UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

January 27, 1992

George G. McComb, Jr.
Chief, Air Quality and Meteorology
United Engineers and Constructors
30 South 17th Street
Post Office Box 8223
Philadelphia, PA 19101

SUBJECT: Submittal of Integrated Gaussian Model (IGM), Version 91255, for Generic Equivalence Demonstration.

Dear Mr. McComb:

We have reviewed your submittal of the IGM (Integrated Gaussian Model) equivalence demonstration, and find that equivalence to EPA procedures has been adequately demonstrated for flat, intermediate terrain, and complex terrain applications.

The IGM model is intended 1) to replicate the Industrial Source Complex Short Term (ISCST) Model for terrain below stack height, 2) to replicate the COMPLEX-I Model and RTDM for complex terrain, and 3) to implement the EPA intermediate terrain guidance for intermediate terrain.

First, IGM was tested for equivalence to the ISCST model using existing EPA test cases for flat and rolling terrain (35 meter, 100 meter, and 200 meter stacks with flat terrain, and a 200 meter stack with terrain less than stack height). An additional test was added, a 35 meter stack with terrain above stack height, to verify that "terrain chopping" is properly implemented. This is essential for the correct implementation of the intermediate terrain guidance. One year of meteorological data each from Pittsburgh (1964) and Oklahoma City (1984) were used. IGM passed these tests, giving results that are virtually identical to the ISCST model.

Second, IGM was tested for equivalence to the COMPLEX-I model and to RTDM. Since terrain data sets for testing equivalence for these models did not exist, such data sets were jointly developed and mutually agreed upon. A 35 meter stack source was used, and the terrain sets were developed for COMPLEX-I and RTDM which were consistent with each other and

consistent with the terrain used in the "terrain chopping test" conducted for ISCST. This consistency is required for the test of the intermediate terrain test conducted later. IGM passed these tests as well.

Third, IGM was tested to be certain it correctly implemented the EPA Intermediate Terrain Policy. Several days of individual data output from each part of the model (ISCST, COMPLEX-I, and RTDM) were reviewed on an hour by hour basis to verify that the correct value was selected by the IGM model consistent with EPA regulations regarding intermediate terrain. All values were selected correctly.

Sincerely,

Russell F. Lee

Russell F. Lee
Meteorologist
Modeling Support Section

cc: Joseph Tikvart