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HONORABLE EVAN MECHAM
Governor
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ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
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I. EXECUTIVE SUMMARY

Recognizing the harmful effects of air pollution, Congress and the Arizona Legislature enacted laws in the 1960's to protect public health and welfare. Amendments to federal legislation in 1970 established National Ambient Air Quality Standards (NAAQS). States were required to develop, implement, and enforce State Implementation Plans (SIPs) to attain and maintain the NAAQS. The SIPs were to include regulations requiring permits for new and existing sources, emission limits, compliance schedules, monitoring, and other elements. Arizona statutes divided jurisdiction between the State and the Counties according to the type and size of source. The State was given jurisdiction over major stationary sources, State or local government entitites, motor vehicles, and mobile sources. All other sources were placed under County Authority.

Maricopa and Pima Counties began monitoring in the Phoenix and Tucson urban areas in the late 1960s while the State initiated surveillance in the other counties. Air quality problems were identified in the two major urban areas and in numerous rural/industrial areas. In Phoenix and Tucson the problems were and continue to be associated with carbon monoxide, ozone, and particulates. The major source of these pollutants is motor vehicle traffic which continually increases due to rapid population growth. In addition, stationary sources of hydrocarbons, a precursor of ozone, and various futitive dust sources are significant. Concentrations of these pollutants increase in the ambient air whenever certain meteorological conditions exist. For carbon monoxide, nocturnal temperature inversions which occur in the winter months are conducive for high concentrations. Conversely, ozone concentrations peak out in the summer months during mid-day when maximum temperatures and solar radiation accelerate the reaction of hydrocarbons with nitrogen oxides to form ozone. Dry, windy conditions, usually in the spring, produce high concentraitons of particulates from wind erosion sources such as disturbed desert lands. conversely, during stable atmospheric conditions which occur in the fall and winter, particulates from vehicular traffic concentrate in the ambient air.

Various control strategies have been applied in Phoenix and Tucson in order to attain air quality standards. For Carbon monoxide they include federal new car emission standards, State emissions inspection of cars, expanded public transit, improved traffic control systems, and car pool incentives. Ozone control measures include those for carbon monoxide plus controls on stationary sources of hydrocarbons. For particulate matter, paving roads

and streets, water application at construction and road improvement sites, emission controls on stationary sources, and restrictions on agricultural burning have been employed to reduce emissions.

As a result of these regulatory actions, pollutant levels in Phoenix and Tucson have generally decreased over the past ten years. This is particularly evident for carbon monoxide concentrations in Tucson which have declined from 13ppm to 9ppm, the level of the 8-hour standard. This is a reduction of 31% at the microscale site, 22nd and Alvernon. In Phoenix concentrations decreased from 20ppm to 13ppm over the last 10 years. This reduction of 35%, however, was for the Phoenix microscale site, 3315 West Indian School Road, are available only from 1981 through 1986. They reflect a smaller reduction in the second highest 8-hour average concentration, from 20ppm to 16ppm, due to the shorter time span. Particulate concentrations measured as TSP (total suspended particulates) have improved at a few sites in Phoenix and Tucson. However, at most sites no reduction has occurred, and violations of standards continue. Unlike carbon monoxide and particulates, ozone concentrations have not improved substantially over the past ten years. Phoenix continues to exceed the standard three to ten times per year with 1-hour concentrations as high as 0.16ppm. In Tucson no violations of the standards have been recorded, but concentration do reach the level of the standard.

Because Phoenix and Tucson failed to attain the standards, the Arizona Center for Law in the Public Interest sued EPA, the Federal Highway Administration, the State of Arizona, and others in 1985. The lawsuit alleged that the State had failed to promulgate adequate plans to control carbon monoxide and ozone in Phoenix and Tucson. Also, it claimed that the adopted plan had not been fully implemented. In addition, EPA had failed to impose sanctions and to prepare an adequate plan. In February, 1986 the Center filed a federal court settlement regarding the lawsuit. This settlement between the Center and EPA called for the cutoff of federal highway funds if acceptable plans were not developed by the Fall of 1986. Draft carbon monoxide plans were prepared and submitted to EPA in December, 1986. In January, 1987 EPA notified the Center that because plan development was progressing adequately, no sanctions would be imposed. As a result the Center reinstituted its lawsuit and presented arguments in Federal District Court in July, 1987. The Court ruled in August, 1987 that EPA must develop an adequate plan within six months, but did not require EPA to impose sanctions.

In the rural/industrial areas, monitoring by the State, the Gila-Pinal Counties Air Quality Control District, and various industries have defined a number of air quality problems. Particulate matter was found to be the most pervasive air contaminant in the southern and western deserts, the central mountains, and the northeast.

The arid climate together with large areas of disturbed land, agriculture, unpaved roads, mineral tailings piles, mining, cement and lime plants, and other fugitive sources contribute to high concentrations in the desert and plateau regions. In the central mountains, wood-burning is the dominant source of particulate matter.

Except for industrial and mobile sources, few particulate control measures have been implemented in the rural areas. A limited amount of road paving and restriction on agricultural and waste burning have been beneficial, but the other rural particulate sources have not been adequately addressed. In contrast, industrial and mobile sources have been required to control process emissions to a much greater degree. Because particulate concentrations in most rural/industrial areas continue to exceed standards, it is apparent that rural and industrial fugitive emissions must be substantially reduced. Progress in the control of particulates has been hampered to a large extent by the proposed revisions to the NAAQS for particulate matter. These revisions which changed the particulate indicator from TSP (total suspended particulates) to PM_{10} (particles equal to or less than 10 microns in diameter) were proposed in 1984, but were not adopted until July, 1987. This has delayed the implementation of SIPs for particulates in Phoenix and Tucson as well as in rural/industrial areas. Currently, the state and Maricopa and Pima Counties are collecting information and data to be used for developing SIPs for PM_{10} which are required by April 30, 1988.

Sulfur dioxide, in addition to particulates, is a pollutant of concern in the rural/industrial areas. In 1986 the major sources of sulfur dioxide in Arizona were four copper smelters operating in Douglas, Hayden, Miami (Inspiration), and San Manuel. Outstanding progress has been achieved in reducing sulfur dioxide concentrations in these areas. In fact, for the first time ever, no violation of the 3-hour or 24-hour standards was detected in 1986 in the State. Further progress was achieved when a consent decree was entered for the Phelps Dodge smelter at Douglas, requiring shutdown until the smelter is capable of meeting EPA/Arizona New Source Performance Standards. The decree also imposed penalties for past violations of standards and failures to comply with other conditions. In addition, this agreement facilitated negotiations with Mexico regarding treatment of sulfur dioxide emissions from the copper smelters at Cananea and Nacozari. Mexican officials agreed to install controls at Nacozari by June, 1988, and to postpone expanded production at Cananea until similar controls are in place. Ground was broken in May, 1986 for an acid plant to capture sulfur dioxide emissions at Nacozari.

II BACKGROUND

A. Legal Authority

The legal authority of the State to regulate air quality comes from the Federal Clean Air Act and from State statutes, both of which are described below.

The first Federal Clean Air Act was passed in 1963. It provided for grants to air pollution control agencies and contained the first federal regulatory authority. The Act was amended in 1965, 1967, 1970 and 1977. One important feature of the Act was the establishment of National Ambient Air Quality standards (NAAQS) in 1970. These standards are set at levels which protect the health and welfare of the population. The NAAQS established ceilings for individual pollutant concentrations which should not be exceeded anywhere in the United States.

Another significant aspect of the Act is the requirement of the States to formulate plans to comply with the NAAQS. Specifically, Section 110 requires states to adopt and submit to EPA a plan which provides for the implementation, maintenance and enforcement of air quality standards within nine months of standard promulgation. This requirement is also referred to as the State Implementation Plan (SIP). The SIP consists of several different elements. Some of the more important SIP components are listed below:

1. Rules including emission limitations and other measures necessary for attainment and maintenance of the standards.
2. Compliance schedules.
3. Ambient monitoring and data analysis.
4. A permitting program including the requirement for preconstruction review and disapproval of new or modified sources which would interfere with the attainment or maintenance of air quality standards.
5. Source surveillance.
6. Inspection and testing of vehicles.
7. Provisions to revise the plan.
8. Legal authority to carry out the SIP.
9. Prevention of air pollution emergency episodes.

Arizona's SIP basically contains State rules, county regulations and the nonattainment area plans. These documents are forwarded by the Arizona Department of Environmental Quality to the Governor for the formal transmittal to EPA. EPA formally approves or disapproves the SIP revisions through Federal Register notices.

The 1977 Clean Air Act amendments added provisions applicable to new sources in attainment areas (in order to prevent significant deterioration of air quality) and imposed additional SIP requirements on existing sources. Recognizing that many SIPs in the country were inadequate, Congress required all SIPs to be reviewed and, where needed, revised SIPs were to be submitted by December 31, 1982. An additional five years would be made available in certain circumstances to achieve NAAQS for ozone or carbon monoxide. The extension required adoption by each state of a vehicle inspection and maintenance program. The Arizona SIP has been partially approved by the EPA and litigation is currently pending on the issue of the EPA imposing sanctions in the state.

A prominent feature of the State statutory approach to air pollution control is the manner in which jurisdiction over air pollution control matters is split between the counties and the State. Both the State and county statutes open with a policy statement declaring the legislature's intent to prevent any further degradation of Arizona's air quality. The basic means by which this end is to be achieved are (1) the establishment of emissions limitations or other regulatory controls (A.R.S.§49-779 and 49-1707); and (2) a permitting program which includes conditional, installation and operating permits (A.R.S.§49-1707).

The language of the State and county statutes is similar. However, there are several areas in which the authority given the State differs from that given the county. The most important difference is the distinction between the size and type of sources subject to State and county jurisdiction. The State has exclusive jurisdiction over air pollution sources having potential total emissions of 75 tons or more a day; air pollution sources owned or controlled by State or local government entities; motor vehicles; other mobile air pollution sources and any source over which the State has asserted jurisdiction. All other sources come under county authority.

During the 1986 legislative session, the Environmental Quality Act was passed which amended the air quality statutes to include regional air quality planning provisions. The amendments represent the first major change in several years to the air quality statutes, except those pertaining to the inspection/maintenance program. The amendments call for regional planning agencies to develop plans for ozone and carbon monoxide by July 1, 1987 and to adopt the plans for local governments by January 1, 1988. A similar requirement for particulate plans with July 1, 1988 and January 1, 1989 deadlines was also included.

