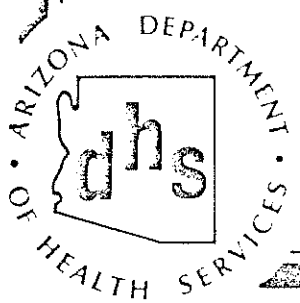
1978

AIR QUALITY DATA FOR ARIZONA

September 1979



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A I R Q U A L I T Y D A T A

F O R A R I Z O N A

HONORABLE BRUCE BABBITT
Governor
State of Arizona

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ACKNOWLEDGEMENTS

The Arizona Bureau of Air Quality Control extends sincere appreciation to the sampler operators named below for their services which included collection and mailing of samples from the State's manual sampling devices.

Ajo	David Harrison
Casa Grande	William Eddings
Clarkdale	Eilene McDevitt
Douglas (15th Street)	John Bates
Douglas (NNE2)	James Huddleston
Eagar	Gail Lund
Flagstaff	Donald Finical
Florence	Les Craig
Grand Canyon	U.S. National Park Staff
Hayden	ADHS - BAQC Technical Service
Joseph City	Dennis Hunt - Nick Randall
Kingman	Mike Charette
Lake Havasu City	Bob Anderson
Miami	Norman Groves - Sam Knight
Mohave Valley	Bob Metcalf
Montezuma Castle National Monument	Barbara Monroe - Kathy Reid
Morenci	Cecil McCullar
Nelson	Don Williams
Nogales	Bill Harrison
Organ Pipe Cactus National Monument	U.S. National Park Staff
Page	Harold Bjorn
Parker	Jack Bathe
Phoenix	Conrad Strivings
Prescott	Rick Santaro
Rillito	Gary Harmon - Earl Miller
Safford	Jim Moser
San Manuel	William Blomquist
Show Low	William Puzz
Sierra Vista	Harvey Ayers
Superior	George Trojanovich
Tucson	Randy Phillips
Yuma	Ruth Nelson

Grateful acknowledgement is made of the assistance provided by the following in supplying air quality data for this report.

Arizona Electric Power Cooperative, Inc.	Robert Maurice
Arizona Public Service Company	James Weiss
ASARCO Incorporated	Lary Cahill
Greenlee County Air Pollution Control District	Grant Stevens
Kennecott Minerals Company	C. K. Vance
Magma Copper Company	Robert J. Groves
Maricopa County Health Department	Greg Witherspoon
Phelps Dodge Corporation	James L. Dick
Pima County Health Department	Richard Bloomingdale
Pinal-Gila Counties Air Quality Control District	Frank H. Gardner
Salt River Project	Donald W. Moon
Southern California Edison Company	Elizabeth C. Ellis

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1. INTRODUCTION

1. INTRODUCTION

The format and content of this report are similar to those of the 1977 report. 1978 data for criteria pollutants are listed in Section 2, long-range trends are discussed in Section 3 and data for chemical composition of particulates are tabulated in Section 4.

Arizona cities and towns monitored for air quality, the operators of the monitoring sites and the pollutants monitored are listed in Table 1. Sites not located in a city or town are given the name of the nearest city or town. The operators of the monitoring sites are abbreviated as follows:

AEPCO	Arizona Electric Power Cooperative, Inc.
APS	Arizona Public Service Company
GREENLEE	Greenlee County Air Pollution Control
JCC	Joint Control Center - A jointly owned system operated by ASARCO Incorporated and Kennecott Minerals Company
MAGMA	Magma Copper Company
MARICOPA	Maricopa County Department of Health Services, Bureau of Air Pollution Control
PD	Phelps Dodge Corporation
P-G	Pinal-Gila Counties Air Quality Control District
PIMA	Pima County Health Department, Air Quality Control District
SCE	Southern California Edison Company
SRP	Salt River Project
STATE	Arizona Department of Health Services, Bureau of Air Quality Control

Figure 1-1, a highway map of Arizona, is included for reference purposes.

The Bureau would appreciate contacts from any organization which is monitoring air quality in Arizona but is not mentioned in this report.

Table 1-1

Cities and Towns Monitored

City or Town	Carbon Monoxide	Hydrocarbons (Non-Methane)	Lead	Nitrogen Dioxide	Oxidants	Particulates	Sulfur Dioxide
Ajo			PD State			PD State	PD State
Apache Junction						P-G	
Boys Ranch			PD			PD	PD
Buckeye			PD		PD	PD	PD
Bullhead City				SCE		SCE	SCE
Casa Grande			State			State	
Clarkdale			State			State	
Clifton							Greenlee
Coolidge			PD	PD	PD	PD	PD
Corona de Tucson						Pima	
Davis Dam				SCE	SCE	SCE	SCE
Douglas			PD State			PD State	PD State
Dragoon				AEPCO		AEPCO	AEPCO
Eagar			State			State	
Flagstaff	State		State		State	State	
Florence			State	State		State	
Glendale	Maricopa		Maricopa		Maricopa	Maricopa	Maricopa
Grand Canyon			State	State		State	State
Green Valley			PD Pima			PD Pima	PD
Hayden			State			State	State JCC
Hereford			PD			PD	PD
Joseph City			State	APS State		APS State	APS
Kansas Settlement				AEPCO		AEPCO	AEPCO
Kearney							JCC
Kingman			State			State	
Lake Havasu City			State			State	
Mammoth						P-G	Magma

Table 1-1 (Cont'd)

Cities and Towns Monitored

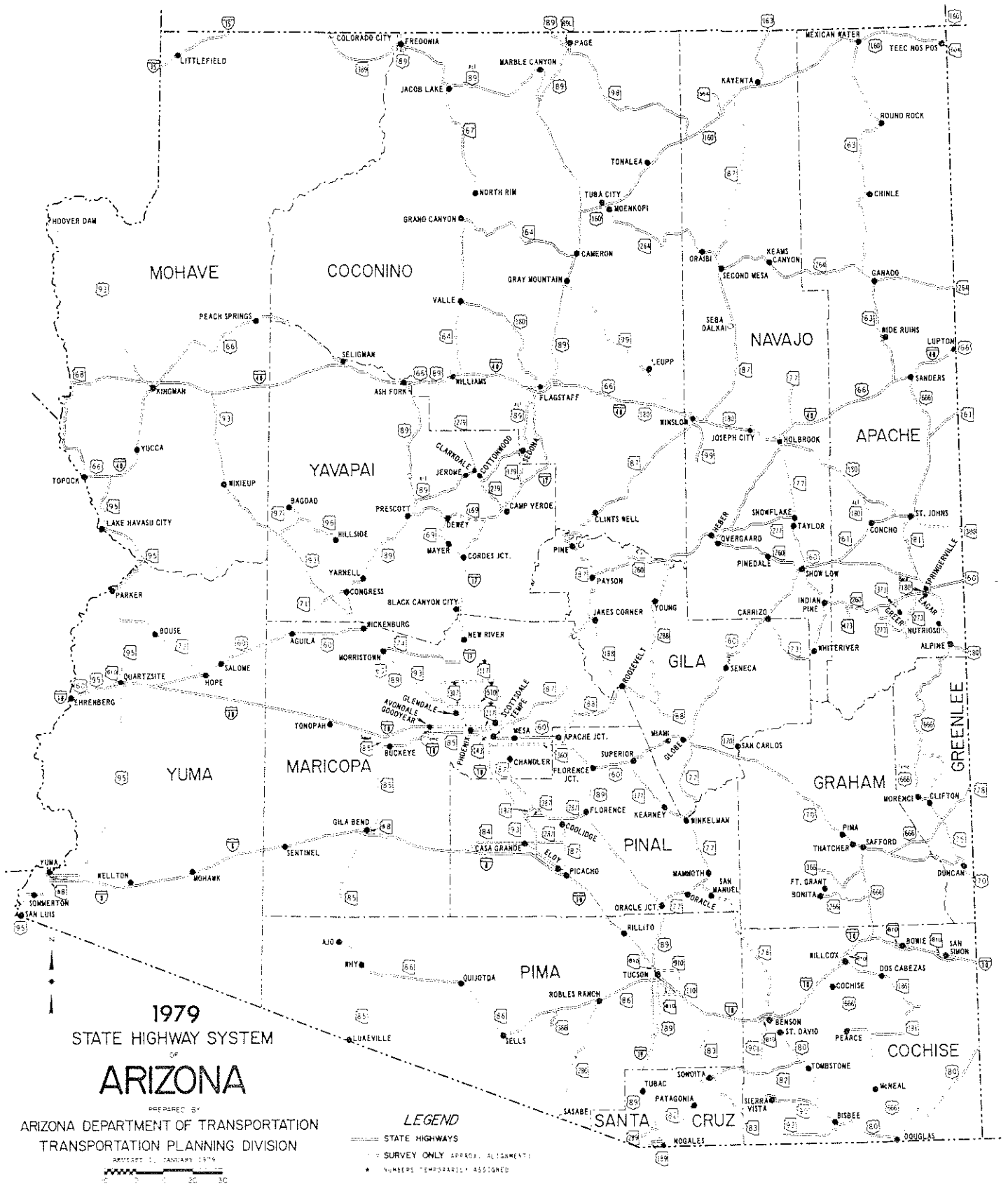
City or Town	Carbon Monoxide	Hydrocarbons (Non-Methane)	Lead	Nitrogen Dioxide	Oxidants	Particulates	Sulfur Dioxide
Marana						P-G	
McNeal			State				
Maricopa	PD	PD	PD	PD	PD	PD	PD
Meadows							JCC
Mesa	Maricopa		Maricopa			Maricopa	Maricopa
Mescal			PD			PD	PD
Miami			State			State	State
Mohave Valley			State			State	
Montezuma Castle							
Morenci			PD State			PD State	PD State
Nelson			State			State	
Nogales			State			State	
Oracle							Magma
Oracle Junction			PD			PD	PD
Organ Pipe			State			State	
Page			State	SRP	SRP	SRP	SRP
Parker			State			State	
Payson						P-G	
Pearce				AEPCO		AEPCO	
Petrified Forest				APS		APS	APS
Phoenix	Maricopa PD State	Maricopa PD	Maricopa PD State	Maricopa PD	Maricopa PD State	Maricopa PD State	Maricopa PD
Prescott			State			State	
Redington							Magma
Rillito			State			State	
Riviera				SCE	SCE	SCE	SCE
Roosevelt						P-G	
Safford			State			State	
St. David				State			
St. Johns			State			SRP	

Table 1-1 (Cont'd)

Cities and Towns Monitored

City or Town	Carbon Monoxide	Hydrocarbons (Non-Methane)	Lead	Nitrogen Dioxide	Oxidants	Particulates	Sulfur Dioxide
San Manuel			State			Magma State	Magma State
Scottsdale	Maricopa		Maricopa	Maricopa	Maricopa	Maricopa	Maricopa
Show Low			State			State	
Sierra Vista	State		State		State	State	
Stanfield						P-G	
Superior			State			State	
Tucson	PD Pima	PD Pima	PD Pima	PD Pima	PD Pima	PD Pima State	PD Pima
Vail			PD			PD	PD
Willcox				AEPCO		AEPCO	AEPCO
Winkelman							JCC
Yuma	State		State		State	State	

Figure 1-1


1979
STATE HIGHWAY SYSTEM
OF
ARIZONA
PREPARED BY
ARIZONA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING DIVISION
REVISED 1 JANUARY 1979
LEGEND
STATE HIGHWAYS
SURVEY ONLY APPROX. ALIGNMENT
NUMBERS TEMPORARILY ASSIGNED
MOHAVE
COCONINO
NAVAJO
APACHE
YAVAPAI
GILA
GREENLEE
YUMA
MARICOPA
GRAHAM
PINAL
PIMA
COCHISE
SANTA CRUZ
LITTLEFIELD
COLORADO CITY
FREDONIA
PAGE
MEXICAN WATER
TEEC NOS POS
MARBLE CANYON
JACOB LAKE
KAYENTA
ROUND ROCK
TONALEA
NORTH RIM
TUBA CITY
MOENKOPI
CHINLE
HOOVER DAM
GRAND CANYON
CAMERON
ORAIBI
KEAMS CANYON
SECOND MESA
GANADO
GRAY MOUNTAIN
VALLE
PEACH SPRINGS
SEBA DALKAI
WIDE RUINS
LUPTON
SELIGMAN
LEUPP
SANDERS
KINGMAN
ASH FORK
WILLIAMS
FLAGSTAFF
WINSLOW
JOSEPH CITY
HOLBROOK
YUCCA
CLARKDALE
COTTONWOOD
JEROME
CLEMENCEAU
TOPOCK
MIXIEUP
BAGDAD
PRESCOTT
CAMP VERDE
CLINTS WELL
SNOWFLAKE
TAYLOR
ST. JOHNS
LAKE HAVASU CITY
HILLSIDE
DEWEY
MAYER
CORDES JCT.
PINE
HEBER
OVERGAARD
CONCHO
PINEDALE
SHOW LOW
SPRINGERVILLE
YARNELL
PAYSON
PARKER
CONGRESS
BLACK CANYON CITY
JAKES CORNER
YOUNG
CARRIZO
INDIAN PINE
GREER
NUTRIOSO
BOUSE
WICKENBURG
AGUILA
NEW RIVER
WHITERIVER
ALPINE
MORRISTOWN
SENECA
SALOME
QUARTZSITE
HOPE
ROOSEVELT
EHRENBERG
GLENDALE
AVONDALE
GOODYEAR
SCOTTSDALE
TEMPE
TONOPAH
MESA
APACHE JCT.
MIAMI
SAN CARLOS
BUCKEYE
PHOENIX
CHANDLER
SUPERIOR
GLOBE
FLORENCE JCT.
MORENCI
CLIFTON
FLORENCE
KEARNEY
WINKELMAN
COOLIDGE
GILA BEND
PIMA
THATCHER
SAFFORD
CASA GRANDE
ELOY
SENTINEL
PICACHO
MAMMOTH
SAN MANUEL
FT. GRANT
BONITA
DUNCAN
YUMA
WELLTON
MOHAWK
ORACLE
ORACLE JCT.
SOMERTON
SAN LUIS
RILLITO
AJO
BOWIE
SAN SIMON
RHY
QUIJOTOA
TUCSON
RILLCOX
DOS CABEZAS
ROBLES RANCH
COCHISE
BENSON
ST. DAVID
PEARCE
GILA BEND
SELLS
TOMBSTONE
SONOITA
McNEAL
TUBAC
PATAGONIA
SIERRA VISTA
BISBEE
SASABE
NOGALES
DOUGLAS

2. 1978 DATA

Table 2-1

Abbreviations

GENERAL

NA	Not Applicable
NR	Not Reported

OPERATORS

JCC	Joint Control Center - A jointly owned system operated by ASARCO Incorporated and Kennecott Minerals Company
AEPCO	Arizona Electric Power Cooperative, Inc.
APS	Arizona Public Service Company
Greenlee	Greenlee County Air Pollution Control
Magma	Magma Copper Company
Maricopa	Maricopa County Department of Health Services, Bureau of Air Pollution Control
PD	Phelps Dodge Corporation
Pima	Pima County Health Department, Air Quality Control District
P-G	Pinal-Gila Counties Air Quality Control District
SRP	Salt River Project
SCE	Southern California Edison Company
State	Arizona Department of Health Services, Bureau of Air Quality Control

EQUIPMENT TYPE

Carbon Monoxide	
NDIR	Non-dispersive infrared
GC	Gas chromotograph
Hydrocarbons - Non-Methane	
GC	Gas chromotograph
Nitrogen Dioxide	
Color	Colorimetric
Chem	Chemiluminescent
Bubbler	Bubbler Sampler, 24-hour
Oxidants	
Coul	Coulometric
Chem	Chemiluminescent
UV	Ultraviolet absorption
Particulates	
Hi-vol	High volume air sampler, 24-hour
Sulfur Dioxide	
Coul	Coulometric
Flame	Flame photometric
Bubbler	Bubbler sampler, 24-hour
Fluor	Fluorescent

