United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450/4-83-003d
January 1987

Air

EPA

Evaluation of Rural Air Quality Simulation Models

Addendum D: Paradise SO_2 Data Base

EPA-450/4-83-003d
January 1987

Evaluation of Rural Air Quality Simulation Models

Addendum D: Paradise SO_2 Data Base

By

William M. Cox
Herschel W. Rorex,
Gerald K. Moss

U.S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, NC 27711

and

Ellen W. Baldridge
Computer Sciences Corporation
Research Triangle Park, NC 27709

This report has been reviewed by the Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

EPA-450/4-83-003d

PREFACE

This report summarizes performance statistics for several rural point source models. The performance of the models is based on SO_2 data collected near the Paradise Power Plant. The report serves as an addendum to a previous publication* on model performance which was based on data from the Clifty Creek Power Plant. Other addenda to the Clifty Creek publication are also planned for additional data bases and for presentation of supplemental information on model performance.

The Paradise SO_2 data base was collected by the Tennessee Valley Authority and used previously by EPA for evaluating the impact of alternative modeling techniques on the ability of MPTER to estimate peak SO_2 levels. This report extends the previous EPA evaluation by including three additional models and by presenting performance results in a standard format that facilitates performance comparison among models and among other data bases, for which results are now available.

---

*Londergan, R. J., D. H. Minott, D. J. Wackter, T. Kincaid and D. Bonitata, 1982. Evaluation of Rural Air Quality Simulation Models. EPA Publication No. EPA-450/4-83-003. U.S. Environmental Protection Agency, Research Triangle Park, N.C. (NTIS No. PB 83-182758).

TABLE OF CONTENTS

		Page
	PREFACE	iii
	TABLES	vi
	FIGURES	vi
1.	INTRODUCTION	1
2.	AIR QUALITY DATA BASE AND STATISTICAL APPROACH	5
3.	MODEL PERFORMANCE RESULTS	9
4.	CONCLUSIONS	23
	REFERENCES	24

APPENDICES

A. Statistics For 25 Highest Values
B. Statistics For All Events
C. Statistics For Highest Concentrations At Each Station
D. Comparisons Of Highest Values For Various Pairings

TABLES

Number		Page
1A-C	Difference of Observed and Predicted Averages of the 25 Highest SO_2 Concentration Values (Unpaired in Time or Location)	12-14
2A-C	Average Difference Between Observed and Predicted Concentration Values Event-By-Event (Paired in Time)	15-19
3A-C	Comparison of Maximum Observed and Maximum Predicted Concentration Values	20-22

FIGURES

Number		Page
1	Site Characteristics and Data Acquisition of the Paradise SO_2 Monitors During 1976	7
2	Paradise Air Quality Monitoring Network	8

SECTION 1

INTRODUCTION

In October of 1982, EPA published the results of a comprehensive evaluation of nine rural air quality simulation models using ambient SO_2, meteorological, and source data for the Clifty Creek Power Plant.[1] The evaluation was based on recommendations by the American Meteorological Society (AMS) regarding the use of statistical methods for comparing observed air quality with model predictions.[2] EPA later published addendums to the Clifty Creek report summarizing the performance of 4 of the original 9 models using data bases available for the Muskingum River Power Plant[3] and the Kincaid Power Plant.[4] The purpose of this addendum is to provide analogous statistical information on model performance based on SO_2 data collected by the Tennessee Valley Authority (TVA) for the Paradise Power Plant.

The Paradise SO_2 data base has been used previously[5] to evaluate the impact of alternative modeling techniques on the ability of MPTER to estimate ground level peak SO_2 concentrations. While the MPTER results presented previously at Paradise are basically consistent with those presented here, this addendum provides additional information, i.e., (1) it includes three additional models, (2) it presents results in a standardized format used in previous evaluations, and (3) it establishes a framework for including results for new models as they are developed and evaluated.

As in the Muskingum and Kincaid evaluations, only four of the original 9 models have been evaluated. The four models are the following: (1) CRSTER/MPTER developed by EPA, (2) MPSDM developed by ERT, Inc., (3) TEM-8A developed

by the Texas Air Control Board, and (4) PPSP developed by the Martin Marietta Corporation. This evaluation is confined to these four models since they essentially span the range of technology represented by the rural models as a group. The five models not applied here all use the Pasquill-Gifford dispersion curves as defined in the MPTER model, although their other features may differ somewhat from each other and from MPTER. Because of the relatively flat terrain (see Figures 1 and 2), no adjustments were made for receptor height above plant grade. The principal technical features of each of the four models used in this study are:

- MPTER/CRSTER - UNAMAP5 (EPA)*

  Full terrain subtraction
  Briggs final plume rise
  Uses stability classes A, B, C, D, E, F
  Stability class restriction (G replaced with F)
  Pasquill-Gifford σ_y and σ_z
  Mixing height (L) used for stability classes A-D
  Uniform mixing beyond where σ_z exceeds 1.6L
  Full plume penetration. When H >L, then ground-level concentration (χ) = 0
  Wind profile power-law coefficients of 0.10, 0.15, 0.20, 0.25, 0.30 and 0.30 for stability classes A-F.

*Although version 5 of MPTER was used in this evaluation, a new version (UNAMAP6) is now available for regulatory use.

- MPSDM (ERT)

  ASME (1979) dispersion coefficients
  Terrain treatment (1/2 height, unstable and neutral; full terrain subtraction, stable)
  Transitional plume rise
  5 stability classes (F used for all stable)
  Stack-tip downwash
  Buoyancy enhanced dispersion (σ_y and σ_z)
  Mixing height not used for stable conditions
  Uniform mixing not assumed
  Briggs partial plume penetration
  Wind profile power law coefficients (.09, .11, .12, .14, .20)

- TEM-8A (Texas Air Control Board)

  Flat terrain assumed
  Horizontal dispersion for 60-minute averages ($\sigma_y = C_i\ \sigma_y PG$;

  where C = 3.35, 2.70, 2.14, 1.71, 1.37, 1.37 for stabilities 1-6)

  Transitional plume rise
  Mixing height not used for stable conditions
  Uniform mixing at 2 times the distance beyond where $\sigma_z = 0.47L$
  Full plume penetration when H >2L; then $\chi = 0$.

- PPSP (Martin Marietta)

  Briggs dispersion coefficients
  Stability class selection based on (1) convective theory of scaling for daytime and (2) the Turner algorithm for nighttime
  Partial penetration of buoyant plume into the capping inversion
  Briggs plume rise formulas, including the "breakup" and "touchdown" models
  No terrain adjustments

It should be noted that EPA did not directly solicit input from the model developers prior to this evaluation. This is due to the fact that the environmental and meteorological features around the Paradise plant are similar in complexity to those same features around Clifty Creek and developer input had already been received. The reader should refer to the Clifty Creek report for a more detailed description of the models and options used.

SECTION 2

AIR QUALITY DATA BASE AND STATISTICAL APPROACH

The Paradise Power plant, located in Kentucky, is operated by the Tennessee Valley Authority (TVA). The plant is a coal-fired facility consisting of three units. Emissions from two identical 704-MW units are vented through two separate stacks, each stack having a height of 183 meters. Emissions from a third unit (1150MW) are vented at 244 meters. The plant is relatively isolated in flat terrain surrounded by rolling hills. The source, ambient concentration and meteorological data used in the evaluation were collected on-site by TVA in 1976 and supplemented with both surface and upper air meteorological data from the NWS station at Nashville, TN.

The ambient SO_2 monitoring network consists of 12 stations located at distances ranging from 3 km to 17 km from the plant. Figure 1, reproduced from reference 5, summarizes the azimuth and distance from the plant for each monitor. Figure 2, also reproduced from reference 5, shows the location of the 12 SO_2 monitoring stations relative to the plant and the on-site meteorological tower operated by TVA.

The on-site meteorological measurements were taken from a 110-meter tower located 1.5 km west of the plant. Measurements included hourly averages of wind speed, wind direction and ambient air temperature, all of which were measured at the 110 meter level. A missing wind speed or wind direction was flagged as missing data. A missing 110 meter temperature was replaced by the 10 meter temperature, the 1 meter temperature or the Nashville NWS surface

temperature, in that sequence. Rural mixing heights and stability classes were derived entirely from the Nashville NWS data using the standard CRSTER preprocessor programs.

Stack data consisted of hourly averages of exit gas velocity, gas temperature, and SO_2 emissions. Hourly average gas velocity and gas temperatures were estimated by linear interpolation using hourly power generation estimates for each unit. Hourly average emission rates were estimated using daily coal consumption and periodic sulfur analysis.

The performance statistics resulting from the evaluation are documented in Appendices A through D to this report. Upper and lower 95 percent confidence limits for the various statistical measures of performance are enclosed in parenthesis. The tables shown in the appendices to this report were generated with a software package that was specifically designed for model evaluation. The system, Model Evaluation Support System (MESS), was created to aid in formatting and handling meteorological, air quality and source characteristic data.[6] A statistical package incorporated into MESS calculates and outputs the AMS performance statistics in the prescribed format.[7] No adjustment was made for background since contributions to ground level monitoring stations from sources other than the Paradise Plant are thought to be minimal.

Figure 1. SITE CHARACTERISTICS AND DATA ACQUISITION OF THE PARADISE SO_2 MONITORS DURING 1976

Receptor number	Azimuth (degrees)	Distance (km)	Height above plant grade (m)	Percentage of missing SO_2 data (n=8784 hrs)
1	31	2.9	-1	62.1
2	47	16.9	24	61.4
3	31	4.67	21	3.7
4	31	6.76	36	61.6
5	32	8.37	15	61.6
6	284	12.7	12	1.8
7	126	8.53	-7	1.4
8	301	3.38	16	2.8
9	150	7.0	15	1.8
10	238	7.66	22	0.3
11	342	6.05	2	0.6
12	178.5	7.90	10	0.6

Note: This figure reproduced by permission of the author (see reference 5)

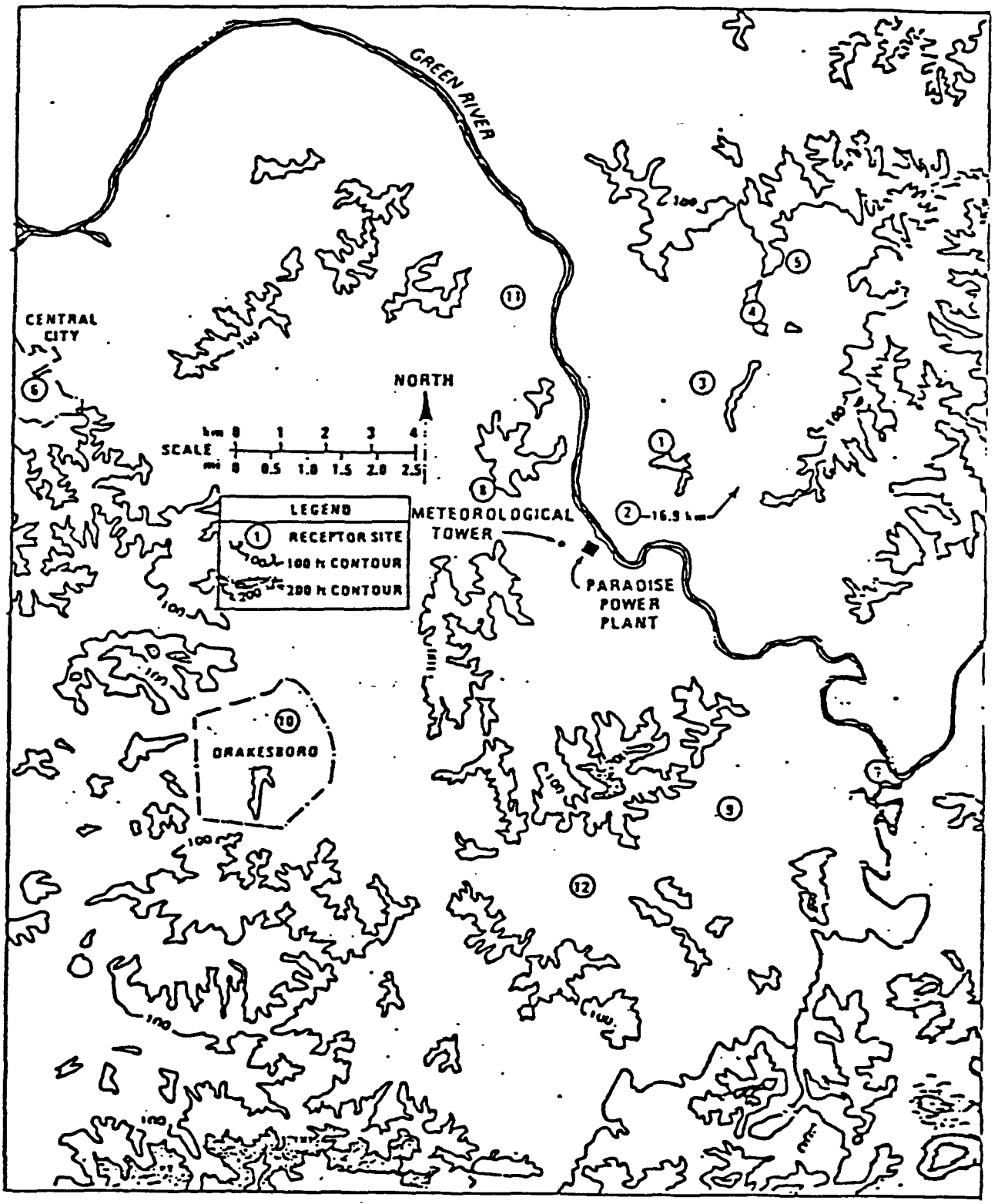

Figure 2. Paradise Air Quality Monitoring Network

Note: This figure reproduced by permission of the author (see reference 5)

SECTION 3

MODEL PERFORMANCE RESULTS

The performance statistics for the four rural models using 1-hour, 3-hour and 24-hour averages of measured and predicted data are presented in detail in the Appendices. Because the material is too voluminous to discuss easily, a series of summary tables analogous to those presented in the Clifty Creek, Muskingum River, and Kincaid reports are shown. Table 1, which is derived from the information contained in Appendix A, compares the bias of each model for the 25 highest observed and predicted concentrations. Table 2, which was derived from Appendix B, compares the bias of each model using all concentration data. Table 3, which was derived from Appendix C and Appendix D, compares the ability of each model to predict the highest concentrations.

Table 1A compares the bias of each model using the averages of the 25 highest observed and predicted 1-hour concentrations. PPSP overpredicts the average observed concentration at each of the 12 stations and for each of the seven meteorological categories; occasionally by a factor of 3 or more. MPSDM also overpredicts the average observed concentrations but not as severely as PPSP. Both TEM-8A and MPTER are relatively unbiased in that overprediction at some stations are offset by underpredictions at other stations. Also, the 95 percent confidence limits for the all station/all event category for both TEM-8A and MPTER encompass zero (0) indicating a lack of significant bias in estimating highest observed 1-hour average concentrations.

Each model exhibits at least some degree of bias for one or more of the wind speed and stability categories. Generally, the higher wind speed categories (>2.5m/s) and unstable conditions are associated with the largest overpredictions while lower wind speeds and more stable conditions are associated with the largest underpredictions. Table 1B and Table 1C present similar information for 3-hour and 24-hour averages respectively. The general trend, which is most noticeable for MPSDM and PPSP, is for smaller overpredictions as averaging period increases. Both TEM-8A and MPTER exhibit noticeable underpredictions for 3-hour and 24-hour averages which were not evident for 1-hour averages.

Table 2A presents results for the all data categories, i.e., all valid data values within a data category paired in time. The number of events and average observed values are for MPTER. The number of events and average observed concentration for the other three models differ slightly from those for MPTER primarily due to the threshold imposed for computation of meaningful performance statistics. For 1-hour averages (Table 2A), the general result is for noticeable underpredictions by MPTER, MPSDM and TEM-8A and noticeable overpredictions by PPSP. There are exceptions to this general tendency, e.g., MPSDM and TEM-8A overpredictions for very unstable conditions (A and B) and PPSP underpredictions for very stable conditions (E and F). Similar results were obtained for 3-hour averages (Table 2B) and 24-hour averages (Table 2C). Note that observed 24-hour concentratons are relatively low compared with those for shorter averaging periods and with the threshold concentration used for 24-hour values ($5_{\mu}g/m^3$). This should be considered when interpreting results presented in Table 2C.

Table 3 compares the maximum observed and predicted concentration using both the single highest values over all events and stations and the average of maximum concentration for each station. The comparisons of average maximum values should be the more meaningful of the two since the 12 station average of maximum values are considerably more robust than the single highest values for the entire network. Not surprisingly, the results are reasonably consistent with results presented in Table 1 for the average of the 25 highest observed and predicted values. For 1-hour averages, MPSDM and PPSP clearly overpredict both the highest values and the average of maximum values across the 12 station network. MPTER and TEM-8A are relatively unbiased, underpredicting the highest value (almost 3,000$\mu g/m^3$) by 370$\mu g/m^3$ and 271$\mu g/m^3$ respectively. Both MPTER and TEM-8A perform even better for the 12 station average of maximums (1604$\mu g/m^3$) where slight overpredictions of 77$\mu g/m^3$ and 12$\mu g/m^3$ occur.

For 3-hour and 24-hour averages, the margin of overprediction by PPSP and MPSDM is smaller than for 1-hour averages while for MPTER and TEM-8A the trend is toward underprediction. In fact, MPTER and TEM-8A each show underpredictions which approach or exceed 10 percent for both 3-hour and 24-hour averages.