B. Health Effects

Although complying with Federal and State air quality laws is one reason for developing rules and plans, issuing permits and taking enforcement actions, the protection of public health must not be overlooked. The air quality standards are set at levels that are adequate to protect human health including those individuals who are particularly susceptable to air pollution (the very young and the elderly). The table below shows the regulated air pollutants and their associated health effects.

Pollutants	Health Effects
Ozone	Respiratory tract problems such as difficult breathing and reduced lung function. Asthma, eye irritation, nasal congestion, reduced resistance to infection, and possibly premature aging of lung tissue.
Airborne Particulates	Eye and throat irritation, bronchitis, lung damage, and impaired visibility.
Carbon Monoxide	Ability of blood to carry oxygen impaired. Cardiovascular, nervous, and pulmonary systems affected.
Sulfur Dioxide	Respiratory tract problems; permanent harm to lung tissue.
Lead	Retardation and brain damage, especially in children.
Nitrogen Dioxide	Respiratory illness and lung damage.
Hazardous Air Pollutants	
Asbestos	A variety of lung diseases, particularly lung cancer.
Beryllium	Primarily lung disease, although also affects liver, spleen, kidneys, and lymph glands.
Mercury	Several areas of the brain as well as the kidneys and bowels affected.
Vinyl Chloride	Lung and liver cancer.

III AIR QUALITY ASSESSMENT

A. Monitoring Networks

In Arizona, ambient air monitoring was conducted by a number of governmental agencies and regulated industries. A list of these monitoring network operators and the areas monitored is given below.

Agency or Industry	Area Monitored
Alamito Corp.	Springerville
Arizona Electric Power Cooperative, Inc.	Cochise
Arizona Public Service Co.	Joseph City
ASARCO, Inc.	Hayden
Inspiration Consolidated Copper Co.	Miami
Magma Copper Co.	San Manuel
Maricopa County Health Department	Phoenix and the remainder of the county
Phelps Dodge Corporation	Douglas
Pima Association of Governments	Tucson
Pima County Health Department	Tucson Metropolitan area
Pinal-Gila Counties Air Quality Control District	Pinal and Gila Counties
Salt River Project	Page and St. Johns
Southern California Edison Co.	Bullhead City, AZ and Laughlin, NV
Tucson Electric Power Co.	Tucson

Maps indicating the locations of the Phoenix, Tucson and statewide monitoring stations are provided in Figures 1, 2, and 3. The Maricopa, Pima, and Gila-Pinal Counties and the Pima Association of Governments networks have been established primarily to monitor urban-related air pollution. In contrast, the industrial networks were operated to monitor emissions from certain industrial facilities. State monitors were employed for

both urban and industrial surveillance. In addition, background air quality was measured at the following sites:

Site	Site Operator
Grand Canyon National Park	State
Montezuma Castle National Monument	State
Organ Pipe Cactus National Monument	State
Corona De Tucson	Pima County Health Dept.
Roosevelt	Gila-Pinal Counties A.Q.C.D.

B. Data Reporting

Ambient air quality data collected in 1986 by the various networks mentioned above are summarized in Appendix A. In addition, Maricopa and Pima Counties publish annual reports which include summaries of their data.

Raw data files are maintained by each of the network operators and are available upon request to them. In addition, the U.S. Environmental Protection Agency (EPA) stores raw data submitted quarterly by Maricopa and Pima Counties and the State. EPA analyzes these data for the purpose of reporting trends in air quality to the Presidnet and Congress.

Maricopa and Pima Counties report the highest pollutant concentrations in Phoenix and Tucson each day to the public via television, radio, newspapers and telephone. The data are reported in pollutant standard index (PSI) units, that is, units of concentration relative to the standards. These reports include the descriptor words, good, moderate, unhealthy, very unhealthy, or hazardous, depending on pollutant levels.

The industrial operators submit either monthly or quarterly data reports to the State, depending on the type of facility. In addition, they are required to report any exceedances of an air quality standard by the next working day. The report includes an explanation of the causes of the exceedances and corrective actions to be taken, if possible, to prevent future occurrences.

C. Urban Air Quality

In Phoenix and Tucson the pollutants of chief concern are carbon monoxide, ozone and particulates. A review of the sources and the meteorology which together produce high ambient concentrations is given below.

1. Sources and Meteorology

Carbon monoxide is emitted primarily by motor vehicles which accounted for 95.1% of total CO emissions in Phoenix in 1984 and 79% in Tucson in 1984. Minor sources included aircraft, agricultural burning, fireplace, structural fires, railroads and off-road vehicles. Because CO is emitted mainly at ground level, it is trapped at nighttime when the lower atmosphere is stagnant due to a surface-based temperative inversion. As a result, CO concentrations are much greater during evening and early morning hours. Surface-based temperature inversions occur after sunset due to the cooling of the earth's surface as it loses heat by radiation. After sunrise, solar radiation heats the earth's surface and the lower atmosphere, resulting in dissipation of the temperature inversion. Since these inversions are more severe during the winter months, CO concentrations frequently exceed the standard then.

Ozone is formed in the atmosphere by the reaction of hydrocarbons with nitrogen oxides. This chemical reaction occurs much faster in the presence of sunlight at higher temperatures. Thus, ozone concentrations are greater in the afternoon hours from May to September and occasionally exceed the standards. Days on which ozone concentrations are high are characterized by low wind speeds, late temperature inversion dissipation, and wind direction shift.

For reactive hydrocarbons the dominant source is motor vehicles, contributing 66% of total emissions in Phoenix in 1984 and 54% in Tucson. Secondary sources include petroleum marketing, organic solvent usage, and miscellaneous area sources. Nitrogen oxides are emitted mainly by motor vehicles (78.5%) followed by stationary source fuel combustion (13.2%) in Phoenix. In Tucson, motor vehicles were also the largest source of nitrogen oxides but their relative contribution is much lower (46.6%) than in Phoenix. Also, in contrast to Phoenix, railroads were the second greatest source (36.5%) in Tucson.

Regarding particulate matter, the primary indicator has been total suspended particles (TSP). This is a term referring to small, solid particles or liquid droplets suspended in the atmosphere with diameters up to 25-45 microns. Until 1987, air quality and emission standards have been expressed in terms of TSP. In 1987, however, EPA revised particulate air quality standards by using PM_{10} rather than TSP as the indicator for particulates. PM_{10} is a symbol for particulate matter equal to or less than 10 microns in diameter. It has been found that particles 10 microns or smaller pose a greater risk to public health. For this reason, PM_{10} has replaced TSP as the indicator of particulate matter.

The primary sources of TSP in Phoenix and Tucson are vehicular traffic on unpaved and paved roads, construction and wind-

blown dust from disturbed and undisturbed desert. Combined, these five categories accounted for 98% of TSP emissions in Phoenix and 93% in Tucson. These sources are also major emitters of PM_{10}, based on preliminary emission inventory data. Furthermore, their relative contributions to total PM_{10} and total TSP emissions are similar.

The effects of meteorology on atmospheric particulate loading are rather complex, due in part to the widely diverse sources of particulate matter. Wind-blown dust sources such as disturbed and undisturbed desert land, sand and gravel pits and landfills emit large quantitites of particulates when wind speeds reach or exceed 10-15 mph (miles per hour) during dry conditions. In contrast, wind speeds below 10 mph allow particulates emitted by traffic on roads and streets, construction activity, and vehicle tailpipes to increase in concentration. This effect is enhanced by the presence of a temperature inversion. Thus, the relationship between particulate concentrations and meteorology depends upon the types of sources in a given area.

2. Controls

For CO the most effective control measure has been the Federal new car standards program, which requires car manufacturers to meet specified emission standards. The second largest CO emission reduction is derived from the state I/M program. Other strategies such as carpool and vanpool programs, public transit improvements, traffic signal coordination, reversible lanes, freeway ramp metering and the elimination of on-street parking have reduced emissions to a lesser extent.

Ozone control is based on reducing emissions of hydrocarbons, one of the precursors of ozone. Thus, because hydrocarbons are emitted chiefly by motor vehicles, the same strategies used to curtail CO emissions are employed to control ozone. In addition, controls on stationary sources of hydrocarbons are required. These include:

* Capture and recovery of gasoline vapors emitted during the filling of underground storage tanks at service stations,

* Vapor seals on large petroleum storage tanks

* Restrictions on the use of photochemically reactive solvents and paints containing these solvents.

Control measures employed to curtail particulate emissions include:

* Paving of roads and streets,

* Application of water to suppress dust at construction and road improvement sites,

* Use of water spray and enclosure during sandblasting,

* Fugitive and process emission controls on sand and gravel, concrete batching and asphalt plants,

* Restrictions on agricultural burning to periods of high atmospheric mixing,

* Required use of air curtain destructors for agricultural burning.

Road and street pavement activities are conducted by the various cities and the counties in the urban areas according to their own schedules. The other control measures listed above, however, are mandated by County air pollution control regulations.

Currently, PM_{10} emission inventories are being developed in order to model ambient air quality in Phoenix and Tucson by dispersion modeling. In addition, receptor modeling will be performed to determine source contributions to ambient air quality. Various control strategies will then be evaluated by modeling in order to develop a nonattainment plan for PM_{10}.

3. Trends

a. Carbon Monoxide

From 1976 to 1986 an overall decrease in carbon monoxide concentrations is reflected in the 8-hour concentration and exceedance data plotted in Figures 4 and 5. In fact, the Tucson curves indicate that the 8-hour standard (9ppm) was attained in 1985 and maintained in 1986 at 22nd Street and Alvernon, a microscale site which has recorded the highest concentrations. The trend for Phoenix is similar except that the plots indicate that second highest concentrations leveled out during the 1982-1986 period at 12-13ppm at the neighborhood scale trend site, 1845 East Roosevelt Street. The microscale site, 3315 West Indian School Road, appears to follow a gradual declining trend in second highest concentrations. However, the exceedance data for this site have been fluctuating sharply from 1984-1986.

b. Ozone

Ozone concentrations have not varied substantially in Phoenix and Tucson during the 1976 through 1986 period as reflected in Figure 6. There was a slight increase in second highest 1-hour concentrations from 1976 to 1981 in Tucson, but subsequently these values stabilized at 0.11-0.12ppm. As a result, there have been no violations of the 1-hour standard (0.12ppm) in Tucson. In Phoenix, concentrations have remained fairly constant at 0.14-0.16ppm over this 11-year period. In contrast, the

number of exceedances of the standard have varied considerably from year to year in Phoenix (refer to Figure 7).