Table 2-2

1978 Carbon Monoxide Data Summary
(in mg/m^3)

Nearest City or Town	Site Location	Operator	Method	Annual Averages	1-Hr. Averages Max.	1-Hr. Averages 2nd High	8-Hr. Averages Max.	8-Hr. Averages 2nd High	Number of Samples
Flagstaff	2501 North 4th Street	State	NDIR	2.0	21	20	10	8	5230
Glendale	600 West Olive	Maricopa	NDIR	2.0	14	11	8	8	3827
Maricopa	Approximately 6.5 mi. N83°W of Maricopa	PD	GC	0.6	5	4	1	1	7507
Mesa	Broadway & Brooks	Maricopa	NDIR	2.2	18	17	10	9	4764
Phoenix	3300 West Camelback	Maricopa	NDIR	2.2	29	23	18	17	7623
Phoenix	4732 South Central	Maricopa	NDIR	2.0	24	18	10	9	8000
Phoenix	8531 North 6th Street	Maricopa	NDIR	1.5	21	19	11	10	8327
Phoenix	1845 East Roosevelt	Maricopa	GC	2.4	22	22	16	15	7887
Phoenix	15 East Monroe, Valley Bank Annex	PD	GC	3.1	43	43	28	23	8171
Phoenix	1740 West Adams	State	NDIR	2.0	21	20	10	8	5230
Scottsdale	2857 North Miller	Maricopa	NDIR	2.0	18	18	12	10	7791
Scottsdale	13665 North Scottsdale Road	Maricopa	NDIR	0.4	8	8	3	3	8278
Sierra Vista	Highway 90 and Fry Boulevard	State	NDIR	2.0	23	21	7	6	4771
Tucson	151 West Congress Street	Pima	NDIR	2.1	16	12	8	8	8327
Tucson	22nd & Craycroft	Pima	NDIR	1.6	18	17	8	7	8110
Tucson	22nd & Alvernon	Pima	NDIR	4.5	26	26	15	13	7549

Table 2-2 (Cont'd)

1978 Carbon Monoxide Data Summary
(in mg/m^3)

Nearest City or Town	Site Location	Operator	Method	Annual Averages	1-Hr. Averages Max.	1-Hr. Averages 2nd High	8-Hr. Averages Max.	8-Hr. Averages 2nd High	Number of Samples
Tucson	32 North Stone, Home Federal Savings Tower, 3rd Floor	PD	GC	1.4	23	18	11	10	6230
Yuma	201 South Second Avenue	State	NDIR	1.0	5	4	4	4	2729

STATE AND FEDERAL STANDARDS:

1-Hr. Average	8-Hr. Average
40 mg/m^3	10 mg/m^3

Table 2-3

1978 Hydrocarbons (Non-Methane) Data Summary
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Method	Annual Averages	3-Hr. Averages (6-9 a.m.) Max.	3-Hr. Averages (6-9 a.m.) 2nd High	Number of 1-Hour Samples
Maricopa	Approximately 6.5 miles N83°W of Maricopa	PD	GC	4	117	86	7742
Phoenix	15 East Monroe, Valley Bank Annex	PD	GC	705	4861	3749	8179
Tucson	32 North Stone, Home Federal Savings Tower, 3rd Floor	PD	GC	551	8011	7795	6946
Tucson	151 West Congress Street	Pima	GC	117	614	421	5875

STATE AND FEDERAL STANDARDS: 3-Hour Average (6-9 a.m.)

160 ug/m^3

Table 2-4

1978 Lead Data Summary
High Volume Sampler
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Averages	Calendar Quarter Averages Max.	2nd High	Number of Samples
Ajo	AZ DOT, Well Road	State	.07	.13*	.07*	47
Ajo	Camelback Mountain, Approximately 1.2 miles N88°W for Smelter Stack	PD	.09	.10	.10	62
Ajo	Oxidation Pond, Approximately 1.2 miles N8°E from Smelter Stack	PD	.14	.14	.18	62
Ajo	South of Tailings Dam, Approximately 1.3 miles N85°E from Smelter Stack	PD	.09	.11	.09	62
Ajo	Town Square, Approximately 0.5 miles N54°W from Smelter Stack	PD	.20	.26	.20	59
Boys Ranch	General Motors Proving Ground	PD	.17	.20	.55	63
Buckeye	Approximately 30 miles W of Phoenix	PD	.40	.49	.31	38
Casa Grande	401 North Marshall Street	State	.18	.26	.19	52
Clarkdale	High School Football Stadium	State	.07*	.08*	.06*	7
Coolidge	2 miles N of Coolidge	PD	.17	.23	.14	63
Douglas	0.75 miles N15°E of Smelter Stack	PD	.18	.21	.17	60
Douglas	1012 G Avenue (Mercantile)	PD	.29	.36	.27	62
Douglas	Pirtleville, 1.3 miles N22.5°E of Smelter Stack	PD	.19	.20	.20	62
Douglas	Emission Control Center	PD	NR	NR	NR	NR
Douglas	U.S. 666, 2 km. NNE of Stack	State	.09*	.14*	.05*	18
Douglas	15th Street Park	State	.14*	.29*	.15*	26
Eagar	Town Hall	State	.15	.21	.15	48

Table 2-4 (Cont'd)

1978 Lead Data Summary
High Volume Sampler
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Averages	Calendar Quarter Averages Max.	Calendar Quarter Averages 2nd High	Number of Samples
Flagstaff	County Courthouse, Birch & San Francisco	State	.20*	.24*	.15*	9
Florence	22nd Street and Willow	State	.09	.16	.12	55
Grand Canyon	Visitor's Center	State	.06*	.07*	.06*	16
Green Valley	2 miles N or Townsite	PD	.14	.17	.14	55
Green Valley	245 West Esperanza	Pima	.16	.03	.02	12
Glendale	6000 West Olive	Maricopa	.80	1.10	1.00	46
Hayden	Old Town Jail, Canyon Drive	State	.22*	.37*	.24	42
Hayden	Montgomery-Reece Ranch	State	.23*	.29*	.28*	41
Hereford	11 miles W of Bisbee	PD	.09	.10	.08	61
Joseph City	3.25 miles SE of Joseph City	State	.05*	.07*	.05	27
Kingman	305 West Beale Street	State	.13*	.17*	.11	31
Lake Havasu	Lake Havasu Community Hospital	State	.09*	.11	.10	41
Maricopa	Approximately 6.5 miles N83°W of Maricopa	PD	.10	.14	.09	63
Mesa	Broadway & Brooks	Maricopa	.70	1.00	.70	38
Mescal	El Paso Natural Gas Company Station, 9 miles W of Benson	PD	.13	.15	.14	59
Miami	Miami Fire Department, 804 Sullivan Street	State	.23	.37	.32	57
Miami	Jones Ranch	State	.09*	.22*	.06	44

Table 2-4 (Cont'd)

1978 Lead Data Summary
High Volume Sampler
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Averages	Calendar Quarter Averages Max.	Calendar Quarter Averages 2nd High	Number of Samples
Morenci	Cadillac Point - 5500, 2.75 miles N51°W of Smelter Stack	PD	.08	.09	.09	61
Morenci	Clifton Fina, 1.75 miles S69°E of Smelter Stack	PD	.22	.25	.22	63
Morenci	Fairbanks, Approximately 2.1 miles S26°E of Smelter Stack	PD	.11	.14	.11	62
Morenci	Mobile Monitor (Silver Basin), Approximately 1.9 miles S51°W of Smelter Stack	PD	.09	.11	.09	59
Morenci	Morenci Mobile (Standpipe), Approximately 2.75 miles S70°W of Smelter Stack	PD	NR	NR	NR	NR
Morenci	Stargo, 1.5 miles N63°W of Smelter Stack	PD	.10	.11	.10	59
Morenci	U.S. 666, Stargo	State	.04	.06	.05	47
Mohave Valley	17.5 miles S of Riviera, near Highway 95	State	.07*	.09*	.06	31
Montezuma Castle	Park Maintenance Building	State	.05*	.06*	.05	39
Nelson	6 miles E of Peach Springs	State	.02*	.03*	.03*	34
Nogales	High School - Plum Street	State	.27*	.54*	.22*	25
Oracle Junction	Near Oracle Junction, Approximately 21 miles N of Tucson	PD	.26	.29	.25	62

Table 2-4 (Cont'd)

1978 Lead Data Summary
High Volume Sampler
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Averages	Calendar Quarter Averages Max.	Calendar Quarter Averages 2nd High	Number of Samples
Organ Pipe	Visitor's Center	State	.03*	.05*	.03	41
Page	Municipal Airport	State	.06*	.07	.05	36
Parker	914 Arizona Avenue	State	.21	.35*	.19	50
Phoenix	201 North Central, Valley Bank Center, Roof	PD	.41	.58	.33	63
Phoenix	15 East Monroe, Valley Bank Annex, 3rd Floor	PD	.92	1.45	.69	63
Phoenix	1845 East Roosevelt	Maricopa	1.90	2.70	2.60	52
Phoenix	4732 South Central	Maricopa	1.20	1.60	1.40	51
Phoenix	8531 North 6th Street	Maricopa	1.40	2.00	1.90	56
Prescott	500 South Marina Street	State	.08*	.09	.09*	24
Rillito	Miller's Market	State	.25	.45	.21	57
Safford	521 10th Avenue	State	.18	.31	.17*	47
St. Johns	13.3 miles E31°S of St. Johns	State	.02*	.02*	.01*	10
San Manuel	LDS Church	State	.06	.07	.06	57
Scottsdale	2857 North Miller Road	Maricopa	1.40	2.20	1.80	58
Scottsdale	13665 North Scottsdale Road	Maricopa	.70	1.10	.60	53
Show Low	City Hall Building, Deuce of Clubs Avenue	State	.17	.39	.11*	46
Sierra Vista	1st Street & Bartow Drive	State	.12*	.14*	.14	43

Table 2-4 (Cont'd)

1978 Lead Data Summary
High Volume Sampler
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Averages	Calendar Quarter Averages Max.	Calendar Quarter Averages 2nd High	Number of Samples
Superior	AZ DOT, 951 Main Street	State	.12*	.17*	.14*	38
Tucson	32 North Stone, Home Federal Savings Tower, Roof	PD	.40	.56	.38	137
Tucson	151 West Congress	Pima	.46	.63	.37	12
Tucson	Alvernon & Ft. Lowell	Pima	.64	.86	.55	12
Tucson	Davis-Monthan Air Force Base	Pima	.37	.55	.27	12
Tucson	Orange Grove & El Camino del Terra	Pima	.34	.45	.33	14
Tucson	South Tucson	Pima	.85	1.10	.73	12
Tucson	Prince Road & Fairview	Pima	.93	1.17	1.16	36
Tucson	7200 East Tanque Verde (Magnetic Observatory)	Pima	.33	.45	.21	24
Vail	El Paso Natural Gas Company Station	PD	.12	.14	.13	61
Yuma	201 South Second Avenue	State	.19*	.33*	.20	39

*Annual and Calendar Quarter Averages are not valid due to insufficient number of samples.

STATE AND FEDERAL STANDARDS: Calendar Quarter Average

1.5 ug/m^3

Table 2-5

1978 Nitrogen Dioxide Data Summary
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Method	Averages	Maximum 1-Hr.	Maximum 24-Hr.	Number of Samples 1-Hr.	Number of Samples 24-Hr.
Bullhead City	224 North Main Street	SCE	Chem	NR	214	NA	3325	NA
Coolidge	2 miles N of Coolidge	P.D.	Chem	10	68	26	7686	319
Davis Dam	Katherine's Landing	SCE	Chem	NR	87	NA	7010	NA
Davis Dam	Dri. Mt. (1 mile NE)	SCE	Chem	NR	102	NA	5255	NA
Dragoon	Dragoon Road	AEPCO	Color	9	NA	39	NA	225
Grand Canyon	Grand Canyon Village	State	Bubbler	17*	NA	45	NA	21
Joseph City	3.25 miles SE of Joseph City	State	Bubbler	30*	NA	111	NA	32
Joseph City	Met. Tower, Cholla Power Plant	APS	Bubbler	1	NA	8	NA	276
Joseph City	Environmental Laboratory	APS	Bubbler	2	NA	9	NA	292
Joseph City	Leroux Substation	APS	Bubbler	2	NA	16	NA	268
Kansas Settlement	Kansas Settlement	AEPCO	Bubbler	8	NA	25	NA	295
Maricopa	Approximately 6.5 miles N83^{o}W of Maricopa	P.D.	Chem	6	51	18	8319	346
Page	Water Tower	SRP	Bubbler	3	NA	12	NA	60
Pearce	Sunsites	AEPCO	Bubbler	5	NA	26	NA	298
Petrified Forest	Microwave Relay Station	APS	Bubbler	2	NA	30	NA	275
Phoenix	1845 East Roosevelt	Maricopa	Chem	44	226	138	6784	NA
Phoenix	15 East Monroe, Valley Bank Annex	P.D.	Chem	40	1018	133	8190	338
Riviera	Fort Mohave (4 miles S)	SCE	Chem	NR	133	NA	4820	NA
St. David	1.8 miles SW of St. David	State	Bubbler	25*	NA	83	NA	39

Table 2-5 (Cont'd)

1978 Nitrogen Dioxide Data Summary
(in ug/m^3)

City or Town	Site Location	Operator	Method	Averages	Maximum 1-Hr.	Maximum 24-Hr.	Number of Samples 1-Hr.	Number of Samples 24-Hr.
Tucson	151 West Congress Street	Pima	Chem	61	432	139	8509	NA
Tucson	22nd & Craycroft	Pima	Color	40	169	92	7268	NA
Tucson	632 West Flores	P.D.	Chem	28	263	88	8671	357
Tucson	32 North Stone, Home Federal Savings Tower, 6th Floor	P.D.	Chem	13	276	88	8747	364
Willcox	Willcox	AEPCO	Bubbler	20	NA	43	NA	278

*Annual average not valid due to insufficient number of samples.