TABLE 1A. DIFFERENCE OF OBSERVED AND PREDICTED AVERAGES OF THE 25 HIGHEST SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 AVERAGING TIME: 1 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) FOR EACH MODEL (UG/M**3)			
		MPTER	MPSDM	PPSP	TEM-8A
1. ALL STATIONS/ALL EVENTS (A-4A)	1590	-149 (-336, 38)	-1309 (-1572, -1046)	-3889 (-4601, -3176)	85 (-127, 296)
2. BY STATION/ALL EVENTS (A-4B)					
STATION 1	444	305 (166, 443)	-561 (-915, -207)	-2494 (-3076, -1911)	-71 (-195, 53)
STATION 2	586	236 (128, 344)	129 (31, 227)	-162 (-287, -37)	235 (83, 388)
STATION 3	1044	-96 (-358, 166)	-491 (-805, -178)	-1690 (-2108, -1271)	263 (0, 526)
STATION 4	525	186 (3, 370)	-410 (-603, -216)	-1072 (-1357, -788)	-43 (-171, 84)
STATION 5	601	242 (34, 450)	-263 (-452, -74)	-721 (-974, -467)	101 (-35, 236)
STATION 6	816	-81 (-206, 43)	-391 (-565, -217)	-959 (-1122, -797)	111 (-44, 267)
STATION 7	1080	99 (-48, 247)	-165 (-319, -11)	-728 (-975, -482)	349 (235, 463)
STATION 8	996	-21 (-237, 195)	-1093 (-1483, -702)	-3439 (-4338, -2539)	205 (39, 372)
STATION 9	991	-107 (-284, 71)	-541 (-803, -279)	-1384 (-1705, -1062)	120 (-62, 303)
STATION10	917	41 (-146, 228)	-592 (-833, -351)	-1298 (-1657, -939)	77 (-111, 265)
STATION11	853	-380 (-594, -166)	-872 (-1108, -636)	-2135 (-2622, -1648)	-105 (-317, 106)
STATION12	729	-350 (-499, -202)	-867 (-1104, -631)	-1563 (-1877, -1248)	-44 (-158, 71)
3. BY METEOROLOGICAL CONDITION (A-5)					
A. WIND SPEED					
< 2.5 M/SEC	1385	266 (49, 483)	-1484 (-1765, -1204)	-3989 (-4731, -3247)	47 (-188, 282)
2.5 TO 5.0	1345	-343 (-497, -189)	-559 (-729, -389)	-2066 (-2364, -1768)	332 (164, 499)
> 5.0 M/SEC	918	-284 (-385, -182)	-357 (-470, -244)	-1191 (-1364, -1019)	-70 (-202, 63)
B. STABILITY GROUP					
CLASS A & B	1400	-319 (-523, -114)	-1222 (-1511, -933)	-3342 (-3840, -2843)	157 (-41, 356)
CLASS C	1221	-26 (-136, 85)	-781 (-1077, -485)	-2745 (-3566, -1923)	-10 (-211, 191)
CLASS D	1126	1008 (874, 1142)	-271 (-560, 17)	-1903 (-2225, -1580)	671 (475, 867)
CLASS E & F	444	431 (383, 479)	269 (213, 325)	-479 (-617, -341)	405 (356, 454)

TABLE 1B. DIFFERENCE OF OBSERVED AND PREDICTED AVERAGES OF THE 25 HIGHEST SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 AVERAGING TIME: 3 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) FOR EACH MODEL (UG/M**3)			
		MPTER	MPSDM	PPSP	TEM-8A
1. ALL STATIONS/ALL EVENTS (A-4A)	995	153 (52, 255)	-290 (-400, -181)	-1557 (-1869, -1245)	258 (164, 352)
2. BY STATION/ALL EVENTS (A-4B)					
STATION 1	234	188 (125, 251)	-110 (-279, 60)	-986 (-1279, -693)	14 (-57, 84)
STATION 2	308	186 (126, 246)	124 (66, 182)	-41 (-108, 26)	143 (75, 210)
STATION 3	538	76 (-44, 196)	-91 (-239, 56)	-741 (-938, -543)	138 (16, 260)
STATION 4	259	145 (63, 227)	-44 (-140, 53)	-372 (-516, -227)	17 (-45, 79)
STATION 5	284	163 (75, 251)	5 (-86, 96)	-232 (-356, -107)	73 (8, 137)
STATION 6	436	14 (-86, 114)	-170 (-287, -53)	-470 (-595, -346)	74 (-23, 170)
STATION 7	600	214 (113, 315)	104 (4, 205)	-226 (-342, -111)	209 (114, 304)
STATION 8	552	144 (8, 279)	-271 (-457, -84)	-1446 (-1864, -1028)	133 (19, 247)
STATION 9	584	102 (-14, 218)	-76 (-217, 66)	-617 (-774, -459)	119 (11, 228)
STATION10	516	161 (24, 299)	-86 (-236, 64)	-427 (-602, -252)	104 (-31, 239)
STATION11	429	-42 (-181, 98)	-283 (-413, -153)	-924 (-1174, -675)	-10 (-110, 89)
STATION12	423	-26 (-129, 78)	-285 (-403, -167)	-835 (-946, -724)	7 (-71, 84)
3. BY METEOROLOGICAL CONDITION (A-5)					
A. WIND SPEED					
< 2.5 M/SEC	761	330 (215, 446)	-341 (-491, -191)	-1466 (-1834, -1098)	215 (87, 344)
2.5 TO 5.0	856	55 (-50, 160)	-148 (-281, -16)	-990 (-1222, -759)	236 (138, 335)
> 5.0 M/SEC	533	-17 (-101, 66)	-119 (-221, -18)	-758 (-874, -643)	41 (-28, 109)
B. STABILITY GROUP					
CLASS A & B	806	9 (-105, 123)	-325 (-462, -188)	-1200 (-1494, -907)	170 (60, 280)
CLASS C	700	95 (-16, 205)	-255 (-400, -110)	-1194 (-1509, -878)	91 (-18, 200)
CLASS D	669	343 (250, 436)	59 (-66, 184)	-904 (-1146, -662)	343 (245, 441)
CLASS E & F	311	306 (250, 361)	213 (150, 277)	-184 (-276, -93)	289 (232, 345)

TABLE 1C. DIFFERENCE OF OBSERVED AND PREDICTED AVERAGES OF THE 25 HIGHEST SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 AVERAGING TIME: 24 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) FOR EACH MODEL (UG/M**3)			
		MPTER	MPSDM	PPSP	TEM-8A
1. ALL STATIONS/ALL EVENTS (A-4A)	238	75 (49, 101)	1 (-29, 32)	-269 (-322, -216)	73 (50, 97)
2. BY STATION/ALL EVENTS (A-4B)					
STATION 1	60	54 (41, 67)	14 (-14, 42)	-142 (-200, -84)	24 (7, 42)
STATION 2	61	42 (28, 55)	28 (14, 42)	-9 (-28, 10)	29 (15, 42)
STATION 3	114	35 (8, 62)	1 (-26, 29)	-157 (-195, -119)	21 (-4, 46)
STATION 4	50	35 (20, 50)	3 (-19, 25)	-67 (-99, -35)	6 (-9, 21)
STATION 5	52	36 (21, 52)	8 (-13, 28)	-45 (-72, -18)	14 (-1, 29)
STATION 6	106	33 (10, 57)	1 (-25, 27)	-69 (-94, -43)	34 (14, 53)
STATION 7	143	83 (58, 108)	58 (32, 84)	-30 (-63, 3)	67 (41, 93)
STATION 8	104	47 (16, 78)	-23 (-65, 18)	-283 (-361, -205)	22 (-8, 51)
STATION 9	139	55 (24, 86)	16 (-16, 49)	-132 (-179, -84)	44 (14, 73)
STATION10	127	75 (41, 108)	38 (3, 73)	-49 (-87, -11)	49 (16, 82)
STATION11	90	23 (-8, 54)	-26 (-60, 8)	-150 (-201, -100)	5 (-19, 29)
STATION12	101	31 (4, 58)	-20 (-50, 11)	-161 (-202, -119)	16 (-8, 40)

TABLE 2A. AVERAGE DIFFERENCE BETWEEN OBSERVED AND PREDICTED CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE(CO) (UG/M**3)	DIFFERENCE OF AVERAGES (CO - CP) FOR EACH MODEL (UG/M**3)			
			MPTER	MPSDM	PPSP	TEM-8A
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4012	195.8	104.9(94.4, 115.5)	21.2(8.0, 34.4)	-220.5(-240.0,-201.0)	56.2(47.4, 65.0)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	8962	153.4	109.2(104.1, 114.4)	60.5(53.9, 67.0)	-80.2(-89.9, -70.5)	63.6(59.2, 67.9)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	373	140.1	130.8(117.1, 144.4)	65.5(31.7, 99.2)	-158.9(-225.9, -91.9)	74.4(57.2, 91.6)
STATION 2	324	151.0	116.1(95.2, 136.9)	78.5(57.5, 99.6)	4.7(-20.3, 29.7)	74.0(54.2, 93.8)
STATION 3	1010	157.2	100.6(83.0, 118.3)	59.9(39.3, 80.6)	-128.8(-155.7,-102.0)	44.5(30.7, 58.4)
STATION 4	230	162.8	125.6(96.1, 155.2)	37.4(-2.5, 77.2)	-110.3(-161.4, -59.1)	34.9(9.4, 60.4)
STATION 5	234	162.3	122.6(89.4, 155.8)	40.5(2.5, 78.5)	-72.5(-117.2, -27.9)	43.3(17.4, 69.2)
STATION 6	982	141.5	90.9(77.1, 104.8)	54.1(37.5, 70.6)	-20.6(-41.9, .8)	64.6(53.1, 76.1)
STATION 7	1065	163.1	121.2(105.8, 136.6)	91.2(74.4, 107.9)	-10.2(-31.1, 10.8)	81.6(68.7, 94.5)
STATION 8	709	169.3	121.1(99.7, 142.6)	44.6(11.4, 77.9)	-223.4(-281.6,-165.3)	64.8(47.0, 82.6)
STATION 9	843	170.4	103.1(83.2, 123.1)	43.8(20.6, 66.9)	-135.2(-164.6,-105.8)	52.8(36.9, 68.7)
STATION10	1336	147.2	122.2(111.6, 132.8)	89.0(74.5, 103.5)	14.7(-4.9, 34.4)	85.9(75.5, 96.3)
STATION11	865	145.3	98.3(80.0, 116.5)	42.7(19.5, 65.9)	-86.3(-121.8, -50.8)	54.4(39.2, 69.6)
STATION12	991	141.9	94.8(80.2, 109.5)	43.3(24.7, 61.8)	-92.0(-118.3, -65.6)	57.7(46.0, 69.4)

(CONTINUED)

TABLE 2A. AVERAGE DIFFERENCE BETWEEN OBSERVED AND PREDICTED CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE(CO) (UG/M**3)	DIFFERENCE OF AVERAGES (CO - CP) FOR EACH MODEL (UG/M**3)			
			MPTER	MPSDM	PPSP	TEM-8A
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	1146	222.8	177.7(159.2, 196.3)	-21.4(-52.9, 10.1)	-250.9(-299.7,-202.0)	72.6(54.6, 90.6)
2.5 TO 5.0	3118	164.2	89.0(78.3, 99.8)	50.2(38.4, 62.1)	-120.3(-136.5,-104.0)	41.7(33.8, 49.6)
> 5.0 M/SEC	4698	129.3	106.0(101.2, 110.8)	88.6(83.9, 93.4)	-8.3(-15.9, -.8)	76.7(72.5, 80.9)
B. STABILITY GROUP						
CLASS A & B	1377	190.0	16.2(-7.0, 39.3)	-98.7(-127.4, -70.1)	-239.8(-279.0,-200.6)	-45.4(-58.8, -31.9)
CLASS C	1659	183.8	93.0(77.5, 108.5)	16.2(-3.4, 35.8)	-174.4(-202.7,-146.2)	5.0(-7.9, 17.9)
CLASS D	3880	145.5	144.1(139.9, 148.2)	109.0(103.6, 114.5)	-61.5(-72.7, -50.4)	119.9(115.7, 124.1)
CLASS E & F	2046	119.1	119.1(116.5, 121.7)	112.7(109.9, 115.6)	80.8(75.4, 86.3)	117.9(115.2, 120.5)

TABLE 2B. AVERAGE DIFFERENCE BETWEEN OBSERVED AND PREDICTED CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE(CO) (UG/M**3)	DIFFERENCE OF AVERAGES (CO - CP) FOR EACH MODEL (UG/M**3)			
			MPTER	MPSDM	PPSP	TEM-8A
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1620	145.7	78.7(67.6, 89.9)	24.5(11.3, 37.7)	-159.9(-180.6,-139.1)	46.1(36.0, 56.2)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4322	102.6	73.0(68.2, 77.8)	41.6(35.8, 47.4)	-55.4(-64.4, -46.3)	44.8(40.4, 49.2)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	176	92.3	85.8(72.4, 99.2)	40.4(11.6, 69.3)	-110.4(-170.5, -50.3)	50.1(33.4, 66.7)
STATION 2	154	102.8	80.9(61.4, 100.4)	54.8(35.4, 74.2)	3.5(-19.8, 26.7)	54.0(34.4, 73.5)
STATION 3	508	101.6	64.9(49.9, 79.9)	41.1(23.8, 58.3)	-87.9(-112.6, -63.2)	31.3(18.3, 44.3)
STATION 4	108	109.1	83.5(56.9, 110.0)	30.5(-1.9, 62.9)	-70.4(-114.2, -26.7)	27.3(3.3, 51.2)
STATION 5	113	107.4	82.0(54.1, 109.8)	31.3(2.6, 59.9)	-43.5(-80.5, -6.4)	34.2(11.1, 57.4)
STATION 6	465	97.2	63.7(50.0, 77.4)	39.0(22.7, 55.4)	-12.0(-32.9, 8.9)	48.0(36.0, 60.1)
STATION 7	496	112.3	82.5(67.5, 97.5)	62.5(46.6, 78.3)	-10.1(-30.4, 10.3)	58.3(44.4, 72.2)
STATION 8	359	107.9	76.7(56.9, 96.5)	30.3(3.0, 57.7)	-146.8(-198.8, -94.9)	43.3(25.6, 60.9)
STATION 9	386	121.8	74.2(54.0, 94.4)	34.6(12.1, 57.0)	-99.2(-129.0, -69.4)	40.8(23.2, 58.3)
STATION10	628	101.0	83.6(72.5, 94.6)	60.2(46.7, 73.6)	8.4(-9.7, 26.5)	60.3(49.1, 71.6)
STATION11	455	88.1	59.8(44.8, 74.8)	26.7(8.6, 44.7)	-54.9(-84.8, -24.9)	33.9(20.9, 46.8)
STATION12	474	96.6	63.9(50.2, 77.6)	29.8(12.7, 47.0)	-68.1(-94.6, -41.7)	41.0(28.7, 53.2)

(CONTINUED)

TABLE 2B. AVERAGE DIFFERENCE BETWEEN OBSERVED AND PREDICTED CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE(CO) (UG/M**3)	DIFFERENCE OF AVERAGES (CO - CP) FOR EACH MODEL (UG/M**3)			
			MPTER	MPSDM	PPSP	TEM-8A
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	495	153.4	119.1(100.4, 137.7)	-5.2(-31.0, 20.6)	-160.6(-202.4,-118.7)	58.7(40.7, 76.8)
2.5 TO 5.0	1506	113.6	62.2(52.1, 72.3)	30.6(19.2, 42.1)	-89.0(-105.5, -72.6)	29.0(20.5, 37.5)
> 5.0 M/SEC	2321	84.7	70.2(65.8, 74.6)	60.0(55.4, 64.7)	-7.5(-15.3, .4)	52.5(48.4, 56.7)
B. STABILITY GROUP						
CLASS A & B	629	134.0	28.7(7.6, 49.9)	-41.1(-66.1, -16.1)	-141.9(-177.8,-106.1)	-14.4(-30.0, 1.2)
CLASS C	717	126.8	60.7(45.1, 76.2)	2.6(-16.0, 21.3)	-145.3(-173.6,-116.9)	4.4(-8.6, 17.5)
CLASS D	1969	95.8	88.5(83.7, 93.3)	66.2(60.6, 71.8)	-44.2(-55.1, -33.3)	68.4(63.6, 73.2)
CLASS E & F	1007	79.1	79.1(75.5, 82.8)	74.3(70.5, 78.1)	46.5(40.3, 52.7)	78.3(74.7, 82.0)

TABLE 2C. AVERAGE DIFFERENCE BETWEEN OBSERVED AND PREDICTED CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE(CO) (UG/M**3)	DIFFERENCE OF AVERAGES (CO - CP) FOR EACH MODEL (UG/M**3)			
			MPTER	MPSDM	PPSP	TEM-8A
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	343	68.8	33.4(25.3, 41.5)	11.6(2.2, 21.0)	-90.9(-106.5, -75.4)	20.6(12.8, 28.5)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1516	37.0	26.1(23.5, 28.6)	14.6(11.7, 17.5)	-21.9(-26.6, -17.2)	15.9(13.5, 18.3)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	69	31.2	29.0(21.8, 36.2)	14.2(2.1, 26.3)	-42.3(-69.3, -15.2)	17.5(8.7, 26.3)
STATION 2	58	34.4	25.8(17.0, 34.7)	17.7(8.6, 26.9)	.1(-11.8, 12.1)	18.0(8.9, 27.1)
STATION 3	184	35.7	23.4(16.2, 30.7)	14.4(6.3, 22.5)	-35.9(-49.4, -22.4)	11.2(4.2, 18.1)
STATION 4	47	32.9	25.2(15.5, 34.8)	7.1(-6.2, 20.4)	-25.6(-43.7, -7.5)	6.6(-3.1, 16.3)
STATION 5	52	30.5	23.3(13.6, 32.9)	7.2(-4.0, 18.4)	-15.9(-31.0, -.9)	8.3(-.7, 17.3)
STATION 6	164	34.9	22.2(14.7, 29.6)	13.6(5.1, 22.0)	-5.5(-16.3, 5.2)	17.2(10.3, 24.2)
STATION 7	156	45.5	33.4(24.3, 42.5)	25.9(16.3, 35.5)	-3.6(-16.2, 9.0)	24.7(15.5, 33.8)
STATION 8	126	37.0	25.6(16.2, 35.1)	8.2(-4.5, 20.9)	-55.6(-81.0, -30.2)	13.1(4.3, 22.0)
STATION 9	130	45.0	26.7(15.0, 38.4)	11.2(-1.0, 23.5)	-40.3(-57.9, -22.7)	14.1(3.5, 24.7)
STATION10	199	40.9	33.9(26.8, 40.9)	24.5(16.8, 32.2)	3.6(-6.6, 13.9)	24.6(17.4, 31.8)
STATION11	165	30.3	20.0(12.8, 27.2)	8.9(.2, 17.5)	-19.5(-33.7, -5.2)	11.3(4.6, 17.9)
STATION12	166	34.4	22.6(15.3, 29.9)	11.1(2.0, 20.1)	-25.3(-39.8, -10.8)	14.7(7.6, 21.8)

TABLE 3A. COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM PREDICTED CONCENTRATION VALUES

PARADISE 1976 AVERAGING TIME: 1 HOUR

MODEL	HIGHEST OBSERVED VALUE OVER ALL EVENTS AND LOCATIONS CoMAX (UG/M**3)	HIGHEST PREDICTED VALUE OVER ALL EVENTS AND LOCATIONS CpMAX (UG/M**3)	DIFFERENCE OF MAXIMUM VALUES Co - Cp (UG/M**3)	AVERAGE OF MAXIMUM VALUES OBSERVED AT EACH STATION Co (UG/M**3)	AVERAGE OF MAXIMUM VALUES PREDICTED AT EACH STATION Cp (UG/M**3)	AVERAGE DIFFERENCE Co - Cp (UG/M**3)
MPTER	2993.0	2623.0	370.0	1603.6	1680.2	-76.6
MPSDM	2993.0	4327.0	-1334.0	1603.6	2692.8	-1089.3
PPSP	2993.0	11834.0	-8841.0	1603.6	4784.4	-3180.8
TEM-8A	2993.0	2722.0	271.0	1603.6	1615.1	-11.5

