



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
324 EAST ELEVENTH STREET
KANSAS CITY, MISSOURI - 64106

January 25, 1984

MEMORANDUM

SUBJECT: Region VII Use of MPTERU for St. Louis Municipal Incinerators

FROM: Carl M. Walter, Chief
Air Branch, Region VII *Carl M. Walter*

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

EPA Region VII has used MPTERU, a non-guideline model, to analyze an urban terrain scenario for the St. Louis municipal incinerators. In support of a pending lawsuit, we seek your endorsement regarding our selection of the MPTERU model for this evaluation.

This matter was previously addressed in a September 27, 1983, memo to the Model Clearinghouse (Mr. Dean Wilson). The September 27 memo included one year of comparison runs (RAM vs. MPTERU) which showed that the two sets of predicted concentrations were identical. Mr. Wilson provided verbal confirmation that we had presented an essentially adequate, though informal, demonstration for the use of MPTERU with terrain in the St. Louis incinerators analysis. The attached comparison evaluation is submitted as a formal demonstration.

Region VII has filed suit against the City of St. Louis because these incinerators violate the Missouri State Implementation Plan (SIP) emission limit. Our dispersion analysis could become an integral part of the supportive evidence. Therefore, we request your formal endorsement regarding our selection of the MPTERU model for this analysis.

We have prepared our demonstration in accordance with the guidance set forth in "Regional Workshops on Air Quality Modeling: A Summary Report." The RAM and MPTERU models were run with five years of St. Louis/Salem meteorological data (1973-1977) and identical input parameters. Ten receptor rings were selected using PTPLU as a screening tool. Although PTPLU is not a representative screening model for urban scenarios, it was used after consultation with the Clearinghouse. Stability class "A" resulted in the closest distance of maximum concentration at approximately 600 meters. Our experience in this analysis indicated that maxima could

occur closer to the source. Therefore, we placed our initial receptor ring radius at 400 meters. Eight additional ring distances were determined as multiples of the initial ring distance. Factors of 1.3, 1.7, 2.3, 3.0, 3.9, 5.2, 6.8, and 9.0 were used. A tenth ring was placed at 4500 meters.

The stack input parameters for the PTPLU run are average values for the two stacks at each incinerator. The respective stack parameters are very similar; consequently, the averaged parameters are representative for screening purposes.

The following comparison illustrates the need for an EPA approved model for urban terrain situations.

St. Louis Municipal Incinerator (South)
Predicted 24-hr Conc. (ug/m³)
STL/SLO 1973

	Maximum	2nd-high
ISC Urban I	115	105
RAM	161	134
MPTERU	297	266

All terrain points in our analysis were modeled at actual elevation, i.e., there was no "terrain chopping." The maximum and high, second-highest concentrations for the south incinerator occurred about 300 meters northwest of the stack at an elevation of 90 ft. above stack base elevation. Although terrain was considered in our analysis of the north incinerator, the maximum and high, second-highest concentrations occurred on flat terrain.

Our demonstration consists of 20 RAM runs, 20 MPTERU runs, and 1 PTPLU run. If you have any questions regarding our submittal, please contact Mr. Larry A. Hacker at FTS 758-3791. Your response to our request will be appreciated.