



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Office of Air Quality Planning and Standards  
Research Triangle Park, North Carolina 27711  
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AIR & Radiation Branch  
U.S. EPA Region V

MEMORANDUM

**SUBJECT:** Attainment Demonstration and Modeling Discussion for  
the South Coast FIP Notice of Proposed Rulemaking

**FROM:** Dean A. Wilson, Meteorologist  
Techniques Evaluation Section, SRAB (MD-14)

**TO:** John Vimont, Regional Meteorologist  
Region IX

In response to your request, the Model Clearinghouse has reviewed your draft preamble language for the subject FIP. In general we find the material to be technically defensible and well-written. Some minor technical comments are provided in Attachment I and some suggested editorial changes are provided in the marked-up pages of Attachment II.

As we discussed on the telephone, there is a potentially significant policy issue associated with the attainment demonstration. This issue stems from the premise used in the FIP that, for various reasons, it is not a useful exercise to define the true (highest possible) design concentration at this time. Instead, the FIP defines design values and control measures that are associated with the information readily available, then promises to perform the requisite refined modeling at a later date. As I mentioned to you on the phone, this issue has been elevated to higher management; its resolution will take place outside the purview of the Clearinghouse.

If you have any questions, please contact me at FTS 629-5683.

Attachments

cc: T. Braverman  
J. Dicke  
G. T. Helms  
E. Meyer  
J. Tikvart

bcc: Regional Modeling Contact, Regions I-VIII, X (with copy of incoming memorandum and list of FY-90 Clearinghouse memoranda)

Attachment I  
Technical Comments on Carbon Monoxide Modeling Section

1. First Paragraph. Since it is later mentioned that a temperature of 59 degrees Fahrenheit is typical of high concentration days, should the temperature on December 13, 1988 be mentioned?
2. Fourth, Fifth and Seventh Paragraph. Someone might question why the data bases to run UAM for CO are not available since the model was run for O<sub>3</sub>. It might be worthwhile clarifying why that is the case.
3. Seventh Paragraph. It is not clear why the demonstration is being dubbed "modified" rollback. It appears to us to be "straight" rollback.
4. Last Paragraph. It is not clear why it is necessary to discuss sub-areas; identified emissions controls seem to be area-wide.

## Attachment II

The EPA has identified several possible modeling approaches for analyzing the area wide component to the CO problem in the South Coast Air Basin. One possibility is to use the RAM model, which is a gaussian plume model appropriate for use in evaluating urban area sources. Unfortunately, gaussian plume models do not adequately simulate the stagnation conditions of concern here. A technique which has been used under similar circumstances in Phoenix, Arizona and Denver, Colorado is to use the Urban Airshed Model to simulate the CO emissions and their impacts on the ambient CO concentrations. This model technically has the best treatment of this type of phenomenon, but also has extremely high data input requirements. Another possibility is the use of a ventilated box model. This technique has been used for evaluating high PM<sub>10</sub> concentrations under stagnation conditions in several other parts of the country. These applications have primarily been in relatively confined, enclosed valleys. It has not been determined whether this modeling approach would be appropriate for the conditions which occur in south-central Los Angeles County. Some type of modified rollback could be used, albeit it lacks the technical underpinning EPA would find most desirable in an attainment demonstration. One assumption behind a rollback approach is that the monitoring locations used in the analysis are actually recording the highest concentrations in the area. The more rigorous modeling approaches allow the consideration of other receptors and the relative impacts of changes in the spatial and temporal distributions of emissions.

*At this time, the monitor value high second half above appears to be the most reasonable number on which to base the CO coeff. of strategy.*

The EPA tested the RAM model to determine the potential for using it in evaluating the CO concentrations in the area, even though its formulation is not particularly well suited to evaluating stagnation conditions. When the model was tested for the stable conditions with a 1 m/s wind speed the concentrations were underestimated by a factor of 10. If the model was artificially constrained by assuming that there was neutral stability with a very low mixing depth, then concentrations could be obtained that were close to the level of the observations. The data necessary to run the UAM was not available to test it, although it is potentially the best suited for simulating the conditions of concern.

*\* Such "alter-  
the fact" stating  
of model inputs  
is not technically  
credible.*

*UAM*

*model*

*see below*

The majority of CO emission reductions being proposed for federal implementation consist of reductions in on-road mobile source emissions, which constitute the vast majority of CO emissions in south-central Los Angeles County. The proposed emission reductions are similar to the Federal Motor Vehicle Control Program in that emission reductions will apply uniformly across the mobile sources inventory. Control strategies that dramatically affect traffic patterns and the distribution of the projected emissions are not being proposed in the federal plan for CO attainment. Also, while growth is projected to occur in this area, the basic patterns of traffic flow are not projected to change dramatically under the federal plan. Therefore, any of the above dispersion modeling approaches will essentially yield

the same result as a modified rollback because of the uniformity of the changes in emissions.