TABLE 3B. COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM PREDICTED CONCENTRATION VALUES

PARADISE 1976 AVERAGING TIME: 3 HOUR

MODEL	HIGHEST OBSERVED VALUE OVER ALL EVENTS AND LOCATIONS CoMAX (UG/M**3)	HIGHEST PREDICTED VALUE OVER ALL EVENTS AND LOCATIONS CpMAX (UG/M**3)	DIFFERENCE OF MAXIMUM VALUES Co - Cp (UG/M**3)	AVERAGE OF MAXIMUM VALUES OBSERVED AT EACH STATION Co (UG/M**3)	AVERAGE OF MAXIMUM VALUES PREDICTED AT EACH STATION Cp (UG/M**3)	AVERAGE DIFFERENCE Co - Cp (UG/M**3)
MPTER	1398.7	1230.7	168.0	960.6	841.3	119.3
MPSDM	1398.7	1777.0	-378.3	960.6	1185.3	-224.7
PPSP	1398.7	4023.7	-2625.0	960.6	2127.3	-1166.7
TEM-8A	1398.7	1018.7	380.0	960.6	760.9	199.7

TABLE 3C. COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM PREDICTED CONCENTRATION VALUES

PARADISE 1976 AVERAGING TIME: 24 HOUR

MODEL	HIGHEST OBSERVED VALUE OVER ALL EVENTS AND LOCATIONS CoMAX (UG/M**3)	HIGHEST PREDICTED VALUE OVER ALL EVENTS AND LOCATIONS CpMAX (UG/M**3)	DIFFERENCE OF MAXIMUM VALUES Co - Cp (UG/M**3)	AVERAGE OF MAXIMUM VALUES OBSERVED AT EACH STATION Co (UG/M**3)	AVERAGE OF MAXIMUM VALUES PREDICTED AT EACH STATION Cp (UG/M**3)	AVERAGE DIFFERENCE Co - Cp (UG/M**3)
MPTER	348.5	285.5	63.0	218.8	159.5	59.3
MPSDM	348.5	374.5	-26.0	218.8	241.5	-22.7
PPSP	348.5	963.2	-614.8	218.8	447.2	-228.4
TEM-8A	348.5	260.6	87.9	218.8	170.8	48.0

SECTION 4

CONCLUSIONS

Four rural models that had been previously evaluated using SO_2 measurements at the Clifty Creek, Muskingum River and Kincaid power plants, were evaluated using an additional data base collected at the Paradise power plant located in Kentucky. The performance of the four models at Paradise followed basic patterns that were similar to those observed for the other three sites. PPSP clearly overpredicted concentrations for almost every data category while MPSDM, MPTER and TEM-8A exhibited smaller biases that were a function of averaging period and meteorological category.

For highest 1-hour concentrations, MPTER and TEM-8A were essentially unbiased while MPSDM showed relatively large overpredictions. Following trends noted for the other three data bases (Clifty Creek, Muskingum River and Kincaid), overpredictions of highest 1-hour values by MPSDM vanished for highest 24-hour averages while the lack of bias for MPTER and TEM-8A shifted toward underpredictions of highest 3-hour and 24-hour averages. Familiar trends were also apparent for meteorological categories; higher wind speed categories and very unstable conditions are associated with the largest overpredictions while lower wind speeds and more stable conditions are associated with the largest underpredictions.

The contrast in performance between the highest concentration data sets and the all data sets were also similar to that observed previously. PPSP overpredicted while MPTER, MPSDM and TEM-8A tend to underpredict significantly for almost every station, meteorological category and averaging period.

REFERENCES

1. Londergan, R. J., et al., "Evaluation of Rural Air Quality Simulation Models." EPA-450/4-83-003, Environmental Protection Agency, Research Triangle Park, N. C., July 1982.

2. Fox, D. G. "Judging Air Quality Model Performance," (A Summary of the AMS Workshop on Dispersion Model Performance, Woods, Hole, MA, Sept. 1980). Bulletin of the Amer. Met. Soc., Volume 62, No. 5, May 1981, pp. 599-609.

3. Cox, W. M. and G. K. Moss, "Evaluation of Rural Air Quality Simulation Models, Addendum A: Muskingum River Data Base." EPA-450/4-83-003a, Environmental Protection Agency, Research Triangle Park, N. C., June 1985.

4. Cox, W. M., et al., "Evaluation of Rural Air Quality Simulation Models, Addendum C: Kincaid SO_2 Data Base." EPA-450/4-83-003C, Environmental Protection Agency, Research Triangle Park, N. C., March 1986.

5. Pierce, T. E., "An Evaluation of Alternative Gaussian Plume Dispersion Modeling Techniques In Estimating Short-Term Sulfur Dioxide Concentrations," Environmental Sciences Research Laboratory, Office of Research and Development, Environmental Protection Agency, Research Triangle Park, N. C., June 1984.

6. Baldridge, K. W., "Model Evaluation Support System Users Manual." Prepared by Computer Science Corporation for EPA, Computer Science Corporation, Research Triangle Park, N. C., 1983.

7. "Statistical Evaluation Subsystem Users Manual." Environmental Protection Agency, Research Triangle Park, N. C., 1985.

