UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
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NOV 20 1989

Ref: 8AT-AP

MEMORANDUM

TO: Dean Wilson
Model Clearinghouse

FROM: Marius Gedgaudas, Chief
Compliance Section and Utah PM-10
Region VIII

SUBJECT: Utah PM-10, Secondary Sulfate and Nitrate Calculations

Over the past few months, the Utah Bureau of Air Quality (UBAQ) has requested guidance for evaluating and apportioning secondary sulfates and nitrates from their chemical mass balance (CMB) filter analyses. The UBAQ again raised this issue in a meeting with Jim Scherer, Region VIII Administrator on October 20, 1989.

Region VIII has been coordinating its response to the State with EPA Headquarters, specifically the Model Clearinghouse. (Please reference the State's May 10, 1989 protocol, problem #2; the June 2, 1989 memo, Irwin Dickstein to Gerald Emison; the June 30, 1989 memo, Gerald Emison to Irwin Dickstein; and the August 22, and October 20, 1989 letters to Burnell Cordner from Douglas Skie.) A summary of EPA's response to the State is as follows:

- There is no specific EPA model to address secondary particles.
- Any technique to address secondary particles must be justified on a case-by-case basis.
- For Utah, the May 10, 1989 protocol is valid. (Although Geneva was the only source mentioned as to how the State is to apportion secondary particles (SO_4, NH_4, NO_3), EPA assumes the same technique will be applied to all sources emitting sulfates and nitrates.)
- The State should address the secondary particulate impact by filter analyses. The control strategy demonstration should qualitatively or empirically address these contributions.

In the October 20, 1989 meeting, the State requested EPA's thoughts on how to calculate the effects of the reduction of precursor emissions on ambient levels of secondary particles. The Region intends to address only the source apportionment issue now, and to address the approach for estimating the effect of

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reducing precursor emissions over the next several weeks.

The apportionment of secondary ammonium nitrate and ammonium sulfate due to precursor NOx and SOx can be estimated from the use of data from existing filters analyzed for these secondary particles when:

a. Kennecott was shut-down, but Geneva was operating,
b. Geneva was shut-down, but Kennecott was operating,
c. Both Geneva and Kennecott were shut-down,
d. Both Geneva and Kennecott were operating.

Primary ammonium nitrates and sulfates and the continental background secondary particulate would have to be subtracted, and consideration would need to be given to the meteorological conditions under which each ambient sample was taken, including any seasonal variation in emissions. The continental background (transported) secondary particulate should be estimated using existing data from outside of both the Salt Lake and Utah County air sheds.

The possible effect of Kennecott primary and precursor emissions on Utah County would be obtained from the up/down scenarios above. This effect could also be used to roughly estimate the effect of non-Kennecott Salt Lake County precursor emissions on Utah County. The effect of the non-Kennecott Salt Lake County precursor emissions on Utah County ambient secondary particulate levels would be assumed to be directly proportional on an emissions basis to the effect of the Kennecott precursor emissions on Utah County ambient secondary particulate levels.

The effect of Geneva's precursor emissions on Utah County secondary emissions would come directly from the up/down filter analyses after subtraction of the estimated Geneva contribution of primary ammonium sulfates and nitrates. The contribution of the rest of the Utah County sources would be the remaining ammonium sulfates and nitrates after subtraction of the contribution of Geneva's primary and secondary emissions, Kennecott, continental background and Salt Lake County background. These contributions would be apportioned to the individual sources on the basis of the emissions inventory.

A similar analysis would be performed for Salt Lake County. The possible effect of Geneva primary and precursor emissions on Salt Lake County would be obtained from the up/down scenarios above. This effect could also be used to roughly estimate the effect of non-Geneva Utah County precursor emissions on Salt Lake County. The effect of the non-Geneva Utah County precursor emissions on Salt Lake County ambient secondary particulate levels would be assumed to be directly proportional on an emissions basis to the effect of the Geneva precursor emissions on Salt Lake County ambient secondary particulate levels.

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The effect of Kennecott's precursor emissions on Utah County secondary levels would come directly from the up/down filter analyses after subtraction of the estimated Kennecott contribution of primary ammonium sulfates and nitrates. The contribution of the rest of the Salt Lake County sources would be the remaining ammonium sulfates and nitrates after subtraction of the contribution of Kennecott's primary and secondary emissions, Geneva, continental background and Utah County background. These contributions would be apportioned to the individual sources on the basis of the emissions inventory.

Since Utah is moving on a fairly tight schedule, we would appreciate an immediate review and concurrence to the above by November 22, 1989. (Utah is submitting its draft SIP to its committee for hearing adoption by November 20, 1989. The Committee will meet on November 27, 1989.) Please contact Lee Hanley at FTS 564-1766 or Dale Wells at FTS 564-1773 for any questions or comments.

cc: Tom Pace, OAQPS (MD15)
Martha Smith, OAQPS (MD15)
Neil Franik, OAQPS (MD14)

Concur generally with the procedure; however, some comments/suggestions on the details of the procedure will follow.

SRAB: Dave 11/21/89 11/21/89

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