STATE AND FEDERAL STANDARDS: Annual Average
100 ug/m^3

Table 2-6

1978 Oxidants Data Summary
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Method	Annual Averages	1-Hr. Avgs. Max.	1-Hr. Avgs. 2nd High	Number of Samples
Buckeye	Approximately 30 miles W of Phoenix	P.D.	Coul	38	147	137	3784
Coolidge	2 miles N of Coolidge	P.D.	Coul	45	161	150	8198
Davis Dam	Dri Mt. (1 mile NE)	SCE	Chem	NR	202	200	6860
Flagstaff	2501 North 4th Street	State	U.V.	57	162	138	5269
Glendale	6000 West Olive	Maricopa	U.V.	30	300	273	7262
Maricopa	Approximately 6.5 miles N83°W of Maricopa	P.D.	Coul	47	151	124	7430
Page	Water Tower	SRP	Bubbler	27	91	72	60
Phoenix	15 East Monroe, Valley Bank Annex	P.D.	Coul	41	164	164	8558
Phoenix	1845 East Roosevelt	Maricopa	U.V.	32	310	279	8294
Phoenix	4237 South Central	Maricopa	U.V.	25	216	216	7367
Phoenix	1740 West Adams	State	U.V.	37	220	175	2694
Riviera	Fort Mohave (4 miles S)	SCE	U.V.	NR	165	163	5100
Scottsdale	2857 North Miller Road	Maricopa	U.V.	33	225	224	7349
Sierra Vista	Highway 90 & Fry Boulevard	State	U.V.	40	151	148	3834
Tucson	151 West Congress Street	Pima	U.V.	36	202	196	8337
Tucson	22nd & Craycroft	Pima	U.V.	48	210	206	7970

Table 2-6 (Cont'd)

1978 Oxidants Data Summary
(in ug/m^3)

Nearest City or Town	Site Location	Operator	Method	Annual Averages	1-Hr. Avgs. Max.	1-Hr. Avgs. 2nd High	Number of Samples
Tucson	32 North Stone, Home Federal Savings Tower, 6th Floor	P.D.	Coul	63	183	183	8010
Yuma	201 South Second Avenue	State	U.V.	42	228	224	4264

STATE AND FEDERAL STANDARDS: 1-Hr. Average

160 ug/m^3

Federal Standard in 1979 changed to 235 ug/m^3

Table 2-7

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Ajo	Camelback Mountain, approximately 1.2 miles N88°W from smelter stack	PD	28	793	500	361
Ajo	Oxidation Pond, approximately 1.2 miles N3°E from smelter stack	PD	74	2821	2350	360
Ajo	South Tailings Dam, approximately 1.3 miles N85°E from smelter stack	PD	60	1078	699	362
Ajo	Town Square, approximately 0.5 miles N54°W from smelter stack	PD	71	2351	1562	359
Ajo	AZ DOT, Well Road	State	69	2356	364	50
Apache Junction	Pinal County Maintenance Yard	P-G	54*	103	79	8
Boys Ranch	General Motors Proving Grounds	PD	77	540	258	183
Buckeye	Approximately 30 miles W of Phoenix	PD	166	1036	358	83
Bullhead City	224 Main Street	SCE	71	131	124	59
Casa Grande	401 North Marshall Road	State	98	467	322	55
Clarkdale	High School Football Stadium	State	47*	85	67	10
Coolidge	2 miles N of Coolidge	PD	67	800	485	182
Corona de Tucson	21 miles SE of Tucson	Pima	20	75	46	59
Davis Dam	Dri Mountain (1 mile NE)	SCE	19	299	56	56
Davis Dam	Katherine's Landing	SCE	25	89	74	59

Table 2-7 (Cont'd)

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Douglas	U.S. 666, 2 km NNE of stack	State	20*	62	37	10
Douglas	0.75 miles N15^{o}E of smelter stack	PD	49	338	300	349
Douglas	1012 G Avenue (Mercantile)	PD	81	248	245	353
Douglas	Pirtleville, 1.3 miles N22.5^{o}E of smelter stack	PD	58	1008	290	359
Douglas	Emission Control Center	PD	18	118	70	46
Douglas	15th Street Park	State	74	195	174	53
Dragoon	Dragoon Road	AEPCO	27	72	57	104
Eagar	Town Hall	State	82	206	164	51
Flagstaff	Birch & San Francisco	State	104*	602	203	12
Florence	22nd Street & Willow	State	67	179	166	59
Glendale	6000 West Olive Avenue	Maricopa	97	162	162	46
Grand Canyon	Grand Canyon Village	State	11*	27	27	22
Green Valley	245 West Esperanza	Pima	45	93	82	56
Green Valley	2 miles N of Townsite	PD	40	156	137	164
Hayden	Old Town Jail, Canyon Drive	State	134*	416	290	44
Hayden	Montgomery-Reece Ranch	State	46*	98	98	44
Hereford	11 miles W of Bisbee	PD	22	459	222	352
Joseph City	3.25 miles SE of Joseph City	State	31*	173	117	29
Joseph City	Environmental Laboratory	APS	35	940	340	263
Joseph City	Leroux Substation, 9.5 miles SE of Joseph City	APS	26	260	150	238

Table 2-7 (Cont'd)

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Joseph City	Met Tower, Cholla Power Plant	APS	17	106	83	241
Kingman	305 West Beale Street	State	55*	121	110	34
Lake Havasu	Lake Havasu Community Hospital	State	31	150	77	45
Mammoth	Pinal County Jail Building	P-G	68*	114	113	12
Maricopa	Approximately 6.5 miles N83°W of Maricopa	PD	43	253	242	182
Marana	Marana Air Park	P-G	59*	107	93	12
Mesa	Broadway & Brooks	Maricopa	86*	272	180	38
Mescal	El Paso Natural Gas Company Station, 9 miles W of Benson	PD	44	274	152	170
Miami	Miami Fire Department, 804 Sullivan Street	State	85	259	222	61
Miami	Jones Ranch	State	20	52	52	45
Mohave Valley	10 miles NW of Topock	State	60*	364	217	34
Montezuma Castle	Park Maintenance Building	State	24*	50	49	41
Morenci	Cadillac Point - 5500, 2.75 miles N51°W of smelter stack	PD	33	183	129	346
Morenci	Clifton Fina, 1.75 miles S69°E of smelter stack	PD	51	216	148	349
Morenci	Mobile Monitor, 2.75 miles S70°W of smelter stack	PD	23	102	94	77
Morenci	Mobile Monitor, approximately 1.9 miles S51°W of smelter stack	PD	44	228	204	257

Table 2-7 (Cont'd)

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Morenci	Fairbanks, approximately 2.1 miles S26^{o}E of smelter stack	PD	64	521	491	354
Morenci	Stargo, 1.5 miles N63^{o}W of smelter stack	PD	40	146	133	343
Morenci	Stargo, Highway 666	State	37	79	77	49
Nelson	6 miles E of Peach Springs	State	18*	100	64	36
Nogales	Nogales High School, Plum Street	State	85*	210	183	24
Oracle Junction	Near Oracle Junction, approximately 21 miles N of Tucson	PD	23	59	58	181
Organ Pipe	Visitor's Center	State	28*	98	79	43
Page	City Water Tower	SRP	25	137	120	61
Page	Airport	State	25*	61	46	38
Parker	914 Arizona Avenue	State	114	476	333	53
Payson	Ranger Station	P-G	41*	82	80	11
Pearce	Sunsites	AEPCO	40	131	128	138
Petrified Forest	Microwave Relay Station	APS	16	71	60	260
Phoenix	1845 East Roosevelt	Maricopa	120	247	208	52
Phoenix	4732 South Central	Maricopa	218	436	400	51
Phoenix	8531 North 6th Street	Maricopa	106	231	189	56
Phoenix	201 North Central, Valley Bank Center, Roof	PD	65	245	217	365
Phoenix	15 East Monroe, Valley Bank Annex, 3rd Floor	PD	98	500	350	364

Table 2-7 (Cont'd)

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Phoenix	1845 East Roosevelt	State	106*	316	154	44
Prescott	500 South Marina Street	State	38*	145	117	36
Rillito	Miller's Market	State	100	329	314	60
Riviera	Camera Site	SCE	28	72	70	57
Riviera	Ft. Mohave (4 miles S)	SCE	32	81	71	59
Riviera	Hancock (1 mile E)	SCE	45	158	116	56
Roosevelt	Ranger Station	P-G	46*	85	71	5
Safford	523 10th Avenue	State	123	281	245	50
St. Johns	Airport	SRP	21*	58	52	30
St. Johns	Mesa Parada	SRP	8*	24	15	13
San Manuel	Townsite, Upper Shopping Center, 2 km SSW of smelter	Magma	43	106	90	59
San Manuel	Golf Course, 3 km NW of smelter	Magma	33	78	64	59
San Manuel	East Peppersauce Wash, 5.8 km ESE of smelter	Magma	35	95	87	57
San Manuel	Dormsite, 1.4 km SSW of smelter	Magma	40	96	80	54
San Manuel	LDS Church	State	26	83	75	60
Scottsdale	2857 North Miller Road	Maricopa	92	147	144	58
Scottsdale	13665 North Scottsdale Road	Maricopa	128	494	350	53
Show Low	City Hall, Deuce of Clubs Avenue	State	70	392	374	46

Table 2-7 (Cont'd)

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Sierra Vista	1st Street & Bartow Drive	State	53	107	83	46
Stanfield	Pinal County Courthouse	P-G	93*	182	173	12
Superior	AZ DOT, 951 Main Street	State	69*	141	137	39
Tucson	Pima College W	Pima	42	79	69	58
Tucson	151 West Congress	Pima	56	277	118	163
Tucson	Alvernon & Ft. Lowell	Pima	126	328	247	59
Tucson	1970 West Ajo Way & Mission Road	Pima	66	323	169	60
Tucson	Davis-Monthan Air Force Base	Pima	69	157	143	60
Tucson	Oracle Road & Magee	Pima	50	163	116	59
Tucson	Golf Links Road & Harrison	Pima	55	118	100	60
Tucson	Hughes Access & Nogales Highway	Pima	43	116	86	60
Tucson	7920 East Tanque Verde Road	Pima	56	174	114	60
Tucson	Prince Road & Fair View	Pima	110	237	211	56
Tucson	Orange Grove & El Camina de Terra	Pima	87	386	382	57
Tucson	1018 South 6th Avenue	Pima	117	208	198	58
Tucson	32 North Stone, Home Federal Savings Tower, Roof	PD	48	292	277	347
Tucson	University of Arizona	State	61	108	107	49

Table 2-7 (Cont'd)

1978 Particulates Data Summary
High Volume Sampler
(in ug/m^3)

City or Town	Site Location	Operator	Annual Geometric Mean	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples
Vail	El Paso Natural Gas Company Station	PD	25	89	79	176
Willcox	Willcox	AEPCO	33	276	122	127
Yuma	201 South Second Avenue	State	112*	329	311	42

*Annual geometric mean not valid due to insufficient number of samples.

STANDARDS:	Annual Geometric Mean	24-Hour Average
State	75 ug/m^3	150 ug/m^3
Federal Primary	75 ug/m^3	260 ug/m^3
Federal Secondary	60 ug/m^3	150 ug/m^3

Table 2-8

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
Ajo	Town Square, approx. 0.5 mi. N54°W from Smelter	PD	Coul	14	618	613	123	107	8730	365
Ajo	Oxidation Pond, approx. 1.2 mi. N8°E from Smelter	PD	Coul	43	1334	1119	411	333	8717	365
Ajo	S. Tailings Dam, approx. 1.3 mi. N85°E from Smelter	PD	Coul	13	1918	1884	338	325	8719	365
Ajo	Camelback Mountain, approx. 1.2 mi. N88°W from Smelter	PD	Coul	9	1035	825	275	118	8739	365
Ajo	Gibson, approx. 1.6 mi. N63°W from Smelter	PD	Coul	8	862	553	238	155	8736	365
Ajo	Shelton, approx. 2.1 mi. N37°W from Smelter	PD	Coul	7	555	511	173	136	8705	365
Ajo	Miller, approx. 4.0 mi. N14°W from Smelter	PD	Coul	5	430	383	68	63	8699	362
Ajo	Well No. 1, approx. 6.2 mi. N9°E from Smelter	PD	Coul	6*	191	165	37	31	4235	177
Ajo	AZ DOT, Well Road	State	Coul	24	1362	1254	322	243	7036	NA
Ajo	Hotshot, approx. 2.9 mi. S60°E from Smelter	PD	Coul	4*	286	283	63	55	4413	184
Boys Ranch	General Motors Proving Ground	PD	Coul	6	90	86	23	22	7870	332
Buckeye	Approx. 30 mi. West of Phoenix	PD	Coul	3*	44	23	22	9	3500	147

Table 2-8 (Cont'd)

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
Bullhead City	224 Main Street	SCE	Flame	NA	181	141	NA	NA	7620	NA
Clifton	Court House	Greenlee	Coul	8	642	242	108	64	6912	NA
Coolidge	2 mi. N of Coolidge	PD	Coul	4	217	173	62	51	8044	348
Davis Dam	Katherine's Landing	SCE	Flame	NA	128	120	NA	NA	7010	NA
Davis Dam	Dri Mountain, 1 mi. NE	SCE	Flame	NA	128	94	NA	NA	8145	NA
Douglas	North 0.75 mi. N15°E of Smelter	PD	Coul	42	1213	1153	249	233	8730	365
Douglas	Curtis, approx. 2.65 mi. N32°W of Smelter	PD	Coul	28	1527	1396	275	220	8731	365
Douglas	Fairgrounds, approx. 3 mi. N55°E of Smelter	PD	Coul	16	741	637	139	123	7118	297
Douglas	Fir, approx. 14 mi. N47°E of Smelter	PD	Coul	21	2078	1171	259	202	8722	364
Douglas	1012 G Avenue (Mercantile)	PD	Coul	29	1093	891	197	191	8727	365
Douglas	Mobile II, approx. 1.6 mi. N70°E of Smelter	PD	Coul	23*	777	637	163	89	1126	47
Douglas	Queen, approx. 1.1 mi. S70°E of Smelter	PD	Coul	18*	1275	550	169	97	1508	61
Douglas	Mobile, approx. 1.0 mi. S67°E of Smelter	PD	Coul	46	1449	1292	320	314	7275	304
Douglas	McNeal, approx. 17.2 mi. N27°W of Smelter	PD	Coul	8*	922	354	115	76	3234	135
Douglas	NW, approx. 1.22 mi. N30°W of Smelter	PD	Coul	55	1711	1310	288	283	8725	365
Douglas	Pirtleville, 1.3 mi. N22.5°E of Smelter	PD	Coul	37	1109	1022	246	215	8704	363

Table 2-8 (Cont'd)

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
Douglas	2 km NNW of Smelter	State	Coul	25*	951	914	189	129	6541	NA
Douglas	U.S. 666, km NNE of Smelter	State	Coul	32*	1069	991	236	191	4877	NA
Dragoon	Dragoon Road	AEPCO	Bubbler	6	NA	NA	42	36	NA	224
Elfrida	1.5 mi. E, .25 mi. S of Elfrida	State	Coul	4*	415	274	59	53	3372	NA
Grand Canyon	Grand Canyon Village	State	Bubbler	7*	NA	NA	32	22	NA	20
Green Valley	2 mi. N of townsite	PD	Coul	0	19	16	8	6	8470	350
Hayden	Hayden Fire Station	JCC	Coul	74	1460	1410	380	376	8538	NA
Hayden	Hayden Junction, Highway 177	JCC	Coul	37	1118	1045	215	178	8711	NA
Hayden	Montgomery Ranch	State	Coul	44	1169	1023	288	283	6678	NA
Hayden	Montgomery Ranch	JCC	Coul	133	1785	1399	395	391	8718	NA
Hayden	Old Town Jail	State	Coul	60	3286	1698	413	343	7584	NA
Hereford	11 mi. W of Bisbee	PD	Coul	0	100	76	16	10	8445	348
Joseph City	Environmental Laboratory	APS	Bubbler/ Meloy	0	27	27	7	1	1519	292
Joseph City	Leroux Substation 9.5 mi. SE of Joseph City	APS	Bubbler/ Meloy	0	29	29	16	8	5736	272
Joseph City	Met Tower	APS	Bubbler/ Meloy	0	39	38	11	3	7015	257
Joseph City	3.25 mi. SE of Joseph City	State	Bubbler	7*	NA	NA	20	20	NA	18
Kansas Settlement	Kansas Settlement	AEPCO	Bubbler	9	NA	NA	50	44	NA	293

Table 2-8 (Cont'd)

