

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III

841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Indiana County, Pennsylvania,
Performance Evaluation Network Design

DATE:

FROM: Alan J. Cimorelli
Regional Modeling Contract (3AM12)

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

Attached is a supplemental report submitted by the Pennsylvania Electric Company (Penelec) to address issues 1 and 2 in the Monitoring Network section of your November 17, 1987 memo to Jesse Baskerville. We have evaluated the report and arrived at several conclusions. If you concur with our assessment, we will advise Penelec, through the Pennsylvania DER, of the following:

1. The utility of collecting data for model evaluation in the area of Conemaugh's maximum impact was examined. The information provided by Penelec indicated that the existing and proposed monitors would identify the same periods of critical impact as would be identified at the maximum impact sites at slightly lower elevations. The existing monitoring locations indicate somewhat lower concentrations but this is due to the predicted location of plume centerline relative to the critical dividing streamline. Because the model evaluation will be carried out with a more representative meteorological data set, the evaluation of the critical plume centerline is only speculative. The location of additional monitors would not be expected to provide better information, there would only be more data.

For the purpose of evaluating the impact of the Conemaugh Plant, the Laurel Ridge monitoring proposed by Penelec is adequate (retain existing sites, reactivate Little Mill Creek, and add one monitor). The added monitor should be at the site identified as number 6 in Figure 4-1. We do not feel that there is any significant information to be gained by requiring additional other monitors on Laurel Ridge. The proposed network configuration adequately reflects the impact during the critical conditions of the model comparison.

We considered the information relative to Seward and arrived at a strikingly different conclusion. The Conemaugh receptors are dominated by Conemaugh. That is, the top 25 predicted concentrations are almost exclusively derived from Conemaugh emissions. The ridge-top monitors are not similarly dominated by Seward, the maximum impact of which is predicted on the side of the ridge. Penelec has conducted a fluid modeling study which demonstrates that the full 183 meter stack height is creditable. The company has not submitted the study because of their dispute about the NSPS limit. They claim that they will be better off using dispersion modeling at the formula height. We have looked at the predicted impact from the actual stack height and found there is a significant fraction of the time when the plume is below the critical dividing streamline. Because the expected plume behavior will be different from the plume at the ridge-top elevation the model evaluation potential must be re-examined. If Penelec agrees to the specification of the NSPS emission limit, as a condition for getting full stack height credit, the maximum impact predicted by RTDM will be less than the NAAQS. There is the further consideration that the Conemaugh plant can "absorb" the differences between Seward's actual emissions and the NSPS without much difficulty. We therefore want to encourage Penelec to accept NSPS for Seward, use RTDM, and emissions balance.

For the purpose of evaluating the Seward Plant there are three options available to Penelec. The availability of all but the first option is contingent upon Penelec's accepting the presumption that Seward will meet the NSPS emission limit.

a. If Penelec chooses not to formalize the fluid modeling study of Seward, the emission limit must be established by modeling with RTDM/MPTER at the GEP height of 105.6 meters. We are firmly convinced that there is no reasonable way to specify a valid model comparison study to represent emissions from a 183 meter stack as if they were being emitted from a 106 meter stack.

b. Even with the actual stack height justified, by accepting the NSPS presumption limit, we seriously question the ability to evaluate relative model performance with the proposed network. We believe that some method must be proposed to provide an explicit comparison of Seward's observed and predicted impact. For that purpose a more comprehensive evaluation of the Seward impact would be necessary, but at a minimum we would require three additional monitors on the ridge slope where Seward's maximum impacts are predicted.

(c) Penelec could conduct a "limited" model evaluation with the existing network. The evaluation would be limited to a subset of data selected on predicted maximum impact time periods (the highest 25) based upon predictions of each competing model. The dispersion model emission limit would be the more restrictive of the RTDM limit on the hillside or the winning model on the "ridge top." What is being offered here is an opportunity for Penelec to be able to model Seward with their (LAPPES) model as a background source when setting the emission limit for Conemaugh.

For options b and c, it is presumed that a dispersion modeled emission limit is established which is greater than the NSPS limit. The acceptability of Seward's meeting that limit would be contingent upon their being able to emissions balance the differences between the dispersion limit and the NSPS limit (plus 20%) with another source.

3. We have been persuaded that the critical receptors for the model evaluation will occur on the Laurel Ridge. We are similarly persuaded that the Conemaugh/Chestnut and Laurel Ridge and the Homer City/Chestnut Ridge source receptor relationships are sufficiently similar so that we can be confident about setting emission limits with the winning model. Therefore, we would accept Penelec's proposal to add one monitor on the Chestnut Ridge. The added monitor should be placed at any one of receptors 22, 25, or 26 identified on Figure 4-2.

With regard to background determinations, we think that hourly background, during the model evaluations study, can be specified as the lowest reading monitor in the network for each hour. For the purpose of setting emission limits, an average, directional dependent background will be determined.

Please provide your comments on our suggested response. If you have any questions, please call me or Denis Lohman at (FTS) 597-8375.

Attachment

cc: J. Baskerville (3AM10)