

November 2, 2004

Diane Fleshman  
NARSTO Management Coordinator's Office

Re: Comments on NARSTO Draft Emission Inventory Assessment from members of the Emissions & Modeling Committee of STAPPA/ALAPCO

Dear Ms. Fleshman:

Members of the Emissions & Modeling Committee have submitted the comments set forth below. Six out of seven of the chapters were reviewed—each by a different Committee member. STAPPA/ALAPCO has consolidated these comments, which we hope will be considered by the NARSTO drafters as they revise the document. These comments have not been endorsed by the full membership of the Committee.

### **Chapter 1—Comment Submitted by an Emissions Specialists in the Northeast**

“Chapter 1 was a fine narrative introduction to the report, but it appears less of a program for inventory improvement than what I had envisioned. I sense too much is being bet upon 'new techniques for filling holes in our emissions inventory.' If so, the source attribution expectations we have for inverse modeling from satellite data and ambient air samples is not well founded.

While the information provided is not completely new to those dealing in air quality planning and management issues, there is a clear recognition of the need to obtain information on source categories which were previously deemed to be ‘small emitters’ and as such were often not regulated under traditional measures.

It should be borne in mind that air quality control and management is often a state and local directed program, which is required to meet and maintain ambient air quality standards that are promulgated at the Federal level or in some instances at the State and local level. Contrast this with the measurement of ambient air quality by State and local programs that provide reasonably consistent data across the nation based on federal procedures. This lack of uniformity and consistency appear to have contributed to the lack of confidence in emissions estimates.

The assessment correctly points to development of innovative methods for providing estimates of emissions and the need for augmenting these methods with the traditional ones. However, many States and local programs may be reluctant to latch on to ‘untested methods’ and require encouragement and assistance from the federal level because of consequences of potential litigation.

Another important issue that has not been discussed is the limitations faced in the development of the state and local level inventories. Often, the inventory development is delayed by the lack of timely guidance that originates at the federal level, and many State and local agencies would be reluctant to proceed without such guidance. Another aspect

that should be borne out is that these emissions data are often viewed as ‘set-in-stone’ and not expected to have associated uncertainty in them. While this issue has been discussed and several research articles have appeared in scientific and technical literature, there appears to have been no active effort on the part of the federal agency to integrate this information in the development of emissions inventories.

While the list of pollutants for which the emissions inventory information is to be gathered is increasing, regulatory policies aimed at streamlining the information appear to have hindered progress in that direction. A classic example is the development of consolidated emissions reporting requirements that failed to include the non-criteria pollutants in its reporting requirements, thereby creating an informational database that is incomplete to address some of the issues that are arising from a ‘one-atmosphere’ approach to address human health and welfare.”

## **Chapter 2—Comments Submitted by an Emissions Inventory Specialist from the Southeast**

The comments for Chapter 2 have been divided into those that are editorial in nature and those that are substantive:

### **Substantive Comments:**

1. “The discussion of the vision for future emissions inventory programs in this chapter lacks foundation and context. The reviewer felt that a document of this nature should summarize “where we’ve been, what we’re doing now, and then, on that foundation, say where we need to go next” rather than discussing current deficiencies and improvements that are needed absent any context.

2. On pages 2-4 of the chapter, lines 42-46, the commenter queried the absence of a regulatory history of Canada, corresponding to Mexico’s and the U.S.’s.

3. Pages 2-16, line 4: The commenter stated, ‘Emission trends are mentioned here.’ We would like to take our most current emission factor table and apply it to old emissions inventory data sets. However, there are many SCCs with multiple emission factors (especially for toxics). You have to choose the best one. When you have thousands of those decisions in an old year of inventory, the time required to compare change over time is prohibitive. So we have to compare changes when different emission factors were used. Any opportunity to call for fixing that problem should not be passed up.

4. Page 2-16, lines 5-8: The challenge of integrating data that are distributed among many sources without requiring strict data format standards or introducing a new data repository to centrally store and maintain the data was an unrealistic goal.