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
Katherine's Landing	Water Treatment Area	SCE	Flame	NA	117	117	NA	NA	7665	NA
Kearny	Crescent Ranch, Highway 177	JCC	Coul	33	830	687	179	168	8662	NA
Kearny	Rear of 304 Hartford	JCC	Coul	38	1006	769	267	188	8690	NA
McNeal	2.5 mi. W, .25 mi. S of McNeal	State	Coul	3*	341	195	55	27	2658	NA
Mammoth	Courthouse, 11.8 km N of Smelter	Magma	Coul	7	1516	833	180	141	8641	365
Maricopa	Approx. 6.5 mi. N83°W of Maricopa	PD	Coul	3	130	44	24	17	7917	341
Mescal	El Paso Natural Gas Co. Station 9 mi W of Benson	PD	Coul	2	124	97	41	27	8108	338
Miami	Cities Service Building	State	Coul	21*	668	573	146	134	1757	NA
Miami	Jones Ranch	State	Coul	64	4565	3609	985	675	8012	NA
Miami	Lower Miami School	State	Coul	21	1349	1235	173	171	8364	NA
Miami	County Landfill	State	Coul	65*	1290	1027	290	279	441	NA
Morenci	Cadillac Point 5500 1.75 mi. N51°W of Smelter	PD	Coul	68	2803	1672	542	409	8688	362
Morenci	Clifton Fina, 1.75 mi. S69°E of Smelter	PD	Coul	46	1101	1022	265	265	8734	364
Morenci	Metcalf, approx. 3.9 mi. N28°W from Smelter	PD	Coul	52	1187	1148	267	241	8507	353
Morenci	Oroville, approx. 2.75 mi. N48°E of Smelter	PD	Coul	17	584	571	115	81	8662	360

Table 2-8 (Cont'd)

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
Morenci	Mobile Monitor, Silver Basin, approx. 1.9 mi. S51°W from Smelter	PD	Coul	54*	2730	2463	493	372	6550	273
Morenci	Mobile, Standpipe, approx. 2.75 mi. S79°W of Smelter	PD	Coul	58*	2070	1939	403	272	2036	85
Morenci	Stargo, 1.5 mi. N63°W of Smelter	PD	Coul	78	1813	1740	495	424	8613	358
Morenci	Eagle Creek Rd., approx. 4.75 mi. S84°W of Smelter	PD	Coul	17	629	524	168	139	8463	348
Morenci	Fairbanks, approx. 2.1 mi. S26°E of Smelter	PD	Coul	16	909	689	152	102	8552	354
Morenci	Stargo, Highway 666	State	Coul	48*	1746	1656	507	261	4957	NA
Morenci	U.S. 666, 4.5 km NW of Smelter	State	Coul	91	3006	1974	576	445	6916	NA
Oracle	New Courthouse, 13.2 km W of Smelter	Magma	Coul	7	1060	818	180	156	8420	354
Oracle	Holy Cross Canyon, 10.7 km WSW of Smelter	Magma	Coul	NA	1268	639	229	159	2133	91
Oracle Junction	Near Oracle Junction, approx. 21 mi. N of Tucson	PD	Coul	5	509	428	111	91	8462	358
Page	Water Tower	SRP	Bubbler	3	NA	NA	10	1	NA	61
Page	SW 7.4 km from Navajo G.S.	SRP	Flame	NA	178	157	42	21	8395	NA
Pearce	Sunsites	AEPCO	Bubbler	7	NA	NA	53	44	NA	298

Table 2-8 (Cont'd)

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
Petrified Forest	Microwave Relay Station	APS	Bubbler/ Flame	0	28	28	5	2	5374	270
Phoenix	1845 East Roosevelt	Maricopa	Coul	3*	NA	NA	18	13	4525	NA
Phoenix	201 N. Central, Valley Bank Center, 29th Floor	PD	Coul	7	102	82	33	31	8284	358
Phoenix	15 East Monroe, Valley Bank Annex, 3rd Floor	PD	Coul	6	83	76	45	28	8348	362
Redington	E of main ranch, 25.2 km SSE of Smelter	Magma	Coul	7	455	281	157	106	8396	353
Riviera	Hancock, 1 mi. E	SCE	Flame	NA	228	128	NA	NA	7445	NA
Riviera	Ft. Mohave, 4 mi. S	SCE	Flame	NA	183	139	NA	NA	7445	NA
St. Johns	Mesa Parada	SRP	Fluor	0*	8	7	0	0	3778	NA
St. Johns	Mesa Parada	State	Bubbler	8*	NA	NA	22	22	NA	12
San Manuel	Upper Shopping Center, 2 km SSW of Smelter	Magma	Coul	59	2349	1290	456	346	8623	365
San Manuel	Golf Course, 3 km WNW of Smelter	Magma	Coul	62	1307	1277	314	313	8442	355
San Manuel	East Peppersauce Wash, 5.8 km ESE of Smelter	Magma	Coul	NA	1094	710	171	152	6235	261
San Manuel	Dormsite, 1.4 km SSW of Smelter	Magma	Coul	NA	1085	1077	254	228	2181	94
San Manuel	LDS Church	State	Coul	53	2476	1527	509	238	6733	NA
San Manuel	Dormsite, 1 km SSW of Smelter	Magma	Coul	NA	1763	1650	454	364	6397	270

Table 2-8 (Cont'd)

1978 Sulfur Dioxide Data Summary
(in ug/m^3)

Site	Location	Operator	Method	Annual Average	3-Hour Average Max.	3-Hour Average 2nd High	24-Hour Average Max.	24-Hour Average 2nd High	Number of Samples 1-Hour	Number of Samples 24-Hour
San Manuel	Mine site, 10.5 km NW of Smelter	Magma	Coul	54	4939	1324	684	342	8524	358
Tucson	32 North Stone, Home Federal Tower, 6th Floor	PD	Coul	3	210	173	45	32	7669	308
Tucson	151 West Congress	Pima	Flame	5	157	113	43	35	6748	NA
Tucson	Oracle Road & Magee	Pima	Coul	2*	201	140	51	43	4877	NA
Tucson	1721 North Tanque Verde Loop Road	Pima	Coul	2*	183	148	36	26	6387	NA
Tucson	22nd & Craycroft	Pima	Coul	3	140	114	37	34	8181	NA
Vail	El Paso Natural Gas Co. Station	PD	Coul	1	95	65	30	29	7646	305
Willcox	Willcox	AEPCO	Bubbler	9	NA	NA	49	47	NA	277
Winkelman	N of Winkelman School property off Highway 77	JCC	Coul	33	1311	1077	198	181	8633	NA
Winkelman	Approx. ½ mi. S of Highway 77 & Junc. 177	JCC	Coul	17	1095	683	148	135	8721	NA
Winkelman	Approx. 1 mi. N of Highway 77 & Junc. 177	JCC	Coul	102	1482	1419	404	326	8713	NA

*Annual average not valid due to insufficient number of samples.

STANDARDS:	Annual Average	3-Hour Average	24-Hour Average
State	80 ug/m^3	1300 ug/m^3	365 ug/m^3
Federal Primary	80 ug/m^3	---	365 ug/m^3
Federal Secondary	---	1300 ug/m^3	---

3. DATA TRENDS

3.1 Carbon Monoxide

For this study the term, season average, is defined as the average concentration for the months of January, February, October, November and December, the period of peak concentrations. The season average is more useful than the annual average because any variations in concentrations due to changes in meteorology or emissions will be greater during the peak months.

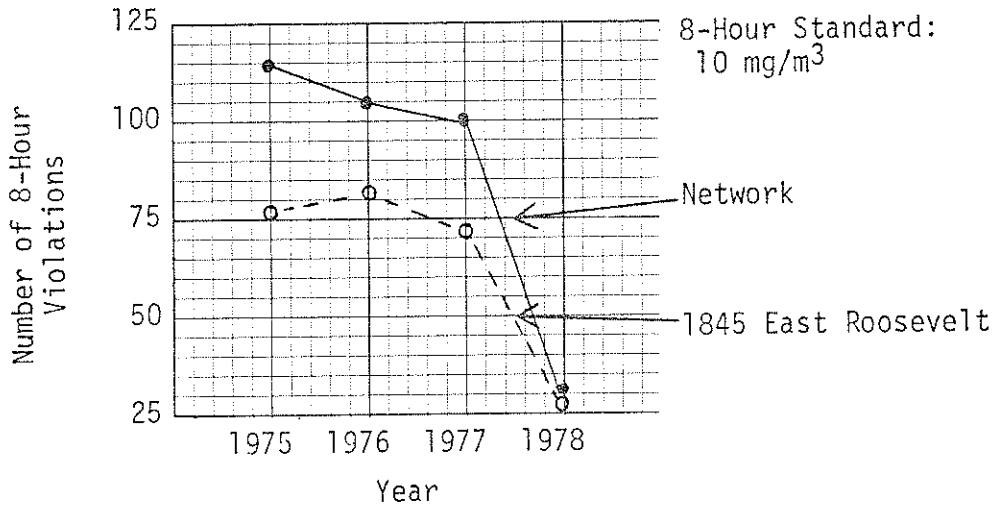
3.1.1 Phoenix

A large decrease in the number of violations of the 8-hour standard was observed in 1978. There were only 28 violations in 1978 compared to 99 in 1977. Figure 3-1 includes the number of violations for 1975-1978 for both the comparative network and for 1845 East Roosevelt, the site of highest concentrations in the comparative network.

Violations have also been measured at other sites, notably, 3300 West Camelback and 1740 West Adams, but these sites were not considered in this analysis because they were not operated for the range of the study period.

Figure 3-1

Number of CO Violations in the Phoenix Area



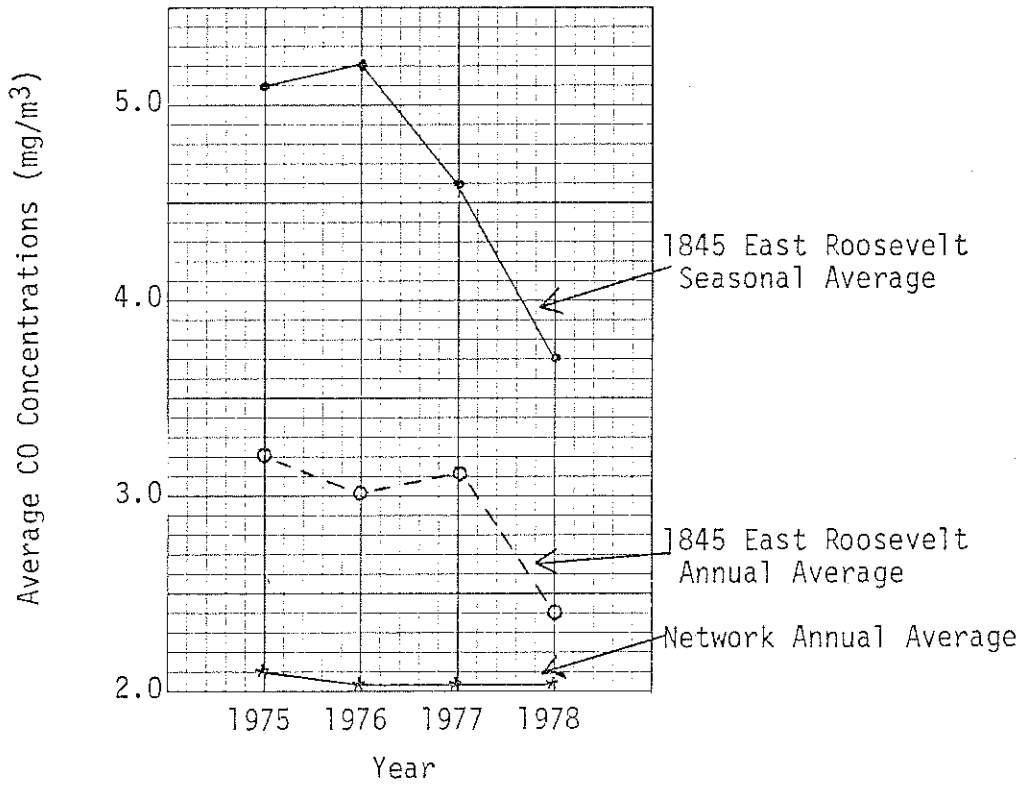
The comparative data represent only those sites operated in 1975-1978, including 1845 East Roosevelt, 4732 South Central and 8531 North 6th Street in Phoenix and Scottsdale (2857 North Miller), Glendale (6000 West Olive) and Mesa (3rd Place and Center in 1975-1977, Broadway and Brooks in 1978).

A significant reduction was also noted in the annual and seasonal average concentrations in 1978 at 1845 East Roosevelt. On the other hand, the network annual average concentration has remained constant for the past three years.

Since meteorology was more favorable for dispersion in 1978, it appears that the network annual average concentration is not an accurate indicator of trends. The insensitivity of the network average concentration to trends is due to the diminishing effect of much lower concentrations at sites such as Glendale and South Central and North 6th Street in Phoenix. Average concentration data are plotted in Figure 3-2 below.

Figure 3-2

Average CO Concentrations in Phoenix Area

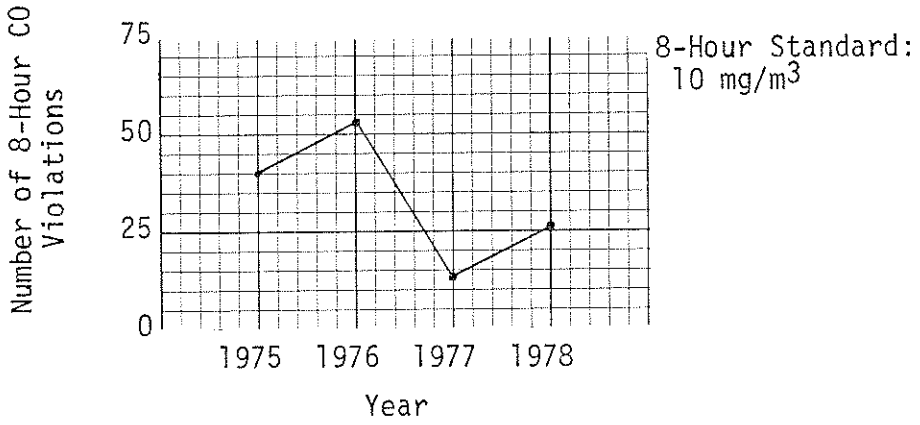


3.1.2 Tucson

Over the same period, 1975-1978, the number of violations has gradually declined in Tucson. However, from 1977 to 1978 an apparent increase in the number of violations occurred. This apparent increase is in doubt because 1977 data were incomplete for the peak site, Alvernon Way and 22nd Street. Thus, 1978 data should be compared with 1976 data. The data are plotted in Figure 3-3.

Figure 3-3

Number of CO Violations in Tucson

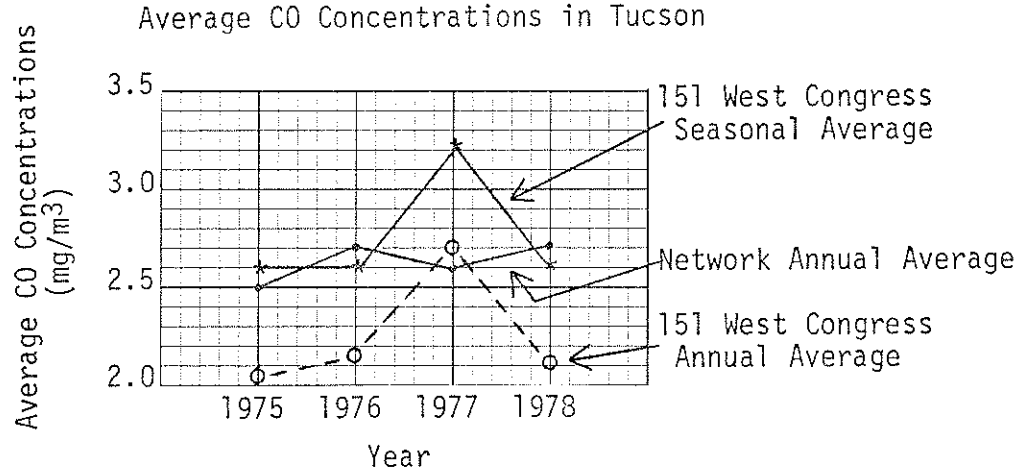


Network sites include 151 West Congress Street, Craycroft and 22nd Street and Alvernon Way and 22nd Street.