APPENDIX A

Statistics For 25 Highest Values

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	1590	1739	-149 (-336, 38)	-190 (-298, -104)	2.38 (1.05, 5.40)	0.64(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	444	139	305 (166, 443)	310 (253, 370)	0.64 (0.28, 1.45)	-0.84(0.385)
STATION 2	586	350	236 (128, 344)	302 (169, 338)	0.63 (0.28, 1.43)	-0.60(0.385)
STATION 3	1044	1140	-96 (-358, 166)	-200 (-318, -85)	3.93 (1.73, 8.92)	0.52(0.385)
STATION 4	525	338	186 (3, 370)	347 (181, 395)	0.30 (0.13, 0.68)	-0.64(0.385)
STATION 5	601	359	242 (34, 450)	369 (167, 416)	0.45 (0.20, 1.01)	-0.64(0.385)
STATION 6	816	897	-81 (-206, 43)	-114 (-211, 51)	1.31 (0.58, 2.97)	0.36(0.385)
STATION 7	1080	980	99 (-48, 247)	138 (-21, 249)	0.61 (0.27, 1.39)	-0.36(0.385)
STATION 8	996	1017	-21 (-237, 195)	109 (-224, 216)	0.45 (0.20, 1.03)	-0.24(0.385)
STATION 9	991	1098	-107 (-284, 71)	0 (-178, 66)	0.57 (0.25, 1.30)	0.32(0.385)
STATION10	917	876	41 (-146, 228)	-85 (-146, 190)	1.07 (0.47, 2.44)	-0.24(0.385)
STATION11	853	1233	-380 (-594, -166)	-410 (-517, -167)	0.41 (0.18, 0.92)	0.56(0.385)
STATION12	729	1079	-350 (-499, -202)	-345 (-486, -179)	0.48 (0.21, 1.09)	0.72(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	1385	1120	266 (49, 483)	173 (67, 375)	1.83 (0.81, 4.16)	-0.44(0.385)
2.5 TO 5.0	1345	1688	-343 (-497, -189)	-361 (-468, -211)	0.89 (0.39, 2.03)	0.68(0.385)
> 5.0 M/SEC	918	1202	-284 (-385, -182)	-333 (-403, -222)	1.75 (0.77, 3.97)	0.72(0.385)
B. STABILITY GROUP						
CLASS A & B	1400	1719	-319 (-523, -114)	-373 (-503, -236)	2.74 (1.21, 6.22)	0.72(0.385)
CLASS C	1221	1246	-26 (-136, 85)	-53 (-145, 58)	1.08 (0.47, 2.44)	0.28(0.385)
CLASS D	1126	118	1008 (874, 1142)	965 (825, 1115)	34.87 (15.36,79.12)	-1.00(0.385)
CLASS E & F	444	13	431 (383, 479)	417 (342, 461)	189 (83.19, 428)	-1.00(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	995	841	153 (52, 255)	145 (64, 234)	1.21 (0.54, 2.76)	-0.52(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	234	46	188 (125, 251)	182 (167, 187)	1.12 (0.49, 2.55)	-0.88(0.385)
STATION 2	308	121	186 (126, 246)	181 (119, 219)	2.95 (1.30, 6.68)	-0.84(0.385)
STATION 3	538	462	76 (-44, 196)	16 (-36, 75)	5.08 (2.24,11.53)	-0.16(0.385)
STATION 4	259	115	145 (63, 227)	213 (134, 241)	0.39 (0.17, 0.87)	-0.76(0.385)
STATION 5	284	121	163 (75, 251)	222 (125, 232)	0.58 (0.26, 1.33)	-0.72(0.385)
STATION 6	436	422	14 (-86, 114)	8 (-46, 66)	1.13 (0.50, 2.56)	-0.12(0.385)
STATION 7	600	386	214 (113, 315)	207 (118, 259)	2.03 (0.89, 4.61)	-0.68(0.385)
STATION 8	552	408	144 (8, 279)	158 (33, 223)	1.17 (0.51, 2.65)	-0.52(0.385)
STATION 9	584	482	102 (-14, 218)	151 (12, 199)	1.01 (0.45, 2.30)	-0.52(0.385)
STATION10	516	355	161 (24, 299)	76 (43, 203)	1.76 (0.77, 3.99)	-0.52(0.385)
STATION11	429	471	-42 (-181, 98)	-13 (-127, 101)	0.47 (0.21, 1.06)	-0.20(0.385)
STATION12	423	449	-26 (-129, 78)	14 (-53, 74)	0.33 (0.15, 0.75)	-0.32(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	761	430	330 (215, 446)	288 (184, 389)	5.13 (2.26,11.65)	-0.68(0.385)
2.5 TO 5.0	856	801	55 (-50, 160)	91 (-49, 158)	1.51 (0.66, 3.42)	-0.24(0.385)
> 5.0 M/SEC	533	550	-17 (-101, 66)	19 (-29, 59)	0.25 (0.11, 0.56)	-0.32(0.385)
B. STABILITY GROUP						
CLASS A & B	806	798	9 (-105, 123)	56 (-103, 103)	1.87 (0.83, 4.25)	0.28(0.385)
CLASS C	700	606	95 (-16, 205)	59 (4, 136)	1.81 (0.80, 4.11)	-0.32(0.385)
CLASS D	669	326	343 (250, 436)	292 (210, 367)	11.25 (4.96,25.54)	-0.96(0.385)
CLASS E & F	311	5	306 (250, 361)	263 (244, 283)	1075 (474, 2440)	-1.00(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 24 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	238	162	75 (49, 101)	83 (58, 96)	0.94 (0.41, 2.14)	-0.80(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	60	6	54 (41, 67)	53 (36, 63)	3.51 (1.55, 7.96)	-0.92(0.385)
STATION 2	61	20	42 (28, 55)	33 (27, 51)	2.71 (1.20, 6.15)	-0.76(0.385)
STATION 3	114	79	35 (8, 62)	31 (15, 43)	1.94 (0.86, 4.40)	-0.56(0.385)
STATION 4	50	15	35 (20, 50)	38 (31, 50)	0.43 (0.19, 0.97)	-0.84(0.385)
STATION 5	52	16	36 (21, 52)	41 (29, 50)	0.69 (0.30, 1.55)	-0.80(0.385)
STATION 6	106	73	33 (10, 57)	50 (18, 57)	0.72 (0.32, 1.64)	-0.56(0.385)
STATION 7	143	60	83 (58, 108)	87 (52, 104)	3.57 (1.57, 8.10)	-0.84(0.385)
STATION 8	104	57	47 (16, 78)	34 (15, 62)	1.74 (0.77, 3.95)	-0.56(0.385)
STATION 9	139	84	55 (24, 86)	49 (25, 77)	1.46 (0.64, 3.30)	-0.52(0.385)
STATION10	127	52	75 (41, 108)	64 (46, 74)	4.03 (1.78, 9.16)	-0.80(0.385)
STATION11	90	67	23 (-8, 54)	31 (9, 54)	0.30 (0.13, 0.68)	-0.52(0.385)
STATION12	101	70	31 (4, 58)	34 (18, 52)	0.50 (0.22, 1.14)	-0.56(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	1590	2899	-1309 (-1572, -1046)	-1332 (-1449, -1058)	0.55 (0.24, 1.25)	0.96(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	444	1005	-561 (-915, -207)	-467 (-713, -59)	0.07 (0.03, 0.15)	0.44(0.385)
STATION 2	586	457	129 (31, 227)	160 (58, 214)	0.88 (0.39, 1.99)	-0.48(0.385)
STATION 3	1044	1536	-491 (-805, -178)	-509 (-695, -326)	1.19 (0.53, 2.70)	0.68(0.385)
STATION 4	525	935	-410 (-603, -216)	-415 (-549, -197)	0.26 (0.11, 0.59)	0.60(0.385)
STATION 5	601	864	-263 (-452, -74)	-226 (-411, -64)	0.59 (0.26, 1.33)	0.40(0.385)
STATION 6	816	1207	-391 (-565, -217)	-319 (-465, -231)	0.41 (0.18, 0.94)	0.56(0.385)
STATION 7	1080	1244	-165 (-319, -11)	-93 (-283, -2)	0.54 (0.24, 1.22)	0.36(0.385)
STATION 8	996	2089	-1093 (-1483, -702)	-769 (-1248, -583)	0.11 (0.05, 0.25)	0.76(0.385)
STATION 9	991	1532	-541 (-803, -279)	-494 (-634, -261)	0.20 (0.09, 0.47)	0.56(0.385)
STATION10	917	1509	-592 (-833, -351)	-597 (-724, -350)	0.46 (0.20, 1.04)	0.64(0.385)
STATION11	853	1725	-872 (-1108, -636)	-843 (-1022, -613)	0.31 (0.14, 0.71)	0.80(0.385)
STATION12	729	1596	-867 (-1104, -631)	-782 (-889, -578)	0.15 (0.07, 0.34)	0.92(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	1385	2870	-1484 (-1765, -1204)	-1431 (-1658, -1237)	0.63 (0.28, 1.43)	0.96(0.385)
2.5 TO 5.0	1345	1904	-559 (-729, -389)	-483 (-687, -403)	0.64 (0.28, 1.46)	0.92(0.385)
> 5.0 M/SEC	918	1275	-357 (-470, -244)	-429 (-482, -273)	1.08 (0.47, 2.44)	0.72(0.385)
B. STABILITY GROUP						
CLASS A & B	1400	2622	-1222 (-1511, -933)	-1157 (-1371, -965)	0.57 (0.25, 1.30)	0.92(0.385)
CLASS C	1221	2002	-781 (-1077, -485)	-453 (-1072, -374)	0.08 (0.04, 0.18)	0.92(0.385)
CLASS D	1126	1397	-271 (-560, 17)	-178 (-435, 71)	0.26 (0.11, 0.58)	0.32(0.385)
CLASS E & F	444	174	269 (213, 325)	276 (209, 316)	2.33 (1.03, 5.30)	-0.96(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	995	1285	-290 (-400, -181)	-293 (-378, -191)	0.90 (0.39, 2.03)	0.68(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	234	344	-110 (-279, 60)	28 (-192, 93)	0.08 (0.04, 0.18)	-0.52(0.385)
STATION 2	308	184	124 (66, 182)	86 (56, 150)	3.99 (1.76, 9.05)	-0.52(0.385)
STATION 3	538	629	-91 (-239, 56)	-98 (-178, -33)	1.17 (0.52, 2.66)	0.48(0.385)
STATION 4	259	303	-44 (-140, 53)	19 (-133, 81)	0.25 (0.11, 0.58)	-0.32(0.385)
STATION 5	284	279	5 (-86, 96)	-1 (-71, 103)	0.52 (0.23, 1.19)	-0.28(0.385)
STATION 6	436	606	-170 (-287, -53)	-182 (-255, -67)	0.63 (0.28, 1.43)	0.48(0.385)
STATION 7	600	496	104 (4, 205)	84 (8, 144)	2.08 (0.92, 4.72)	-0.36(0.385)
STATION 8	552	822	-271 (-457, -84)	-258 (-392, -46)	0.40 (0.18, 0.91)	0.44(0.385)
STATION 9	584	660	-76 (-217, 66)	-16 (-150, 35)	0.52 (0.23, 1.18)	0.24(0.385)
STATION10	516	602	-86 (-236, 64)	-112 (-175, -17)	1.12 (0.49, 2.54)	0.44(0.385)
STATION11	429	712	-283 (-413, -153)	-253 (-368, -158)	0.57 (0.25, 1.29)	0.64(0.385)
STATION12	423	708	-285 (-403, -167)	-234 (-392, -127)	0.24 (0.10, 0.54)	0.60(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	761	1102	-341 (-491, -191)	-374 (-487, -204)	0.94 (0.41, 2.14)	0.68(0.385)
2.5 TO 5.0	856	1004	-148 (-281, -16)	-51 (-239, -4)	0.61 (0.27, 1.39)	0.36(0.385)
> 5.0 M/SEC	533	652	-119 (-221, -18)	-49 (-149, 1)	0.16 (0.07, 0.36)	0.32(0.385)
B. STABILITY GROUP						
CLASS A & B	806	1131	-325 (-462, -188)	-297 (-450, -197)	0.81 (0.36, 1.85)	0.64(0.385)
CLASS C	700	956	-255 (-400, -110)	-244 (-359, -114)	0.60 (0.26, 1.36)	0.56(0.385)
CLASS D	669	610	59 (-66, 184)	76 (-17, 135)	0.95 (0.42, 2.15)	-0.28(0.385)
CLASS E & F	311	98	213 (150, 277)	206 (175, 222)	2.75 (1.21, 6.24)	-0.96(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 24 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	238	236	1 (-29, 32)	12 (-27, 35)	0.57 (0.25, 1.29)	-0.32(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	60	46	14 (-14, 42)	37 (11, 44)	0.21 (0.09, 0.48)	-0.60(0.385)
STATION 2	61	33	28 (14, 42)	21 (14, 38)	1.84 (0.81, 4.18)	-0.56(0.385)
STATION 3	114	112	1 (-26, 29)	-5 (-22, 13)	1.82 (0.80, 4.13)	0.16(0.385)
STATION 4	50	47	3 (-19, 25)	13 (-7, 29)	0.16 (0.07, 0.37)	-0.48(0.385)
STATION 5	52	44	8 (-13, 28)	13 (1, 30)	0.31 (0.14, 0.70)	-0.44(0.385)
STATION 6	106	105	1 (-25, 27)	9 (-14, 24)	0.51 (0.22, 1.15)	-0.28(0.385)
STATION 7	143	85	58 (32, 84)	59 (24, 75)	2.51 (1.11, 5.70)	-0.68(0.385)
STATION 8	104	127	-23 (-65, 18)	-27 (-51, 14)	0.54 (0.24, 1.22)	0.28(0.385)
STATION 9	139	123	16 (-16, 49)	11 (-14, 41)	1.15 (0.51, 2.62)	-0.20(0.385)
STATION10	127	89	38 (3, 73)	18 (9, 37)	3.04 (1.34, 6.89)	-0.52(0.385)
STATION11	90	116	-26 (-60, 8)	-6 (-38, 9)	0.24 (0.10, 0.54)	0.36(0.385)
STATION12	101	121	-20 (-50, 11)	-21 (-34, 11)	0.35 (0.15, 0.79)	0.24(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	1590	5479	-3889 (-4601, -3176)	-3460 (-3827, -2989)	0.05 (0.02, 0.12)	1.00(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	444	2937	-2494 (-3076, -1911)	-2168 (-2837, -1473)	0.02 (0.01, 0.05)	1.00(0.385)
STATION 2	586	748	-162 (-287, -37)	-120 (-241, -33)	0.41 (0.18, 0.93)	0.36(0.385)
STATION 3	1044	2734	-1690 (-2108, -1271)	-1627 (-2154, -1206)	0.45 (0.20, 1.01)	0.88(0.385)
STATION 4	525	1597	-1072 (-1357, -788)	-942 (-1236, -687)	0.11 (0.05, 0.24)	0.92(0.385)
STATION 5	601	1321	-721 (-974, -467)	-680 (-872, -437)	0.26 (0.12, 0.60)	0.76(0.385)
STATION 6	816	1775	-959 (-1122, -797)	-943 (-1075, -797)	0.50 (0.22, 1.14)	1.00(0.385)
STATION 7	1080	1808	-728 (-975, -482)	-575 (-858, -431)	0.16 (0.07, 0.37)	0.84(0.385)
STATION 8	996	4435	-3439 (-4338, -2539)	-2808 (-3628, -2121)	0.02 (0.01, 0.04)	1.00(0.385)
STATION 9	991	2375	-1384 (-1705, -1062)	-1278 (-1502, -988)	0.13 (0.06, 0.29)	1.00(0.385)
STATION10	917	2215	-1298 (-1657, -939)	-1312 (-1499, -822)	0.17 (0.07, 0.38)	0.92(0.385)
STATION11	853	2988	-2135 (-2622, -1648)	-1874 (-2146, -1518)	0.06 (0.03, 0.14)	1.00(0.385)
STATION12	729	2292	-1563 (-1877, -1248)	-1450 (-1585, -1156)	0.08 (0.04, 0.18)	1.00(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	1385	5374	-3989 (-4731, -3247)	-3671 (-4041, -3039)	0.06 (0.03, 0.14)	1.00(0.385)
2.5 TO 5.0	1345	3411	-2066 (-2364, -1768)	-1964 (-2231, -1660)	0.15 (0.07, 0.34)	1.00(0.385)
> 5.0 M/SEC	918	2109	-1191 (-1364, -1019)	-1146 (-1259, -1019)	0.29 (0.13, 0.66)	1.00(0.385)
B. STABILITY GROUP						
CLASS A & B	1400	4742	-3342 (-3840, -2843)	-3013 (-3566, -2693)	0.14 (0.06, 0.33)	1.00(0.385)
CLASS C	1221	3966	-2745 (-3566, -1923)	-2313 (-2603, -1833)	0.01 (0.00, 0.02)	1.00(0.385)
CLASS D	1126	3028	-1903 (-2225, -1580)	-1800 (-2062, -1512)	0.20 (0.09, 0.45)	1.00(0.385)
CLASS E & F	444	922	-479 (-617, -341)	-387 (-494, -318)	0.13 (0.06, 0.30)	0.88(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	995	2552	-1557 (-1869, -1245)	-1287 (-1824, -1060)	0.06 (0.03, 0.15)	1.00(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	234	1220	-986 (-1279, -693)	-709 (-1353, -569)	0.03 (0.01, 0.06)	0.96(0.385)
STATION 2	308	348	-41 (-108, 26)	-59 (-96, 3)	1.44 (0.63, 3.26)	0.40(0.385)
STATION 3	538	1279	-741 (-938, -543)	-707 (-848, -589)	0.43 (0.19, 0.99)	0.92(0.385)
STATION 4	259	631	-372 (-516, -227)	-229 (-440, -161)	0.10 (0.04, 0.23)	0.68(0.385)
STATION 5	284	516	-232 (-356, -107)	-198 (-298, -82)	0.23 (0.10, 0.52)	0.48(0.385)
STATION 6	436	906	-470 (-595, -346)	-555 (-626, -328)	0.52 (0.23, 1.19)	0.84(0.385)
STATION 7	600	826	-226 (-342, -111)	-198 (-306, -149)	1.05 (0.46, 2.39)	0.72(0.385)
STATION 8	552	1998	-1446 (-1864, -1028)	-1062 (-1499, -844)	0.06 (0.03, 0.14)	0.92(0.385)
STATION 9	584	1200	-617 (-774, -459)	-555 (-671, -481)	0.38 (0.17, 0.86)	0.92(0.385)
STATION10	516	943	-427 (-602, -252)	-439 (-504, -320)	0.64 (0.28, 1.45)	0.76(0.385)
STATION11	429	1353	-924 (-1174, -675)	-685 (-1057, -622)	0.11 (0.05, 0.26)	0.96(0.385)
STATION12	423	1258	-835 (-946, -724)	-860 (-929, -711)	0.27 (0.12, 0.62)	1.00(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	761	2226	-1466 (-1834, -1098)	-1168 (-1626, -921)	0.09 (0.04, 0.21)	1.00(0.385)
2.5 TO 5.0	856	1846	-990 (-1222, -759)	-905 (-1047, -733)	0.15 (0.06, 0.33)	1.00(0.385)
> 5.0 M/SEC	533	1291	-758 (-874, -643)	-711 (-818, -596)	0.12 (0.05, 0.27)	1.00(0.385)
B. STABILITY GROUP						
CLASS A & B	806	2007	-1200 (-1494, -907)	-1060 (-1329, -794)	0.11 (0.05, 0.26)	0.92(0.385)
CLASS C	700	1894	-1194 (-1509, -878)	-976 (-1125, -834)	0.09 (0.04, 0.20)	0.96(0.385)
CLASS D	669	1573	-904 (-1146, -662)	-801 (-924, -721)	0.15 (0.07, 0.35)	0.96(0.385)
CLASS E & F	311	495	-184 (-276, -93)	-228 (-268, -94)	0.54 (0.24, 1.22)	0.76(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 24 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	238	507	-269 (-322, -216)	-241 (-294, -211)	0.14 (0.06, 0.31)	1.00(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	60	202	-142 (-200, -84)	-137 (-179, -45)	0.04 (0.02, 0.10)	0.56(0.385)
STATION 2	61	70	-9 (-28, 10)	-22 (-29, 10)	0.61 (0.27, 1.39)	0.20(0.385)
STATION 3	114	271	-157 (-195, -119)	-158 (-182, -120)	0.49 (0.22, 1.11)	0.88(0.385)
STATION 4	50	117	-67 (-99, -35)	-51 (-78, -21)	0.07 (0.03, 0.16)	0.56(0.385)
STATION 5	52	97	-45 (-72, -18)	-27 (-54, -10)	0.16 (0.07, 0.37)	0.40(0.385)
STATION 6	106	175	-69 (-94, -43)	-70 (-99, -41)	0.56 (0.25, 1.27)	0.68(0.385)
STATION 7	143	173	-30 (-63, 3)	-25 (-61, -2)	0.81 (0.36, 1.84)	0.44(0.385)
STATION 8	104	387	-283 (-361, -205)	-263 (-320, -183)	0.11 (0.05, 0.26)	0.92(0.385)
STATION 9	139	271	-132 (-179, -84)	-96 (-146, -85)	0.34 (0.15, 0.77)	0.76(0.385)
STATION10	127	176	-49 (-87, -11)	-71 (-80, -42)	1.65 (0.73, 3.75)	0.80(0.385)
STATION11	90	240	-150 (-201, -100)	-123 (-163, -79)	0.10 (0.04, 0.22)	0.92(0.385)
STATION12	101	262	-161 (-202, -119)	-150 (-173, -114)	0.17 (0.07, 0.38)	0.92(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	1590	1505	85 (-127, 296)	88 (-44, 174)	1.22 (0.54, 2.76)	-0.32(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	444	514	-71 (-195, 53)	-89 (-147, -3)	0.93 (0.41, 2.12)	0.44(0.385)
STATION 2	586	350	235 (83, 388)	319 (212, 362)	0.25 (0.11, 0.56)	-0.84(0.385)
STATION 3	1044	781	263 (0, 526)	217 (66, 281)	3.71 (1.63, 8.41)	-0.56(0.385)
STATION 4	525	568	-43 (-171, 84)	-41 (-159, 69)	0.88 (0.39, 1.99)	0.20(0.385)
STATION 5	601	500	101 (-35, 236)	57 (-41, 186)	2.62 (1.15, 5.95)	-0.24(0.385)
STATION 6	816	704	111 (-44, 267)	151 (8, 303)	0.58 (0.25, 1.31)	-0.36(0.385)
STATION 7	1080	731	349 (235, 463)	409 (234, 442)	1.77 (0.78, 4.01)	-0.72(0.385)
STATION 8	996	791	205 (39, 372)	263 (89, 348)	1.10 (0.48, 2.49)	-0.56(0.385)
STATION 9	991	871	120 (-62, 303)	224 (58, 292)	0.53 (0.23, 1.19)	-0.52(0.385)
STATION10	917	840	77 (-111, 265)	76 (-40, 194)	1.06 (0.47, 2.40)	-0.24(0.385)
STATION11	853	958	-105 (-317, 106)	-72 (-166, 36)	0.42 (0.18, 0.95)	0.32(0.385)
STATION12	729	772	-44 (-158, 71)	-42 (-123, 38)	1.19 (0.52, 2.69)	0.28(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	1385	1339	47 (-188, 282)	13 (-108, 173)	1.22 (0.54, 2.77)	-0.24(0.385)
2.5 TO 5.0	1345	1013	332 (164, 499)	392 (249, 466)	0.67 (0.30, 1.52)	-0.72(0.385)
> 5.0 M/SEC	918	988	-70 (-202, 63)	-32 (-139, 48)	0.61 (0.27, 1.37)	0.24(0.385)
B. STABILITY GROUP						
CLASS A & B	1400	1243	157 (-41, 356)	67 (-43, 229)	3.63 (1.60, 8.23)	-0.28(0.385)
CLASS C	1221	1231	-10 (-211, 191)	45 (-97, 209)	0.19 (0.08, 0.43)	-0.44(0.385)
CLASS D	1126	454	671 (475, 867)	766 (559, 826)	0.77 (0.34, 1.74)	-0.84(0.385)
CLASS E & F	444	39	405 (356, 454)	397 (322, 435)	24.46 (10.78,55.51)	-1.00(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	995	736	258 (164, 352)	242 (165, 333)	1.82 (0.80, 4.12)	-0.64(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	234	220	14 (-57, 84)	12 (-53, 74)	0.73 (0.32, 1.65)	-0.44(0.385)
STATION 2	308	165	143 (75, 210)	141 (87, 179)	1.38 (0.61, 3.14)	-0.68(0.385)
STATION 3	538	400	138 (16, 260)	84 (26, 123)	4.13 (1.82, 9.37)	-0.48(0.385)
STATION 4	259	243	17 (-45, 79)	13 (-41, 69)	0.94 (0.41, 2.12)	-0.24(0.385)
STATION 5	284	211	73 (8, 137)	28 (-2, 115)	2.22 (0.98, 5.04)	-0.28(0.385)
STATION 6	436	362	74 (-23, 170)	50 (9, 113)	1.32 (0.58, 2.99)	-0.40(0.385)
STATION 7	600	391	209 (114, 304)	167 (104, 243)	3.30 (1.45, 7.48)	-0.64(0.385)
STATION 8	552	419	133 (19, 247)	31 (8, 163)	3.27 (1.44, 7.43)	-0.40(0.385)
STATION 9	584	465	119 (11, 228)	133 (34, 196)	1.37 (0.60, 3.11)	-0.48(0.385)
STATION10	516	411	104 (-31, 239)	47 (3, 139)	1.92 (0.85, 4.37)	-0.44(0.385)
STATION11	429	439	-10 (-110, 89)	-22 (-97, 52)	1.62 (0.71, 3.67)	0.20(0.385)
STATION12	423	417	7 (-71, 84)	17 (-47, 70)	0.78 (0.34, 1.76)	-0.36(0.385)
3. BY METEOROLOGICAL CONDITION (A-5)						
A. WIND SPEED						
< 2.5 M/SEC	761	545	215 (87, 344)	211 (91, 301)	1.95 (0.86, 4.42)	-0.60(0.385)
2.5 TO 5.0	856	619	236 (138, 335)	252 (128, 322)	2.25 (0.99, 5.10)	-0.68(0.385)
> 5.0 M/SEC	533	492	41 (-28, 109)	63 (7, 116)	0.41 (0.18, 0.93)	-0.56(0.385)
B. STABILITY GROUP						
CLASS A & B	806	636	170 (60, 280)	215 (47, 265)	2.35 (1.04, 5.34)	-0.52(0.385)
CLASS C	700	609	91 (-18, 200)	49 (-6, 143)	1.95 (0.86, 4.43)	-0.28(0.385)
CLASS D	669	326	343 (245, 441)	319 (230, 376)	4.33 (1.91, 9.83)	-0.84(0.385)
CLASS E & F	311	22	289 (232, 345)	252 (230, 272)	24.84 (10.94,56.36)	-1.00(0.385)

TABLE A. COMPARISON OF 25 HIGHEST OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 24 HOUR

DATA SETS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	DIFFERENCE OF MEDIANS (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS (A-4A)	238	164	73 (50, 97)	75 (52, 90)	1.47 (0.65, 3.33)	-0.80(0.385)
2. BY STATION/ALL EVENTS (A-4B)						
STATION 1	60	36	24 (7, 42)	33 (13, 40)	0.83 (0.37, 1.89)	-0.56(0.385)
STATION 2	61	33	29 (15, 42)	21 (13, 38)	2.36 (1.04, 5.36)	-0.56(0.385)
STATION 3	114	92	21 (-4, 46)	15 (-4, 27)	3.53 (1.56, 8.01)	-0.32(0.385)
STATION 4	50	44	6 (-9, 21)	9 (-2, 22)	0.42 (0.19, 0.96)	-0.44(0.385)
STATION 5	52	38	14 (-1, 29)	15 (3, 28)	0.81 (0.36, 1.84)	-0.44(0.385)
STATION 6	106	73	34 (14, 53)	36 (19, 47)	1.49 (0.66, 3.39)	-0.60(0.385)
STATION 7	143	76	67 (41, 93)	69 (40, 89)	2.59 (1.14, 5.88)	-0.72(0.385)
STATION 8	104	82	22 (-8, 51)	7 (-7, 31)	2.17 (0.96, 4.93)	-0.24(0.385)
STATION 9	139	95	44 (14, 73)	41 (15, 64)	1.77 (0.78, 4.01)	-0.44(0.385)
STATION10	127	78	49 (16, 82)	29 (19, 46)	4.81 (2.12,10.91)	-0.72(0.385)
STATION11	90	85	5 (-19, 29)	6 (-5, 24)	0.64 (0.28, 1.45)	-0.28(0.385)
STATION12	101	85	16 (-8, 40)	16 (2, 34)	0.72 (0.32, 1.64)	-0.52(0.385)

