UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711
July 27, 1990

MEMORANDUM

SUBJECT: ASARCO, East Helena Overall Modeling Protocol

FROM: Joseph A. Tikvart, Chief J. Tikvart
Source Receptor Analysis Branch (MD-14)

TO: Douglas M. Skie, Chief
Air Programs Branch, Region VIII (8AT-AP)

This memorandum is in response to your June 20 and July 11, 1990 memoranda requesting assistance from my office in reviewing the subject protocol. It also responds to John Notar's July 19, 1990 memorandum requesting a Model Clearinghouse review of the protocol and the Region VIII technical comments on that protocol.

Attached are the Model Clearinghouse comments on these materials. Based on the Clearinghouse comments, as well as your own, it appears to us that ASARCO and the State of Montana certainly have a long way to go before a final modeling protocol can be agreed upon. The July 9, 1990 "Preliminary Modeling Protocol," prepared by CPP, is ambiguous and open-ended. It appears to be more of a consultant's proposal to conduct an investigative study rather than a regulatory modeling protocol that provides a step by step recipe leading to an estimate of the design concentration and testing the SIP emission limit.

Given the extensiveness of our comments, as well as those of John Notar, we believe that it is premature to meet with the State and the Company on August 1. I understand that you agree and are taking steps to cancel the meeting. Our combined concerns should be forwarded to ASARCO and at least one more iteration of the protocol should take place before we can sit down to serious negotiation with the State and the source.

As I indicated in the March 1, 1990 memorandum to you, a straightforward application of the ISCST model is appropriate for the simple terrain receptors near the smelter. Apparently the source wants to apply ISCST, but not in a straightforward way, i.e. with many differences from recommended model options and input data. While we don't have a problem with that in principle, we do require that they follow Agency procedures in justifying their proposals. Development and execution of these procedures is not a simple matter. It requires considerable expertise and an adequate timeframe.

Perhaps a somewhat analogous situation has recently occurred in Hamilton County, OH. In that case, industry wanted to have an opportunity to continue to study the SO_2 problem in the area and to develop/test nonguideline models

that might be more applicable than the recommended Guideline techniques. To preclude a long dragged out process, Region V issued a SIP call to the State. The expectation is that the State will submit a revised SIP based on Guideline modeling. Industrial interests can, in the interim between SIP submittal and final compliance, attempt, following established guidance, to show that they have a more appropriate model. A SIP revision could then be entertained that would change the emission limits to those that can be justified with the new model. We don't know if you could do something similar in the East Helena case, but it might be worth exploring. Mike Koerber (688-0661) is a good Region V contact on the Ohio issue.

If you would like to discuss this and any other alternatives in the East Helena situation, please contact me at 629-5562. The Model Clearinghouse contact for technical/procedural issues is Dean Wilson (629-5683).

Attachment

cc: R. Bauman
W. Laxton
J. Notar
M. Smith
D. Stonefield

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

OAQPS/TSD/SRAB/TES:DWilson:bcannady:MD-14:x5681:July 27, 1990
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Attachment

Model Clearinghouse Comments Relative to the July 9, 1990
Preliminary Modeling Protocol for the
ASARCO East Helena Smelter

Region VIII July 19, 1990 Comments

1. The Model Clearinghouse generally agrees with the Region VIII comments. We suggest taking a slightly different posture relative to a few of these comments, as indicated in our next two points.

2. Simple Terrain, Comment 1. While we don't disagree that guidance may suggest that a receptor model might have to be used in certain circumstances, we believe that the intent of the guidance is that use of the receptor model alone is really a "last resort" to be used in extreme circumstances. On p. 14 of the "Protocol for Reconciling Differences Among Receptor and Dispersion Models," the following statement appears. "If, however, it is clearly evident that the dispersion model results are inconsistent with the majority of the physical data and cannot be made consistent through justifiable modifications to the input data, the CMB estimates should be used as the basis for control strategy development." This statement is consistent with the order of preference for modeling provided on pp. 4-1 of the PM_{10} SIP Development Guideline; the use of a dispersion model is preferred over the use of a receptor model alone. Only if it is clear, based on all the technical information available, that the dispersion model is not appropriate, would use of the receptor model alone be acceptable.

3. Meteorological Inputs, Comments 2-5. From a technical standpoint we generally agree with the Region VIII comments. As noted in our subsequent comments, the heat island proposal, as well as other aspects of the ASARCO protocol, make ISC a nonguideline model. The acceptance of the heat island effect, minimum mixing depth, and other ASARCO proposals, would come as the result of a comparative performance evaluation of the proposed techniques with the recommended procedure.

ASARCO Protocol

General Comments

1. Because a number of nonrecommended or undefined model options and/or model inputs are proposed, some of which are identified in subsequent comments or in the Region VIII comments, the application of ISCST and complex terrain models must be considered as inconsistent with guidance. While guidance does not preclude the use of these nonrecommended techniques, there is a procedure which needs to be followed to justify their use. As mentioned in the March 1, 1990 memorandum from Joseph A. Tikvart to Douglas M. Skie, if the Company wishes to consider an alternative model to ISCST, it will be necessary to conduct a formal comparative evaluation of such an alternative model with the ISCST model. Chapter 3 of the ASARCO protocol seems to recognize that there might be a need to make some kind of demonstration in this regard. While the protocol mentions the use of the "Interim Procedures for Evaluating Air Quality Models," EPA 450/4/84/023, it provides almost no detail as to how the evaluation is to be carried out.

2. The ASARCO protocol is replete with procedures that are open-ended, i.e. either it is not clear exactly what is to take place as a consequence of a given outcome of a technical procedure, or the next steps are left open to renegotiation of the protocol. Some of these open-ended procedures are identified in subsequent comments or in Region VIII's July 19 comments on the ASARCO protocol.

3. Where the Model Clearinghouse has had some input from time-to-time, we have not reviewed the final monitoring network or the meteorological data collection network. We assume that Region VIII has found these networks to be acceptable for their intended purposes. However, we doubt that the monitoring network was designed with model evaluation in mind. The existing network would have to be reevaluated and likely augmented if ASARCO plans an "Interim Procedures" evaluation. See General Comment #1 and Specific Comment #11.

4. In a similar vein to the previous comment, the Model Clearinghouse has previously reviewed some aspects of the receptor modeling and the emissions. However, we have not reviewed any details of these data, namely Reference 3 on the chemical mass balance or References 2, 13, 14 or 15 on the emissions inventory. We assume that Region VIII has reviewed these reports.

Specific Comments

1. Page 2, last sentence, continuing to p. 3. The flow pattern has not been justified.

2. Page 2, complex terrain modeling. While not yet included in the Guideline on Air Quality Models, the CTDM is available for consideration as well.

3. Page 3, first full paragraph. The procedures for modeling in intermediate terrain between stack height and plume height need to be defined.

4. Page 3, top paragraph, last sentence. Also p. 4, last sentence. The provision for future revisions to the modeling protocol based on subjective interpretation of modeling results is open-ended and thus not consistent with the purpose of a regulatory modeling protocol.

5. Page 6, last paragraph, similar to Comment 5. The reasoning is open-ended and not in concert with a good regulatory modeling protocol.

6. Page 7, first paragraph. The derivation of on-site specific wind profiles needs to be reconciled with EPA guidance.

7. Page 7, last paragraph through the top of p. 9. The proposals on surface roughness, heat island and mixing depth all differ from guidance. These proposed techniques make the application of ISC and the complex terrain models essentially nonguideline techniques. See General Comment #1.

8. Page 9, last paragraph. Unless EPA provides an opinion to the contrary, the modeling for emission limitations should be done at formula GEP height.

9. Page 12. The 2% criteria is arbitrary. Resolution of how to determine the background is open-ended.

10. Chapter 3, pp. 13-14. It is not clear what is being compared here, what the exact statistical tests are or what the decision criteria are. If this chapter is intended to establish whether the model is performing acceptably, the specific criteria need to be developed and need to be consistent with EPA guidance. If there is to be a pass/fail test, then the consequences of "fail" must be defined. Also it is not clear why this evaluation is being proposed. Isn't it redundant in intent with the reconciliation between receptor modeling and dispersion modeling?

11. Page 15. The model reconciliation process is loosely defined. It is not clear what statistics are to be calculated to determine whether the two models are within 20%. Also the 20% value is arbitrary and would need to be justified.

12. Page 30, ISC Input Parameters. The choice for ISW (28) (regulatory default) may be OK if the regulatory agencies and ASARCO agree on a procedure for inputting site-specific wind profiles. However the choices for ISW (22) and ISW (24) make this version of ISC nonguideline.

FY 90 MODEL CLEARINGHOUSE MEMORANDA

Date	Region	Subject
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_2 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_{10} 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
06/21/90	VI	Offshore and Coastal Dispersion (OCD) Model
07/27/90	VIII	ASARCO, East Helena Overall Modeling Protocol