The effect of incomplete data in 1977 for the Alvernon site reappears in Figure 3-4, a plot of annual average concentrations. An increase in the seasonal and annual average values occurred at 151 West Congress, but not for the network in 1977.

Figure 3-4

Average CO Concentrations in Tucson

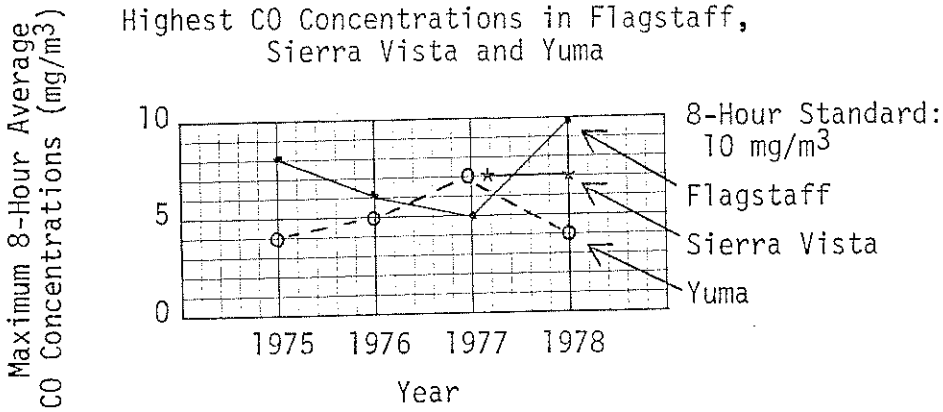


3.1.3 Other Areas

No violations of the standards have been detected since monitoring was started in 1975 in Flagstaff and Yuma. Maximum and second highest readings are plotted in Figure 3-5 for general information. No trends can be determined because these data are incomplete and it has been necessary to move the monitor in Flagstaff several times.

Figure 3-5

Highest CO Concentrations in Flagstaff, Sierra Vista and Yuma



3.2 Hydrocarbons

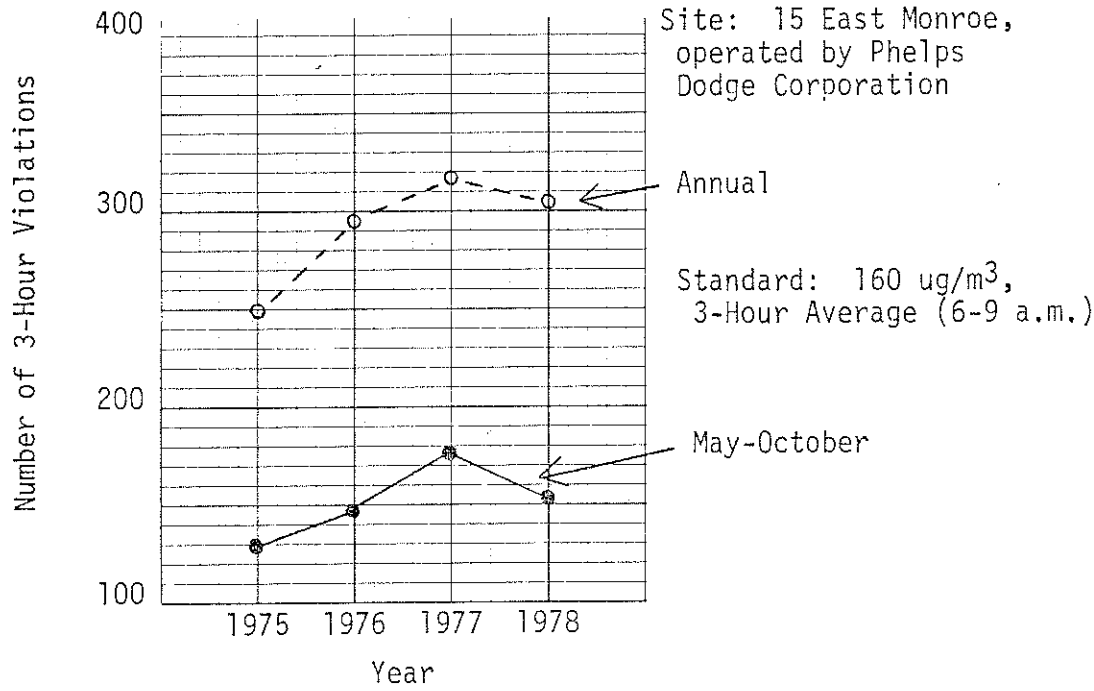
3.2.1 Phoenix

The number of violations of the hydrocarbons air quality standard increased steadily in 1976 and 1977 and then declined slightly in 1978. The reference data in Figure 3-6 reveal this trend in both the annual and oxidants seasonal statistics.

The oxidants season is defined as May-October, the period of highest oxidants concentrations, for the purposes of this report.

Figure 3-6

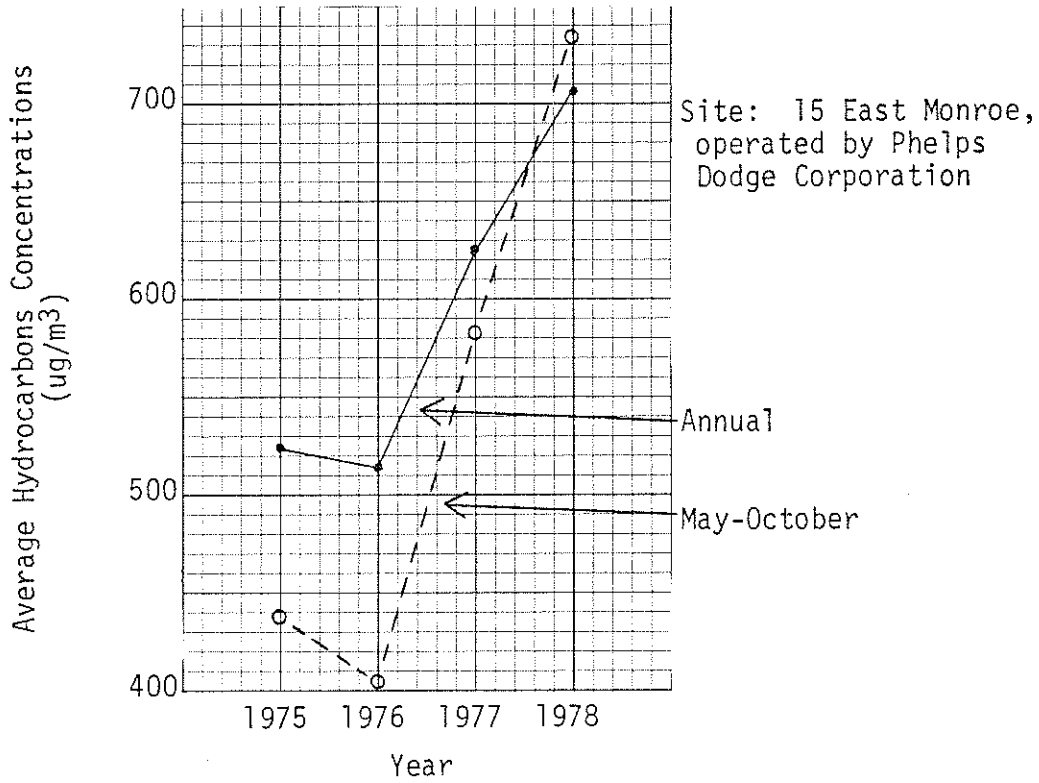
Number of Hydrocarbons Violations in Phoenix



Average concentrations exhibit a different pattern, one of sharply rising concentrations in recent years. Again, there is agreement between the annual and seasonal values.

Figure 3-7

Average Hydrocarbons Concentrations in Phoenix



It is noteworthy that average hydrocarbons concentrations at 15 East Monroe and the number of oxidants violations in the Phoenix area (see Figure 3-14) increased significantly in 1977 and 1978.

3.2.2 Tucson

Tucson trends are different from Phoenix trends. Concentrations dropped in 1976 and 1977 but, in 1978, they increased significantly. This pattern was followed both annually and during the peak oxidant season, May-October.

The increase in hydrocarbons concentrations in 1978 is interesting in view of the fact that oxidants concentrations also rose in 1978. The hydrocarbons data are illustrated in Figure 3-8 and 3-9 and the oxidants data in Figure 3-16.

Figure 3-8

Number of Hydrocarbons Violations in Tucson

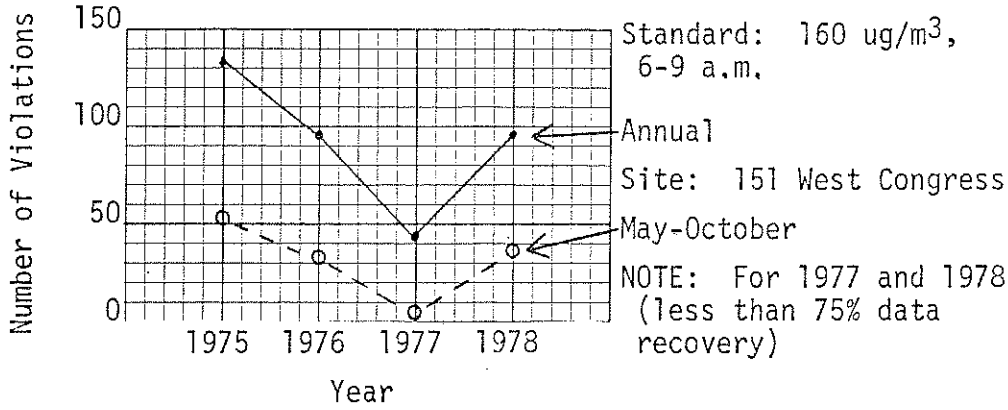
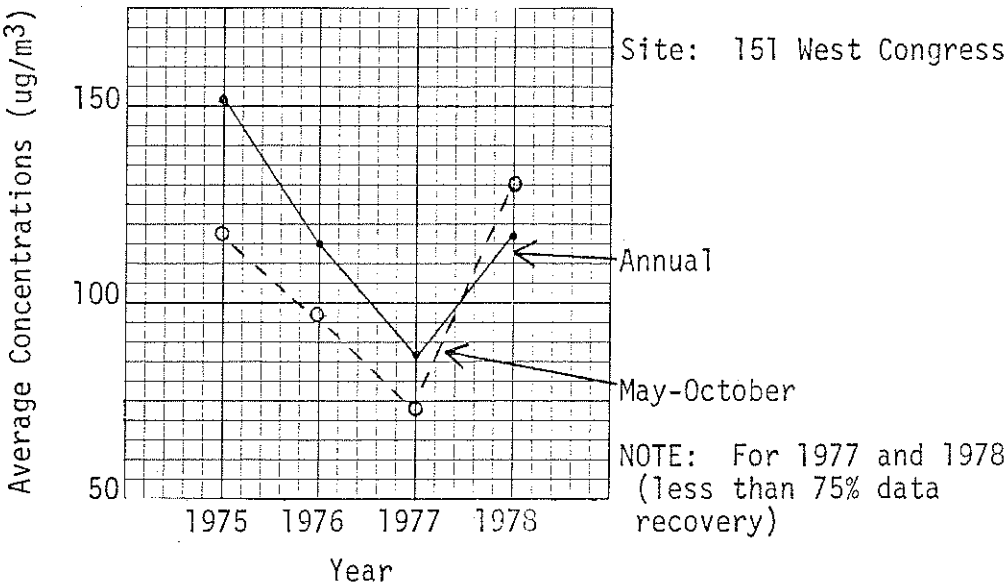


Figure 3-9

Average Hydrocarbons Concentrations in Tucson



3.3 Lead

3.3.1 Phoenix

Lead data for Phoenix are best exemplified by the following graphs:

Figure 3-10

Highest Lead Concentrations in Phoenix Area

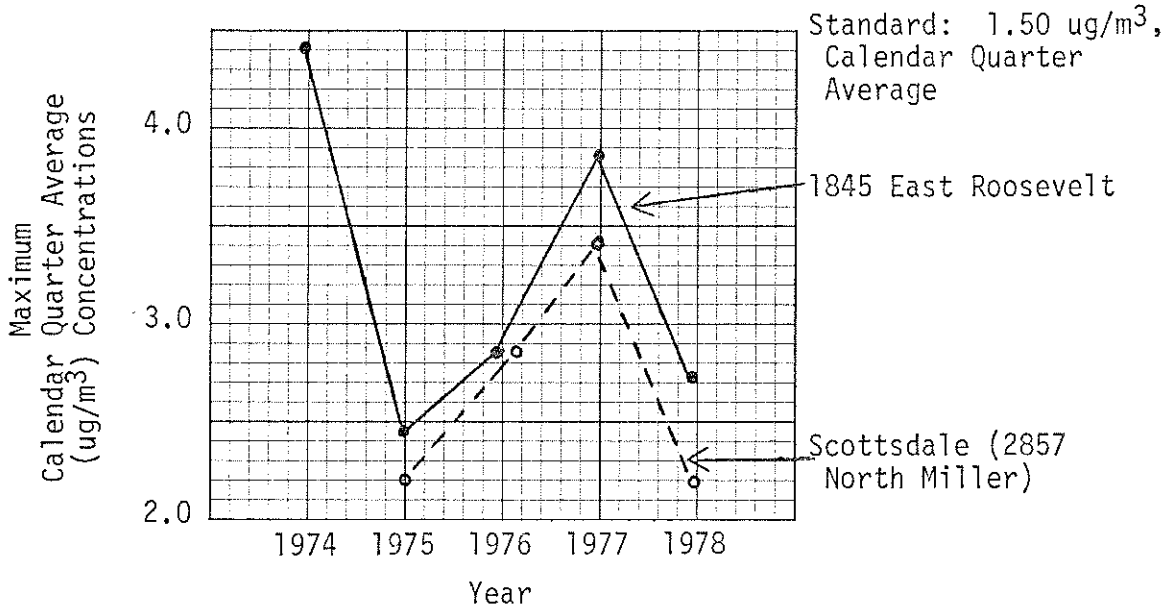
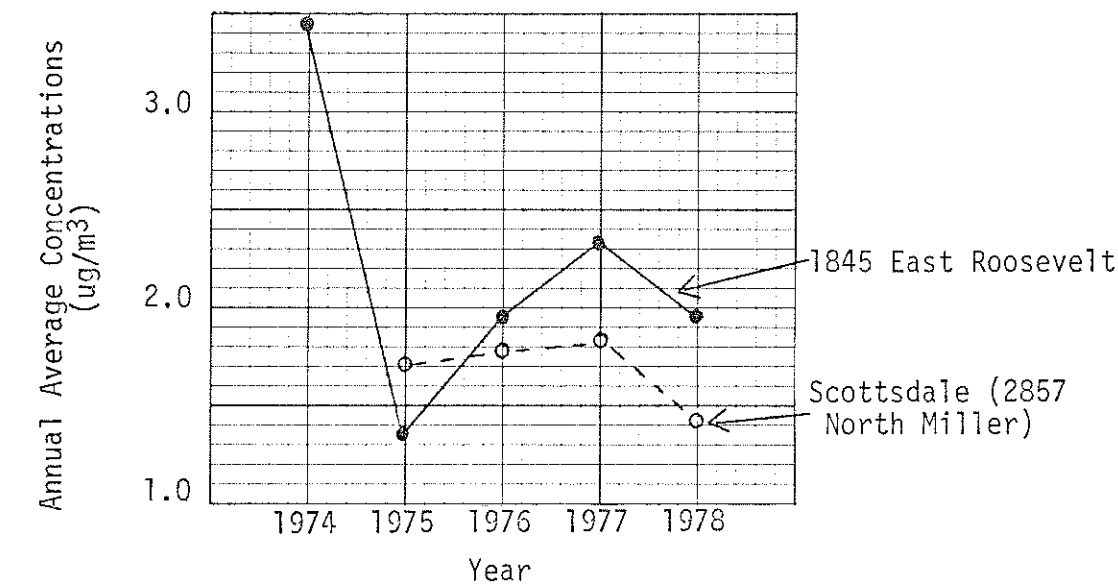


Figure 3-11

Average Lead Concentrations in Phoenix Area



No consistent pattern in these data appears. Concentrations fell in 1975 and 1978, but increased in 1976 and 1977.