APPENDIX B

Statistics For All Events

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4012	195.8	90.9	104.9 (94.4, 115.5)	0.71 (0.67, 0.75)	-0.74 (0.030)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	8962	153.4	44.1	109.2 (104.1, 114.4)	0.82 (0.79, 0.86)	-0.83 (0.020)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	373	140.1	9.3	130.8 (117.1, 144.4)	2.09 (1.71, 2.57)	-0.94 (0.100)
STATION 2	324	151.0	34.9	116.1 (95.2, 136.9)	2.02 (1.63, 2.52)	-0.72 (0.107)
STATION 3	1010	157.2	56.6	100.6 (83.0, 118.3)	0.88 (0.77, 0.99)	-0.80 (0.061)
STATION 4	230	162.8	37.2	125.6 (96.1, 155.2)	0.88 (0.68, 1.14)	-0.87 (0.127)
STATION 5	234	162.3	39.7	122.6 (89.4, 155.8)	1.15 (0.89, 1.48)	-0.79 (0.126)
STATION 6	982	141.5	50.5	90.9 (77.1, 104.8)	0.64 (0.56, 0.72)	-0.81 (0.061)
STATION 7	1065	163.1	41.9	121.2 (105.8, 136.6)	1.27 (1.13, 1.43)	-0.80 (0.059)
STATION 8	709	169.3	48.1	121.1 (99.7, 142.6)	0.92 (0.79, 1.06)	-0.86 (0.072)
STATION 9	843	170.4	67.2	103.1 (83.2, 123.1)	0.75 (0.65, 0.86)	-0.74 (0.066)
STATION10	1336	147.2	25.0	122.2 (111.6, 132.8)	1.20 (1.08, 1.33)	-0.89 (0.053)
STATION11	865	145.3	47.0	98.3 (80.0, 116.5)	0.47 (0.41, 0.53)	-0.87 (0.065)
STATION12	991	141.9	47.1	94.8 (80.2, 109.5)	0.47 (0.41, 0.53)	-0.85 (0.061)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	1146	222.8	45.1	177.7 (159.2, 196.3)	1.82 (1.62, 2.05)	-0.87 (0.057)
2.5 TO 5.0	3118	164.2	75.2	89.0 (78.3, 99.8)	0.61 (0.57, 0.66)	-0.74 (0.034)
> 5.0 M/SEC	4698	129.3	23.3	106.0 (101.2, 110.8)	0.72 (0.68, 0.76)	-0.88 (0.028)
B. STABILITY GROUP						
CLASS A & B	1377	190.0	173.8	16.2 (-7.0, 39.3)	0.51 (0.46, 0.56)	-0.48 (0.052)
CLASS C	1659	183.8	90.8	93.0 (77.5, 108.5)	0.91 (0.82, 1.00)	-0.62 (0.047)
CLASS D	3880	145.5	1.4	144.1 (139.9, 148.2)	132 (124, 141)	-0.96 (0.031)
CLASS E & F	2046	119.1	0.1	119.1 (116.5, 121.7)	2481 (2275, 2705)	-1.00 (0.043)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (UG/M**3)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4012	104.9 (89.9, 120.0)	0.86	318(311, 325)	335	223.1	0.13 (0.10, 0.16)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	8962	109.2 (101.4, 117.1)	0.91	250(246, 254)	273	179.5	-0.01 (-0.03, 0.01)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	373	130.8 (112.4, 149.1)	0.98	130(121, 140)	184	142.2	0.08 (-0.02, 0.18)
STATION 2	324	116.1 (83.8, 148.3)	0.84	194(180, 210)	226	165.6	-0.04 (-0.14, 0.07)
STATION 3	1010	100.6 (74.5, 126.7)	0.89	299(286, 312)	315	197.8	-0.09 (-0.15,-0.03)
STATION 4	230	125.6 (97.2, 154.1)	0.92	199(182, 219)	235	166.4	0.24 (0.12, 0.36)
STATION 5	234	122.6 (81.3, 164.0)	0.89	240(220, 264)	269	170.4	0.14 (0.01, 0.26)
STATION 6	982	90.9 (70.4, 111.5)	0.90	210(201, 220)	229	163.9	0.10 (0.04, 0.17)
STATION 7	1065	121.2 (97.1, 145.2)	0.89	263(253, 275)	290	190.3	-0.06 (-0.12, 0.00)
STATION 8	709	121.1 (88.4, 153.9)	0.93	286(272, 302)	310	195.8	0.03 (-0.04, 0.11)
STATION 9	843	103.1 (66.3, 140.0)	0.86	305(291, 321)	322	217.0	-0.07 (-0.13, 0.00)
STATION10	1336	122.2 (104.9, 139.5)	0.95	202(194, 210)	236	161.2	-0.04 (-0.10, 0.01)
STATION11	865	98.3 (71.5, 125.0)	0.93	278(265, 291)	294	179.3	-0.03 (-0.10, 0.04)
STATION12	991	94.8 (74.4, 115.3)	0.92	232(222, 243)	251	169.3	0.03 (-0.03, 0.09)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	1146	177.7 (151.1, 204.3)	0.93	325(312, 339)	370	245.5	-0.03 (-0.09, 0.02)
2.5 TO 5.0	3118	89.0 (74.8, 103.2)	0.86	301(294, 309)	314	203.3	0.03 (-0.00, 0.07)
> 5.0 M/SEC	4698	106.0 (98.2, 113.7)	0.94	178(175, 182)	207	147.6	-0.14 (-0.16,-0.11)
B. STABILITY GROUP							
CLASS A & B	1377	16.2 (-15.1, 47.5)	0.71	445(429, 462)	445	288.7	-0.03 (-0.08, 0.02)
CLASS C	1659	93.0 (70.6, 115.4)	0.80	343(332, 355)	355	240.9	-0.14 (-0.18,-0.09)
CLASS D	3880	144.1 (137.5, 150.6)	0.98	132(129, 135)	195	146.3	-0.11 (-0.14,-0.07)
CLASS E & F	2046	119.1 (115.1, 123.0)	1.00	60(58, 62)	133	119.1	-0.04 (-0.08, 0.01)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1620	145.7	67.0	78.7 (67.6, 89.9)	1.11 (1.00, 1.22)	-0.68 (0.048)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4322	102.6	29.6	73.0 (68.2, 77.8)	1.30 (1.22, 1.38)	-0.82 (0.029)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	176	92.3	6.5	85.8 (72.4, 99.2)	3.45 (2.56, 4.65)	-0.95 (0.145)
STATION 2	154	102.8	21.9	80.9 (61.4, 100.4)	4.32 (3.14, 5.94)	-0.71 (0.155)
STATION 3	508	101.6	36.7	64.9 (49.9, 79.9)	1.38 (1.16, 1.65)	-0.79 (0.085)
STATION 4	108	109.1	25.7	83.5 (56.9, 110.0)	1.16 (0.79, 1.70)	-0.86 (0.185)
STATION 5	113	107.4	25.4	82.0 (54.1, 109.8)	1.50 (1.03, 2.17)	-0.85 (0.181)
STATION 6	465	97.2	33.5	63.7 (50.0, 77.4)	0.91 (0.76, 1.09)	-0.81 (0.089)
STATION 7	496	112.3	29.8	82.5 (67.5, 97.5)	2.14 (1.80, 2.56)	-0.80 (0.086)
STATION 8	359	107.9	31.2	76.7 (56.9, 96.5)	1.54 (1.26, 1.90)	-0.84 (0.102)
STATION 9	386	121.8	47.6	74.2 (54.0, 94.4)	1.26 (1.04, 1.54)	-0.70 (0.098)
STATION10	628	101.0	17.5	83.6 (72.5, 94.6)	2.01 (1.72, 2.35)	-0.88 (0.077)
STATION11	455	88.1	28.3	59.8 (44.8, 74.8)	0.67 (0.56, 0.81)	-0.89 (0.090)
STATION12	474	96.6	32.7	63.9 (50.2, 77.6)	0.73 (0.61, 0.88)	-0.82 (0.088)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	495	153.4	34.3	119.1 (100.4, 137.7)	3.06 (2.56, 3.65)	-0.82 (0.086)
2.5 TO 5.0	1506	113.6	51.5	62.2 (52.1, 72.3)	0.99 (0.89, 1.09)	-0.72 (0.050)
> 5.0 M/SEC	2321	84.7	14.5	70.2 (65.8, 74.6)	1.24 (1.15, 1.35)	-0.89 (0.040)
B. STABILITY GROUP						
CLASS A & B	629	134.0	105.3	28.7 (7.6, 49.9)	0.83 (0.71, 0.97)	-0.53 (0.077)
CLASS C	717	126.8	66.1	60.7 (45.1, 76.2)	1.23 (1.06, 1.43)	-0.57 (0.072)
CLASS D	1969	95.8	7.3	88.5 (83.7, 93.3)	6.18 (5.65, 6.75)	-0.92 (0.043)
CLASS E & F	1007	79.1	0.0	79.1 (75.5, 82.8)	33818 (29884,38269)	-1.00 (0.061)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1620	78.7 (65.0, 92.4)	0.83	202(196, 210)	217	151.0	0.22 (0.17, 0.27)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4322	73.0 (67.1, 78.9)	0.90	155(152, 159)	172	112.9	0.08 (0.05, 0.11)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	176	85.8 (70.4, 101.3)	0.97	85(77, 96)	121	92.2	0.13 (-0.02, 0.27)
STATION 2	154	80.9 (59.4, 102.4)	0.85	115(104, 130)	140	100.8	0.16 (0.00, 0.31)
STATION 3	508	64.9 (46.1, 83.7)	0.87	169(159, 180)	181	117.3	0.04 (-0.05, 0.13)
STATION 4	108	83.5 (61.7, 105.3)	0.92	108(95, 124)	136	101.3	0.41 (0.24, 0.55)
STATION 5	113	82.0 (49.8, 114.1)	0.92	130(115, 150)	153	105.5	0.26 (0.07, 0.42)
STATION 6	465	63.7 (47.9, 79.4)	0.90	133(125, 142)	147	106.8	0.22 (0.13, 0.31)
STATION 7	496	82.5 (62.5, 102.5)	0.89	171(161, 183)	190	124.4	-0.02 (-0.11, 0.07)
STATION 8	359	76.7 (56.1, 97.3)	0.92	180(168, 195)	196	118.8	0.11 (0.01, 0.21)
STATION 9	386	74.2 (44.3, 104.1)	0.84	201(188, 217)	214	144.6	0.01 (-0.09, 0.10)
STATION10	628	83.6 (69.2, 97.9)	0.94	140(133, 149)	163	107.3	0.01 (-0.07, 0.09)
STATION11	455	59.8 (42.7, 76.9)	0.93	155(146, 166)	166	101.4	0.10 (0.01, 0.19)
STATION12	474	63.9 (47.4, 80.4)	0.90	144(136, 154)	158	106.6	0.10 (0.01, 0.19)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (UG/M**3)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	495	119.1 (96.6, 141.6)	0.90	211(199, 225)	242	159.4	0.01 (-0.08, 0.10)
2.5 TO 5.0	1506	62.2 (51.2, 73.2)	0.85	186(180, 193)	196	127.3	0.14 (0.09, 0.18)
> 5.0 M/SEC	2321	70.2 (64.3, 76.1)	0.94	112(108, 115)	132	93.7	-0.06 (-0.10,-0.02)
B. STABILITY GROUP							
CLASS A & B	629	28.7 (6.0, 51.5)	0.73	257(244, 272)	258	167.0	0.10 (0.02, 0.17)
CLASS C	717	60.7 (43.7, 77.6)	0.77	215(204, 227)	223	150.1	-0.03 (-0.10, 0.04)
CLASS D	1969	88.5 (82.4, 94.7)	0.96	111(108, 115)	142	99.4	-0.05 (-0.09,-0.01)
CLASS E & F	1007	79.1 (74.6, 83.6)	1.00	59(56, 62)	99	79.1	0.07 (0.01, 0.13)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	343	68.8	35.4	33.4 (25.3, 41.5)	1.47 (1.19, 1.81)	-0.43 (0.104)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1516	37.0	10.9	26.1 (23.5, 28.6)	1.99 (1.80, 2.20)	-0.73 (0.049)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	69	31.2	2.2	29.0 (21.8, 36.2)	8.60 (5.32,13.88)	-0.94 (0.232)
STATION 2	58	34.4	8.5	25.8 (17.0, 34.7)	4.19 (2.48, 7.08)	-0.64 (0.253)
STATION 3	184	35.7	12.3	23.4 (16.2, 30.7)	1.73 (1.29, 2.31)	-0.71 (0.142)
STATION 4	47	32.9	7.8	25.2 (15.5, 34.8)	1.02 (0.57, 1.83)	-0.81 (0.281)
STATION 5	52	30.5	7.3	23.3 (13.6, 32.9)	1.52 (0.87, 2.65)	-0.83 (0.267)
STATION 6	164	34.9	12.7	22.2 (14.7, 29.6)	1.40 (1.03, 1.90)	-0.70 (0.150)
STATION 7	156	45.5	12.1	33.4 (24.3, 42.5)	4.45 (3.24, 6.10)	-0.65 (0.154)
STATION 8	126	37.0	11.3	25.6 (16.2, 35.1)	2.12 (1.49, 3.02)	-0.79 (0.171)
STATION 9	130	45.0	18.4	26.7 (15.0, 38.4)	2.05 (1.45, 2.89)	-0.54 (0.169)
STATION10	199	40.9	7.1	33.9 (26.8, 40.9)	4.53 (3.43, 5.99)	-0.81 (0.136)
STATION11	165	30.3	10.3	20.0 (12.8, 27.2)	0.78 (0.57, 1.06)	-0.82 (0.150)
STATION12	166	34.4	11.8	22.6 (15.3, 29.9)	1.19 (0.88, 1.62)	-0.73 (0.149)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	343	33.4 (24.1, 42.7)	0.74	71(66, 77)	79	57.1	0.13 (0.02, 0.23)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1516	26.1 (23.2, 29.0)	0.87	48(46, 49)	54	36.6	0.12 (0.07, 0.17)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	69	29.0 (19.9, 38.1)	0.96	30(26, 36)	42	30.6	-0.00 (-0.24, 0.23)
STATION 2	58	25.8 (18.8, 32.9)	0.90	30(25, 37)	39	28.8	0.27 (0.01, 0.49)
STATION 3	184	23.4 (15.0, 31.9)	0.84	48(43, 53)	53	35.7	0.10 (-0.05, 0.24)
STATION 4	47	25.2 (19.1, 31.2)	0.94	25(21, 32)	35	28.3	0.43 (0.16, 0.64)
STATION 5	52	23.3 (14.9, 31.6)	0.92	31(26, 38)	38	28.6	0.23 (-0.05, 0.47)
STATION 6	164	22.2 (14.5, 29.9)	0.83	43(39, 48)	48	36.1	0.22 (0.07, 0.36)
STATION 7	156	33.4 (20.3, 46.5)	0.84	59(53, 66)	68	46.4	-0.06 (-0.22, 0.10)
STATION 8	126	25.6 (17.6, 33.7)	0.90	44(39, 50)	51	34.9	0.36 (0.20, 0.50)
STATION 9	130	26.7 (13.8, 39.5)	0.77	67(59, 76)	71	47.4	0.04 (-0.14, 0.21)
STATION10	199	33.9 (25.3, 42.4)	0.92	50(46, 56)	61	39.4	0.02 (-0.12, 0.15)
STATION11	165	20.0 (12.9, 27.2)	0.89	44(40, 50)	49	32.2	0.12 (-0.04, 0.26)
STATION12	166	22.6 (14.2, 30.9)	0.87	44(40, 49)	49	33.3	0.16 (0.01, 0.31)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4388	179.1	157.9	21.2 (8.0, 34.4)	0.31 (0.29, 0.33)	-0.55 (0.029)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	9712	141.5	81.1	60.5 (53.9, 67.0)	0.34 (0.33, 0.35)	-0.69 (0.020)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	392	133.3	67.8	65.5 (31.7, 99.2)	0.12 (0.10, 0.15)	-0.82 (0.097)
STATION 2	360	135.9	57.3	78.5 (57.5, 99.6)	1.39 (1.13, 1.71)	-0.54 (0.101)
STATION 3	1083	146.6	86.7	59.9 (39.3, 80.6)	0.45 (0.40, 0.51)	-0.69 (0.058)
STATION 4	273	137.2	99.8	37.4 (-2.5, 77.2)	0.27 (0.21, 0.35)	-0.62 (0.116)
STATION 5	281	135.2	94.7	40.5 (2.5, 78.5)	0.47 (0.37, 0.59)	-0.51 (0.115)
STATION 6	1046	132.8	78.8	54.1 (37.5, 70.6)	0.34 (0.30, 0.39)	-0.70 (0.059)
STATION 7	1134	153.2	62.0	91.2 (74.4, 107.9)	0.77 (0.69, 0.87)	-0.69 (0.057)
STATION 8	760	157.9	113.3	44.6 (11.4, 77.9)	0.22 (0.19, 0.25)	-0.70 (0.070)
STATION 9	948	151.5	107.7	43.8 (20.6, 66.9)	0.38 (0.33, 0.43)	-0.58 (0.062)
STATION10	1385	142.0	53.0	89.0 (74.5, 103.5)	0.39 (0.35, 0.43)	-0.81 (0.052)
STATION11	931	135.0	92.3	42.7 (19.5, 65.9)	0.22 (0.19, 0.25)	-0.73 (0.063)
STATION12	1119	125.7	82.4	43.3 (24.7, 61.8)	0.21 (0.19, 0.24)	-0.66 (0.057)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	1344	190.0	211.4	-21.4 (-52.9, 10.1)	0.22 (0.20, 0.24)	-0.54 (0.052)
2.5 TO 5.0	3276	156.3	106.0	50.2 (38.4, 62.1)	0.42 (0.39, 0.45)	-0.63 (0.034)
> 5.0 M/SEC	5092	119.3	30.6	88.6 (83.9, 93.4)	0.66 (0.62, 0.69)	-0.76 (0.027)
B. STABILITY GROUP						
CLASS A & B	1517	172.5	271.2	-98.7 (-127.4, -70.1)	0.24 (0.21, 0.26)	-0.31 (0.049)
CLASS C	1770	172.2	156.0	16.2 (-3.4, 35.8)	0.37 (0.34, 0.41)	-0.49 (0.046)
CLASS D	4319	130.7	21.7	109.0 (103.6, 114.5)	1.08 (1.02, 1.14)	-0.78 (0.029)
CLASS E & F	2106	115.7	3.0	112.7 (109.9, 115.6)	8.34 (7.65, 9.08)	-0.94 (0.042)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4388	21.2 (0.5, 41.9)	0.75	429(420, 438)	429	250.1	0.09 (0.06, 0.12)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	9712	60.5 (50.8, 70.1)	0.83	338(334, 343)	344	199.3	-0.06 (-0.08,-0.04)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	392	65.5 (14.4, 116.5)	0.91	355(332, 383)	361	187.5	-0.15 (-0.24,-0.05)
STATION 2	360	78.5 (44.7, 112.4)	0.73	217(202, 234)	230	169.5	-0.14 (-0.24,-0.04)
STATION 3	1083	59.9 (28.8, 91.1)	0.82	364(349, 380)	368	215.0	-0.11 (-0.17,-0.05)
STATION 4	273	37.4 (-13.7, 88.4)	0.77	336(310, 367)	337	202.3	-0.01 (-0.13, 0.11)
STATION 5	281	40.5 (-10.1, 91.1)	0.73	324(300, 354)	326	196.1	-0.00 (-0.12, 0.12)
STATION 6	1046	54.1 (27.5, 80.6)	0.84	272(261, 284)	277	182.4	0.01 (-0.05, 0.07)
STATION 7	1134	91.2 (66.0, 116.4)	0.83	296(284, 309)	310	195.4	-0.06 (-0.12,-0.00)
STATION 8	760	44.6 (-3.5, 92.8)	0.85	476(454, 502)	478	241.0	-0.05 (-0.12, 0.02)
STATION 9	948	43.8 (5.9, 81.6)	0.75	380(364, 398)	383	231.5	-0.11 (-0.17,-0.04)
STATION10	1385	89.0 (69.7, 108.3)	0.91	278(269, 289)	292	175.5	-0.03 (-0.08, 0.02)
STATION11	931	42.7 (8.1, 77.3)	0.85	372(356, 390)	374	207.6	-0.08 (-0.14,-0.01)
STATION12	1119	43.3 (18.8, 67.8)	0.80	322(309, 336)	325	184.7	-0.05 (-0.11, 0.01)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	1344	-21.4 (-62.5, 19.7)	0.76	626(603, 651)	626	360.4	-0.17 (-0.22,-0.12)
2.5 TO 5.0	3276	50.2 (34.4, 66.1)	0.81	346(338, 355)	350	219.4	-0.01 (-0.04, 0.03)
> 5.0 M/SEC	5092	88.6 (80.5, 96.7)	0.86	188(184, 191)	208	143.9	-0.17 (-0.19,-0.14)
B. STABILITY GROUP							
CLASS A & B	1517	-98.7 (-138.1, -59.4)	0.63	592(572, 614)	600	363.8	-0.11 (-0.16,-0.06)
CLASS C	1770	16.2 (-9.0, 41.4)	0.72	447(433, 462)	447	282.7	-0.14 (-0.19,-0.10)
CLASS D	4319	109.0 (101.3, 116.8)	0.87	191(187, 195)	220	146.9	-0.10 (-0.12,-0.07)
CLASS E & F	2106	112.7 (107.9, 117.6)	0.97	71(68, 73)	133	118.3	-0.23 (-0.27,-0.19)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1734	136.1	111.6	24.5 (11.3, 37.7)	0.53 (0.48, 0.58)	-0.49 (0.046)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4622	96.0	54.4	41.6 (35.8, 47.4)	0.56 (0.52, 0.59)	-0.68 (0.028)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	188	86.6	46.2	40.4 (11.6, 69.3)	0.19 (0.14, 0.25)	-0.80 (0.140)
STATION 2	172	92.0	37.2	54.8 (35.4, 74.2)	2.55 (1.89, 3.44)	-0.50 (0.147)
STATION 3	532	97.0	55.9	41.1 (23.8, 58.3)	0.70 (0.59, 0.83)	-0.68 (0.083)
STATION 4	125	94.3	63.8	30.5 (-1.9, 62.9)	0.45 (0.32, 0.64)	-0.58 (0.172)
STATION 5	140	86.7	55.4	31.3 (2.6, 59.9)	0.75 (0.54, 1.05)	-0.48 (0.163)
STATION 6	489	92.4	53.4	39.0 (22.7, 55.4)	0.46 (0.38, 0.55)	-0.71 (0.087)
STATION 7	521	106.9	44.5	62.5 (46.6, 78.3)	1.31 (1.11, 1.56)	-0.69 (0.084)
STATION 8	381	101.7	71.4	30.3 (3.0, 57.7)	0.41 (0.34, 0.50)	-0.70 (0.099)
STATION 9	421	111.7	77.1	34.6 (12.1, 57.0)	0.66 (0.55, 0.80)	-0.51 (0.094)
STATION10	652	97.4	37.2	60.2 (46.7, 73.6)	0.75 (0.64, 0.87)	-0.78 (0.075)
STATION11	487	82.3	55.7	26.7 (8.6, 44.7)	0.34 (0.28, 0.40)	-0.74 (0.087)
STATION12	514	89.1	59.3	29.8 (12.7, 47.0)	0.33 (0.28, 0.39)	-0.65 (0.085)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	593	128.1	133.3	-5.2 (-31.0, 20.6)	0.44 (0.38, 0.52)	-0.43 (0.079)
2.5 TO 5.0	1582	108.2	77.6	30.6 (19.2, 42.1)	0.58 (0.52, 0.64)	-0.61 (0.048)
> 5.0 M/SEC	2447	80.3	20.3	60.0 (55.4, 64.7)	0.92 (0.85, 1.00)	-0.78 (0.039)
B. STABILITY GROUP						
CLASS A & B	674	125.1	166.2	-41.1 (-66.1, -16.1)	0.41 (0.35, 0.48)	-0.37 (0.074)
CLASS C	783	116.2	113.5	2.6 (-16.0, 21.3)	0.51 (0.45, 0.59)	-0.39 (0.069)
CLASS D	2131	88.6	22.3	66.2 (60.6, 71.8)	1.44 (1.32, 1.57)	-0.75 (0.042)
CLASS E & F	1034	77.1	2.7	74.3 (70.5, 78.1)	9.23 (8.17,10.42)	-0.94 (0.060)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1734	24.5 (8.7, 40.3)	0.73	254(246, 263)	256	164.3	0.18 (0.14, 0.23)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4622	41.6 (34.5, 48.8)	0.83	200(196, 204)	204	125.0	0.02 (-0.01, 0.05)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	188	40.4 (5.4, 75.5)	0.87	209(190, 233)	212	118.2	-0.11 (-0.25, 0.03)
STATION 2	172	54.8 (32.1, 77.4)	0.75	124(112, 139)	135	100.1	0.09 (-0.06, 0.24)
STATION 3	532	41.1 (19.4, 62.7)	0.82	203(191, 216)	207	126.9	0.00 (-0.08, 0.09)
STATION 4	125	30.5 (-1.6, 62.6)	0.75	172(153, 196)	174	117.5	0.14 (-0.04, 0.31)
STATION 5	140	31.3 (2.0, 60.6)	0.73	161(144, 183)	163	111.7	0.13 (-0.04, 0.29)
STATION 6	489	39.0 (17.0, 61.1)	0.84	172(161, 183)	176	116.7	0.15 (0.06, 0.23)
STATION 7	521	62.5 (41.0, 83.9)	0.83	186(175, 198)	196	127.8	-0.01 (-0.10, 0.07)
STATION 8	381	30.3 (-3.2, 63.8)	0.84	269(251, 289)	270	145.9	0.03 (-0.07, 0.13)
STATION 9	421	34.6 (5.0, 64.2)	0.75	242(227, 259)	244	157.2	-0.06 (-0.15, 0.04)
STATION10	652	60.2 (45.7, 74.7)	0.90	173(164, 183)	183	115.7	0.02 (-0.05, 0.10)
STATION11	487	26.7 (5.2, 48.1)	0.85	202(190, 216)	204	117.3	0.01 (-0.08, 0.10)
STATION12	514	29.8 (8.7, 50.9)	0.81	196(185, 209)	198	121.3	0.02 (-0.06, 0.11)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	593	-5.2 (-38.7, 28.3)	0.69	336(318, 357)	336	214.2	-0.11 (-0.19,-0.03)
2.5 TO 5.0	1582	30.6 (18.0, 43.3)	0.79	223(215, 231)	225	140.3	0.08 (0.03, 0.13)
> 5.0 M/SEC	2447	60.0 (53.5, 66.6)	0.89	122(119, 126)	136	93.4	-0.10 (-0.14,-0.06)
B. STABILITY GROUP							
CLASS A & B	674	-41.1 (-67.3, -14.8)	0.63	332(315, 350)	334	211.0	-0.00 (-0.08, 0.07)
CLASS C	783	2.6 (-17.6, 22.9)	0.67	272(259, 287)	272	175.3	-0.05 (-0.12, 0.02)
CLASS D	2131	66.2 (59.2, 73.2)	0.87	137(133, 141)	152	101.9	-0.09 (-0.13,-0.05)