The EPA is proposing to use a modified rollback approach, in spite of its inherent limitations. The EPA has concluded that the data bases to run the UAM, the model with potentially the best technical applicability, are not available at this time. The formulation of a gaussian plume model, such as RAM, does not adequately simulate the observed conditions. EPA has not identified a suitable box model for this application. The emission controls proposed in the federal plan affect the emission inventory in the same relative sense as the Federal Motor Vehicle Control Program. Therefore, for the purposes of this plan, using a modified rollback should yield a reasonable estimate of the controls necessary to attain the CO NAAQS. While this technique yields a reasonable estimate of what will be required, it can not yield information on areas which are not monitored. Therefore, EPA maintains that future modeling for the SCAB must be refined by using a suitable area-wide model combined with CO hot-spot analyses to adequately evaluate the total CO problem in the SCAB and that further controls may need to be identified as a result of that analysis.

*insert previous P if needed*

From analysis of the data at the various monitoring locations in the SCAB, the EPA has defined a sub-area where the rollback analysis will be applied. EPA's selection of the sub-area is constrained by the traffic data available. The subset of data available for evaluating the emissions changes, including growth, were "Regional Statistical Areas (RSAs)," defined by Southern California Association of Governments (SCAG). The selected RSAs encompass the area where the highest CO concentrations have been measured and run from the Los Angeles Central Business District, west to the coast, and south to Long Beach. The overall VMT growth in these areas is projected to be approximately 13%. As discussed elsewhere in this document, the goal is to achieve attainment by 2000. Based on the design concentration of 23.4 ppm, emission reductions of at least 60%, relative to the 1987 baseline emissions, are necessary to bring ambient air quality levels down to the NAAQS.

#### Emission Inventory and Mobile Source Controls

The emission inventory used for the CO analysis is different than that assembled by the SCAQMD. Mobile source CO emissions are dependent on vehicle speed and on temperature; generally emissions increase as speed or temperature decreases. The SCAQMD used a temperature of 75°F for their analysis. The EPA's analysis was based on an ambient temperature of 59°F which is representative of conditions during high CO events in the area. The EPA emission estimates are based on the MOBILE4 emission model, modified to account for the California emission standards, whereas the SCAQMD analysis was based on CARB's EMFAC7-D emission model.

FY 90 MODEL CLEARINGHOUSE MEMORANDA

<u>Date</u>	<u>Region</u>	<u>Subject</u>
10/17/89	VI	Ambient Air
11/7/89	II	Interpretation of On-site Meteorological Data Requirements and the Use of RTDM for a PSD Source
11/28/89	VIII	Utah PM-10 Secondary Sulfate and Nitrate Calculations
01/02/90	IV	Effect of Changing Stack Heights on Prevention of Significant Deterioration (PSD) Modeling and Monitoring
01/10/90	VIII	Utah PM-10, Secondary Sulfate and Projections
01/10/90	VIII	Review of The Utah County PM-10 Draft SIP
01/11/90	VI	Alternative Emission Reduction (Bubble) SIP Revision Authorizing Operation of a New Sulfur Recovery Plant at the Conoco Inc. Ponca City Refinery
01/16/90	VI	Recent Texas Air Control Board (TACB) Evaluation of the ISC Area Source Algorithm
01/16/90	V	Refined Metals Lead Modeling Analysis
02/22/90	III	Approval of Equivalence Demonstration Plan Integrated Intermediate Terrain Model
03/01/90	VIII	East Helena Lead SIP
03/23/90	III	Mon Valley SO <sub>2</sub> Study Allegheny County, PA
05/10/90	VIII	Four Billings Montana Modeling Proposals
05/14/90	VIII	Comments on the Overview of Geneva Steel's PM <sub>10</sub> Control Plan

FY 90 MODEL CLEARINGHOUSE MEMORANDA (cont'd)

05/24/90	VI	Review of El Paso/Juarez Modeling Plan
06/04/90	III	Definition of Postapproval Monitoring
06/14/90	VII	Doe Run, Herculaneum Lead SIP
06/18/90	IX	Attainment Demonstration and Modeling Discussion for the South Coast FIP Notice of Proposed Rule-making