5. Two additional ideas occurred to me while reading this material. (1) EPA says they won't guarantee security of 'confidential' data so don't send it. That instruction is pretty open-ended so different agencies will respond as their local practices dictate. That may include not sending the emissions at all - and those could be significant. Many agencies have devised administrative work-arounds to get the emissions to EPA without revealing business-sensitive data. EPA should offer suggestions about how to send the emissions data that will be nationally consistent. (2) The discussion about GIS systems reminded me about a mind-set folks from the GIS background - as well as many in the permitting and emissions inventory communities. We consider a point source to reflect the permitted equipment that has associated GIS data. GIS folks think of the geographic location as the point source. Most of the time it doesn't matter: you don't pick up an electric utility and move it somewhere else. However, there are portable sources such as asphalt or concrete plants that can move throughout a state (or into other states and back). Those sources have compliance histories, fee histories, as well as emissions inventory histories that are associated with their facility IDs (or permit numbers). If the point of view of the GIS folks prevailed, everything would be lost every time a portable source moved. This issue might not have a major impact on the total inventory but it makes for unnecessary messiness and should be standardized.

6. Pages 2-22: The commenter again noted the need for one emission factor per SCC (or PCC)

7. Pages 2-22: In the 'Data Collection Techniques' category, they list several goals. Standardizing the data collection front-end would go a long way toward minimizing interpretation errors on the part of data providers. The way a question is framed, together with its context, can significantly influence the responses to a question.

8. Pages 2-23: In the 'Timeliness' category, asking for point source information from the State/Local/Provincial/Tribal agencies may be unrealistic. In our case, inventories are not even due until March 31. That would allow two weeks for quality assurance.

9. In the 'Affordability' category I'd like to add a suggestion that links to other emission factor sources be made available at the CHIEF site. Example links include [http://www.npi.gov.au/handbooks/approved\\_handbooks/eetmanuals.html](http://www.npi.gov.au/handbooks/approved_handbooks/eetmanuals.html) and <http://www.sdapcd.co.san-diego.ca.us/toxics/emissions/emissions.html>

### **Editorial Suggestions for Chapter 2:**

1. "Pages 1-3, line 31. The convention in the air pollution community is to use 'toxics' rather than 'toxins.'

2. 'Emissions inventory' and 'emission inventory' are used inconsistently throughout the document. One usage should be chosen.
3. Depending on what argument the author was trying to build, for smoothness of flow 'Airborne Particulate Matter' leads into a discussion of 'Regional Haze and Visibility' better than into 'Air Toxics.' However, I can easily see that toxic health effects are more important than quality-of-life issues. Not recommending either, wanted to raise the question.
4. Page 2-7, line 13: 'over fertilization' should be hyphenated.
5. Page 2-9, line 8: 'a urban' should be 'an urban...'
6. Page 2-9, line 11: Should grids not be 4, 12, and 36 kilometers, rather than 'grid cells that are 4 to 6 kilometers...'
7. Pages 2-7—2-10: The discussions of 'Regional Ecosystem Effects' and 'Regional Climate Change' seem as if they are repetitive. Rewrite suggested.
8. Page 2-10: Clarify or define 'radiative forcing,' which appears here for the first time.
9. Pages 2-9—2-11 The spatial scales in Section 2.3 go from very fine scale to hemispheric scale. The next paragraph about the temporal scale starts out with 'As the requirements for emission data at finer spatial resolution grow...' It wouldn't be so jolting if the spatial scales went from very large to very fine. Then that sentence would flow smoothly from the previous discussion.
10. Page 2-12, line 15 This is the first occurrence of 'black carbon' in the text (it appears in the List of Acronyms but no discussion there either). It is explained later in the document about why they used black carbon instead of elemental carbon. It should certainly be explained the first time it's used.
11. Pages 19-22: Several typos, missing words, mistakes with verb and noun agreement and (on page 2-22) an instance where 'elemental carbon' should be listed as 'black carbon' were noted by the reviewer. Also, the reviewer queried whether the reference to 'nonpoint sources' was intended or, rather, 'area sources' and 'nonroad sources' were intended by the author?"