CLASS E & F	1034	74.3 (69.5, 79.2)	0.97	61(59, 64)	96	78.3	0.06 (0.00, 0.12)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	347	68.1	56.5	11.6 (2.2, 21.0)	0.77 (0.63, 0.96)	-0.28 (0.103)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1597	35.1	20.5	14.6 (11.7, 17.5)	0.88 (0.80, 0.97)	-0.54 (0.048)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	71	30.3	16.1	14.2 (2.1, 26.3)	0.43 (0.27, 0.70)	-0.75 (0.228)
STATION 2	63	31.8	14.1	17.7 (8.6, 26.9)	2.21 (1.34, 3.65)	-0.46 (0.242)
STATION 3	190	34.6	20.2	14.4 (6.3, 22.5)	0.97 (0.73, 1.29)	-0.55 (0.140)
STATION 4	52	29.8	22.7	7.1 (-6.2, 20.4)	0.35 (0.20, 0.60)	-0.54 (0.267)
STATION 5	62	25.7	18.5	7.2 (-4.0, 18.4)	0.60 (0.36, 1.00)	-0.35 (0.244)
STATION 6	170	33.7	20.1	13.6 (5.1, 22.0)	0.77 (0.57, 1.04)	-0.56 (0.148)
STATION 7	160	44.4	18.5	25.9 (16.3, 35.5)	2.43 (1.78, 3.32)	-0.52 (0.152)
STATION 8	134	34.8	26.6	8.2 (-4.5, 20.9)	0.53 (0.38, 0.74)	-0.61 (0.166)
STATION 9	143	41.0	29.7	11.2 (-1.0, 23.5)	1.16 (0.84, 1.62)	-0.29 (0.161)
STATION10	206	39.6	15.1	24.5 (16.8, 32.2)	1.93 (1.47, 2.54)	-0.67 (0.134)
STATION11	175	28.6	19.8	8.9 (0.2, 17.5)	0.40 (0.30, 0.54)	-0.62 (0.145)
STATION12	171	33.5	22.4	11.1 (2.0, 20.1)	0.53 (0.39, 0.71)	-0.56 (0.147)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	347	11.6 (1.0, 22.2)	0.65	77(72, 83)	78	56.8	0.26 (0.16, 0.35)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1597	14.6 (11.1, 18.1)	0.77	56(54, 58)	58	38.8	0.12 (0.07, 0.17)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	71	14.2 (-0.5, 28.8)	0.83	53(46, 64)	55	36.9	-0.07 (-0.30, 0.16)
STATION 2	63	17.7 (10.6, 24.9)	0.81	30(26, 37)	35	26.1	0.33 (0.09, 0.54)
STATION 3	190	14.4 (4.9, 23.9)	0.77	56(51, 62)	57	39.2	0.04 (-0.11, 0.18)
STATION 4	52	7.1 (-2.6, 16.8)	0.69	42(35, 52)	42	31.9	0.28 (0.01, 0.51)
STATION 5	62	7.2 (-2.3, 16.7)	0.73	37(32, 45)	38	28.6	0.31 (0.07, 0.52)
STATION 6	170	13.6 (3.1, 24.0)	0.75	51(46, 57)	53	38.3	0.17 (0.02, 0.31)
STATION 7	160	25.9 (11.8, 40.0)	0.77	62(56, 70)	67	46.7	-0.03 (-0.18, 0.13)
STATION 8	134	8.2 (-9.6, 26.0)	0.80	68(61, 78)	69	43.5	0.17 (-0.00, 0.33)
STATION 9	143	11.2 (-1.8, 24.3)	0.64	70(63, 79)	71	47.8	0.11 (-0.05, 0.27)
STATION10	206	24.5 (15.5, 33.5)	0.84	50(45, 55)	55	37.9	0.23 (0.09, 0.35)
STATION11	175	8.9 (-0.5, 18.2)	0.77	55(50, 61)	55	35.2	0.12 (-0.03, 0.26)
STATION12	171	11.1 (0.9, 21.2)	0.78	55(50, 62)	56	36.6	0.15 (-0.00, 0.29)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4978	157.8	378.4	-220.5 (-240.0,-201.0)	0.10 (0.09, 0.11)	0.24 (0.027)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	11299	121.7	201.8	-80.2 (-89.9, -70.5)	0.10 (0.10, 0.11)	-0.39 (0.018)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	488	107.1	266.0	-158.9 (-225.9, -91.9)	0.02 (0.02, 0.03)	-0.39 (0.087)
STATION 2	407	120.2	115.5	4.7 (-20.3, 29.7)	0.54 (0.44, 0.65)	-0.29 (0.095)
STATION 3	1424	111.5	240.4	-128.8 (-155.7,-102.0)	0.14 (0.12, 0.15)	-0.22 (0.051)
STATION 4	345	108.5	218.8	-110.3 (-161.4, -59.1)	0.10 (0.08, 0.13)	-0.22 (0.104)
STATION 5	342	111.0	183.6	-72.5 (-117.2, -27.9)	0.21 (0.17, 0.25)	-0.20 (0.104)
STATION 6	1152	120.6	141.2	-20.6 (-41.9, 0.8)	0.16 (0.14, 0.18)	-0.52 (0.057)
STATION 7	1266	137.2	147.4	-10.2 (-31.1, 10.8)	0.31 (0.28, 0.35)	-0.41 (0.054)
STATION 8	934	128.5	351.9	-223.4 (-281.6,-165.3)	0.05 (0.04, 0.05)	-0.33 (0.063)
STATION 9	1166	123.2	258.4	-135.2 (-164.6,-105.8)	0.14 (0.13, 0.16)	0.19 (0.056)
STATION10	1500	131.1	116.4	14.7 (-4.9, 34.4)	0.16 (0.15, 0.18)	-0.63 (0.050)
STATION11	1059	118.7	204.9	-86.3 (-121.8, -50.8)	0.07 (0.06, 0.08)	-0.50 (0.059)
STATION12	1216	115.6	207.6	-92.0 (-118.3, -65.6)	0.09 (0.08, 0.10)	-0.40 (0.055)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	1525	167.5	418.3	-250.9 (-299.7,-202.0)	0.07 (0.06, 0.07)	-0.32 (0.049)
2.5 TO 5.0	3948	129.7	249.9	-120.3 (-136.5,-104.0)	0.14 (0.13, 0.15)	-0.28 (0.031)
> 5.0 M/SEC	5826	104.3	112.6	-8.3 (-15.9, -0.8)	0.16 (0.15, 0.17)	-0.48 (0.025)
B. STABILITY GROUP						
CLASS A & B	1667	157.0	396.8	-239.8 (-279.0,-200.6)	0.10 (0.09, 0.11)	0.19 (0.047)
CLASS C	2124	143.5	318.0	-174.4 (-202.7,-146.2)	0.11 (0.10, 0.12)	0.18 (0.042)
CLASS D	5216	108.2	169.7	-61.5 (-72.7, -50.4)	0.11 (0.10, 0.12)	-0.38 (0.027)
CLASS E & F	2292	106.3	25.5	80.8 (75.4, 86.3)	0.34 (0.32, 0.37)	-0.78 (0.040)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4978	-220.5 (-254.8,-186.2)	0.50	683(670, 697)	718	379.3	0.09 (0.06, 0.12)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	11299	-80.2 (- 95.4, -65.0)	0.66	538(531, 545)	544	277.0	-0.07 (-0.09,-0.05)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	488	-158.9 (-262.7, -55.1)	0.65	770(725, 822)	786	333.7	-0.16 (-0.24,-0.07)
STATION 2	407	4.7 (-32.3, 41.8)	0.60	262(246, 282)	262	183.6	-0.04 (-0.14, 0.06)
STATION 3	1424	-128.8 (-173.5, -84.1)	0.56	546(527, 567)	561	314.4	-0.18 (-0.23,-0.13)
STATION 4	345	-110.3 (-184.7, -35.8)	0.55	494(460, 535)	506	275.6	-0.08 (-0.18, 0.03)
STATION 5	342	-72.5 (-138.2, -6.8)	0.55	431(401, 466)	436	247.2	-0.07 (-0.17, 0.04)
STATION 6	1152	-20.6 (-58.5, 17.3)	0.74	379(365, 396)	380	226.2	-0.08 (-0.14,-0.02)
STATION 7	1266	-10.2 (-42.1, 21.8)	0.69	381(367, 397)	381	232.1	-0.01 (-0.06, 0.05)
STATION 8	934	-223.4 (-310.5,-136.4)	0.62	904(865, 947)	931	409.6	0.01 (-0.06, 0.07)
STATION 9	1166	-135.2 (-180.8, -89.6)	0.55	533(512, 555)	549	328.3	-0.12 (-0.18,-0.06)
STATION10	1500	14.7 (-11.8, 41.2)	0.80	388(375, 403)	389	207.6	-0.01 (-0.06, 0.04)
STATION11	1059	-86.3 (-142.1, -30.5)	0.72	604(579, 631)	609	289.8	-0.11 (-0.16,-0.05)
STATION12	1216	-92.0 (-133.4, -50.5)	0.66	476(458, 496)	485	268.4	-0.06 (-0.12,-0.01)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	1525	-250.9 (-313.3,-188.5)	0.62	1004(970,1041)	1034	517.2	-0.14 (-0.18,-0.09)
2.5 TO 5.0	3948	-120.3 (-144.1, -96.4)	0.60	525(514, 537)	538	306.8	-0.03 (-0.06, 0.01)
> 5.0 M/SEC	5826	-8.3 (-22.6, 5.9)	0.71	313(307, 319)	313	193.9	-0.20 (-0.23,-0.18)
B. STABILITY GROUP							
CLASS A & B	1667	-239.8 (-293.8,-185.8)	0.53	833(806, 862)	867	450.1	-0.07 (-0.12,-0.03)
CLASS C	2124	-174.4 (-209.6,-139.3)	0.53	678(658, 699)	700	376.6	-0.07 (-0.11,-0.03)
CLASS D	5216	-61.5 (-79.4, -43.7)	0.66	431(423, 439)	435	246.2	-0.16 (-0.19,-0.14)
CLASS E & F	2292	80.8 (72.9, 88.8)	0.88	150(146, 154)	170	128.6	-0.29 (-0.33,-0.25)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1908	123.9	283.7	-159.9 (-180.6,-139.1)	0.14 (0.13, 0.15)	0.25 (0.044)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	5240	84.8	140.2	-55.4 (-64.4, -46.3)	0.14 (0.13, 0.15)	-0.40 (0.027)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	222	73.8	184.1	-110.4 (-170.5, -50.3)	0.03 (0.02, 0.04)	-0.40 (0.129)
STATION 2	192	82.7	79.3	3.5 (-19.8, 26.7)	0.75 (0.56, 0.99)	-0.26 (0.139)
STATION 3	665	77.7	165.7	-87.9 (-112.6, -63.2)	0.17 (0.14, 0.19)	-0.24 (0.075)
STATION 4	157	75.4	145.9	-70.4 (-114.2, -26.7)	0.14 (0.11, 0.20)	0.18 (0.153)
STATION 5	160	76.0	119.5	-43.5 (-80.5, -6.4)	0.27 (0.20, 0.36)	-0.18 (0.152)
STATION 6	534	84.6	96.6	-12.0 (-32.9, 8.9)	0.21 (0.18, 0.25)	-0.53 (0.083)
STATION 7	571	97.7	107.8	-10.1 (-30.4, 10.3)	0.43 (0.37, 0.51)	-0.43 (0.080)
STATION 8	447	86.8	233.6	-146.8 (-198.8, -94.9)	0.07 (0.06, 0.08)	-0.38 (0.091)
STATION 9	511	92.2	191.4	-99.2 (-129.0, -69.4)	0.20 (0.17, 0.24)	0.21 (0.085)
STATION10	693	91.6	83.2	8.4 (-9.7, 26.5)	0.28 (0.24, 0.33)	-0.62 (0.073)
STATION11	531	75.5	130.4	-54.9 (-84.8, -24.9)	0.09 (0.07, 0.11)	-0.54 (0.083)
STATION12	557	82.5	150.7	-68.1 (-94.6, -41.7)	0.10 (0.09, 0.12)	-0.42 (0.081)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	658	115.5	276.0	-160.6 (-202.4,-118.7)	0.11 (0.09, 0.13)	-0.21 (0.075)
2.5 TO 5.0	1842	93.1	182.1	-89.0 (-105.5, -72.6)	0.16 (0.15, 0.18)	-0.29 (0.045)
> 5.0 M/SEC	2740	71.9	79.3	-7.5 (-15.3, 0.4)	0.17 (0.16, 0.18)	-0.51 (0.037)
B. STABILITY GROUP						
CLASS A & B	714	118.2	260.1	-141.9 (-177.8,-106.1)	0.15 (0.13, 0.17)	-0.24 (0.072)
CLASS C	906	100.5	245.8	-145.3 (-173.6,-116.9)	0.13 (0.12, 0.15)	0.23 (0.064)
CLASS D	2485	76.1	120.3	-44.2 (-55.1, -33.3)	0.14 (0.13, 0.16)	-0.39 (0.039)
CLASS E & F	1135	70.3	23.8	46.5 (40.3, 52.7)	0.49 (0.44, 0.55)	-0.74 (0.057)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1908	-159.9 (-186.4,-133.4)	0.47	435(421, 449)	463	266.6	0.18 (0.14, 0.22)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	5240	-55.4 (-67.2, -43.5)	0.66	331(325, 338)	336	180.2	0.02 (-0.01, 0.05)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	222	-110.4 (-183.2, -37.5)	0.65	461(422, 509)	473	218.6	-0.09 (-0.22, 0.05)
STATION 2	192	3.5 (-21.7, 28.7)	0.61	149(135, 165)	148	107.0	0.18 (0.04, 0.31)
STATION 3	665	-87.9 (-120.8, -55.0)	0.57	335(318, 354)	346	203.2	-0.10 (-0.17,-0.02)
STATION 4	157	-70.4 (-116.8, -24.1)	0.55	275(248, 309)	283	169.4	0.04 (-0.12, 0.19)
STATION 5	160	-43.5 (-86.8, -0.1)	0.58	237(214, 267)	240	149.0	0.01 (-0.15, 0.16)
STATION 6	534	-12.0 (-41.3, 17.4)	0.75	242(228, 258)	242	147.3	0.05 (-0.04, 0.13)
STATION 7	571	-10.1 (-38.4, 18.2)	0.69	237(224, 252)	237	154.2	0.09 (0.01, 0.18)
STATION 8	447	-146.8 (-216.4, -77.3)	0.64	545(512, 584)	564	263.3	0.10 (0.01, 0.19)
STATION 9	511	-99.2 (-136.7, -61.7)	0.53	350(330, 373)	364	230.3	-0.06 (-0.14, 0.03)
STATION10	693	8.4 (-12.3, 29.1)	0.79	233(222, 246)	233	135.7	0.09 (0.02, 0.16)
STATION11	531	-54.9 (-92.2, -17.6)	0.74	353(333, 376)	357	174.2	-0.02 (-0.10, 0.07)
STATION12	557	-68.1 (-104.4, -31.9)	0.66	313(296, 333)	320	180.7	0.05 (-0.03, 0.14)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	658	-160.6 (-210.2,-110.9)	0.56	557(528, 589)	579	315.4	-0.06 (-0.13, 0.02)
2.5 TO 5.0	1842	-89.0 (-108.5, -69.5)	0.60	351(340, 362)	362	207.8	0.07 (0.03, 0.12)
> 5.0 M/SEC	2740	-7.5 (-19.2, 4.3)	0.73	217(212, 223)	217	129.1	-0.11 (-0.15,-0.07)
B. STABILITY GROUP							
CLASS A & B	714	-141.9 (-177.4,-106.4)	0.56	482(458, 509)	502	279.0	0.04 (-0.04, 0.11)
CLASS C	906	-145.3 (-177.6,-113.0)	0.50	438(419, 459)	461	266.3	-0.02 (-0.09, 0.04)
CLASS D	2485	-44.2 (-59.2, -29.2)	0.66	282(274, 290)	285	162.6	-0.06 (-0.10,-0.02)
CLASS E & F	1135	46.5 (38.5, 54.5)	0.87	110(106, 115)	119	87.7	-0.09 (-0.14,-0.03)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	350	67.5	158.4	-90.9 (-106.5, -75.4)	0.19 (0.15, 0.23)	0.41 (0.103)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1752	32.1	54.0	-21.9 (-26.6, -17.2)	0.19 (0.17, 0.21)	-0.31 (0.046)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	80	27.0	69.3	-42.3 (-69.3, -15.2)	0.06 (0.04, 0.09)	-0.32 (0.215)
STATION 2	67	29.9	29.8	0.1 (-11.8, 12.1)	0.61 (0.38, 0.99)	-0.28 (0.235)
STATION 3	215	30.7	66.5	-35.9 (-49.4, -22.4)	0.18 (0.13, 0.23)	0.25 (0.131)
STATION 4	67	23.2	48.8	-25.6 (-43.7, -7.5)	0.13 (0.08, 0.20)	0.21 (0.235)
STATION 5	70	22.7	38.7	-15.9 (-31.0, -0.9)	0.22 (0.14, 0.36)	-0.16 (0.230)
STATION 6	181	31.7	37.2	-5.5 (-16.3, 5.2)	0.33 (0.25, 0.44)	-0.43 (0.143)
STATION 7	167	42.6	46.2	-3.6 (-16.2, 9.0)	0.63 (0.46, 0.85)	-0.31 (0.149)
STATION 8	157	29.8	85.4	-55.6 (-81.0, -30.2)	0.07 (0.05, 0.10)	-0.28 (0.153)
STATION 9	164	35.9	76.1	-40.3 (-57.9, -22.7)	0.27 (0.20, 0.37)	0.24 (0.150)
STATION10	214	38.1	34.5	3.6 (-6.6, 13.9)	0.54 (0.41, 0.71)	-0.53 (0.131)
STATION11	183	27.4	46.8	-19.5 (-33.7, -5.2)	0.11 (0.08, 0.15)	-0.48 (0.142)
STATION12	187	30.7	56.0	-25.3 (-39.8, -10.8)	0.14 (0.10, 0.18)	-0.33 (0.141)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	350	-90.9 (-107.8, -74.0)	0.23	133(124, 144)	161	113.3	0.27 (0.17, 0.37)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1752	-21.9 (-27.5, -16.3)	0.58	96(93, 99)	98	58.6	0.14 (0.09, 0.18)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	80	-42.3 (-70.6, -14.0)	0.55	123(106, 146)	129	73.7	-0.05 (-0.27, 0.17)
STATION 2	67	0.1 (-11.8, 12.1)	0.67	37(32, 45)	37	26.8	0.45 (0.24, 0.63)
STATION 3	215	-35.9 (-52.2, -19.5)	0.49	101(93, 112)	107	69.4	-0.02 (-0.15, 0.11)
STATION 4	67	-25.6 (-41.8, -9.5)	0.45	67(57, 81)	71	47.6	0.30 (0.06, 0.50)
STATION 5	70	-15.9 (-30.4, -1.4)	0.54	56(48, 67)	58	38.6	0.28 (0.05, 0.49)
STATION 6	181	-5.5 (-19.1, 8.0)	0.67	71(65, 79)	71	48.7	0.07 (-0.07, 0.22)
STATION 7	167	-3.6 (-20.1, 12.9)	0.58	78(70, 87)	78	53.5	0.12 (-0.03, 0.27)
STATION 8	157	-55.6 (-85.2, -26.1)	0.54	150(136, 170)	160	85.2	0.25 (0.10, 0.39)
STATION 9	164	-40.3 (-57.7, -22.9)	0.42	108(98, 122)	115	78.2	0.13 (-0.03, 0.27)
STATION10	214	3.6 (-8.8, 16.1)	0.70	67(61, 74)	67	46.3	0.25 (0.12, 0.37)
STATION11	183	-19.5 (-35.9, -3.0)	0.66	92(83, 102)	94	53.8	0.19 (0.05, 0.33)
STATION12	187	-25.3 (-41.0, -9.6)	0.57	93(85, 104)	96	56.0	0.22 (0.07, 0.35)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4539	173.1	116.9	56.2 (47.4, 65.0)	1.04 (0.98, 1.10)	-0.44 (0.029)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	10557	130.2	66.7	63.6 (59.2, 67.9)	1.05 (1.01, 1.09)	-0.53 (0.019)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	420	124.4	50.0	74.4 (57.2, 91.6)	0.66 (0.55, 0.80)	-0.66 (0.094)
STATION 2	382	128.1	54.1	74.0 (54.2, 93.8)	1.53 (1.25, 1.87)	-0.43 (0.098)
STATION 3	1249	127.1	82.6	44.5 (30.7, 58.4)	1.27 (1.14, 1.42)	-0.44 (0.054)
STATION 4	313	119.6	84.7	34.9 (9.4, 60.4)	0.78 (0.62, 0.97)	-0.39 (0.109)
STATION 5	311	122.1	78.8	43.3 (17.4, 69.2)	1.42 (1.14, 1.78)	-0.36 (0.109)
STATION 6	1135	122.4	57.8	64.6 (53.1, 76.1)	0.93 (0.83, 1.04)	-0.57 (0.057)
STATION 7	1238	140.3	58.7	81.6 (68.7, 94.5)	1.88 (1.68, 2.10)	-0.52 (0.055)
STATION 8	838	143.2	78.4	64.8 (47.0, 82.6)	1.23 (1.07, 1.41)	-0.52 (0.066)
STATION 9	1036	138.6	85.9	52.8 (36.9, 68.7)	1.04 (0.92, 1.18)	-0.43 (0.060)
STATION10	1475	133.3	47.4	85.9 (75.5, 96.3)	1.02 (0.92, 1.13)	-0.69 (0.050)
STATION11	1011	124.3	69.9	54.4 (39.2, 69.6)	0.61 (0.54, 0.69)	-0.58 (0.060)
STATION12	1149	122.4	64.7	57.7 (46.0, 69.4)	0.75 (0.67, 0.84)	-0.57 (0.057)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	1417	180.2	107.6	72.6 (54.6, 90.6)	1.04 (0.94, 1.16)	-0.47 (0.051)
2.5 TO 5.0	3796	134.9	93.2	41.7 (33.8, 49.6)	1.16 (1.09, 1.24)	-0.38 (0.031)
> 5.0 M/SEC	5344	113.7	37.0	76.7 (72.5, 80.9)	0.97 (0.92, 1.02)	-0.65 (0.026)
B. STABILITY GROUP						
CLASS A & B	2100	124.6	170.0	-45.4 (-58.8, -31.9)	1.05 (0.97, 1.15)	0.20 (0.042)
CLASS C	2120	143.8	138.8	5.0 (-7.9, 17.9)	0.93 (0.86, 1.02)	-0.20 (0.042)
CLASS D	4277	132.0	12.1	119.9 (115.7, 124.1)	6.61 (6.22, 7.02)	-0.79 (0.029)
CLASS E & F	2060	118.3	0.5	117.9 (115.2, 120.5)	156 (143, 171)	-0.98 (0.042)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	4539	56.2 (40.5, 71.9)	0.71	291(286, 298)	297	202.1	0.07 (0.04, 0.10)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	10557	63.6 (55.7, 71.4)	0.75	237(233, 240)	245	167.9	-0.07 (-0.09,-0.05)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	420	74.4 (46.8, 102.0)	0.81	187(175, 200)	201	148.4	-0.09 (-0.18, 0.01)
STATION 2	382	74.0 (42.7, 105.3)	0.70	210(196, 226)	222	150.0	-0.13 (-0.23,-0.03)
STATION 3	1249	44.5 (20.0, 69.1)	0.68	266(256, 277)	270	180.1	-0.15 (-0.20,-0.09)
STATION 4	313	34.9 (-4.5, 74.3)	0.66	234(217, 254)	236	161.2	-0.04 (-0.15, 0.07)
STATION 5	311	43.3 (1.3, 85.3)	0.65	241(224, 262)	245	168.5	-0.08 (-0.18, 0.04)
STATION 6	1135	64.6 (42.3, 87.0)	0.78	205(197, 214)	215	156.8	-0.07 (-0.13,-0.01)
STATION 7	1238	81.6 (56.7, 106.5)	0.76	241(232, 251)	254	173.5	-0.09 (-0.15,-0.04)
STATION 8	838	64.8 (33.8, 95.8)	0.76	251(239, 263)	259	181.9	0.09 (0.02, 0.16)
STATION 9	1036	52.8 (21.1, 84.5)	0.68	272(261, 284)	277	191.0	-0.08 (-0.14,-0.02)
STATION10	1475	85.9 (66.5, 105.3)	0.84	213(206, 221)	230	158.2	-0.09 (-0.14,-0.04)
STATION11	1011	54.4 (27.7, 81.1)	0.78	258(247, 269)	263	168.9	-0.10 (-0.16,-0.04)
STATION12	1149	57.7 (37.7, 77.7)	0.76	211(203, 220)	219	154.9	-0.08 (-0.14,-0.03)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	1417	72.6 (44.5, 100.8)	0.72	372(359, 386)	379	249.2	-0.16 (-0.21,-0.10)
2.5 TO 5.0	3796	41.7 (29.3, 54.0)	0.68	250(245, 256)	254	178.7	-0.01 (-0.04, 0.02)
> 5.0 M/SEC	5344	76.7 (69.4, 84.0)	0.81	170(167, 173)	187	138.7	-0.18 (-0.20,-0.15)
B. STABILITY GROUP							
CLASS A & B	2100	-45.4 (-65.0, -25.7)	0.42	319(310, 329)	322	216.8	-0.03 (-0.07, 0.01)
CLASS C	2120	5.0 (-14.1, 24.1)	0.58	325(315, 335)	325	226.0	-0.15 (-0.19,-0.11)
CLASS D	4277	119.9 (113.0, 126.7)	0.89	149(145, 152)	191	138.9	-0.17 (-0.20,-0.14)
CLASS E & F	2060	117.9 (113.7, 122.0)	0.99	61(60, 63)	133	118.6	-0.14 (-0.18,-0.10)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1763	134.0	87.9	46.1 (36.0, 56.2)	1.35 (1.23, 1.48)	-0.39 (0.046)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4891	90.8	46.0	44.8 (40.4, 49.2)	1.36 (1.28, 1.44)	-0.54 (0.028)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	195	83.5	33.4	50.1 (33.4, 66.7)	0.85 (0.64, 1.12)	-0.68 (0.138)
STATION 2	172	92.2	38.3	54.0 (34.4, 73.5)	2.40 (1.78, 3.25)	-0.42 (0.147)
STATION 3	599	86.2	54.9	31.3 (18.3, 44.3)	1.52 (1.30, 1.79)	-0.44 (0.079)
STATION 4	139	84.8	57.5	27.3 (3.3, 51.2)	0.99 (0.71, 1.38)	-0.35 (0.163)
STATION 5	144	84.3	50.0	34.2 (11.1, 57.4)	1.70 (1.23, 2.37)	-0.35 (0.160)
STATION 6	516	87.6	39.5	48.0 (36.0, 60.1)	1.19 (1.00, 1.41)	-0.59 (0.085)
STATION 7	550	101.4	43.1	58.3 (44.4, 72.2)	2.13 (1.80, 2.52)	-0.55 (0.082)
STATION 8	413	93.9	50.6	43.3 (25.6, 60.9)	1.61 (1.33, 1.95)	-0.54 (0.095)
STATION 9	453	103.9	63.1	40.8 (23.2, 58.3)	1.41 (1.17, 1.69)	-0.38 (0.090)
STATION10	674	94.2	33.9	60.3 (49.1, 71.6)	1.43 (1.23, 1.66)	-0.69 (0.074)
STATION11	513	78.2	44.3	33.9 (20.9, 46.8)	0.84 (0.71, 1.00)	-0.62 (0.085)
STATION12	523	87.7	46.8	41.0 (28.7, 53.2)	0.89 (0.75, 1.06)	-0.58 (0.084)

