Wilson

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

APR 6 1993

MEMORANDUM

SUBJECT: Nonmethane Organic Compounds (NMOC) and Nitrogen Oxides (NO_x) Monitoring Required for the Empirical Kinetics Modeling Approach (EKMA) for Nonattainment Areas in Ohio

Ellen Baldridge

FROM: Ellen Baldridge, Computer Specialist
Model Application Section, SRAB, TSD (MD-14)

TO: Rebecca Calby, Regional Meteorologist
Regulation Development Branch, Region V (AR-18J)

In response to your request on the above subject, the Model Clearinghouse has reviewed your position on the application of EKMA in Ohio.

The most recent guidance on the use of EKMA (Environmental Protection Agency 1989) is silent on the use of default ratios in EKMA State implementation plan (SIP) analyses. This implies that the use of such ratios is not generally recommended. Therefore, we endorse the approach you mention which entails collecting NMOC and NO_x data in Toledo and Dayton consistent with monitoring guidance and requirements of the EKMA and subsequently using these data in the model. We believe this represents the most defensible modeling procedure and is the approach most consistent with the 1989 guidance for using EKMA.

We understand, however, the concern you raise over the timing issue requiring a SIP remission to be in place by November 1993. We agree that prior to the availability of NMOC and NO_x monitored data in Toledo and Dayton, it may be necessary to resort to other procedures for estimating the NMOC/NO_x ratio.

We agree that use of a default ratio is the only viable interim procedure open to Ohio for use in Toledo and Dayton. A question then arises as to what default value should be used. As you have noted, our earlier guidance suggested "~9.5:1" as a default value. More recent data compiled by Baugues (1991)--(See table 1) suggest typical 50th percentile ratios to be slightly lower (~8.8:1). This appears to be more in line with the middle of the distribution of ratios found in nearby cities. For example, the range of 25-75 percentile values of the ratios in Cleveland, Cincinnati, Detroit, and Indianapolis is 7.0-9.9; 6.4-9.1; 6.5-10.0; and 7.5-10.7 respectively. Thus, we recommend use of a default using more recent data.

Attachments
Table 1
References Cited Sheet

cc: P. Dolwick, Region V
D. Grano, MD-15
T. Helms, MD-15
A. Van Meter, MD-14
D. Wilson, MD-14

Table 1

Appendix D: Example REGNAME.FIL

			Design	O3	O3	VOC	VOC	NOX	NOX	Ratio (Percentiles)		
Design Yr	Future Yr	City Name	O3	Max	Min	Min	Max	Min	Max	25%	50%	75%
123456789012	123456789012	123456789012345	123456	12	12	1234	1234	12345	12345	1234	1234	1234
ATLGA1.SFC	ATLGA2.SFC	ATLANTA	0.162	25	06	0.38	1.46	0.048	0.198	7.4	9.7	10.7
AUSTX1.SFC	AUSTX2.SFC	AUSTIN	0.101	25	06	0.48	1.88	0.077	0.160	7.4	7.9	8.4
BALMD1.SFC	BALMD2.SFC	BALTIMORE	0.194	25	06	0.43	1.51	0.042	0.200	6.6	7.4	8.8
BATLA1.SFC	BATLA2.SFC	BATON ROUGE	0.164	25	06	0.44	1.83	0.025	0.103	15.2	20.3	22.6
BIRAL1.SFC	BIRAL2.SFC	BIRMINGHAM	0.133	25	06	0.44	2.87	0.055	0.242	7.5	9.4	12.3
BOSMA1.SFC	BOSMA2.SFC	BOSTON	0.177	25	06	0.34	1.13	0.045	0.084	7.1	8.1	11.3
CHANC1.SFC	CHANC2.SFC	CHARLOTTE	0.158	25	06	0.37	1.52	0.028	0.169	8.3	10.7	13.1
CHIIL1.SFC	CHIIL2.SFC	CHICAGO	0.191	25	06	0.39	1.65	0.040	0.217	4.6	6.8	10.4
CINOH1.SFC	CINOH2.SFC	CINCINNATI	0.157	25	06	0.63	1.90	0.068	0.276	6.4	7.8	9.1
CLEOH1.SFC	CLEOH2.SFC	CLEVELAND	0.157	25	06	0.53	2.40	0.042	0.251	7.0	9.0	9.9
DALTX1.SFC	DALTX2.SFC	DALLAS	0.140	25	06	0.25	1.89	0.047	0.220	6.1	8.2	9.4
DENCO1.SFC	DENCO2.SFC	DENVER	0.122	25	06	0.79	2.44	0.118	0.227	6.8	7.2	8.1
DETMI1.SFC	DETMI2.SFC	DETROIT	0.144	25	06	0.26	1.14	0.031	0.139	6.5	8.2	10.0
ELPTX1.SFC	ELPTX2.SFC	EL PASO	0.170	25	06	0.23	1.90	0.033	0.160	5.5	7.3	11.8
HARCT1.SFC	HARCT2.SFC	HARTFORD	0.168	25	06	0.29	0.79	0.030	0.630	7.0	9.8	10.6
HOUTX1.SFC	HOUTX2.SFC	HOUSTON	0.220	25	06	0.38	3.36	0.050	0.343	7.7	9.7	11.0
INDIN1.SFC	INDIN2.SFC	INDIANAPOLIS	0.118	25	06	0.51	2.50	0.042	0.376	7.5	8.8	10.7
JACFL1.SFC	JACFL2.SFC	JACKSONVILLE	0.119	25	06	0.37	1.19	0.023	0.131	8.2	8.9	9.6
KANMO1.SFC	KANMO2.SFC	KANSAS CITY	0.120	25	06	0.34	1.23	0.029	0.270	7.1	9.1	10.8
LAKLA1.SFC	LAKLA2.SFC	LAKE CHARLES	0.130	25	06	0.14	1.55	0.024	0.060	13.5	17.0	25.1
LOSCA1.SFC	LOSCA2.SFC	LOS ANGELES	0.330	40	06	0.46	2.04	0.056	0.249	6.5	8.2	10.0
LOUKY1.SFC	LOUKY2.SFC	LOUISVILLE	0.149	25	06	0.42	9.42	0.025	1.140	5.1	11.0	14.3
MEMTN1.SFC	MEMTN2.SFC	MEMPHIS	0.140	25	06	0.92	2.44	0.087	0.289	6.7	8.5	9.1
MIAFL1.SFC	MIAFL2.SFC	MIAMI	0.138	25	06	0.19	1.53	0.032	0.126	7.7	10.5	11.2
NASTN1.SFC	NASTN2.SFC	NASHVILLE	0.138	25	06	0.64	1.69	0.029	0.157	11.5	14.6	21.9
NEWNY1.SFC	NEWNY2.SFC	NEW YORK CITY	0.207	25	06	0.46	2.00	0.046	0.237	7.4	9.1	10.4
PHIPA1.SFC	PHIPA2.SFC	PHILADELPHIA	0.187	25	06	0.31	1.23	0.045	0.177	6.4	7.9	9.3
PHOAZ1.SFC	PHOAZ2.SFC	PHOENIX	0.120	25	06	0.42	1.89	0.051	0.231	6.5	8.2	10.0
PORQR1.SFC	PORQR2.SFC	PORTLAND	0.110	25	06	0.19	1.30	0.028	0.092	7.3	8.8	13.4
RICVA1.SFC	RICVA2.SFC	RICHMOND	0.140	25	06	0.14	0.65	0.020	0.075	6.7	8.6	10.4
SACCA1.SFC	SACCA2.SFC	SACRAMENTO	0.160	25	06	0.14	0.41	0.030	0.091	3.7	4.4	5.2
SAIMO1.SFC	SAIMO2.SFC	ST LOUIS	0.156	25	06	0.37	2.40	0.039	0.217	8.3	10.2	11.0
SALUT1.SFC	SALUT2.SFC	SALT LAKE CITY	0.143	25	06	0.33	1.61	0.027	0.177	9.2	10.1	12.0
SANTX1.SFC	SANTX2.SFC	SAN ANTONIO	0.120	25	06	0.32	1.32	0.033	0.183	7.0	8.4	9.6
SNDCA1.SFC	SNDCA2.SFC	SAN DIEGO	0.170	25	06	0.35	1.73	0.044	0.183	6.5	6.8	8.6
SNFCA1.SFC	SNFCA2.SFC	SAN FRANCISCO	0.140	25	06	0.20	1.37	0.030	0.167	6.0	7.6	8.2
TAMFL1.SFC	TAMFL2.SFC	TAMPA	0.129	25	06	0.17	1.06	0.027	0.110	6.1	8.0	8.2
TULOK1.SFC	TULOK2.SFC	TULSA	0.118	25	06	0.26	2.70	0.025	0.185	7.5	14.8	21.0
WASDC1.SFC	WASDC2.SFC	WASHINGTON DC	0.163	25	06	0.32	1.23	0.030	0.095	7.1	12.4	15.1

REFERENCES CITED

United States Environmental Protection Agency, 1989, Procedures for Applying City-Specific EKMA, EPA-450/4-89-012

Baugues, K., 1991, Collection of Data for the Regulatory Impact Analysis Database Memorandum, US EPA, Research Triangle Park, North Carolina 27711