### **Chapter 3—Not reviewed**

### **Chapter 4—Comments Submitted by an Emissions Inventory Specialist in the Midwest**

“My impression of this section can be summed up by what some of the authors stated on page 2-13 of the NARSTO report:

‘Gathering emission and activity factor data and constructing emission inventories for air quality assessment and management have not traditionally been regarded as glamorous pursuits...No one has ever been elected to the U.S. National Academies of Science or Engineering primarily for their work on emission inventories.’

This inferiority complex mentality is pervasive in Chapter 4. Chapter 4 provides an opportunity to identify some of the good things that have been done regarding emission inventories over the last few years and identify the funding problems EPA has faced in trying to develop an adequate program. These both are lacking in this section. For example, the discussion of the Emission Inventory Improvement Project (EIIP) is set forth in a total of three short paragraphs and a table on page 4-1. The amount of money spent by the States from their 105 grants and the work done by the States and Locals through STAPPA/ALAPCO over approximately five years to complete these documents is not mentioned. In fact, the discussion of street vendor cooking on page 4-8 goes into more detail than the EIIP discussion.

The discussions on AP-42 and FIRE contained in 4-3 and 4-6 does not discuss EPA's timetable or methodology for keeping this information up-to-date. The discussion regarding either AP-42 or FIRE does not contain information on how many people are needed to keep this information timely at EPA. It appears this was a conscious decision by the writers because none of the information for the United States, Canada, or Mexico in this section identifies costs associated with this information for the three member countries of NARSTO.

EPA's opportunity to appeal for funding for its emission inventory program, either implicitly or explicitly, appears in Box 4-1 on page 4-7. This box is titled "The Conceptual Future of the EPA's Emission Factor Program." The information in the box does give the reader reasons why EPA wants to improve its emission inventory data collection model. The four reasons are laudable-save money, less subjectivity regarding emission factors, supply a range of emission factors rather than just one number, and help people that use emission factors for other reasons than they were intended. These are all good reasons to modify the program. However, the box information does not contain a timeline or mention the cost but gives this as an undefined goal of the future program. The box information should be modified to include these important factors.

Moreover, the following paragraph in Chapter 4 was a little unsettling to me. ‘It is hoped that the restructuring of its [USEPA's] emission factor program will result in a more streamlined process for developing and maintaining these factors. Another goal is to reduce the costs of the program while at the same time yield more up-to-date emission factors.’

If you read most of the 303 page report, you will see the authors argue that the completion of accurate, timely emission inventories is essential for good air quality management. If you do not have good emission information, you can not expect to have

good predictive modeling results. Without good predictive modeling tools, your air quality planning is circumspect. The entire NARSTO report appears to argue, implicitly, that this is an important area where more financial resources are needed. This paragraph shows up in a box discussing EPA's future in emission inventory that appears to say EPA wants to do the right thing but may not be able to do it. 'It is hoped that the restructuring' does not strike me as something EPA would say if it was committed to improving its emission inventory program.

The rest of Chapter 4 discusses a data collection future and mentions that it would be nice if emission inventories could be completed in real time, similar to weather forecasts, rather than the current two or three year wait for emission inventory data. The discussion identifies Continuous Emission Monitoring Systems (CEMS) and Predicted Emission Monitoring Systems (PEMS) as the wave of the future for completing real time emission inventories. It is mentioned briefly that this information is only available from a small portion of the emission inventory sources (e.g. EGUs). It does not discuss the costs associated with all sources installing the equipment necessary for CEMS or PEMS and should do so."