The 1845 East Roosevelt and Scottsdale sites data were plotted because highest concentrations occur at these sites. Exceedances of the quarterly air quality standard were also measured at the 8531 North 6th Street and 4732 South Central Avenue sites in 1978.

Lead concentrations are highest during the fall and winter months, following the same pattern as carbon monoxide and hydrocarbons.

3.3.2 Tucson

Only one exceedance of the air quality standard has been detected in Tucson, 1.62 ug/m^3, in the fourth quarter, 1977. This exceedance, however, was based on an inadequate number of samples, six. A minimum of 11 samples is required for a valid quarterly average.

Data for the site, 1016 West Prince Road, are listed below:

Year	Quarterly Average Concentration Maximum	2nd High	Annual Average Concentration	Number of Samples for Year
1977	1.62	1.28	1.02	24
1978	1.29	1.16	.99	55

3.3.3 Other Areas

No exceedances of the standard were determined at any of the 24 sites in the State's network in 1978. The highest concentrations were 0.45 ug/m^3 in Rillito, 0.39 ug/m^3 in Show Low and 0.37 ug/m^3 in Miami.

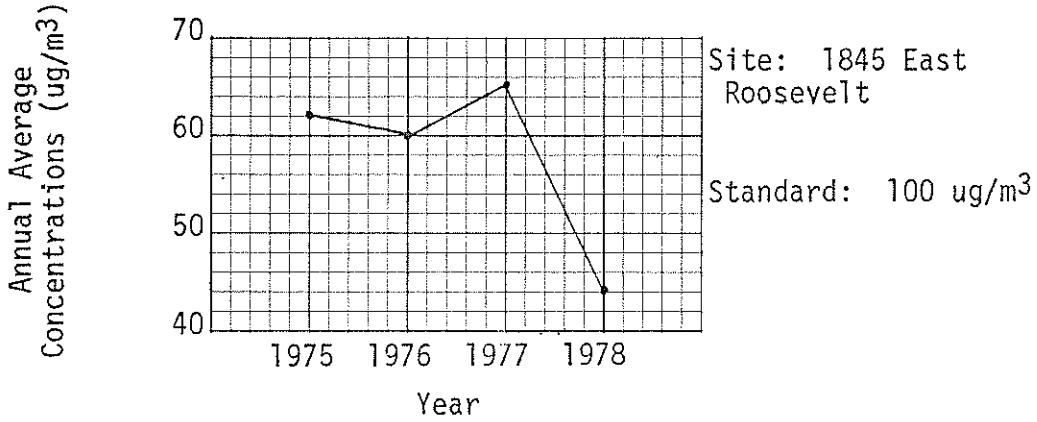
3.4 Nitrogen Dioxide

3.4.1 Phoenix

Nitrogen dioxide concentrations changed very little from 1975-1977, but declined sharply in 1978. Presumably, this large decrease was due to the unusual meteorological conditions in 1978.

Figure 3-12

Nitrogen Dioxide Concentrations in Phoenix

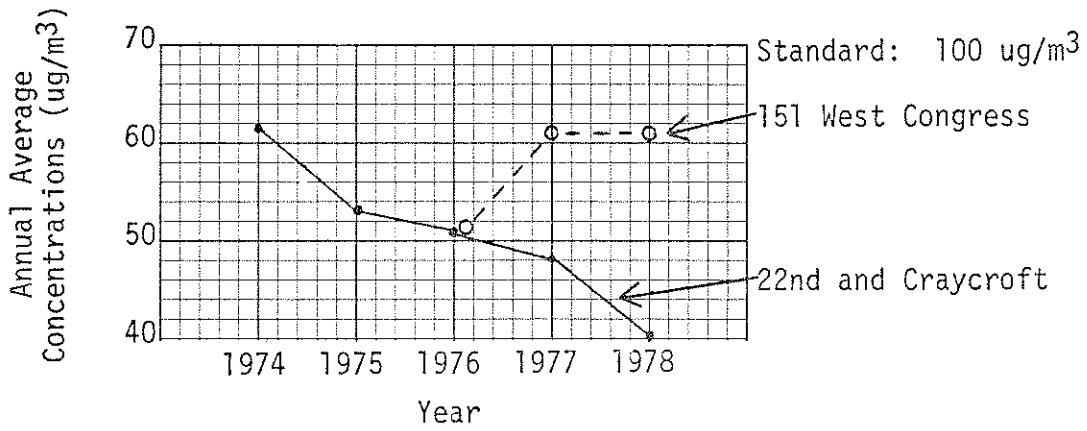


3.4.2 Tucson

The two monitoring sites exhibit different trends as shown in Figure 3-14. At 151 West Congress Street, NO_2 concentrations have increased and then leveled out. On the other hand, at 22nd Street and Craycroft, NO_2 concentrations have been gradually falling.

Figure 3-13

Nitrogen Dioxide Concentrations in Tucson



3.5 Oxidants

For this study the term, oxidants seasonal average, is defined as the average oxidants concentration for the months of May through October, the period of peak concentrations. The seasonal average is more useful than the annual average because variations in concentrations due to changes in meteorology or emissions will be greater during the peak months.

It should also be noted that the following discussion of oxidant violations pertains to violations of the state standard, 160 ug/m^3 (.08 ppm). The federal standard was increased from 160 ug/m^3 to 235 ug/m^3 (.12 ppm) in February, 1979. The new federal standard is based on the number of days in which the standard is exceeded. The standard allows an average of one exceedance day per year, based on a three year running average of exceedance days.

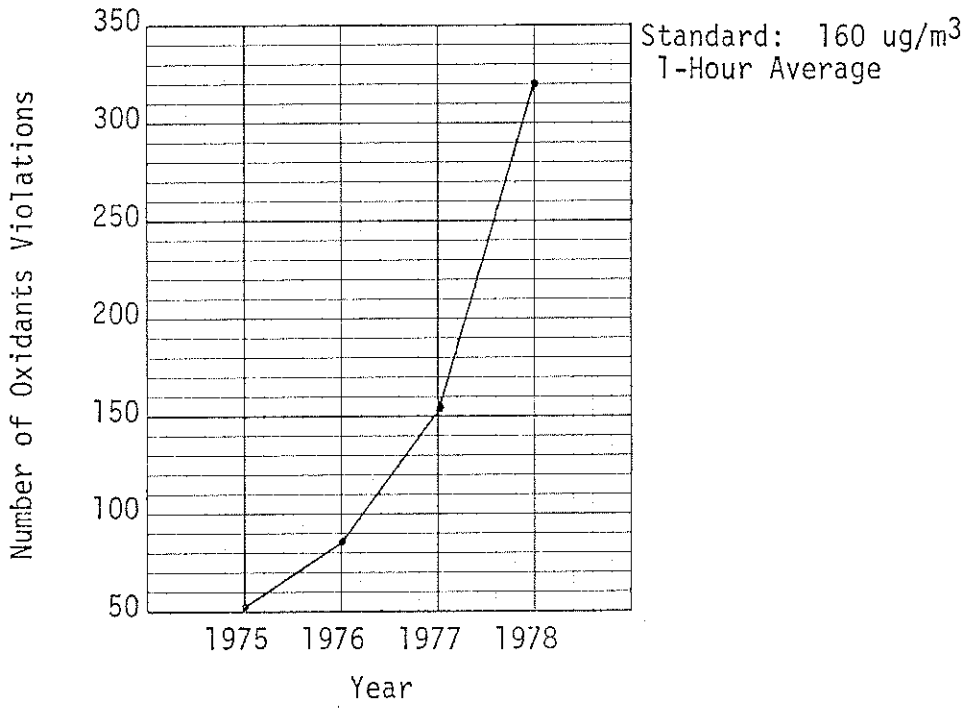
3.5.1 Phoenix

The number of violations of the 1-hour standard was much higher, 109% to be exact, in 1978 as compared to 1977.

In fact, the annual rate of increase in the number of violations has climbed rapidly, from 62% in 1976 to 109% in 1978.

Figure 3-14

Number of Oxidants Violations in Phoenix Area

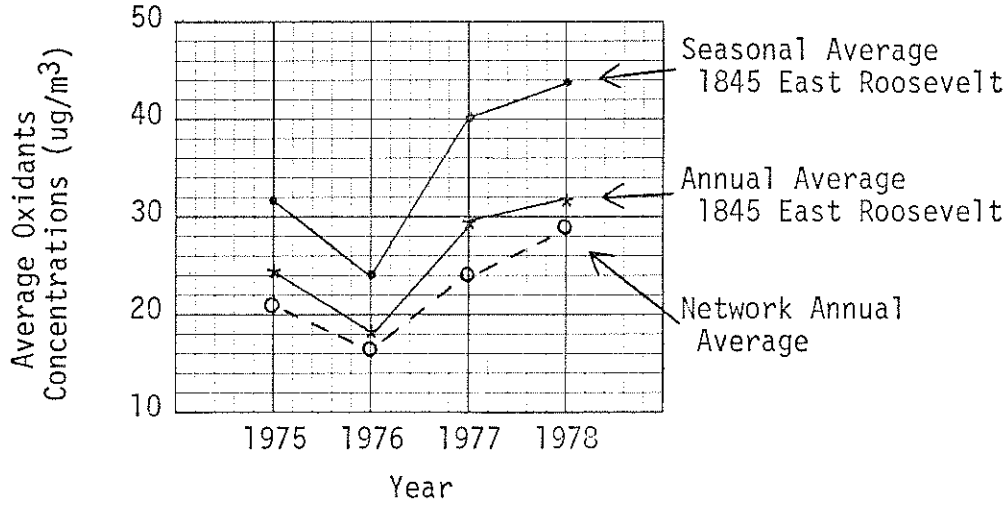


Network sites include 1845 East Roosevelt, 4732 South Central and 8531 North 6th Street in Phoenix, Glendale (6000 West Olive) and Scottsdale (2857 North Miller).

Average concentrations data also exhibit a rising trend except in 1976, when concentrations dropped significantly. Three statistics were plotted in Figure 3-15 to depict these trends. Of the three, the seasonal average for one of the higher concentrations sites, 1845 East Roosevelt, indicates more variation than the network annual average or the site annual average.

Figure 3-15

Average Oxidants Concentrations in Phoenix Area

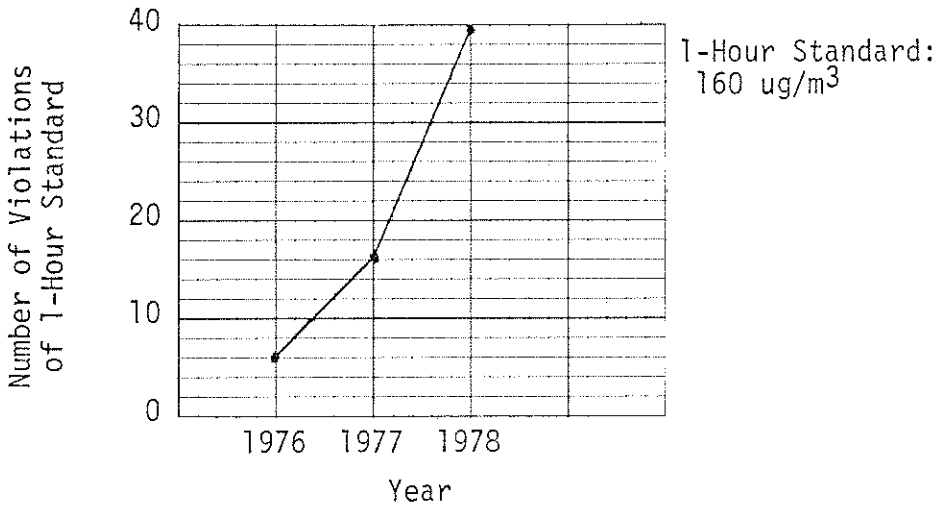


3.5.2 Tucson

As in Phoenix, the Tucson data show an upward trend in the number of oxidants violations (refer to Figure 3-16) from 1976 to 1978. 1975 data were not plotted because a different type of oxidants analyzer was used at one of the sites.

Figure 3-16

Number of Oxidants Violations in Tucson

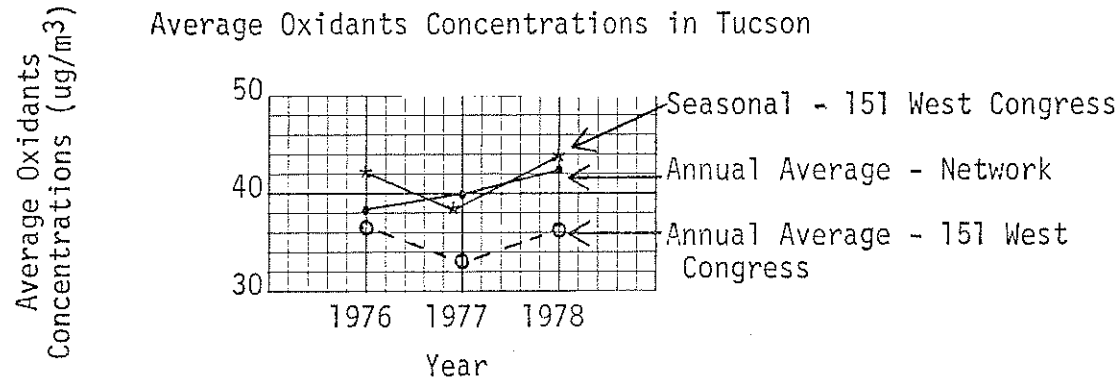


The monitoring sites are 151 West Congress Street and Craycroft and 22nd Street.

Average concentration data differ in that the network average indicates a continual increase in oxidants concentrations since 1976, whereas 151 West Congress shows a decrease in 1977 followed by an increase in 1978 to approximately the 1975 level (see Figure 3-17).

Figure 3-17

Average Oxidants Concentrations in Tucson

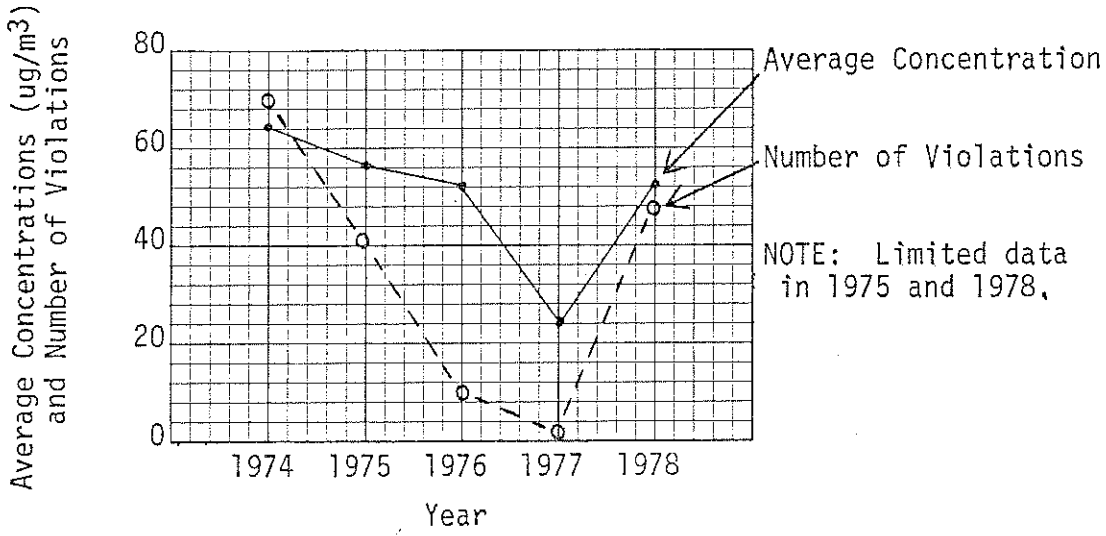


3.5.3 Yuma

Oxidants data for Yuma for 1974-1978 are summarized in Figure 3-18 below. The reason for relatively low concentrations in 1977 is unknown. Data recovery, 84.9%, was satisfactory in 1977.

