The contractor will work with the MARAMA Project Manager and a technical support committee, and will be required to contact individual states (a contact person for each state will be provided) to obtain or confirm certain information or data.

#### **D. Submittal of Proposals**

If you are interested in being considered for this project, please submit the information listed below to MARAMA by 5:00 pm EST, March 7, 2008. No late offers will be accepted. Ten paper copies and one electronic copy of the complete proposal must be submitted (MARAMA uses Word, Excel, and PowerPoint, so electronic copies must use these programs). Electronic copies may be submitted to [swierman@marama.org](mailto:swierman@marama.org). Paper copies may be submitted to Susan S.G. Wierman, Executive Director, MARAMA, 8600 LaSalle Road, Suite 636, Towson, MD, 21286.

Proposals should be limited to 10 (single-spaced) pages typed with 12 point font size with a margin of 1" on all four sides, and should address the following:

- **Technical Proposal and Draft Work Plan.** Summarize work to be done (proposed approach) for the work described above. Include a schedule (a time chart) for completing the project, showing support you will need from project sponsors and subcontractors, review periods for draft documents, and other relevant information. Include information about any work already completed or underway, or funded by another source, that could satisfy MARAMA's requirements.
- **Qualifications and Responsibilities.** Identify key personnel for performance of the work under this RFP. Short resumes of major personnel and the roles each would play in this project should be included. Specify the amount of time that the key personnel will dedicate to the project. Indicate the responsibilities each will have in this project. Any change in key personnel associated with the project shall be made only with prior written approval of MARAMA's Executive Director. These conditions pertain to both prime contractor and subcontractor personnel.
- **Cost.** Proposal costs must be linked to deliverables so that billing and payment can be linked to the delivery of products. Include hourly rates and estimated hours for personnel proposed to work on the project.

- References. Studies or projects referred to should be identified and the name of the customer shown, including the name, address, email address, and telephone number of a responsible official of the customer, company or agency who may be contacted as a reference.
- Non-Disclosure/Confidentiality. Indicate willingness to enter into a non-disclosure and/or confidentiality agreement(s) regarding access to potentially state confidential and/or company proprietary information.
- Small and Disadvantaged Business. Indicate the percentage of small business, Minority-Owned Business Enterprise (MBE), and/or Women-Owned Business Enterprise (WBE) participation. MARAMA seeks to meet EPA goals for utilizing these businesses under 40 CFR 30.44 (b).
- Eligibility. Proposals must certify that the contractor is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by a Federal department or agency. In addition, contractors are prohibited from awarding subcontracts of \$25,000 or more to persons (individuals or organizations) that have been debarred, suspended, or excluded by a Federal department or agency.

Any questions about this RFP should be sent in writing via email to Alice Lutrey at [alutrey@marama.org](mailto:alutrey@marama.org). Questions and answers will be posted on MARAMA's website at [www.marama.org](http://www.marama.org) under "Requests for Proposals." No further questions or answers will be posted after February 29, 2008

### **E. Evaluation of Proposals**

Interested parties are encouraged but not required to keep their proposals under 10 pages. To provide documentation of prior work, you may reference materials available on the internet rather than submitting copies.

Information submitted will be used to help determine whether available resources are sufficient to conduct the project and which contractor or contractors to invite to prepare a work plan to conduct one or more projects.

MARAMA may select more than one contractor for individual projects or establish an umbrella contract to cover more than one project. MARAMA will proceed with work assignments for specific projects as resources and time permit.

Depending on the nature and scope of proposals received, MARAMA may request the preparation of follow-up proposals from one or more contractors. MARAMA may adjust the scope of work depending on the proposals received.

MARAMA will only select experienced contractor(s). The contractor must demonstrate experience with emission inventory preparation, the EGAS system, analysis of ammonia air emissions, and/or calculation of condensable PM<sub>2.5</sub> emissions, as applicable.

Selection criteria will include 1) the experience, expertise, and other qualifications of personnel assigned to the project, 2) technical evaluation of proposed approach, 3) ability to leverage previous and current work for EPA or other regions, 4) price, 5) percentage of MBE/WBE participation, 6) availability to conduct the project in a timely manner, and 7) the level of effort proposed for the personnel and firm. MARAMA is not required to select the lowest cost bid, but will consider the cost and the other factors listed. Proposals will be evaluated based upon estimated expenditures for the listed assignments. Work assignments will be authorized on a fixed price basis.