The reviewer's last comment concerns Table 4-11 on page 4-54. The table summarizes the "Limitations and Associated Needs for Immediate Emphasis in the United States, Canada, and Mexico." The table lists nine areas and supplies a proposed resolution and a potential for support to resolve these issues. The reviewer notes, "it is interesting that this table does not include a people factor--training. I would argue that if you do not have a training component as part of our plan you can not possibly attain the resolutions identified in this table."

### **Chapter 5—Comments from an Emissions Inventory Specialists in the Northeast**

"Chapter 5 speaks to variability in the emission factor and activity data. It recognizes the bad data condition and does not seem to discuss the no-data condition. To the extent the report does discuss the no-data condition, it neither identifies suspect sources nor proposes a remedial program. The report should address and propose solutions for no-data conditions.

The no-data condition exists with cement plant emissions in which kilns emit all of the above referred to 'chemical species.' I found a small (80 TPH clinker) cement plant with a recent tested level of 365 TPY NH<sub>3</sub>. Regardless, the EIIP's most recent factor would indicate 30 TPY NH<sub>3</sub> from the plant, as well as no VOC, and little of the SO<sub>2</sub> and CO, which is released in substantial amounts while burning off the CO<sub>2</sub> and S in the rock.

Coal may be one of many inventory sectors in the 'bad data' condition, for which the report at Chapter 5 suggests a 'reality test' will pinpoint. Because NH<sub>3</sub> is in the fossil rock that is burned in cement making, it is in coal and other fossil fuels too. EPA's AP-42 has an emission factor for coal based upon two tests performed in 1979 and 1984, which differ by three orders of magnitude. I am unsure why they selected the lower test as the preferred factor to be used, but it seems as though they did.

I have some other observations about source categories that should be included in this bad data category: In a prior letter to EPA, the RPO Directors identified a number of specific source categories where EPA's AP-42 factors and inventory guidance are inadequate. This includes a dearth of source level primary PM fine mass measured emission factors, from categories the nation's RPOs felt were significant. At that time, we did not fully anticipate the effect of EPA's latest guidance about road dust, and also expected our Residential Wood Combustion survey would result in an accurate RWC inventory.

On the basis of the latest EPA guidance, New York's preliminary 2002 annual inventory of primary PM 2.5 indicates two-thirds of our annual total manmade PM is residential wood combustion. The next largest category is road dust, and that is over 10% of the total. This inventory is so poor that I hesitate to recommend it for even the most primitive dispersion model development because it is likely that inappropriate and inaccurate source attribution will result from depending on it.

Meaningful source attribution requires good source-level speciated data--which is not currently populating our shared data bases. The D.C. Circuit Court of Appeals remanded the BART regional haze rule with the expectation that we will accurately identify individual point source contribution levels upon affected Class I areas. We need this capability as well to resolve PM nonattainment problems which for many of us involve a transported component. We need to identify transported and local amounts and chemical/atmospheric mechanisms so we can arrange for the appropriate control wherever it is needed.

We do have an opportunity: the States and Locals have available source testing that is now being performed for RATA CEM tests, MACT tests, SARA Title 3 tests, Mobile Source toxics, NESHAPS, and NSPS testing. These data should be solicited from our sources, and then reviewed for quality and shared through a clearing house. Where is the program to make that happen for the speciated primary PM fine, and NH<sub>3</sub>, NO<sub>x</sub>, SO<sub>x</sub>, & Volatile-Semi Volatile OC precursor emissions? The NARSTO report should address this concern.”

## **Chapter 6—Comments Submitted by an Emissions Inventory Specialist in the Great Lakes Region**

“Chapter 6 describes several evolving methodologies that are potentially applicable as advanced technologies for developing and verifying emission inventories. It provides eye-opening knowledge to the emission inventory community on the future perspectives. This chapter also discusses improving the emission rate algorithm and an advanced database management. However, the Introduction and Overview Section only serves its purpose for the evolving methodologies not the others. The entire chapter was written with a lot of efforts on observation and measurement methods.

As indicated in the Summary and Conclusions Section, the evolving measurement methods discussed in this chapter are especially useful for variable and intermittent sources, such as transportation, urban area sources, wildfires, biogenic sources, and dust rising from the surface. However, the emission inventory community will still follow the standard practice using the emission factor approach to estimate emissions in the foreseeable future. More future perspectives need to be provided to the emission inventory community on the improvement in emission factors (such as items suggested in the Emissions Factors Improvement Project Survey recently conducted by EPA), the collection of more representative activity factors, and the development of better control factors. Examples of bottom-up activity data surveys (such as a residential wood combustion activity data survey conducted by MN), community-based inventories, and neighborhood emission assessments (such as an air quality study in the Wilmington neighborhood of Los Angeles conducted by CARB) could be used to demonstrate the improvements.

The Advanced Database Management Section should include the establishment of a standardized electronic emission reporting system. The system will allow industries and S/L/T state agencies report emission data, make emission estimates, and perform quality control checks on-line. Internet based data sharing systems at a state level and a local level could also be exemplified. Minnesota is constructing an air quality portion of the Environmental Data Access (EDA) web site to make emission inventory data available through a map-based system. It is scheduled to be available in the end of 2004.

A future vision of a timely emission inventory should also be discussed along with its accuracy and comprehensiveness. Ideas from EPA's Rapid Inventory Development Pilot project could be included in this chapter.

Some typos in Chapter 6:

Page 6-34, Line 20, 6.2.1 should be 6.3.1.

Page 6-34, Line 34, 5 should be a superscript.

Page 6-35, Line 18, 6.2.2 should be 6.3.2.

Page 6-36, Line 38, 6.2.3 should be 6.3.3.

Page 6-37, Line 32, delete "the" from "with other the information sources".

Page 6-41, Line 11, "to me client needs" should be "to meet client needs."

## **Chapter 7—Comments Submitted by an Emissions Inventory Specialist from a Western State**

In general, the reviewer agrees with the "Findings and Recommendations".

"However," the reviewer states, "they do not address where the needed 'resources' {staff & cash} should come from and the quantity and quality of the resources. There needs to be a discussion on the resources the emitting sources would need to collect the needed data.

### **Section 7.1.1 - Inventory Improvements**



Should include biogenic (vegetation growth and decay) sources and geogenic (earthquakes, volcanoes, etc). If you can smell or see it there has to be an emission source.

For small sources one shoe (type of collection sheet) does not fit all. The collection sheets need to be tailored to match the source type. Different information is needed if you are looking at a mine, a power plant, dry cleaner, ICE, fuel distribution, waste water treatment plants, etc.

Most environmental employees I work with know and understand spreadsheets (Excel, Lotus, etc) and not databases (Access, dBase, etc). The agencies {State and federal} can hire the staff to convert the data.

Industry needs a very large voice in developing the forms used to collected data of emission calculations.

#### Section 7.1.2 - Estimation Methodology

Many factors control the emissions for soil and aggregates. They include hardness, crushability, moisture, etc. Therefore, much is uncertain regarding the emission factors for surface & pit mines, sand and gravel activities. Need different methodologies by source size. A 50% error in a 10 tpy source is small compared to 20% for a 1,000 tpy source {5 tpy of emissions versus 200 tpy}. Also small sources do not have the resources (staff or cash) to complete a detailed report.

#### Section 7.1.3 - Timeliness

Data should be collected from the sources on an annual basis. If less frequent, the source may not remember how it generated the last report either because it has been lost or there has been a change in personnel or it is simply not high on its priority list.

The three best ways to improve the inventory are:

1. Educate the agency staff,
2. Educate the emitters, and
3. Educate the users.”

Thank you for this opportunity to submit the comments of members of the STAPPA/ALAPCO Emissions & Modeling Committee to NARSTO. We hope that they prove helpful as you revise the NARSTO Draft Emission Inventory Assessment. Please contact me or Mary Stewart Douglas if you have any questions about these comments.

Sincerely yours,

Roger Westman  
Co-Chair, Emissions & Modeling Committee