Yuma ozone data are also plotted in Figure 6 for the purpose of comparison with Phoenix and Tucson. Readings for 1976 and 1977 appear to be suspect, and should be discounted. For the remaining period, 1978-1986, second highest concentrations varied for the most part between 0.10 and 0.11ppm. Thus, as in Phoenix and Tucson, no long-term change in ozone concentrations is apparent.

c. TSP

TSP concentrations in Phoenix, Glendale, Mesa, and Scottsdale were, in general, fairly consistent from 1980 through 1986 (refer to Figures 8 and 9). Annual mean values at the stable sites were approximately:

Phoenix - (Roosevelt)	105 ug/m^3
Phoenix - (N. 6th Street)	100 ug/m^3
Glendale	90 ug/m^3
Mesa	85 ug/m^3
Scottsdale	90 ug/m^3

In 1982 and 1983 concentrations were 5-15 ug/m^3 lower, probably because of excessive precipitation. The only exceptions to this trend were the South Central (4732 S. Central Ave.) and W. McDowell (1826 W. McDowell Rd.) sites in Phoenix. At the South Central site the annual mean concentration was considerably higher in 1980 and 1981 at about 180 ug/m^3. In 1982 the annual mean decreased substantially and remained at about 120 ug/m^3 through 1986. Paving streets in the local area is the likely reason for this improvement. In contrast, at the W. McDowell site, concentrations have steadily increased except in 1983, from 140 ug/m^3 in 1982 to 210 ug/m^3 in 1986. This upward trend is probably due to construction work on the Black Canyon Freeway.

In Tucson TSP concentrations have generally followed a pattern similar to that for most of the Phoenix area sites (see Figure 10). Again, 1982 and 1983 mean values were reduced, indicating a regional meteorological impact (probably excessive rainfall). At three of the trend sites, concentrations remained relatively constant except in 1982 and 1983. These sites and their approximate mean concentrations are:

Palm Avenue (2nd St. & Palm Ave.)	75 ug/m^3
6th Avenue (1810 S. 6th Ave.)	100 ug/m^3
Prince Road (1016 E. Prince Rd.)	100 ug/m^3

The Orange Grove site (3401 W. Orange Grove Rd.) has experienced a decline in annual means, from 108 ug/m^3 in 1981-1982 to about 88 ug/m^3 in 1984-1986. A similar pattern was followed at the Harrison site (2181 S. Harrison Rd.), with concentrations declining from 59 ug/m^3 in 1980 to 43 ug/m^3 in 1986.

d. PM_{10}

The urban areas of Phoenix and Tucson were initially monitored for PM_{10} in 1985, and sampling continued in 1986. Due to this short time frame, it is not possible to assess long-term trends. However, some information is available regarding the attainment status of the urban areas. In Phoenix both monitoring sites (4732 S. Central and 1845 E. Roosevelt) have exceeded the annual and 24-hour standards. These standards are 50 ug/m^3 and 150 ug/m^3, respectively. In Tucson the 24-hour standard was exceeded once in 1985 at the only site (3401 W. Orange Grove Rd.). A summary of 1986 PM_{10} monitoring data is given in Table 7 in Appendix A.

e. Lead and Nitrogen Dioxide

There are no air quality problems with respect to lead and nitrogen dioxide in Arizona. Moreover, lead concentrations continue to decline in both Phoenix and Tucson (see Figure 11). This trend is the result of motorists using unleaded gasoline in place of leaded gasoline.

Nitrogen dioxide concentrations are well below the annual standard (100 ug/m^3) in the urban areas (refer to Figure 12). In Phoenix a downward trend in the annual mean from 76 ug/m^3 in 1979 to 30 ug/m^3 in 1985 is indicated. No monitoring for nitrogen dioxide in Phoenix was performed in 1986. The Tucson data exhibit a slightly different pattern. An increase from 46 ug/m^3 in 1979 to 70 ug/m^3 in 1981 is followed by a gradual decrease in 45 ug/m^3 in 1985. 1986 Tucson data are not currently available.

D. Rural Air Quality

1. Areas, Sources and Meteorology

In reviewing rural air quality it is convenient to divide the State into three geographical regions as follows:

Southern and Western Deserts

Central Mountains

Northeast Plateau

Figure 13 illustrates a suitable apportionment of Arizona into these three regions. Air pollution sources and affected

areas in each region are discussed below.

a. Southern and Western Deserts

Due in part to the arid climate of this region, particulate matter is the pollutant of most concern. This concern is focused on areas where fugitive dust sources abound. Dominant sources include disturbed desert land, unpaved roads, agriculture, and industry. It should be noted that particulate emissions from disturbed desert lands and agriculture are more widespread than industrial emissions in this region. This is because large areas of land are or have been used for agriculture and grazing whereas fugitive industrial emissions are confined to several specific areas. Examples of rural areas in this region where exceedances of particulate standards have been monitored include:

County	Town or Area
Cochise	Douglas, Kansas Settlement, Wilcox
Graham	Safford
La Paz	Parker
Maricopa	Avondale, Boys Ranch, Buckeye, Chandler, Laveen, Litchfield Park
Mohave	Bullhead City, Riviera, Topock
Pima	Rillito
Pinal	Casa Grande, Coolidge, Florence, Maricopa, Stanfield
Santa Cruz	Nogales
Yuma	Yuma

In addition, an industrial source (cement plant) is located in Rillito.

As a point of emphasis, this list of towns and associated areas is not inclusive. There are other similar areas in this region where particulate concentrations are excessive due to extensive farming and attendant land disturbance and unpaved roads. The list is simply intended to indicate the wide scope of this problem.

Because unstable land surfaces are the major source category, wind speed and precipitation are the critical meteorological factors. Higher wind speeds, in general, cause higher particulate

concentrations. This effect is reflected in the seasonal variations of particulate concentrations wherein the greatest concentrations occur in the spring months, April through June. During these months, wind speeds are usually the highest, and precipitation is at a minimum. Nogales is an exception to this trend in that fall and winter concentrations are the highest. This is probably the result of wood-burning and vehicular traffic, both in Nogales, Arizona and Nogales, Sonora.

In addition to agriculture, there are several industrial facilities which are significant sources of particulates in this region. They are:

County	Town or Areas	Industrial Facility
Cochise	Paul Spur	Lime plant
Gila	Hayden	Copper concentrator and smelter
	Miami	Copper mine, concentrator and smelter
Greenlee	Morenci	Copper mine and concentrator
Pima	Ajo	Copper mine and concentrator
	Green Valley/ Sahuarita	Copper mine and concentrator
	Rillito	Cement plant
Pinal	San Manuel	Copper concentrator and smelter

Similar to agricultural areas, these industrial sites emit wind-generated particulate matter. Tailing piles, surface mines, and quarries are sources of this type of particulates.

Unpaved haul roads, which emit both wind-generated and traffic-generated particulates, are another significant source in industrial areas. During periods of low vehicular traffic, high wind speeds cause particulate concentrations to increase. In contrast, during periods of high vehicular traffic, low wind speeds allow higher concentrations of particulates to develop. This effect is intensified during stable atmospheric conditions.

A third type of particulate emissions in industrial areas is process fugitive emissions. Included in this category are emissions from material handling and storage, ore crushing and grinding, and copper smelter processing. Their impact on air quality varies, depending on the emission point and meteorological conditions. For example, emissions from material handling and storage increase during windy conditions and

decline during atmospheric stagnations. On the other hand, fugitive smelter processing and ore crushing and grinding emissions are trapped during stable conditions, but are dispersed by high wind speeds.

Finally, in this region a fourth emission category is stack emissions, primarily from copper smelters. Directly-emitted particulates from the smelter have a minor impact on ambient air quality. However, smelters do contribute to particulate concentrations because they emit sulfur dioxide. In the atmosphere these sulfur dioxide emissions are converted to sulfate particles, increasing plume opacity and ground-level particulate concentrations. Also, due to long-range transport of the plumes, visibility is reduced throughout Arizona and the Four Corners area.

In contrast, significant concentrations of sulfur dioxide at ground level are usually confined to within approximately 10 miles of each smelter. Beyond that distance sulfur dioxide is substantially dispersed and converted to sulfate particles. Ground-level concentrations of stack emissions increase considerably whenever certain meteorological and topographical conditions exist. In flat terrain near the stack, these meteorological conditions are low wind speeds and clear skies two to five hours after sunrise. At this time the surface-based temperature inversion is burned off to the height of the plume, causing the plume to fumigate downward to ground level. Later, as dissipation of the inversion rises above plume height, the plume fumigates upward as well as downward. As a result, the greatest sulfur dioxide concentrations typically occur from 10 AM to 2 PM in the smelter towns.

In areas of elevated terrain relative to the smelter, concentrations increase when the plume impinges the ground. This usually occurs during nighttime when a surface-based temperature inversion exists.

b. Central Mountains

In this region particulate matter is the only pollutant which presents a problem. The primary sources of particulate emissions are residential and industrial wood-burning. Thus, standards are exceeded in Eagar, Flagstaff, Payson, Prescott, and Show Low in the fall and winter months. These exceedances occur during periods of low wind speed and atmospheric stagnation.

Also, in this region there is a cement plant at Clarkdale, and a lime plant at Nelson. Process fugitive emissions and traffic on adjacent, unpaved roads are the chief sources of particulates in these areas. However, in Clarkdale no exceedance of the TSP standards has been monitored in recent years. In

Nelson, concentrations exceeded the secondary, 24-hour standard for TSP in 1985 and 1986. As with wood-burning, these fugitive dust emissions are trapped and concentrated during periods of atmospheric stability.

There are coal-fired power plants in Springerville and St. Johns, but they contribute very little to particulate or sulfur dioxide concentrations.

C. Northeast Plateau

Again, the pollutant of major interest is particulate matter. Excessive TSP concentrations have been measured at Holbrook, Joseph City, Page, and Winslow during windy conditions. The chief sources of particulates are disturbed desert land and unpaved roads. At Joseph City and Page the impact of local coal-fired plants on particulate and sulfur dioxide concentrations is minimal. The power plant at Page does, however, contribute to ground-level concentrations in the Vermilion Cliffs area 20 miles southwest at Page. This is due to plume impingement on high terrain during stable atmospheric conditions. Nevertheless, particulate and sulfur dioxide concentrations do not exceed standards in this area.