(CONTINUED)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)						
A. WIND SPEED						
< 2.5 M/SEC	584	130.1	71.4	58.7 (40.7, 76.8)	1.79 (1.52, 2.10)	-0.41 (0.080)
2.5 TO 5.0	1762	97.3	68.3	29.0 (20.5, 37.5)	1.28 (1.16, 1.40)	-0.39 (0.046)
> 5.0 M/SEC	2545	77.3	24.7	52.5 (48.4, 56.7)	1.31 (1.21, 1.42)	-0.68 (0.038)
B. STABILITY GROUP						
CLASS A & B	810	104.2	118.6	-14.4 (-30.0, 1.2)	1.26 (1.10, 1.45)	0.13 (0.068)
CLASS C	913	99.7	95.3	4.4 (-8.6, 17.5)	1.21 (1.07, 1.38)	-0.13 (0.064)
CLASS D	2156	87.6	19.2	68.4 (63.6, 73.2)	3.80 (3.49, 4.13)	-0.70 (0.041)
CLASS E & F	1012	78.7	0.4	78.3 (74.7, 82.0)	132 (117, 149)	-0.99 (0.060)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (UG/M**3)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	1763	46.1 (33.2, 59.0)	0.71	200(193, 207)	205	142.2	0.15 (0.10, 0.19)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	4891	44.8 (38.9, 50.8)	0.77	155(152, 158)	161	109.5	0.02 (-0.00, 0.05)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	195	50.1 (28.4, 71.7)	0.83	118(108, 132)	128	96.0	0.00 (-0.14, 0.14)
STATION 2	172	54.0 (32.1, 75.8)	0.76	127(115, 142)	138	96.8	0.05 (-0.10, 0.20)
STATION 3	599	31.3 (13.5, 49.1)	0.70	164(156, 174)	167	112.5	-0.03 (-0.10, 0.06)
STATION 4	139	27.3 (3.0, 51.6)	0.69	136(122, 155)	139	101.1	0.10 (-0.07, 0.26)
STATION 5	144	34.2 (8.4, 60.1)	0.72	138(124, 156)	142	103.5	0.05 (-0.12, 0.21)
STATION 6	516	48.0 (29.9, 66.2)	0.80	134(127, 143)	143	103.8	0.07 (-0.02, 0.16)
STATION 7	550	58.3 (38.0, 78.6)	0.77	168(159, 179)	178	117.8	-0.03 (-0.11, 0.06)
STATION 8	413	43.3 (21.6, 64.9)	0.77	162(151, 174)	167	111.7	0.22 (0.13, 0.31)
STATION 9	453	40.8 (15.4, 66.2)	0.68	191(180, 205)	196	134.1	-0.01 (-0.10, 0.08)
STATION10	674	60.3 (44.6, 76.0)	0.85	152(145, 161)	164	107.7	-0.05 (-0.12, 0.03)
STATION11	513	33.9 (17.2, 50.5)	0.79	152(143, 162)	156	101.8	-0.03 (-0.12, 0.05)
STATION12	523	41.0 (24.6, 57.3)	0.77	140(132, 150)	146	102.6	0.04 (-0.05, 0.12)

(CONTINUED)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
4. BY METEOROLOGICAL CONDITION, ALL STATIONS (B-4)							
A. WIND SPEED							
< 2.5 M/SEC	584	58.7 (34.6, 82.8)	0.71	230(218, 244)	237	159.1	-0.08 (-0.16, 0.00)
2.5 TO 5.0	1762	29.0 (19.1, 39.0)	0.69	175(169, 181)	177	120.4	0.08 (0.03, 0.13)
> 5.0 M/SEC	2545	52.5 (46.5, 58.5)	0.84	112(109, 115)	124	90.5	-0.10 (-0.14,-0.06)
B. STABILITY GROUP							
CLASS A & B	810	-14.4 (-30.3, 1.5)	0.50	217(207, 228)	217	147.7	0.09 (0.02, 0.15)
CLASS C	913	4.4 (-11.0, 19.8)	0.56	207(198, 217)	207	141.3	-0.06 (-0.12, 0.00)
CLASS D	2156	68.4 (62.2, 74.6)	0.85	118(115, 122)	136	96.0	-0.11 (-0.15,-0.07)
CLASS E & F	1012	78.3 (73.8, 82.8)	1.00	60(57, 62)	98	78.9	-0.06 (-0.13,-0.00)

