UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
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Ref: 8AT-AP

MEMORANDUM

TO: Dean Wilson
SRAB,OAQPS, MD-14

FROM: John Notar, Meteorologist
8AT-AP

SUBJECT: Utah Request to use ISCST for Urban Wide PM-10 SIP

The State of Utah, Division of Environmental Health (DEH) has proposed the use of ISCST for its PM-10 SIPs in Salt Lake City and Provo, Utah. Attached you will find a memorandum to Region VIII addressing DEH's reasons for preferring ISCST over RAM for these two urban SIPs.

Region VIII's position is that for the major part these urban areas are dominated by low level wood burning and road dust emission, RAM is appropriate. To address specific point source of refineries and petrochemical plants along the Salt Lake shore line, ISCST is the appropriate model. The calculated impacts of these two models will be additive at the receptors impacted by both source types, industrial and urban areas.

I will go through each of Utah's six reasons for preferring ISCST and explain Region VIII's position.

(DEH) 1. Source emission rates can vary in different ways for the following types of sources:

A. Vary by wind speed - This allows the model to calculate emission rates that vary with wind speed. Ideal for the fugitive dusting that occurs from wind erosion.

Region VIII - Both ISCST and RAM require individual AP-42 calculations to determine specific emission rates based on different wind speeds. Therefore, there is no difference between ISCST and RAM.

(DEH) B. Vary by hour of day - This allows more accurate temporal distribution of vehicular emissions.

Region VIII - This can be done with both ISCST and RAM.

(DEH) C. Vary by season - This allows for accounting of seasonal emissions such as fires, agricultural and unpaved roads. This can be accomplished with ISCST and RAM. Colorado Department of Health has done this for the Denver PM-10 SIP using RAM.

(DEH) D. Vary by hour of day and season - This allows for accounting of space heating type emissions which vary greatly by hour and by season. This can be accomplished with both ISCST and RAM. Colorado Department of Health has done this for the Denver PM-10 SIP using RAM.

(DEH) 2. Complex area sources which cannot fit into the RAM requirements of using a standard area source integral size.

Region VIII - The method of depicting area sources by a square or number of different sized squares is the same for both RAM and ISCST.

The area source algorithm in RAM is designed to handle large area sources. The ISCST area source algorithm is designed for smaller area sources, and provides higher resolution near the smaller industrial area sources. This higher resolution by ISCST is needed for the industrial sources, but is unnecessary when modeling urban area wide emissions.

(DEH) 3. Source contributions can be summarized for any number of sources or source groups. RAM only allows 10 area sources and 25 point source contributions (and on separate basis only).

Region VIII - This is true, RAM does only list the 25 point sources and the 10 area sources with the greatest expected ground-level impact are listed. Does SRAB know of an existing algorithm in a Region or State to allow a larger listing of high point and area sources that Utah could borrow. Would this minor code change be acceptable and not considered a nonguideline model? It would be beneficial in helping identify areas crucial in the design of the control strategy.

(DEH) 4. Building downwash can be explicitly modeled.

Region VIII - For the industrial sources, located along the Salt Lake shore and other large inland point sources, the ISCST model should be employed for downwash calculations. The calculated concentrations then can be added to the RAM impacts at the same receptors.

(DEH) 5. Software preprocessors for ISCST already exist.

Region VIII - This is true since the PM-10 SIP call for Salt Lake City, Provo, and Denver will be the first time RAM has been used in Region VIII in the last 8 years. Region VIII is in agreement with the guidance found in Example Modeling to illustrate SIP development for the PM-10 NAAQS which requires RAM in urban scenarios.

(DEH) 6. Rolling terrain is required for accurate modeling of the valleys.

Region VIII - Believes that for most of the urban area in consideration, the terrain is flat. That is below final plume rise of most point sources. The Salt Lake City and Provo areas are mostly dominated by residential wood burning and road dust PM-10 emissions where the RAM model would be applied. These emissions are trapped under the strong surface based inversion causing the measured high concentration. These emissions are homogeneously mixed within the inversion layer. The "rolling terrain" is also, for most areas, embedded within the inversion layer. Therefore, the need for refined terrain impaction is unnecessary. Therefore, RAM is appropriate for a large portion of the urban area.

Also, the highest PM-10 impacts will be found in the downtown central business district. The terrain in the central business district is flat. The critical design day receptor will be in the central business district. Therefore, to address terrain features near the outskirts of town is unnecessary.

Only in southern Provo does the rolling terrain pose a possible problem. If the rolling terrain is higher than the inversion or mixing layer, can this exempt the area from modeling? Or, can SHORTZ be applied to these limited rolling terrain areas?

One additional statement in defense of RAM is the resolution and quantity of PM-10 data in both monitoring and in the inventory. To use ISCST would be pushing the temporal and spatial limit of this data beyond its true nature.

Region VIII requests of the clearinghouse a determination on each of the six issues discussed, and a general determination on the ISCST verus RAM for urban wide PM-10 area source emissions such as residential wood burning and road dust.

If there are any questions regarding these issues, please contact me at FTS 564-1755.

Enclosure