2. Controls

In the copper mining and smelting areas, a number of emission control measures are utilized. Sulfur dioxide emissions from the smelters at Hayden, Miami, and San Manuel are treated and converted to sulfuric acid. However, at San Manuel, only part of the sulfur dioxide emissions are treated while the remainder is released to the atmosphere. In order to prevent violations of ambient standards when dispersion is poor, the smelter must curtail production. By November 1988, however, this smelter must process all sulfur dioxide emissions.

For particulate emissions, the copper mines and smelters employ different types of control devices and methods. Particulates emitted by the smelters are removed by electrostatic precipitators while both baghouse filters and electrostatic precipitators are used on the concentrate dryers. Emissions from the ore crushers are controlled with scrubbers and baghouse filters. Spray bars are operated at material transfer points to suppress fugitive emissions. To reduce wind-blown emission from tailings piles, the following methods are utilized:

Watering the tailings

Forming berms around the tailings

Planting vegetation on the tailings

Planting trees as windbreaks

In addition, the mines and smelters water haul roads to reduce fugitive dust emissions.

At other industrial facilities, a variety of measures are used to control particulates emitted during material processing. They include baghouse filters and scrubbers at the cement plants, gravel bed filters at the lime plants, and cyclone separators and filtration structures at the cotton gins. Also, the cement and lime plants apply dust suppressant compounds to haul roads.

For portable sources of particulate matter which are operated throughout the State, the following control equipment are employed:

Asphalt batching plants - scrubbers and baghouse filters

Sand and gravel plants - spray bars

Concrete batch plants - baghouse filters

Portable sand blasters - water sprays and enclosures

3. Trends

a. Sulfur Dioxide

Sulfur dioxide air quality continued to improve in 1986 in the copper smelter areas. In fact, for the first time ever, no violation of the 3-hour or 24-hour standards was detected (refer to Figures 14 & 15). There were one 3-hour exceedance in Douglas and two exceedances in San Manuel. However, because the two exceedances in San Manuel occurred at different sites, no violation of the 3-hour standard occurred. State and Federal Standards allow one exceedance per year at each site. Protection of the 24-hour standard was even better with no exceedance of the standard in 1986.

b. Carbon Monoxide

Carbon monoxide data for Flagstaff and Prescott for 1980-1986 are plotted in Figure 16. It can be seen that the second highest 8-hour concentration in Prescott increased from 5.3ppm in 1980 to 6.6ppm in 1981. From 1981 through 1984 this statistic was relatively constant at 6.3-6.6ppm. A decrease to 5.4ppm in 1985 was followed by an increase in 6.9ppm in 1986. In Flagstaff a similar trend was followed except that concentrations remained stable from 1982 through 1986 at 5.5.9ppm.

c. Total Suspended Particulates (TSP)

Trend data for rural and industrial areas are listed in Table 1.

Comments on these data, annual geometric mean concentrations for 1980 through 1986, are summarized below:

Ajo - A large decrease in 1985 due to smelter shutdown, from 77 ug/m^3 in 1984 to 39 ug/m^3 in 1985.

Apache Junction - ca.* 62 ug/m^3.

Bullhead City - No consistent trend; from 70-96 ug/m^3.

Clarkdale - ca. 56 ug/m^3.

Douglas (U.S. 666) - ca. 54 ug/m^3.

Douglas (City Park) - ca. 132 ug/m^3 in 1980-1981; ca. 92 ug/m^3 thereafter.

Flagstaff - ca. 75 ug/m^3 in 1980-1985; decrease in 1986 to 55 ug/m^3, probably due to sampler relocation.

Grand Canyon - ca. 11 ug/m^3.

Green Valley - ca. 37 ug/m^3.

Hayden - No consistent trend; 158 ug/m^3 in 1986.

Joseph City - ca. 31 ug/m^3.

Kansas Settlement - ca. 37 ug/m^3.

Mammoth - ca. 44 ug/m^3.

Marana - Concentrations continually decreasing from 43 ug/m^3 in 1980 to 12 ug/m^3 in 1986.

Montezuma Castle - ca. 26 ug/m^3.

Morenci - No consistent trend; 63 ug/m^3 in 1986.

Nelson - ca. 41 ug/m^3 through 1983; ca. 77 ug/m^3 thereafter.

Nogales - ca. 102 ug/m^3 from 1983-1986; 1980-1983 data suspect due to limited number of samples.

Page - ca. 35 ug/m^3.

Paul Spur - ca. 331 ug/m^3 from 1980-1983; ca. 186 ug/m^3 in 1985-1986 due to sampler relocation necessitated by change in process area.

Payson - ca. 106 ug/m^3 from 1981-1984; ca. 217 ug/m^3 in 1985-1986.

* circa (approximate figure)

Prescott - ca.* 72 ug/m^3.

Rillito - ca. 109 ug/m^3 in 1980-1984; 88 ug/m^3 in 1985-1986.

Roosevelt - ca. 27 ug/m^3.

Safford - Gradual decrease from 125 ug/m3 in 1980 to 84 ug/m^3 in 1986.

San Manuel - ca. 36 ug/m^3.

Show Low - ca. 53 ug/m^3.

Sierra Vista - ca. 50 ug/m^3.

Springerville - ca. 15 ug/m^3.

St. Johns - ca. 22 ug/m^3.

Stanfield - No consistent trend, 86 ug/m^3 in 1986.

Yuma - 124 ug/m^3 in 1980-1981; 103 ug/m^3 in 1982-1986.

d. PM_{10}

Monitoring for PM_{10} in the rural and industrial areas of Arizona began in 1985 and continued in 1986. Because only two years of data are available, it is too early to determine long-term trends. A summary of the compliance status of the monitored areas, however, is given below based on 1985 and 1986 data. Detailed statistical value for 1986 are presented in Table 7 in Appendix A.

Areas Exceeding Federal PM_{10} Standards

	Annual	24-Hour
Douglas	X	X
Hayden	X	X
Nogales	X	X
Paul Spur	X	X
Rillito	X	X
Yuma	X	X

Areas Not Exceeding standards

Ajo

* circa (approximate figure)

Flagstaff

Organ Pipe

Safford

EPA's standards are 50 ug/m^3, annual average, and 150 ug/m^3, 24-hour average.

In Bisbee, Casa Grande, and Show Low a limited number of samples were collected in 1986. Nevertheless, preliminary data indicate that Casa Grande may exceed the annual standard.

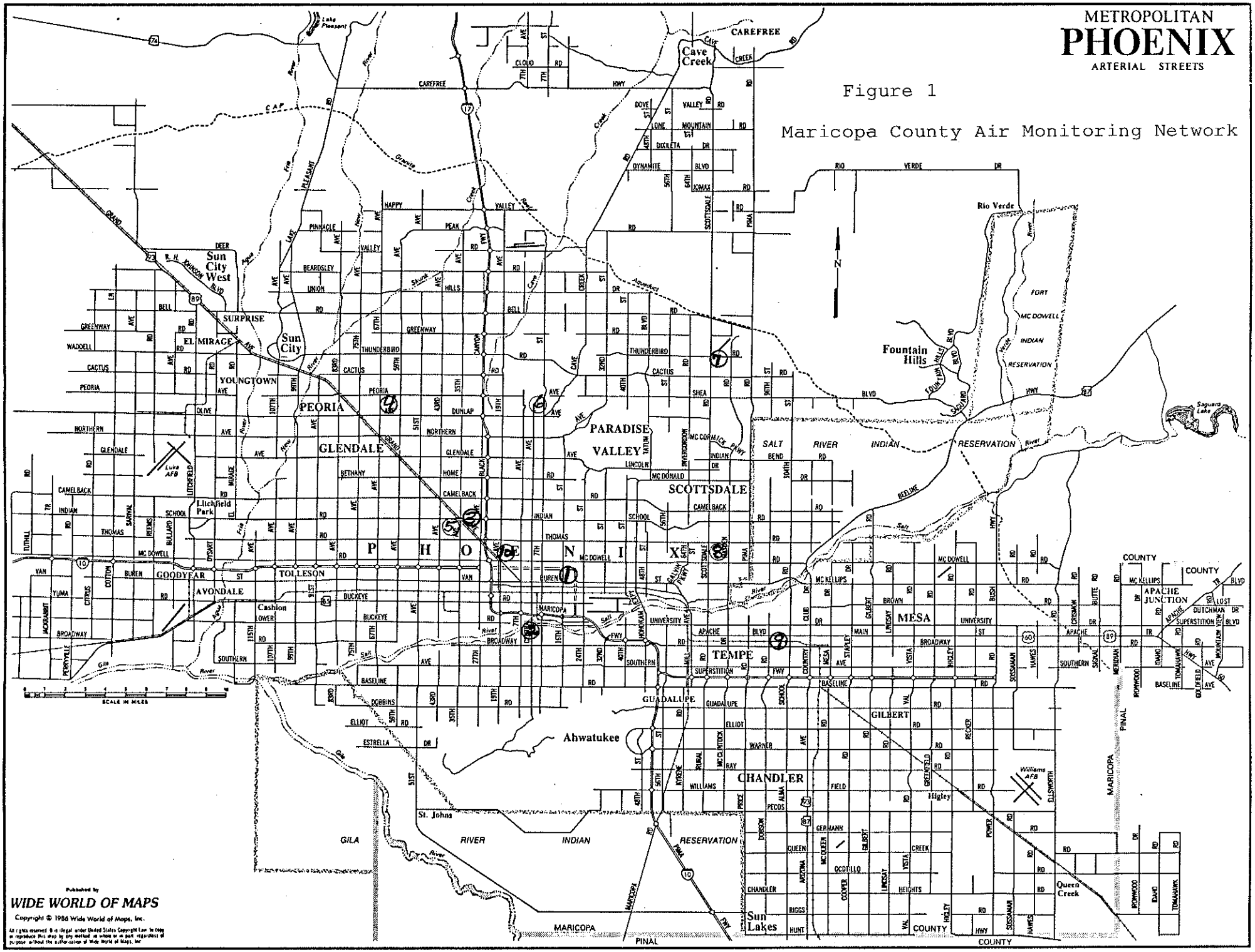
Table 1

PARTICULATE CONCENTRATIONS IN VARIOUS CITIES
Annual Geometric Mean (ug/m^3)