TABLE B. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES (Co - Cp) (UG/M**3)	VARIANCE COMPARISON (So**2/Sp**2)	FREQUENCY DISTRIBUTION COMPARISON (F(Co) - F(Cp)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	346	68.2	47.6	20.6 (12.8, 28.5)	1.65 (1.34, 2.04)	-0.19 (0.103)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1675	33.5	17.6	15.9 (13.5, 18.3)	1.71 (1.55, 1.88)	-0.43 (0.047)
3. ALL CONCENTRATIONS, BY STATION (B-1)						
STATION 1	72	30.0	12.5	17.5 (8.7, 26.3)	1.27 (0.80, 2.04)	-0.63 (0.227)
STATION 2	62	32.2	14.2	18.0 (8.9, 27.1)	2.49 (1.50, 4.13)	-0.44 (0.244)
STATION 3	205	32.1	21.0	11.2 (4.2, 18.1)	1.53 (1.16, 2.02)	-0.36 (0.134)
STATION 4	60	26.0	19.4	6.6 (-3.1, 16.3)	0.75 (0.45, 1.26)	-0.27 (0.248)
STATION 5	65	24.5	16.2	8.3 (-0.7, 17.3)	1.23 (0.75, 2.02)	-0.25 (0.239)
STATION 6	174	32.9	15.7	17.2 (10.3, 24.2)	1.70 (1.26, 2.30)	-0.52 (0.146)
STATION 7	165	43.0	18.4	24.7 (15.5, 33.8)	3.04 (2.24, 4.13)	-0.43 (0.150)
STATION 8	149	31.4	18.3	13.1 (4.3, 22.0)	1.56 (1.13, 2.16)	-0.44 (0.158)
STATION 9	151	38.9	24.8	14.1 (3.5, 24.7)	1.96 (1.42, 2.71)	-0.21 (0.157)
STATION10	211	38.7	14.1	24.6 (17.4, 31.8)	2.66 (2.03, 3.49)	-0.60 (0.132)
STATION11	182	27.6	16.3	11.3 (4.6, 17.9)	0.85 (0.64, 1.15)	-0.53 (0.143)
STATION12	179	32.1	17.3	14.7 (7.6, 21.8)	1.10 (0.82, 1.48)	-0.47 (0.144)

TABLE B. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SO2 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 24 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT (A-1)	346	20.6 (11.4, 29.9)	0.65	68(63, 73)	71	50.4	0.18 (0.08, 0.28)
2. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION) (B-3)	1675	15.9 (12.9, 18.9)	0.72	48(46, 49)	50	34.1	0.13 (0.09, 0.18)
3. ALL CONCENTRATIONS, BY STATION (B-1)							
STATION 1	72	17.5 (7.4, 27.6)	0.81	35(30, 42)	39	28.2	0.13 (-0.10, 0.36)
STATION 2	62	18.0 (10.6, 25.4)	0.81	28(24, 34)	33	24.6	0.44 (0.21, 0.62)
STATION 3	205	11.2 (2.5, 19.8)	0.65	49(45, 55)	50	34.2	0.05 (-0.08, 0.19)
STATION 4	60	6.6 (-0.8, 14.0)	0.60	31(26, 37)	31	23.9	0.35 (0.11, 0.56)
STATION 5	65	8.3 (0.2, 16.5)	0.68	29(25, 35)	30	23.8	0.37 (0.13, 0.56)
STATION 6	174	17.2 (8.6, 25.9)	0.76	44(40, 50)	48	35.4	0.09 (-0.06, 0.23)
STATION 7	165	24.7 (10.5, 38.8)	0.74	60(54, 67)	64	44.2	-0.00 (-0.16, 0.15)
STATION 8	149	13.1 (4.2, 22.1)	0.71	45(40, 51)	47	33.3	0.34 (0.19, 0.47)
STATION 9	151	14.1 (2.6, 25.6)	0.60	61(55, 69)	62	41.5	0.16 (0.01, 0.32)
STATION10	211	24.6 (14.7, 34.5)	0.80	53(48, 58)	58	37.3	0.03 (-0.11, 0.16)
STATION11	182	11.3 (3.8, 18.8)	0.73	43(39, 48)	44	30.1	0.12 (-0.02, 0.27)
STATION12	179	14.7 (7.2, 22.3)	0.76	44(40, 49)	46	31.1	0.18 (0.03, 0.32)

APPENDIX C

Statistics For Highest Concentrations At Each Station

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1603.6	1680.2	-76.6 (-400, 247)	0.42	509 (361, 865)	494	350.1	0.46 (-0.15, 0.82)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1294.1	1370.9	-76.8 (-253, 99)	0.50	277 (196, 470)	276	216.7	0.79 (0.39, 0.94)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
960.6	841.3	119.3 (-45, 284)	0.67	259 (184, 440)	275	217.2	0.67 (0.16, 0.90)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 3 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
805.4	627.8	177.7 (23, 332)	0.75	243 (172, 413)	293	241.9	0.46 (-0.15, 0.82)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
218.8	159.5	59.3 (14, 105)	0.75	72 (51, 122)	91	75.2	0.60 (0.04, 0.87)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPTER AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
176.6	132.5	44.0 (-4, 92)	0.75	76 (54, 129)	85	66.1	0.34 (-0.29, 0.76)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1603.6	2692.8	-1089.3 (-1644, -535)	0.08	873 (618,1482)	1373	1124.8	0.36 (-0.27, 0.77)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1294.1	2256.1	-962.0 (-1426, -498)	0.08	730 (517,1240)	1189	963.2	0.50 (-0.11, 0.83)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	PERFORMANCE MEASURES: BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	PERFORMANCE MEASURES: CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	PERFORMANCE MEASURES: CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (UG/M**3)	PERFORMANCE MEASURES: CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
960.6	1185.3	-224.7 (-465, 16)	0.25	378 (268, 643)	426	323.0	0.55 (-0.03, 0.86)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 3 HOUR

AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	PERFORMANCE MEASURES: BIAS: FRACTION OF POSITIVE RESIDUALS (Co > Cp)	PERFORMANCE MEASURES: CHARACTERISTIC DISCREPANCIES: NOISE (SD) (UG/M**3)	PERFORMANCE MEASURES: CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (UG/M**3)	PERFORMANCE MEASURES: CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
805.4	979.4	-174.0 (-379, 31)	0.25	323 (229, 549)	355	299.8	0.45 (-0.16, 0.81)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
218.8	241.5	-22.7 (-77, 32)	0.42	86 (61, 146)	85	78.2	0.52 (-0.08, 0.84)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: MPSDM AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
176.6	188.8	-12.2 (-69, 45)	0.33	90 (64, 152)	87	68.7	0.21 (-0.42, 0.70)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1603.6	4784.4	-3180.8 (-4807, -1555)	0.00	2559 (1813,4345)	4015	3180.8	0.29 (-0.35, 0.74)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1294.1	3818.7	-2524.6 (-3625, -1424)	0.00	1732 (1227,2941)	3021	2524.6	0.34 (-0.29, 0.76)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
960.6	2127.3	-1166.7 (-1770, -564)	0.00	949 (672,1611)	1479	1166.7	0.46 (-0.15, 0.82)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 3 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
805.4	1755.9	-950.4 (-1459, -442)	0.08	800 (567,1359)	1221	959.3	0.35 (-0.28, 0.77)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
218.8	447.2	-228.4 (-351, -106)	0.00	193 (137, 327)	294	228.4	0.47 (-0.15, 0.82)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: PPSP AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
176.6	369.5	-192.9 (-302, -84)	0.08	171 (121, 291)	253	215.5	0.11 (-0.49, 0.64)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1603.6	1615.1	-11.5 (-426, 403)	0.58	653 (462,1108)	625	521.5	0.17 (-0.45, 0.68)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 1 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
1294.1	1187.2	106.9 (-94, 308)	0.50	317 (224, 538)	322	180.9	0.62 (0.08, 0.88)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
960.6	760.9	199.7 (73, 327)	0.83	200 (142, 340)	277	204.9	0.82 (0.46, 0.95)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 3 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
805.4	599.4	206.1 (68, 344)	0.75	217 (154, 369)	293	214.5	0.57 (0.00, 0.86)

TABLE C

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
218.8	170.8	48.0 (10, 86)	0.75	60 (42, 102)	75	57.3	0.73 (0.26, 0.92)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION (A - 2)

PARADISE 1976 MODEL: TEM-8A AVERAGING TIME: 24 HOUR

		PERFORMANCE MEASURES					
		BIAS		CHARACTERISTIC DISCREPANCIES			
AVERAGE OBSERVED VALUE (Co) (UG/M**3)	AVERAGE PREDICTED VALUE (Cp) (UG/M**3)	AVERAGE DIFFERENCE (Co - Cp) (UG/M**3)	FRACTION OF POSITIVE RESIDUALS (Co > Cp)	NOISE (SD) (UG/M**3)	ROOT MEAN SQUARE ERROR (UG/M**3)	AVERAGE ABSOLUTE DIFFERENCE (UG/M**3)	CORRELATION COEFFICIENT
176.6	131.6	44.9 (3, 87)	0.75	67 (47, 113)	78	56.7	0.42 (-0.20, 0.80)

APPENDIX D

Comparisons Of Highest Values For Various Pairings

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:MPTER AVERAGING TIME: 1 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	2993.0 (3, 96,14)	2623.0 (11,101,10)	370.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	2993.0 (3, 96,14)	.0 (3, 96,14)	2993.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	2993.0 (3, 96,14)	642.0 (9, 96,14)	2351.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	2993.0 (3, 96,14)	1943.0 (3,158,10)	1050.0
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	428.0 (11,101,10)	2623.0 (11,101,10)	-2195.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	428.0 (11,101,10)	2623.0 (11,101,10)	-2195.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	1497.0 (11, 1,11)	2623.0 (11,101,10)	-1126.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:MPTER AVERAGING TIME: 3 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	1398.7 (10,321, 5)	1230.7 (11,252, 5)	168.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	1398.7 (10,321, 5)	.0 (10,321, 5)	1398.7
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	1398.7 (10,321, 5)	.0 (1,321, 5)	1398.7
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	1398.7 (10,321, 5)	1088.0 (10, 97, 5)	310.7
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	53.3 (11,252, 5)	1230.7 (11,252, 5)	-1177.3
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	169.0 (1,252, 5)	1230.7 (11,252, 5)	-1061.7
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	1104.7 (11, 1, 4)	1230.7 (11,252, 5)	-126.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:MPTER AVERAGING TIME: 24 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	348.5 (10,306, 1)	285.5 (12,254, 1)	63.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	348.5 (10,306, 1)	.0 (10,306, 1)	348.5
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	348.5 (10,306, 1)	.0 (1,306, 1)	348.5
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	348.5 (10,306, 1)	148.8 (10, 97, 1)	199.6
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	49.0 (12,254, 1)	285.5 (12,254, 1)	-236.5
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	101.3 (9,254, 1)	285.5 (12,254, 1)	-184.1
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	232.8 (12,159, 1)	285.5 (12,254, 1)	-52.7

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:MPSDM AVERAGING TIME: 1 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	2993.0 (3, 96,14)	4327.0 (8,208,10)	-1334.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	2993.0 (3, 96,14)	.0 (3, 96,14)	2993.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	2993.0 (3, 96,14)	2413.0 (9, 96,14)	580.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	2993.0 (3, 96,14)	3048.0 (3,224,10)	-55.0
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	.0 (8,208,10)	4327.0 (8,208,10)	-4327.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	80.0 (12,208,10)	4327.0 (8,208,10)	-4247.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	2004.0 (8,223,14)	4327.0 (8,208,10)	-2323.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:MPSDM AVERAGING TIME: 3 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	1398.7 (10,321, 5)	1777.0 (9,261, 4)	-378.3
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	1398.7 (10,321, 5)	1.0 (10,321, 5)	1397.7
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	1398.7 (10,321, 5)	115.0 (6,321, 5)	1283.7
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	1398.7 (10,321, 5)	1321.7 (10,215, 3)	77.0
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	.0 (9,261, 4)	1777.0 (9,261, 4)	-1777.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	409.7 (7,261, 4)	1777.0 (9,261, 4)	-1367.3
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	1104.7 (9,275, 5)	1777.0 (9,261, 4)	-672.3

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:MPSDM AVERAGING TIME: 24 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	348.5 (10,306, 1)	374.5 (8,208, 1)	-26.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	348.5 (10,306, 1)	76.7 (10,306, 1)	271.8
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	348.5 (10,306, 1)	76.7 (10,306, 1)	271.8
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	348.5 (10,306, 1)	248.7 (10,215, 1)	99.8
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	6.7 (8,208, 1)	374.5 (8,208, 1)	-367.8
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	46.8 (12,208, 1)	374.5 (8,208, 1)	-327.7
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	276.2 (8, 82, 1)	374.5 (8,208, 1)	-98.3

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:PPSP AVERAGING TIME: 1 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	2993.0 (3, 96,14)	11834.0 (8,234, 9)	-8841.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	2993.0 (3, 96,14)	.0 (3, 96,14)	2993.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	2993.0 (3, 96,14)	2727.0 (9, 96,14)	266.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	2993.0 (3, 96,14)	4993.0 (3,224,10)	-2000.0
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	.0 (8,234, 9)	11834.0 (8,234, 9)	-11834.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	.0 (1,234, 9)	11834.0 (8,234, 9)	-11834.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	2004.0 (8,223,14)	11834.0 (8,234, 9)	-9830.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:PPSP AVERAGING TIME: 3 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	1398.7 (10,321, 5)	4023.7 (8,234, 3)	-2625.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	1398.7 (10,321, 5)	57.3 (10,321, 5)	1341.3
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	1398.7 (10,321, 5)	972.3 (6,321, 5)	426.3
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	1398.7 (10,321, 5)	2152.0 (10,215, 3)	-753.3
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	.0 (8,234, 3)	4023.7 (8,234, 3)	-4023.7
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	.0 (1,234, 3)	4023.7 (8,234, 3)	-4023.7
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	1309.3 (8,223, 5)	4023.7 (8,234, 3)	-2714.3

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:PPSP AVERAGING TIME: 24 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	348.5 (10,306, 1)	963.2 (8,247, 1)	-614.8
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	348.5 (10,306, 1)	201.5 (10,306, 1)	147.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	348.5 (10,306, 1)	201.5 (10,306, 1)	147.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	348.5 (10,306, 1)	421.3 (10,215, 1)	-72.8
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	85.8 (8,247, 1)	963.2 (8,247, 1)	-877.5
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	85.8 (8,247, 1)	963.2 (8,247, 1)	-877.5
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	276.2 (8, 82, 1)	963.2 (8,247, 1)	-687.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:TEM-8A AVERAGING TIME: 1 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	2993.0 (3, 96,14)	2722.0 (11,188, 8)	271.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	2993.0 (3, 96,14)	.0 (3, 96,14)	2993.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	2993.0 (3, 96,14)	616.0 (9, 96,14)	2377.0
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	2993.0 (3, 96,14)	1839.0 (3,224,10)	1154.0
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	.0 (11,188, 8)	2722.0 (11,188, 8)	-2722.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	.0 (3,188, 8)	2722.0 (11,188, 8)	-2722.0
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	1497.0 (11, 1,11)	2722.0 (11,188, 8)	-1225.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:TEM-8A AVERAGING TIME: 3 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	1398.7 (10,321, 5)	1018.7 (10,195, 3)	380.0
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	1398.7 (10,321, 5)	1.0 (10,321, 5)	1397.7
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	1398.7 (10,321, 5)	33.3 (6,321, 5)	1365.3
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	1398.7 (10,321, 5)	1018.7 (10,195, 3)	380.0
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	.0 (10,195, 3)	1018.7 (10,195, 3)	-1018.7
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	.0 (3,195, 3)	1018.7 (10,195, 3)	-1018.7
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	1398.7 (10,321, 5)	1018.7 (10,195, 3)	380.0

TABLE D. COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS (A - 3)

PARADISE 1976 MODEL:TEM-8A AVERAGING TIME: 24 HOUR

SO2 CONCENTRATIONS (UG/M**3)
(STATION,DAY,TIME PERIOD)

	OBSERVED	PREDICTED	DIFFERENCE
MAX Co AND MAX Cp	348.5 (10,306, 1)	260.6 (11,256, 1)	87.9
MAX Co AND PREDICTED VALUE FOR SAME EVENT AND LOCATION AS MAX Co	348.5 (10,306, 1)	11.6 (10,306, 1)	336.9
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME EVENT AS MAX Co (ANY LOCATION)	348.5 (10,306, 1)	82.2 (11,306, 1)	266.3
MAX Co AND HIGHEST PREDICTED VALUE FOR SAME LOCATION AS MAX Co (ANY EVENT)	348.5 (10,306, 1)	189.8 (10,215, 1)	158.7
MAX Cp AND OBSERVED VALUE FOR SAME EVENT AND LOCATION AS MAX Cp	102.5 (11,256, 1)	260.6 (11,256, 1)	-158.1
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME EVENT AS MAX Cp (ANY LOCATION)	102.5 (11,256, 1)	260.6 (11,256, 1)	-158.1
MAX Cp AND HIGHEST OBSERVED VALUE FOR SAME LOCATION AS MAX Cp (ANY EVENT)	231.7 (11, 1, 1)	260.6 (11,256, 1)	-28.9

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-450/4-83-003d	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Evaluation of Rural Air Quality Simulation Models Addendum D: Paradise SO_2 Data Base		5. REPORT DATE January 1987
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) William M. Cox, Herschel W. Rorex, Gerald K. Moss, Ellen W. Baldridge		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Source Receptor Analysis Branch, Monitoring and Data Analysis Division, U. S. Environmental Protection Agency		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS		13. TYPE OF REPORT AND PERIOD COVERED
		14. SPONSORING AGENCY CODE EPA-450/4-83-003d

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This addendum provides additional information regarding the performance of four rural air quality simulation models using SO_2 air quality and a modelers data base assembled for the Paradise Power Plant. The report contains numerous tabulations of each model's performance in terms of statistical measures recommended by the AMS. The four models evaluated included MPTER (EPA), PPSP (Martin Marietta Corp), MPSDM (ERT) and TEM-8A (Texas Air Control Board). Results from this evaluation were similar in many ways to those obtained for Clifty Creek, Muskingum River and Kincaid. PPSP clearly over-predicted concentrations in almost every data category while MPSDM, MPTER, and TEM exhibited relatively small but detectable biases depending on averaging period and data category.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Mathematical Modeling Meteorology Sulfur Dioxide Statistical Measure Performance Evaluation	Air Quality Impact Assessment	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE