



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

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Ref: 8AT-AP

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MEMORANDUM

TO: Dean Wilson. (MD-14)
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FROM: Mindy Mohr (8AT-AP) *Mindy Mohr*
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SUBJECT: Review of March 11, 1991 ASARCO Modeling Protocol

The Montana Air Quality Bureau (MAQB) has submitted the latest version of the ASARCO East Helena Lead SIP modeling protocol, which is dated March 11, 1991. A copy of this protocol was sent to Joe Tikvart on March 22, 1991. In this revised protocol, ASARCO has again attempted to address the remainder of the outstanding issues discussed in our letter to the State dated February 13, 1991.

Our comments on this latest version of the protocol are grouped into two categories: those remaining issues which were not adequately addressed and which require additional revision to the protocol, and those issues which do not necessarily require protocol revision, but which EPA must restate for clarity.

We appreciate your assistance in reviewing this latest version of the modeling protocol, and request your review/concurrence with Region VIII's response to these various issues. Unless you notify us of additional concerns with this memorandum, or with the modeling protocol, by April 15, 1991, we will assume that this memorandum addresses the issues and concerns of EPA (Region VIII and Headquarters) and will transmit these comments to the State.

Remaining Issues Needing Protocol Revision

1. The second complete paragraph on page 4, the second paragraph on page 9, and Table 4 on page 43, all state that wind data from the 103 meter level will be used to model the stacks in complex terrain (using the VALLEY and ISCLT models). This is incorrect. VALLEY and ISCLT modeling must use the same meteorological sites and observation levels as is described in Table 4 for the COMPLEX I and ISCST modeling. For stacks of less than 35 meters, temperature,

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wind direction and wind speed should be taken from the Kennedy Park 10 meter site; for stacks between 35 and 103 meters, these inputs should be taken from the 35 meter level of the zinc stack. Data from the 103 meter level should be used only for stacks greater than or equal to 103 meters in height. Page 4, page 9, and the top of Table 4, must be corrected.

2. The protocol states on pages 14, 15, and 16 that, "if it is clearly evident that the dispersion model results are inconsistent with the majority of the physical data (does not reconcile) and cannot be made consistent through justifiable modifications, the model which best represents physical reality will be used as the basis for control strategy development." This statement appears to be inconsistent with the agreement reached during the October 24, 1990 meeting and outlined in EPA's November 6, 1990 letter, and indicates that EPA needs to clarify its position on the use of dispersion modeling for the East Helena Lead SIP as follows:

The EPA guideline dispersion models must first be utilized for all modeling runs through the reconciliation process, as per the "Protocol for Reconciling Differences Among Receptor and Dispersion Models" (EPA-450/4-87-008). During the reconciliation process, justified changes may be made in the emission inventory or the CMB analysis to help the dispersion and CMB models reconcile. Note, however, that as stated in the November 6, 1990 letter, the reconciliation process should not include changes to the dispersion model or changes to meteorological inputs to the model. (This does not preclude justifiable modifications to the input data which have been approved by EPA as part of the modeling protocol prior to the initial modeling.)

As agreed to in EPA's letter of March 8, 1990, the initial reconciliation process should be performed using, as a minimum, data from the 3rd and 4th quarters of 1990; the data from the first two quarters of 1991 should then be used for "model verification". However, as stated in that letter, we believe that it is important, if at all possible within the schedule, to include ambient data from the first quarter in 1991 in the receptor modeling analysis and reconciliation process. Once the initial reconciliation effort is completed in the spring of 1991, the State and EPA can determine whether or not the models (dispersion and CMB) can be reconciled. At that point, we will discuss further whether a performance evaluation is necessary.

The inconsistent statements in the modeling protocol should be modified to reflect EPA's position, as is stated above and in EPA's letter of November 6, 1990.

3. The emission inventory described on page 7 as "(c) a compliance year 1993 emission inventory of allowable daily lead emissions to demonstrate the adequacy of the control strategies" should include the effects of the Superfund remedial cleanup activity in the town of East Helena. It is not certain that cleanup activity will be completed by the compliance year, therefore the protocol should state that these emissions will be estimated, whenever possible, and included in compliance year modeling.
4. The second paragraph on page 9 should state that wind speeds will be scaled up to the various stack tops using the default power law exponents in ISCLT, as well as in the other models.
5. On page 14, the second paragraph states that "The reconciliation process is an iterative process in which the two model results are compared, evaluated, modified and compared again until all possible modifications and corrections are made." The protocol should state that the term "modified" can only apply to CMB/filter analysis and emission inventory data, and not to the dispersion model itself.
6. In the first paragraph on page 16, in what appears to refer to modeling for the attainment demonstration, it states that, using daily emission rates (maximum allowable emission rates for industrial sources and actual emission rates for non-industrial sources) for the period of July 1, 1990 through June 30, 1991, and hourly meteorology, the reconciled ISCST model will be run to estimate quarterly average lead concentrations. This paragraph also states that "after the model is run, the results will be compared with the ambient air quality standard at all locations. If the estimates are below the standard, compliance will have been demonstrated for purposes of this lead SLP revision".

This paragraph contains two errors. First, the emission rates for non-industrial sources should be scaled up from the actual rates, which were measured during the base year, to projected rates for the attainment year. For example, if additional traffic is expected within East Helena by the attainment year, road dust estimates should be increased. Therefore, the phrase "actual emission rates for non-industrial sources" should be revised to read "projected emission rates for non-industrial sources". Second, since East Helena quality-assured ambient data shows that the lead

NAAQS is currently being exceeded, with industry operating at emission rates which are less than or equal to maximum allowable rates, any modeling prediction which shows compliance with the lead NAAQS at maximum allowable emission rates is clearly unrealistic. If this unexpected scenario were to occur, the State must consider existing air quality in the vicinity of ASARCO along with the modeling results in establishing control requirements. It would be unacceptable to refrain from requiring emission controls with this scenario.

7. In a January 21, 1991 letter from TRC to John Coefield of the MAQB (see Attachment), corrections were listed to the previously-reported heights of the meteorological data stations on the zinc stack and the plant yard tower. These errors were discovered as a result of the December meteorological network audit. As a result, all references to the 117 meter level of the zinc stack should refer to 103 meters, and the plant yard upper temperature level should be 11 meters, rather than 8 meters. This requires corrections to Figure 3 of the protocol.
8. The protocol does not provide the appropriate receptor density on ASARCO plant property where public access is not precluded (Figure 1b on page 24). The protocol states on page 7 that "receptors are included within the ASARCO property as requested by EPA but not within the operational area of the smelter". However, Figure 1b does not show adequate receptor density in the eastern-most area, which is within the ASARCO property line but not within the operational area of the smelter (portions of grids labeled 63, 64, 65, 74, 75, and 76). The receptor density for the town of East Helena is correct and this same density should be applied to the ambient air on ASARCO property where the public has access.
9. On page 34, the switch for ISCLT input parameter ISW(22) should be set equal to 1 (regulatory default options used), as is being done for ISCST.
10. On page 13, the discussion of background concentration indicates that the EPA-recommended procedure for determining background concentration requires that background be calculated using measured lead values for all days when the winds are blowing in a specified sector (i.e. not blowing from the smelter towards the monitor). This latest version of the protocol indicates that ASARCO will identify 12 days to be used to calculate a quarterly average background concentration. EPA questions the basis on which ASARCO would pick these 12 days, and requests that the protocol be revised to state that ASARCO will use data from all days which fall in the correct sector. If the minimum number of

days needed to calculate a quarterly lead concentration (i.e. 12) which meet the criteria for determining background concentration are not available for a given quarter, this situation should be identified to EPA and an alternative proposal presented.

Issues Reiterated for Clarity; Protocol Revision Not Needed

1. The postprocessor program described on page 5 for comparing VALLEY and ISCLT concentrations, or COMPLEX I and ISCST concentrations, in intermediate terrain must be reviewed and approved by EPA before it can be applied. Note that this evaluation of the concentrations at each receptor must be made for each of the wind speed, wind direction, and stability categories within the quarterly STAR deck.
2. The first paragraph on page 15 states that "whatever modifications are decided upon, technical justification will be provided". This is only acceptable before modeling starts and must have EPA approval prior to implementation. Modifications which would deviate from the "Guidelines on Air Quality Models" would require an Interim Procedures (performance evaluation) analysis.
3. On page 7, EPA assumes that the appropriate downwash algorithms will be applied when modeling building effects with the ISCST and ISCLT models.
4. In the GEP Stack Height paragraph on page 11, the last two sentences are not explicit. Note that the GEP stack height can be determined by using a formula presented in the stack height regulation, or by using appropriate field or fluid modeling studies, or by assuming the de minimis level of 65 meters. For this study, actual stack heights must be used for model reconciliation, and the lesser of the EPA-approved GEP stack height or actual stack height must be used for compliance modeling. To date, EPA has not approved the field study, completed to demonstrate GEP stack height of the blast furnace stack, as meeting the requirements of the 1985 stack height rules; therefore, ASARCO must either demonstrate that the previous field study did meet the 1985 stack height rules, complete a fluid model or another field study to demonstrate the GEP stack height, or use the formula height or de minimis stack height of 65 meters.

cc: Joe Tikvart, Source Receptor Analysis Branch, HQ
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