Figure 3-18

Oxidants Concentrations and Violations in Yuma



3.6 Particulates

3.6.1 Phoenix

Annual geometric means at the six monitors operated for the period of 1974-1978 are plotted in Figure 3-19. Four of the sites, East Roosevelt and North 6th Street in Phoenix plus Scottsdale (North Miller Road) and Glendale exhibit moderate variations from year to year whereas North Scottsdale and South Central Avenue show large changes from one year to the next. The four "stable" sites are evidently varying from year to year due to changes in meteorology. On the other hand, the two "unstable" sites are being affected by strong local sources such as construction, unpaved roads, etc.

Overall, there appears to be no significant trend in particulates concentrations in Phoenix. All sites in the network are exceeding the annual air quality standard, 75 ug/m^3.

3.6.2 Tucson

Concentrations from 1975-1978 are fairly constant except at a few sites such as 3915 East Ft. Lowell Road where a sharp drop in concentrations is indicated on Figure 3-20. The 1970 West Ajo Way, 151 West Congress and 8100 South Nogales Highway stations also disply a downward trend but not as steep as the Ft. Lowell Road site. The other sites exhibit random variation, probably caused by meteorological fluctuations.

Of the ten stations in Figure 3-20, three are exceeding the annual air quality standard. They are 3915 East Ft. Lowell Road, 3401 West Orange Grove Road and South Tucson.

3.6.3 Other Areas

1974-1978 annual geometric mean data are tabulated in Table 3-1. Mean values are annotated when a sufficient number of samples (45 per calendar year) was not collected.

At most of the sites concentrations declined in 1978, presumably due to meteorology. At Miami (Jones Ranch) and San Manuel the annual geometric mean decreased approximately 50% in 1978.

On the other hand, two sites in Arizona, Eagar and Show Low, show slight increases. These two sites, located in the White Mountains area, are influenced by meteorological conditions and emissions which are different from those affecting desert sites.

Figure 3-19

Particulates Concentrations in the Phoenix Area

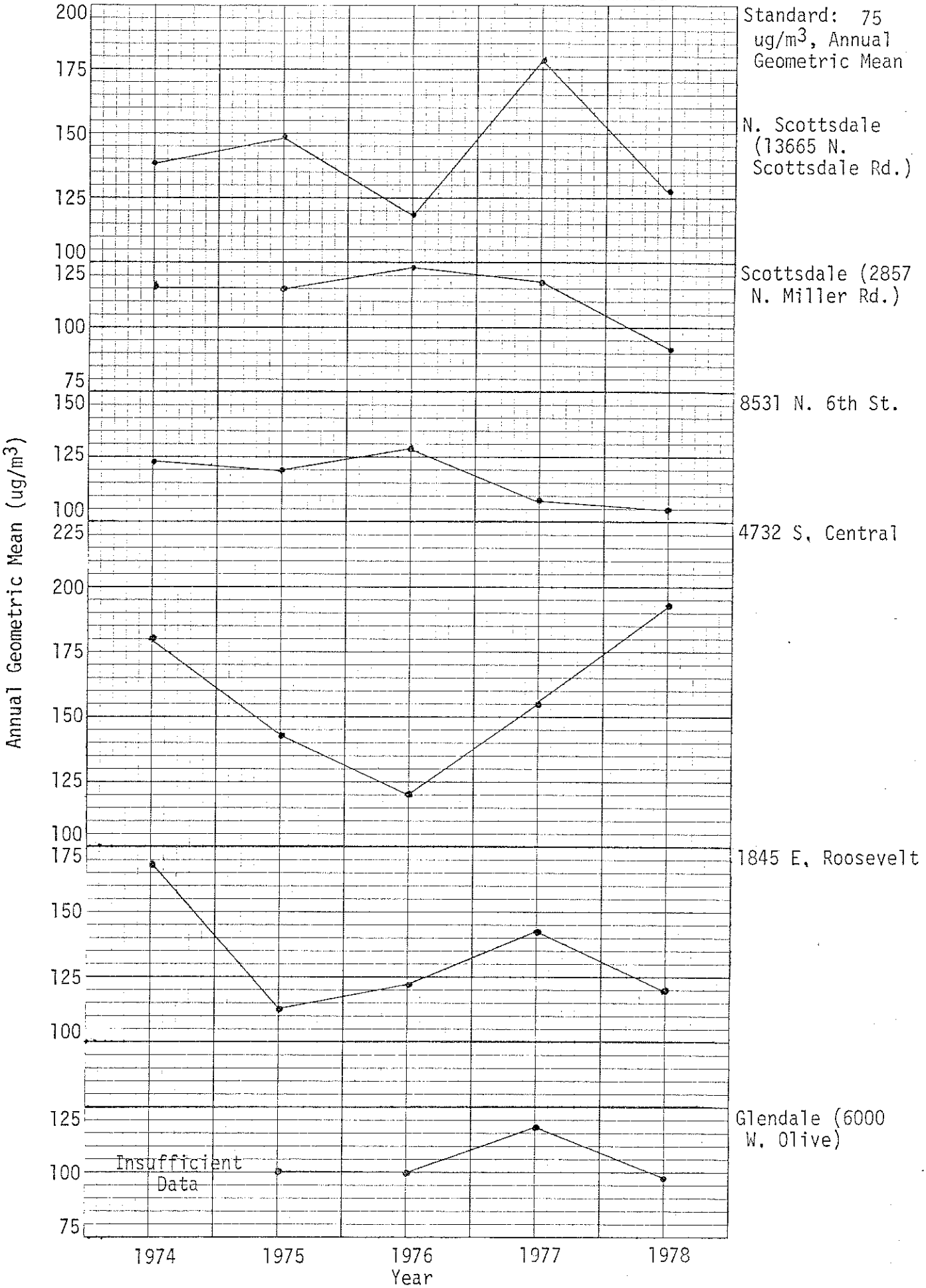


Figure 3-20

Particulates Concentrations in Tucson

Standard: 74 ug/m^3, Annual Geometric Mean

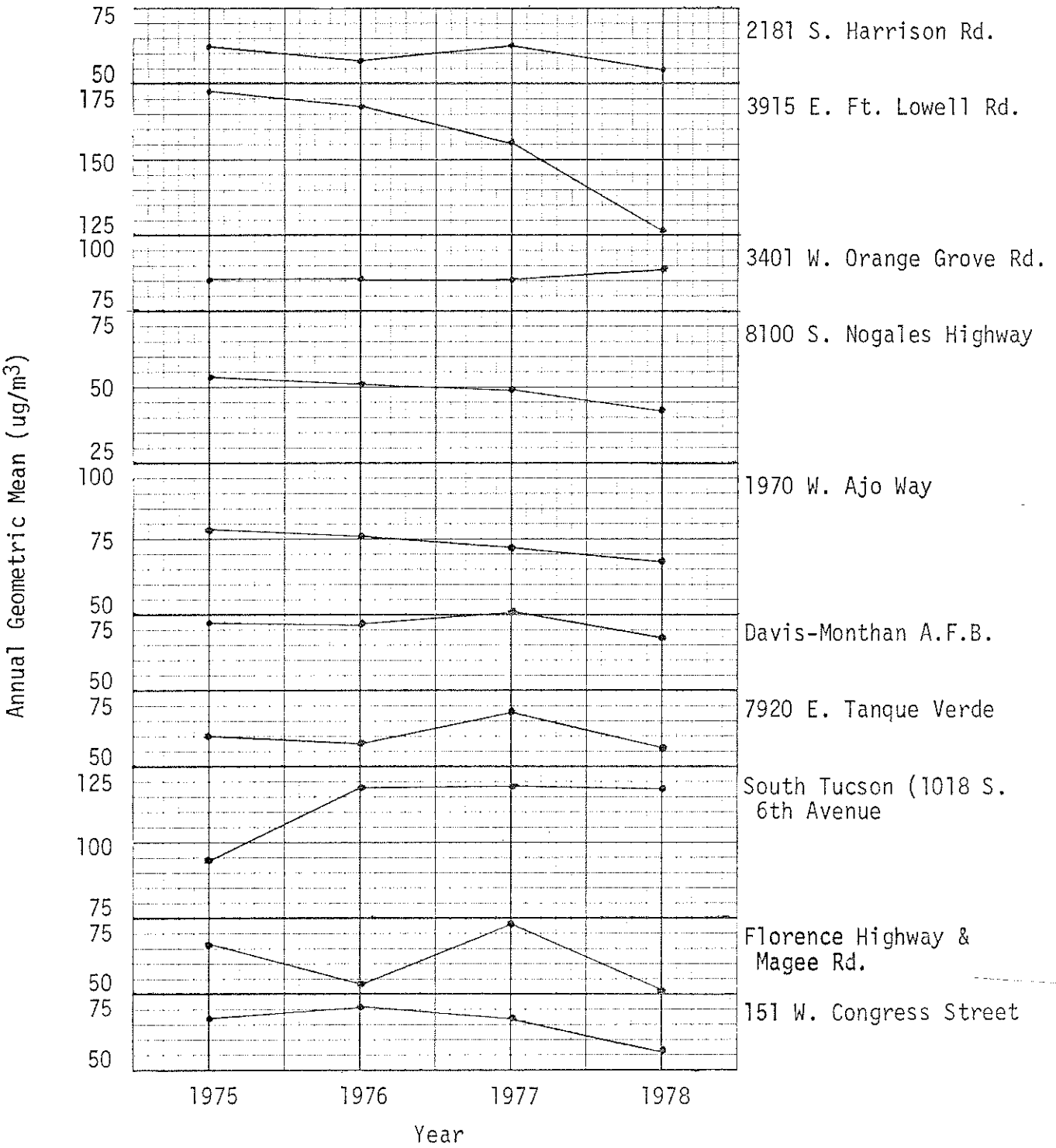


Table 3-1

Particulates in Non-Urban Areas of Arizona
1974-1978

Annual Geometric Mean Concentration (ug/m^3)

Site	1974	1975	1976	1977	1978
Ajo	59	83	92	72*	69
Casa Grande	142*	147	122	118*	98
Clarkdale	54	53	48	51	NA
Douglas (15th Street)	NA	86	74	82	74
Douglas (U.S. 666)	43	49	43	46	NA
Eagar	NA	66	73	74	82
Flagstaff	53	67	79	79*	NA
Florence	85	NA	107*	93	67
Grand Canyon	17*	14*	14*	18*	11*
Hayden	181	165	119	92*	134*
Kingman	58	57*	56	51	55*
Lake Havasu City	54	42	37	44	31
Miami (Jones Ranch)	NA	44*	38	43	20
Montezuma Castle National Monument	27	27	30	30*	24*
Morenci	56*	60	50	47*	37
Organ Pipe Cactus National Monument	23*	28	33	33	28*
Page	48	44	41*	37	25*
Prescott	45*	48	50	47	38*
Rillito	NA	NA	112	143*	100
San Manuel	NA	NA	43	50	26
Show Low	49*	48*	61	64	70
Sierra Vista	61	54	59	63*	53
Superior	84	84	101	96	69*
Yuma	111	147	142	133	112*

NA - Not Available
*Annual geometric mean not valid due to insufficient number of samples.

Regarding long-term trends there are only six sites which clearly indicate a change. Eagar and Flagstaff show a gradual increase in concentrations while Casa Grande, Hayden, Lake Havasu City and Page appear to be decreasing.

3.7 Sulfur Dioxide

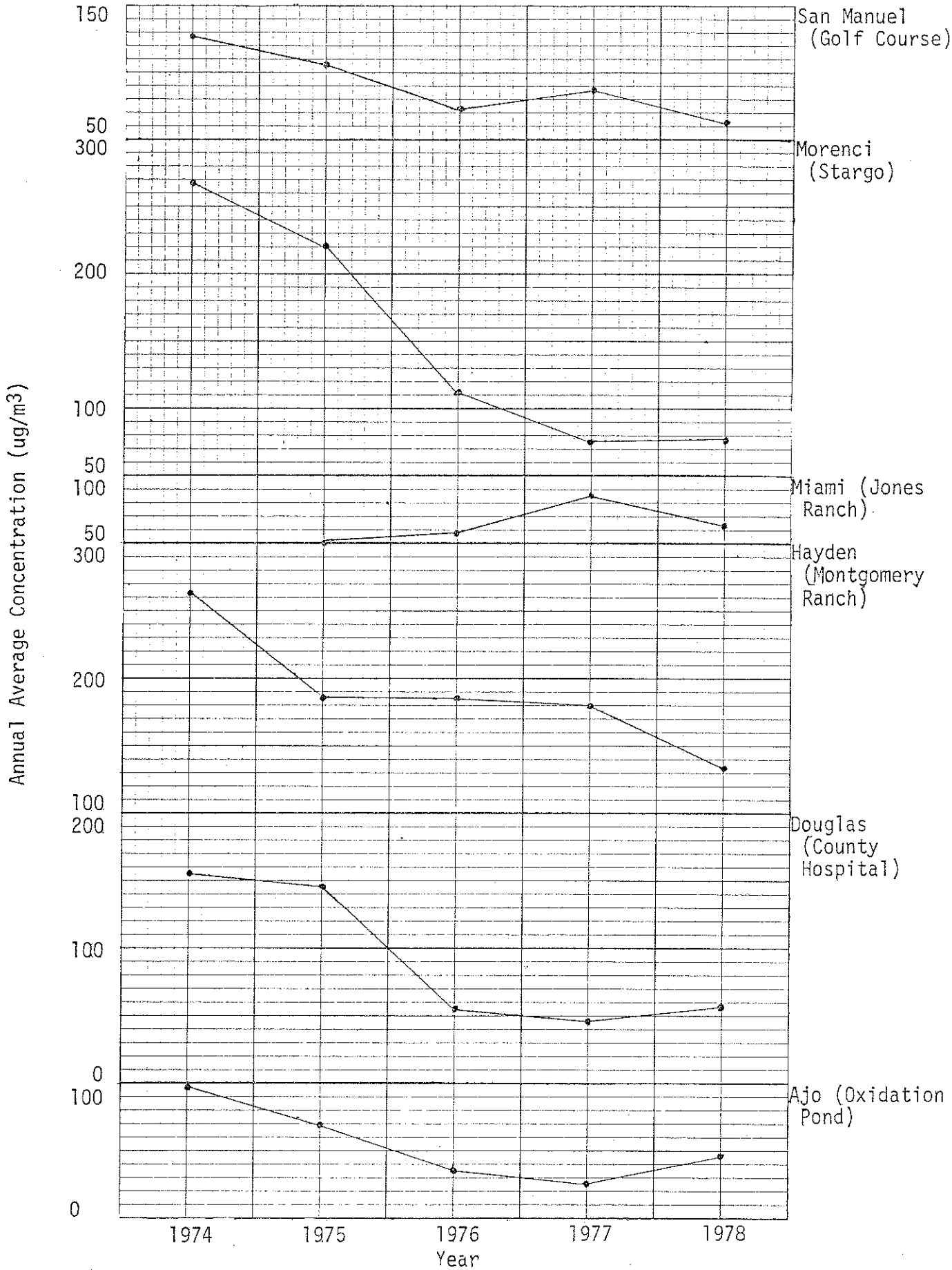
3.7.1 Copper Smelter Areas

Annual average data for 1974-1978 for copper smelter areas are illustrated in Figure 3-21. Five of the six areas exhibit a downward trend in concentrations, especially in 1976.

At Miami, however, SO_2 concentrations increased slightly in 1976 and 1977 and then declined in 1978. All areas were in compliance with the annual average air quality standard in 1978 except Hayden.

Figure 3-21

Sulfur Dioxide Concentrations in Smelter Areas
Standard; 80 ug/m^3, Annual Average



4. NON-CRITERIA POLLUTANTS

Table 4-1

1978 Benzene Soluble Organics Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Ajo	Camelback Mountain, approx. 1.2 mi. N88°W from Smelter	PD	4.0	NA	66
Ajo	Oxidation Pond, approx. 1.2 mi. N8°E from Smelter	PD	4.5	NA	67
Ajo	South Tailings Dam, approx. 1.3 mi. N85°E from Smelter	PD	3.7	NA	68
Ajo	Town Square, approx. 0.5 mi. N54°W from Smelter	PD	5.6	NA	64
Ajo	AZ DOT, Well Road	State	1.0	4.4	50
Boys Ranch	General Motors Proving Ground	PD	3.5	NA	68
Buckeye	Approx. 30 mi. W of Phoenix	PD	7.0*	NA	41
Casa Grande	401 North Marshall Road	State	2.5	8.1	55
Clarkdale	High School Football Stadium	State	0.6*	1.7	10
Coolidge	2 mi. N of Coolidge	PD	3.1	NA	69
Douglas	U. S. 666, 2 km NNE of Smelter	State	0.8*	1.7	20
Douglas	15th Street Park	State	2.1*	7.3	27
Douglas	0.75 mi. N15°E of Smelter	PD	3.5	NA	66
Douglas	1012 G Avenue-Mercantile	PD	4.5	NA	67
Douglas	Pirtleville, 1.3 mi. N22.5°	PD	3.6	NA	68
Eagar	Town Hall	State	7.5	44.0	51
Flagstaff	Birch & San Francisco	State	9.4*	25.2	12
Florence	22nd Street & Willow	State	1.0	4.1	59
Glendale	6000 West Olive Avenue	Maricopa	2.9	19.7	45

Table 4-1 (Cont'd)

1978 Benzene Soluble Organics Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Grand Canyon	Grand Canyon Village	State	0.6*	1.8	16
Green Valley	2 mi. N of Townsite	PD	3.2	NA	62
Hayden	Old Town Jail, Canyon Drive	State	2.8*	12.1	44
Hayden	Montgomery-Reece Ranch	State	0.6*	4.3	44
Hereford	11 mi. W of Bisbee	PD	3.9	NA	65
Joseph City	3.25 mi. SE of Joseph City	State	0.6*	1.8	29
Kingman	305 West Beale Street	State	1.4*	4.4	34
Lake Havasu	Lake Havasu Community Hospital	State	0.7	3.7	45
Maricopa	Approx. 6.5 mi. N83°W of Maricopa	PD	3.1	NA	69
Mesa	Broadway & Brooks	Maricopa	3.0*	11.0	37
Mescal	El Paso Natural Gas Company Station, 9 mi. W of Benson	PD	3.3	NA	63
Miami	Miami Fire Department, 804 Sullivan Street	State	1.3	4.0	61
Miami	Jones Ranch	State	0.2	1.5	45
Mohave Valley	17.5 mi. S of Riviera near Highway 95	State	0.8*	5.5	34
Montezuma Castle	Park Maintenance Building	State	0.6*	9.8	41
Morenci	Stargo, Highway 666	State	0.8	3.0	50
Morenci	Cadillac Point-5500, 2.75 mi. N51°W of Smelter	PD	3.2	NA	59
Morenci	Clifton Fina, 1.75 mi. S69°E of Smelter	PD	3.7	NA	56

Table 4-1 (Cont'd)

1978 Benzene Soluble Organics Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Morenci	Mobile Monitor, Silver Basin, approx. 1.9 mi. S51°W of Smelter	PD	4.0	NA	51
Morenci	Fairbanks, approx. 2.1 mi. S26°E of Smelter	PD	3.8	NA	59
Morenci	Stargo, 1.5 mi. N63°W of Smelter	PD	2.7	NA	58
Nelson	6 mi. E of Peach Springs	State	0.2*	0.9	36
Nogales	Nogales High School - Plum Street	State	3.1*	10.4	25
Oracle Junction	Near Oracle Junction, approx. 2.1 mi. N of Tucson	PD	3.3	NA	68
Organ Pipe	Visitor's Center	State	0.2*	2.1	42
Page	Airport	State	1.4*	7.1	38
Parker	914 Arizona Avenue	State	1.9	6.1	53
Phoenix	201 North Central, Valley Bank Center, Roof	PD	4.8	NA	136
Phoenix	15 East Monroe, Valley Bank Annex, 3rd Floor	PD	7.4	NA	68
Phoenix	1845 East Roosevelt	Maricopa	7.0	36.8	51
Phoenix	4732 South Central	Maricopa	7.1	21.1	51
Phoenix	8531 North 6th Street	Maricopa	5.0	25.0	54
Prescott	500 South Marina Street	State	2.2*	23.4	26
Rillito	Miller's Market	State	1.4	4.5	60
Safford	523 10th Avenue	State	2.2	7.3	50

Table 4-1 (Cont'd)

1978 Benzene Soluble Organics Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
San Manuel	LDS Church	State	0.4	2.0	60
Scottsdale	2857 North Miller Road	Maricopa	5.0	18.2	58
Scottsdale	13665 North Scottsdale Road	Maricopa	2.1	8.8	53
Show Low	City Hall, Deuce of Clubs Avenue	State	2.7	43.8	46
Sierra Vista	1st Street & Bartow Drive	State	1.1	2.5	47
Superior	AZ DOT, 951 Main Street	State	0.8*	2.6	39
Tucson	32 North Stone, Home Federal Savings Tower, Roof	PD	5.8	NA	130
Vail	El Paso Natural Gas Company Station	PD	2.7	NA	66
Yuma	201 South Second Avenue	State	2.9	10.0	42

*Annual average not valid due to insufficient number of samples.

Table 4-2

1978 Nitrates Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Ajo	AZ DOT, Well Road	State	2.1	7.0	50
Casa Grande	401 North Marshall Road	State	3.9	16.4	55
Clarkdale	High School Football Stadium	State	1.9*	4.6	10
Douglas	U. S. 666, 2 km NNE of Smelter	State	1.1*	3.6	20
Douglas	15th Street Park	State	1.7*	4.6	27
Eagar	Town Hall	State	1.8	4.3	51
Flagstaff	Birch & San Francisco	State	1.3*	2.2	12
Florence	22nd Street & Willow	State	2.6	7.6	59
Glendale	6000 West Olive Avenue	Maricopa	3.0	19.5	46
Grand Canyon	Grand Canyon Village	State	1.0*	1.7	16
Hayden	Old Town Jail, Canyon Drive	State	2.2*	11.4	44
Hayden	Montgomery-Reece Ranch	State	1.9*	4.3	44
Joseph City	3.25 mi. SE of Joseph City	State	0.8*	1.7	29
Kingman	305 West Beale Street	State	2.2*	5.2	34
Lake Havasu	Lake Havasu Community Hospital	State	2.8	7.8	45
Mesa	Broadway & Brooks	Maricopa	1.6*	6.6	37
Miami	Miami Fire Department, 804 Sullivan Street	State	2.0	5.5	61
Miami	Jones Ranch	State	2.0	8.8	45
Mohave Valley	17.5 mi. S of Riviera near Highway 95	State	2.2*	4.5	34
Montezuma Castle	Park Maintenance Building	State	2.1*	5.9	41
Morenci	Stargo, Highway 666	State	1.4	6.6	50

Table 4-2 (Cont'd)

1978 Nitrates Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Nelson	6 mi. E of Peach Springs	State	1.3*	4.4	36
Nogales	Nogales High School, Plum Street	State	1.7*	3.0	25
Organ Pipe	Visitor's Center	State	1.8*	4.6	42
Page	Airport	State	2.5*	6.9	38
Parker	914 Arizona Avenue	State	3.6	11.3	53
Phoenix	1845 East Roosevelt	Maricopa	2.8	10.2	52
Phoenix	4732 South Central	Maricopa	2.0	7.3	51
Phoenix	8531 North 6th Street	Maricopa	2.3	8.2	55
Prescott	500 South Marina Street	State	1.8*	5.1	26
Rillito	Miller's Market	State	3.4	21.9	60
Safford	523 10th Avenue	State	2.1	7.0	50
San Manuel	LDS Church	State	1.6	5.6	60
Scottsdale	2857 North Miller Road	Maricopa	1.8	6.3	58
Scottsdale	13665 North Scottsdale Road	Maricopa	1.7	6.8	51
Show Low	City Hall, Deuce of Clubs Avenue	State	1.4	5.8	46
Sierra Vista	1st Street & Bartow Drive	State	1.9	6.7	47
Superior	AZ DOT, 951 Main Street	State	2.9*	7.1	39
Yuma	201 South Second Avenue	State	3.6*	10.5	42

*Annual average not valid due to insufficient number of samples.

Table 4-3

1978 Sulfates Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Ajo	AZ DOT, Well Road	State	6.6	31.7	50
Casa Grande	401 North Marshall Road	State	4.3	15.9	55
Clarkdale	High School Football Stadium	State	3.0*	6.7	10
Douglas	U. S. 666, 2 km NNE of Smelter	State	7.1*	16.9	20
Douglas	15th Street Park	State	6.7*	13.4	27
Eagar	Town Hall	State	2.8	9.6	51
Flagstaff	Birch & San Francisco	State	2.0*	7.2	12
Florence	22nd Street & Willow	State	5.8	20.4	55
Glendale	6000 West Olive Avenue	Maricopa	5.1	11.4	45
Grand Canyon	Grand Canyon Village	State	1.5*	5.9	16
Green Valley	245 West Esperanza	Pima	4.2*	10.3	24
Hayden	Old Town Jail, Canyon Drive	State	12.5*	22.1	44
Hayden	Montgomery-Reece Ranch	State	13.9*	25.6	44
Joseph City	3.25 mi. SE of Joseph City	State	5.9*	16.4	29
Kingman	305 West Beale Street	State	3.4*	9.9	34
Lake Havasu	Lake Havasu Community Hospital	State	2.3	8.5	45
Mesa	Broadway & Brooks	Maricopa	4.0*	9.0	37
Miami	Jones Ranch	State	7.4	19.0	45
Miami	Miami Fire Department, 804 Sullivan Street	State	12.7	25.7	61
Mohave Valley	17.5 mi. S of Riviera near Highway 95	State	3.0*	7.1	34
Montezuma Castle	Park Maintenance Building	State	1.7*	8.3	41

Table 4-3 (Cont'd)

1978 Sulfates Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Morenci	Stargo, Highway 666	State	12.1	31.9	50
Nelson	6 mi. E of Peach Springs	State	1.0*	5.8	36
Nogales	Nogales High School, Plum Street	State	6.1*	16.3	25
Organ Pipe	Visitor's Center	State	3.0	9.7	42
Page	Airport	State	4.3*	15.4	38
Parker	914 Arizona Avenue	State	4.8	15.0	53
Phoenix	1845 East Roosevelt	Maricopa	5.4	11.8	52
Phoenix	4732 South Central	Maricopa	5.0	12.7	51
Phoenix	8531 North 6th Street	Maricopa	3.8	10.1	56
Prescott	500 South Marina Street	State	1.1*	9.0	26
Rillito	Miller's Market	State	7.0	18.3	60
Safford	523 10th Avenue	State	6.7	13.9	50
San Manuel	LDS Church	State	9.3	25.8	60
Show Low	City Hall, Deuce of Clubs Avenue	State	4.0	10.9	46
Sierra Vista	1st Street & Bartow Drive	State	5.0	12.7	47
Superior	AZ DOT, 951 Main Street	State	5.9*	12.3	39
Scottsdale	2857 North Miller Road	Maricopa	4.0	10.1	58
Scottsdale	13665 North Scottsdale Road	Maricopa	4.0	11.2	51
Tucson	32 North Stone, Home Federal Savings Tower, 6th Floor	PD	4.0	15.0	103
Tucson	151 West Congress Street	Pima	5.1*	12.8	24
Tucson	Alvernon & Ft. Lowell	Pima	5.7*	14.7	24
Tucson	Davis-Montham Air Force Base	Pima	5.6*	13.7	24

Table 4-3 (Cont'd)

1978 Sulfates Data Summary
High Volume Sampler (in ug/m^3)

Nearest City or Town	Site Location	Operator	Annual Average	Maximum 24-Hour Average	Number of Samples
Tucson	Orange Grove & El Camino del Terra	Pima	5.6*	13.9	22
Tucson	South Tucson	Pima	5.4*	11.0	24
Tucson	Prince Road & Fairview	Pima	5.7*	13.0	23

*Annual average not valid due to insufficient number of samples.

APPENDICES

AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Arizona Standard[a]	Federal Standards[b] Primary	Secondary
Carbon Monoxide	1-hour	40	40	40
	8-hour	10	10	10
Hydrocarbons	3-hour (6-9 a.m.)	160	160	160
Nitrogen dioxide	Annual	100	100	100
Oxidants (ozone)[c]	1-hour	160	235	235
Particulates	24-hour	150	260	150
	Annual (Geom. Mean)	75	75	60
Sulfur dioxide	3-hour	1300	---	1300
	24-hour	365	365	---
	Annual	80	80	---
Lead	Calendar Quarter	1.5	1.5	1.5

NOTE: Units are ug/m^3 except for carbon monoxide which has units of mg/m^3.

Reference conditions are 25^oC and 760 mm Hg.

(a) Not to be exceeded more than once per year.

(b) Not to be exceeded more than once per year except, in the case of ozone, not to be exceeded more than once per year based on a 3-year running average.

(c) Federal standards specify ozone.

IMPACT OF THE NEW FEDERAL STANDARD FOR OZONE

The Phoenix area is the only area in Arizona where the new federal ozone standard has been exceeded. A summary of Phoenix data is given below:

Number of Exceedances of Air Quality Standards			3-Year Running Average Number of Exceedances of Federal Standards
Year	State	Federal	
1975	26	2	2.0*
1976	25	3	2.5**
1977	64	11	5.3
1978	81	10	8.0

*Based on 1975 data.
**Based on 1975 and 1976 data.

MONITORING SITE: 1845 East Roosevelt Street

In comparing the above data, the differences between the state standard (which was also the federal standard until February 8, 1979) and the federal standard must be considered. For instance, the state standard is 160 ug/m^3 (.08 ppm) whereas the federal standard is 235 ug/m^3 (.12 ppm). The definition of an exceedance of the state standard is any hourly average concentration which exceeds the level of the standard. An exceedance of the federal standard is defined as any day on which one or more hourly average concentrations exceed the level of the standard.

The state and federal definitions of attainment of the standard are vastly different. Attainment of the state standard exists when not more than one exceedance of the standard per year per network is measured. Attainment of the federal standard exists when the expected number of exceedances of the standard per year per site is equal to or less than one, as determined by specified procedures. These procedures define the expected number of exceedances per year as the average number of exceedances at a monitoring site during the past three calendar years. If the three-year running average number of exceedances is less than or equal to one, attainment exists.