Site	1980	1981	1982	1983	1984	1985	1986
Ajo	85	86	68	56	77	39	40[c]
Apache Junction	78[c]	65	57	51	61	65	60[c]
Bullhead City	66	87	70	84	93	96	80
Clarkdale*	71[c]	46[c]	--	52	59	50[c]	56
Douglas (U.S. 666)	57	65[c]	54	46	56[c]	48	52
Douglas (City Park)	136	128[c]	90[c]	91[c]	88[c]	92	98
Flagstaff*	81[c]	81	77[c]	68	62	78	55
Grand Canyon	11[c]	16	12	5	11	11	10
Green Valley	39	46	33	27	39	37	39
Hayden	152[c]	287	132	98	122	123	158
Joseph City	37	34	30	27	34	31	25
Kansas Settlement	41	44	31	32	44	35	31[c]
Mammoth	--	56	43	37	41	41	47[c]
Marana	43[c]	45	35	28	29	19	12[c]
Miami	86	75	69	70	81	80	72
Montezuma Castle	27[c]	31	24	24	33	22	23
Morenci	50	55[c]	35	43	78	43[c]	63
Nelson	37[c]	42	42[c]	42	75[c]	84	72
Nogales	147[c]	121[c]	136[c]	98[c]	100	89	119
Page	36[c]	38	36	31	38	35	31
Paul Spur*	381	354[c]	303	284[c]	--	178[c]	193[c]
Payson*	--	110	110	88	115	218	216[c]
Prescott	--	76	71	62	71	81	73[c]
Rillito*	114	112	107[c]	--	101[c]	84	92
Roosevelt	36[c]	38	26	21	28	13	28[c]
Safford	125	107	107	95	96[c]	93[c]	84
San Manuel	29	49	36	33	39	32	34
Show Low	62	66	47	49	43	55	51
Sierra Vista	52[c]	53	45	48	52	53	49[c]
Springerville	--	--	15	12	18	15	16
St. Johns	24	23	19	22	22	24	18
Stanfield	65[c]	103	74	92	115	92	86[c]
Yuma	126	121	90	107	100	109	104

* Clarkdale relocated in 1982
Flagstaff relocated in 1986
Payson relocated in 1980
Paul Spur relocated in 1985
Rillito relocated in 1983

c Mean value based on a limited number of samples.


METROPOLITAN
PHOENIX
ARTERIAL STREETS
Figure 1
Maricopa County Air Monitoring Network
PHOENIX
GLENDALE
PEORIA
SURPRISE
EL MIRAGE
Sun City
Sun City West
YOUNGTOWN
PARADISE VALLEY
SCOTTSDALE
Rio Verde
Fountain Hills
Cave Creek
CAREFREE
Litchfield Park
GOODYEAR
AVONDALE
TOLLESON
Cashion
Ahwatukee
TEMPE
MESA
GILBERT
CHANDLER
Higley
Queen Creek
Sun Lakes
APACHE JUNCTION
Luke AFB
Williams AFB
Saguaro Lake
SALT RIVER INDIAN RESERVATION
FORT MC DOWELL INDIAN RESERVATION
GILA RIVER INDIAN RESERVATION
St. Johns
MARICOPA COUNTY
PINAL COUNTY
SCALE IN MILES
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MARICOPA COUNTY AIR MONITORING NETWORK

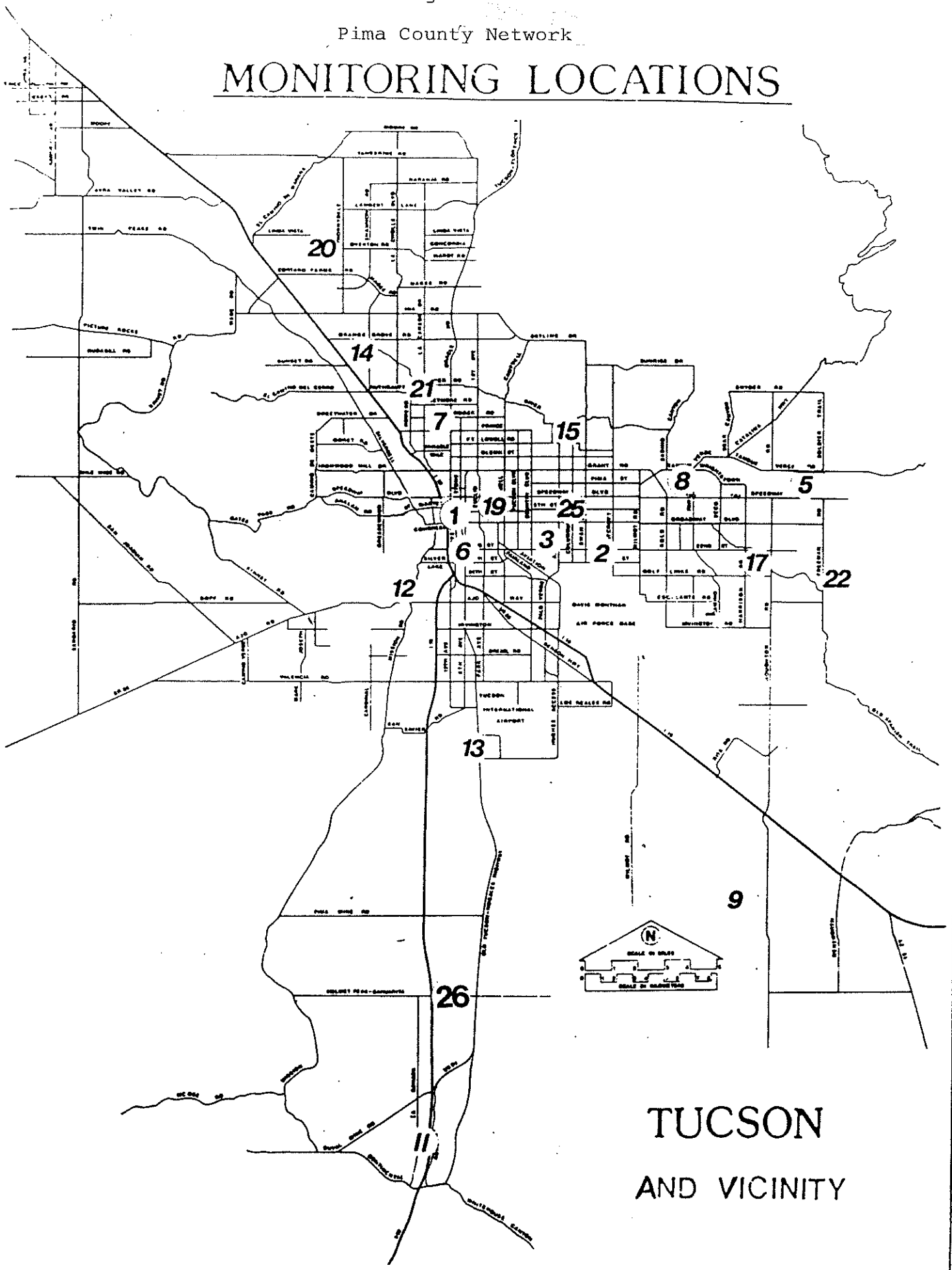
Map Key For Figure 1

Map Number	Site
1	1845 East Roosevelt - Phoenix
2	4732 South Central - Phoenix
3	3315 West Indian School - Phoenix
4	6000 West Olive Avenue - Glendale
5	3847 West Earll - Phoenix
6	8531 North 6th Street - Phoenix
7	13665 North Scottsdale - Scottsdale
8	2857 West Miller Road - Scottsdale
9	Broadway & Brooks - Mesa
10	1826 West McDowell - Phoenix

Figure 2

Pima County Network

MONITORING LOCATIONS



PIMA COUNTY

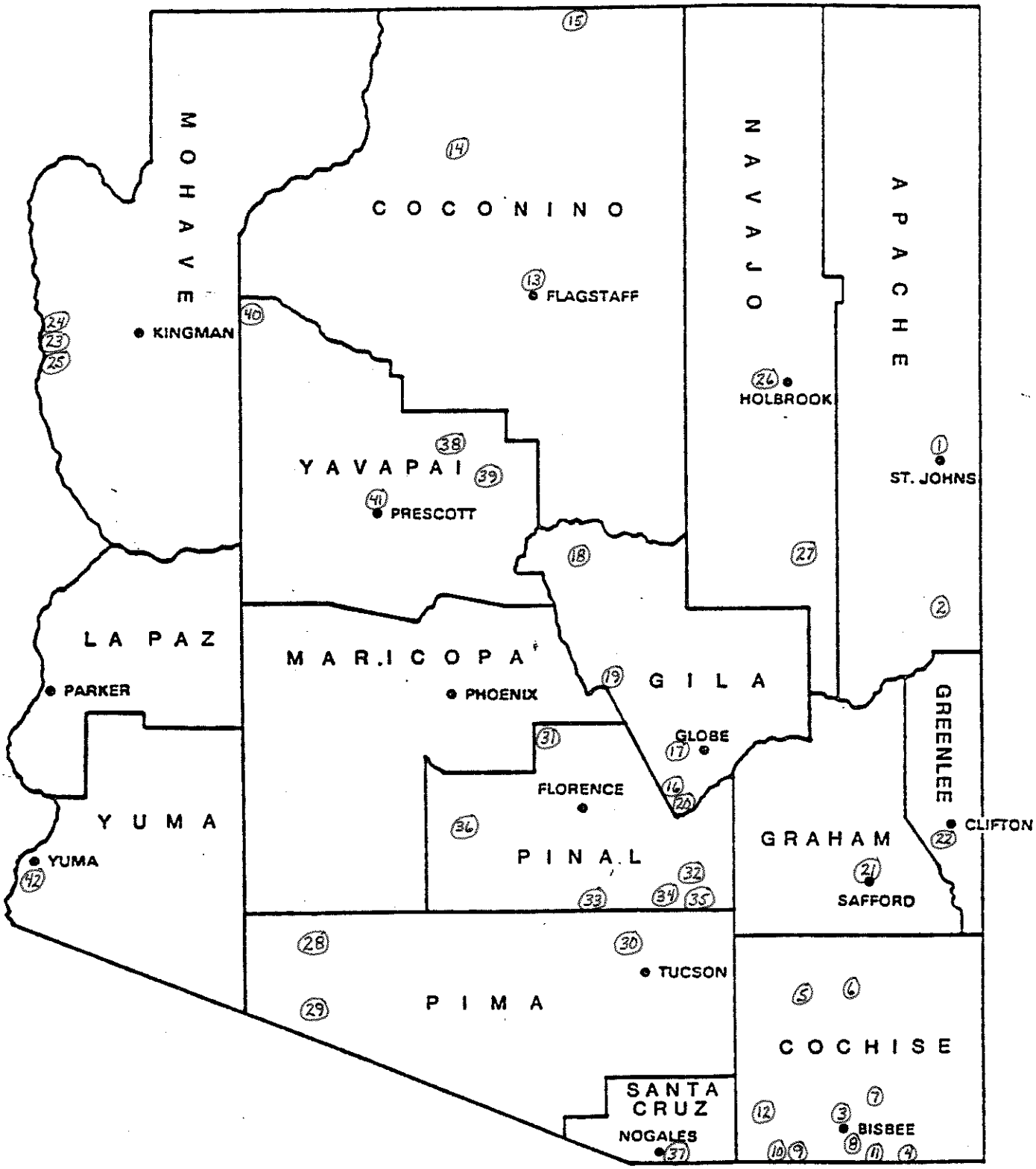
AQCD Monitoring Sites - Key For Figure 2

Tucson and Vicinity

Map No.	Site
1	Downtown 151 West Congress St.
2	22nd/ Craycroft 1237 S. Beverly
3	22nd/ Alvernon 3895 E. 22nd
5	Tanque Verde Loop 1721 N. Tanque Verde Loop Rd.
6	So. Tuc. AZ 1810 S. 6th Ave.
7	Prince Road 1016 W. Prince Rd.
8	Magnetic Observ. 7290 E. Tanq. Vde.
9	Corona de Tuc. 22000 South Houghton Rd.
11	Green Valley AZ 241 W. Esperanza Blvd.
12	Border Patrol 1970 W. Ajo Way
13	Hughes/Nogales
14	Orange Grove 3401 W. Org Grv.
15	Alvernon/ Ft. Lowell 3915 E. Ft. Lowell Rd.
17	Golf Links/ Harrison 2181 South Harrison Rd.
19	U. of A. 2nd St. & Palm Ave.
20	Arthur Pack 9101 North Thornydale Rd.
21	Pomona Ave/PD 4591 North Pomona Ave.
22	Saguaro/NME Freeman Rd/ Old Spanish Trl.
25	Broadway/Swan 4575 E. Broadway Blvd.
26	Sahuarita Jr. High 350 W. Helmet Peak Rd.

Figure 3

Air Quality Monitoring
Sites in Arizona



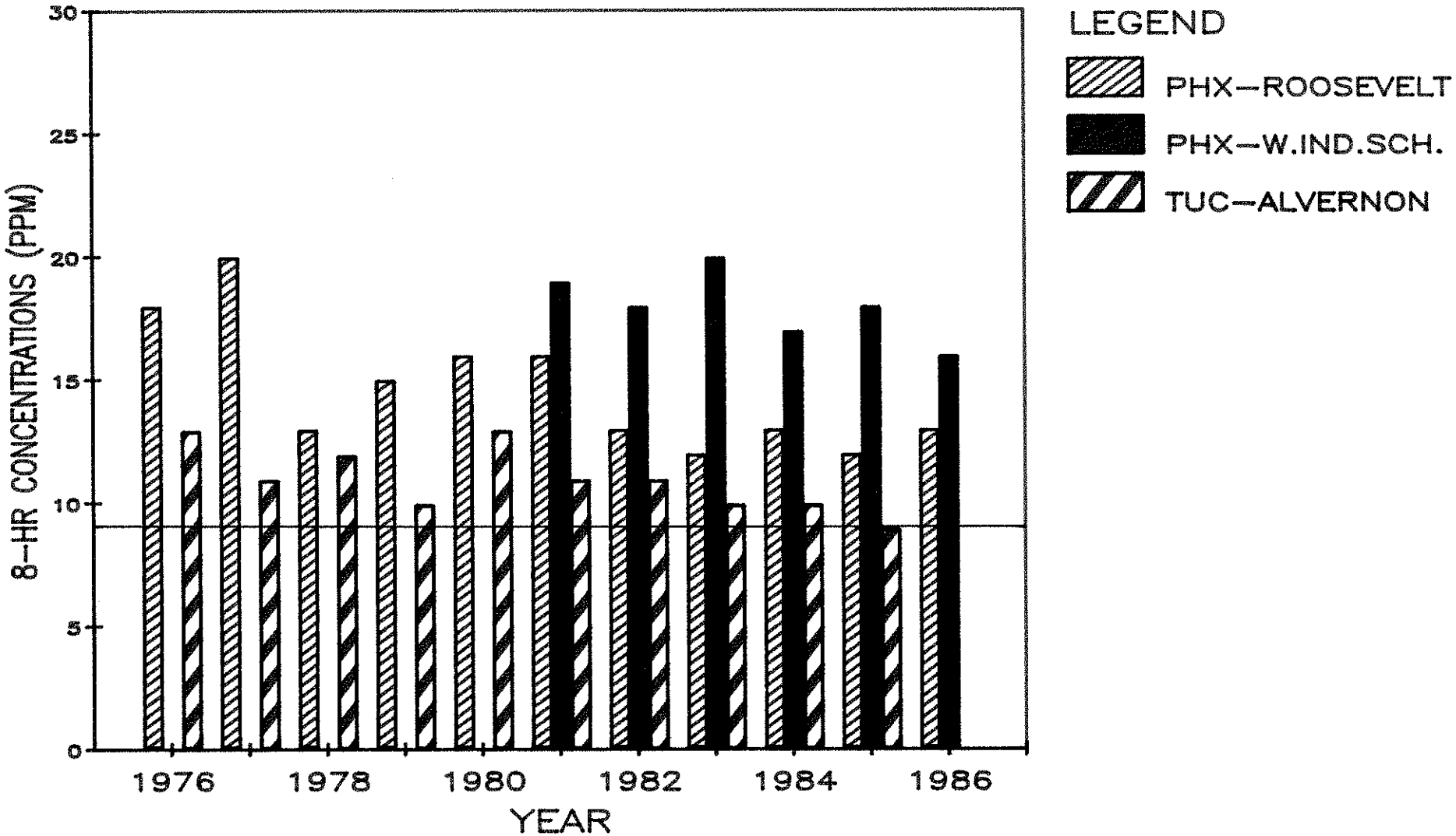
For Figure 3

1986 Map Key of Towns and Counties Monitored

Map No.	Town &	County	Map No.	Town &	County
1	St. John	Apache	23	Bullhead City	Mohave
2	Springerville		24	Davis Dam	
3	Bisbee	Cochise	25	Riviera	
4	Douglas		26	Joseph City	Navajo
5	Dragoon		27	Show Low	
6	Kansas Settlement		28	Ajo	Pima
7	McNeal		29	Organ Pipe	
8	Lazy K.J. Ranch		30	Rillito	
9	Naco		See Separate Map for Other Pima Sites		
10	Palominas		31	Apache Junction	Pinal
11	Paul Spur		32	Mammoth	
12	Sierra Vista		33	Marana	
13	Flagstaff	Coconino	34	Oracle	
14	Grand Canyon		35	San Manuel	
15	Page		36	Stanfield	
16	Hayden	Gila	37	Nogales	Santa Cruz
17	Miami		38	Clarkdale	Yavapai
18	Payson		39	Montezuma Castle	
19	Roosevelt		40	Nelson	
20	Winkelman		41	Prescott	
21	Safford	Graham	42	Yuma	Yuma
22	Morenci	Greenlee			
See Separate Map		Maricopa			

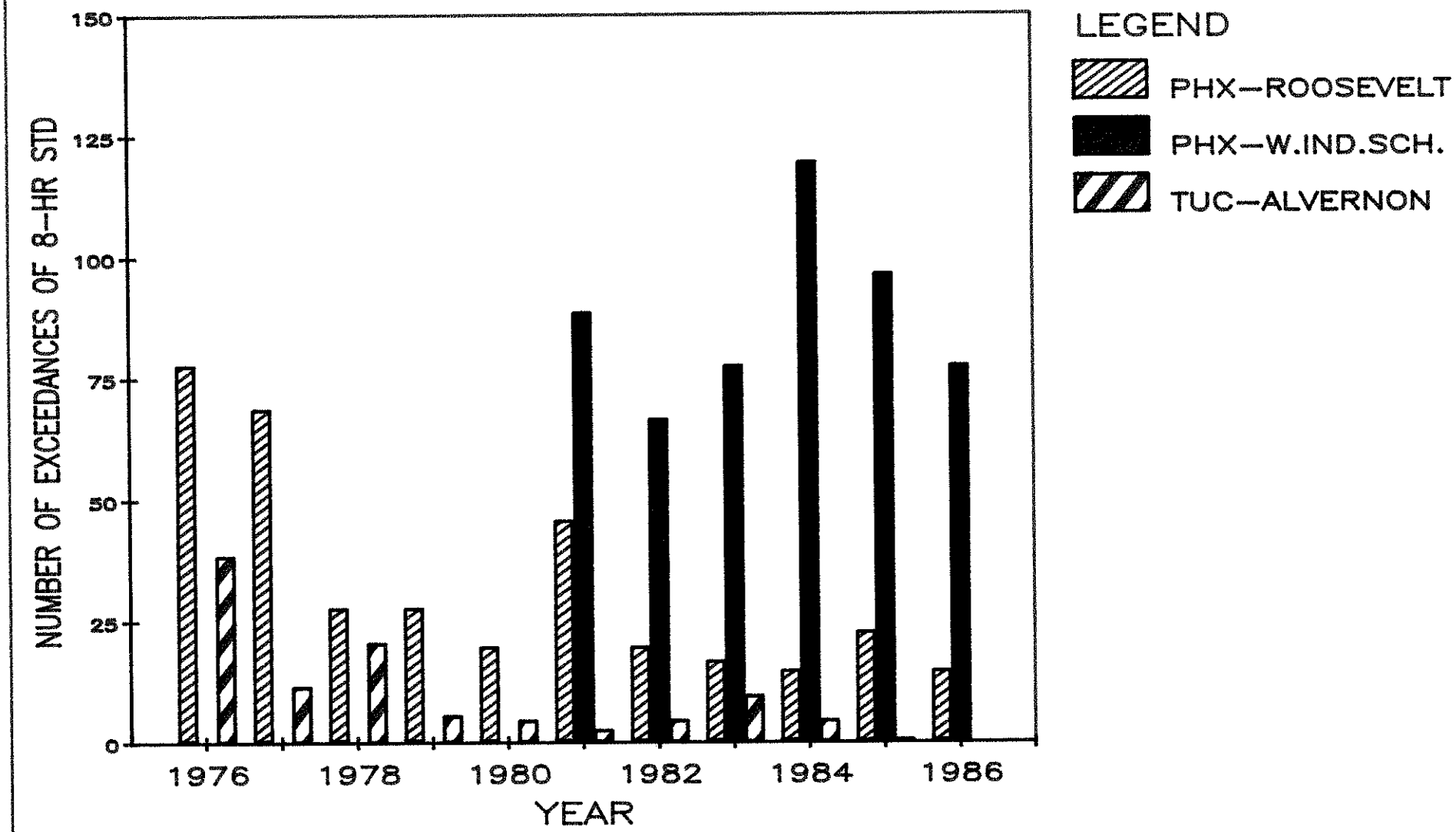
See Table 1, Appendix A for Pollutants Monitored

FIGURE 4
CARBON MONOXIDE CONCENTRATIONS IN PHOENIX AND TUCSON



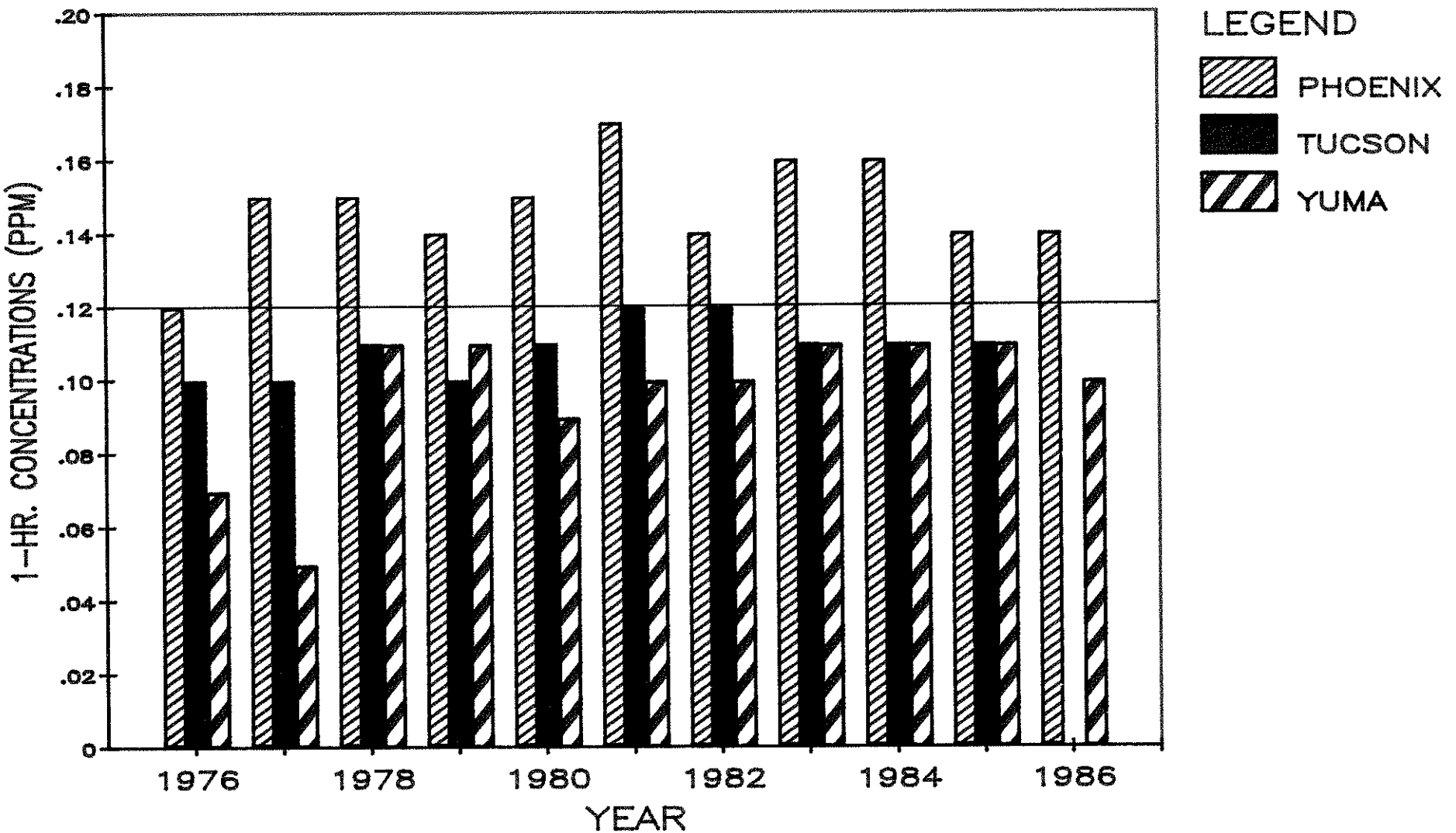
2ND HIGHEST CONCENTRATIONS 1986 NA FOR TUCSON STANDARD IS 9 PPM

FIGURE 5
CARBON MONOXIDE EXCEEDANCES IN PHOENIX AND TUCSON



1986 NA FOR TUCSON

FIGURE 6
OZONE CONCENTRATIONS
IN PHOENIX TUCSON AND YUMA



2ND HIGHEST CONCENTRATION 1986 NA FOR TUCSON STANDARD IS .12 PPM

FIGURE 7
OZONE EXCEEDANCES
FOR PHOENIX 5 SITE NETWORK

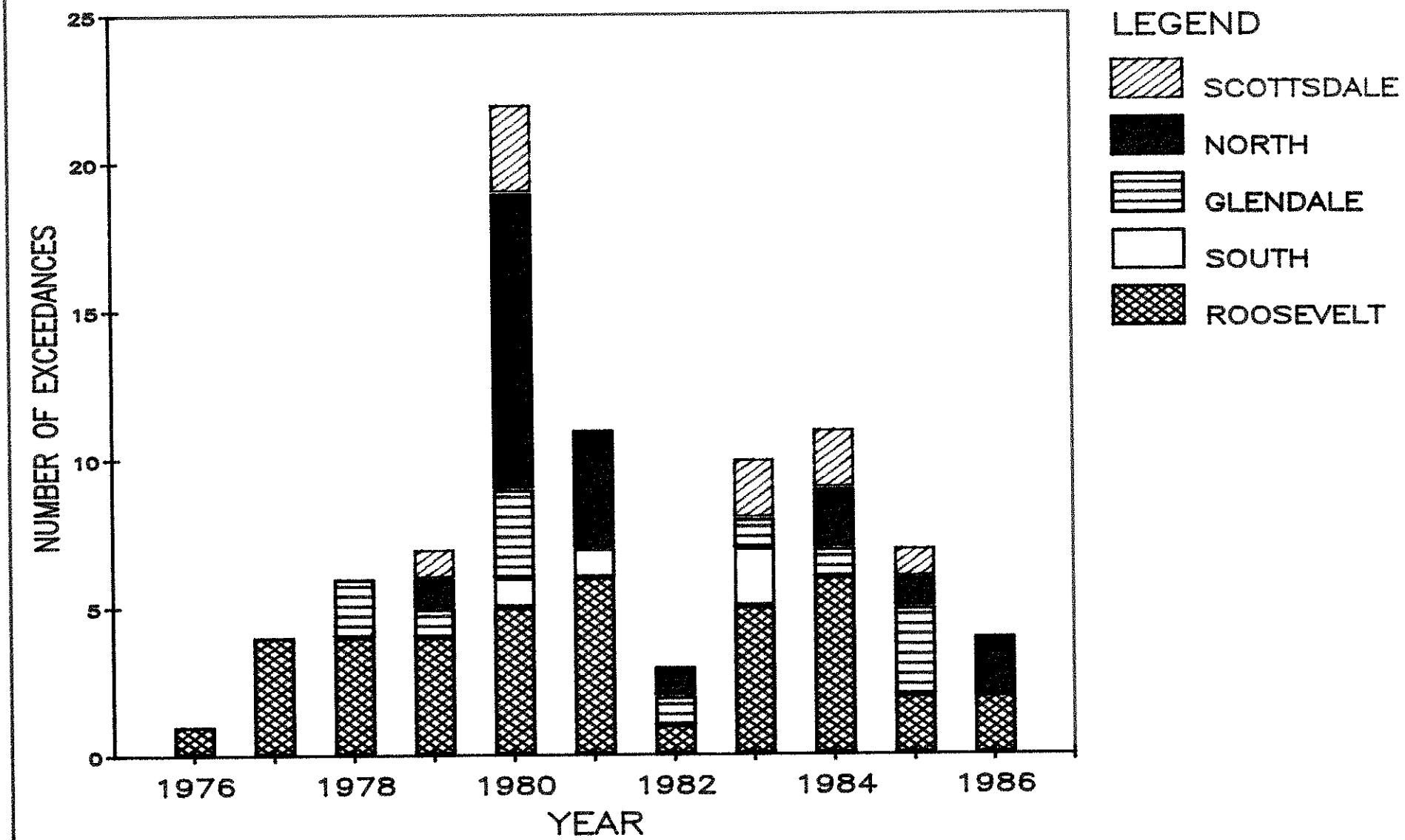


FIGURE 8
TOTAL SUSPENDED PARTICULATE CONCENTRATIONS IN PHOENIX

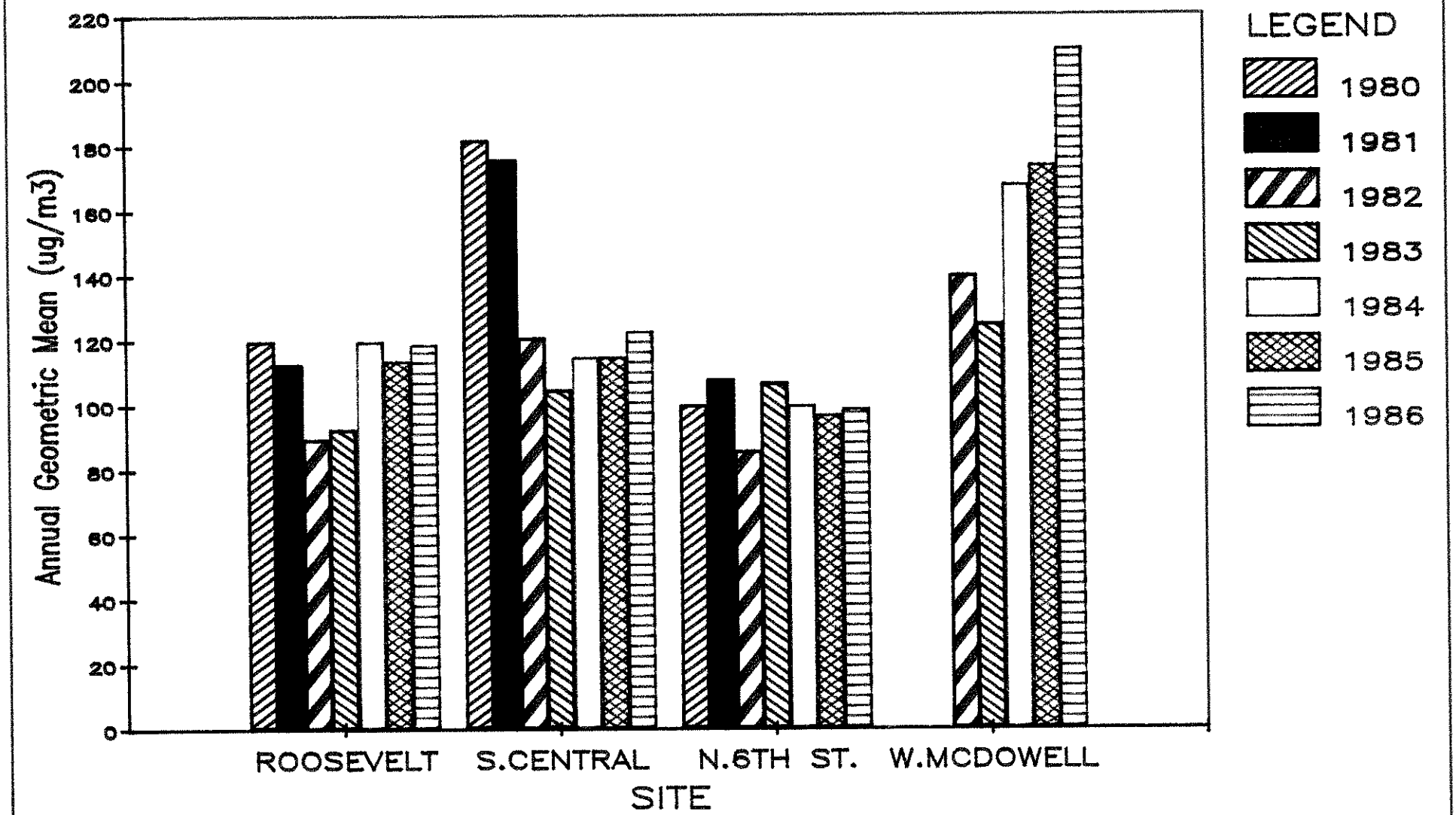


FIGURE 9
TOTAL SUSPENDED PARTICULATE CONCENTRATIONS IN PHOENIX SUBURBS

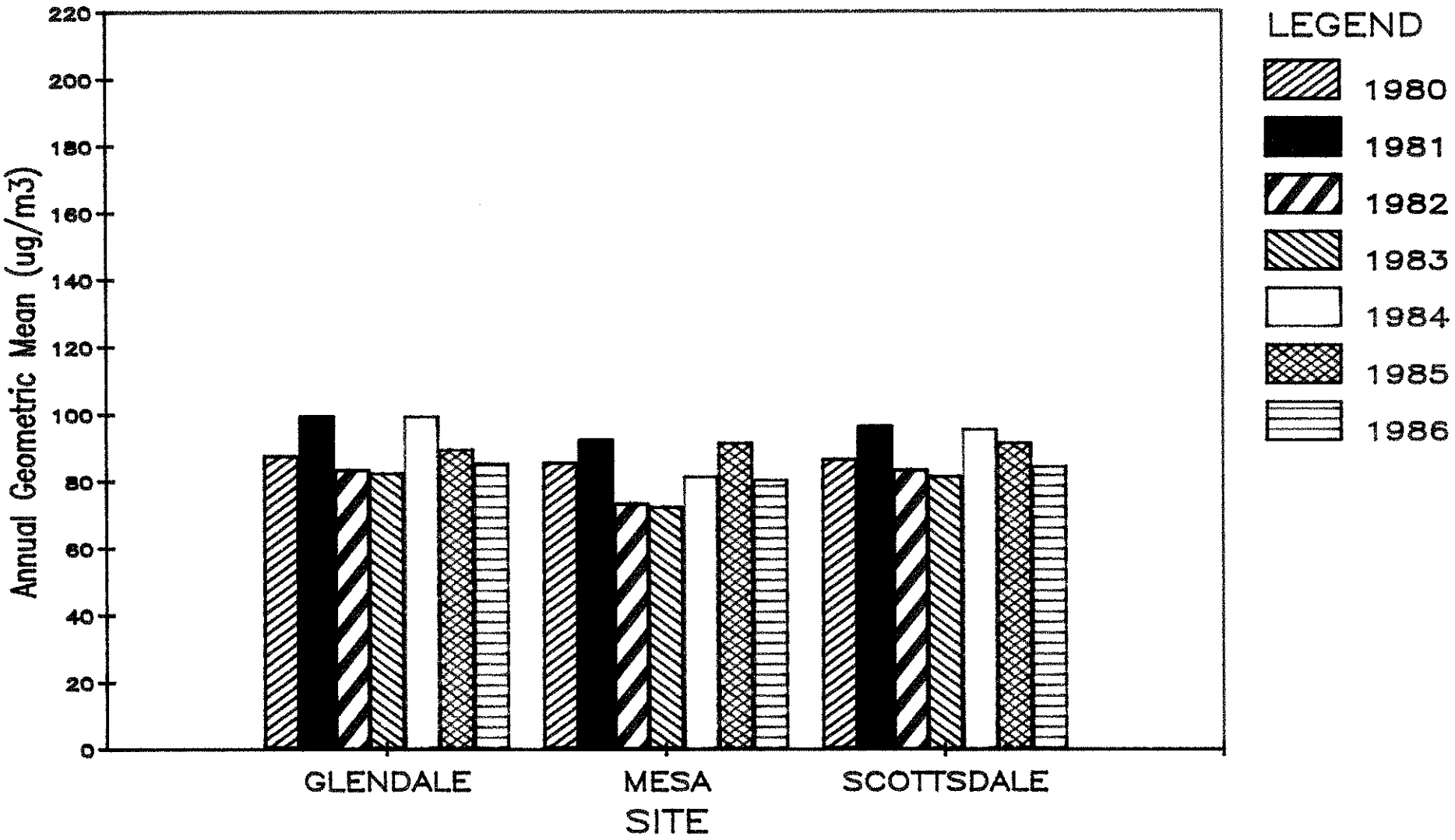


FIGURE 10
TOTAL SUSPENDED PARTICULATE CONCENTRATIONS IN TUCSON

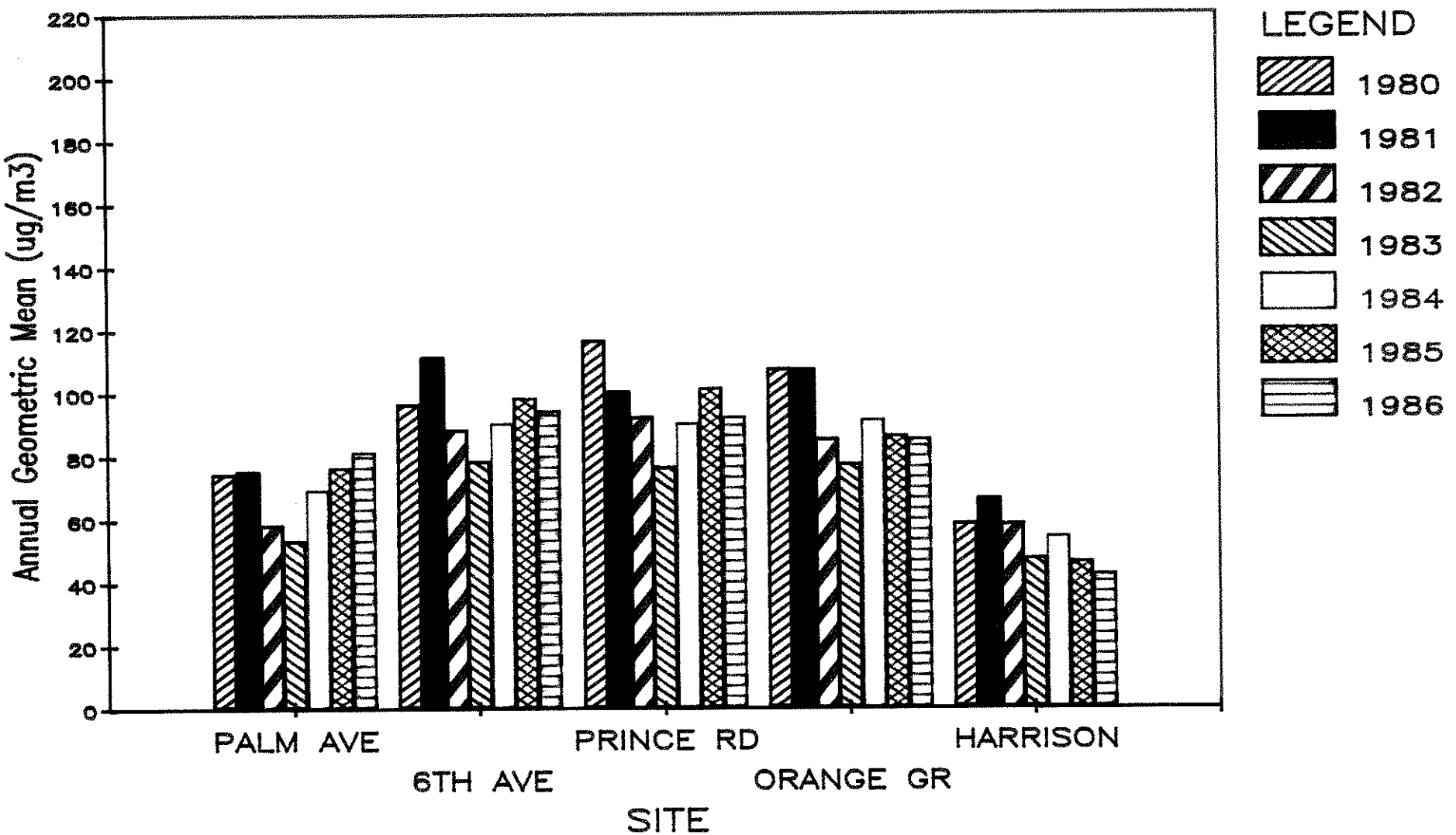
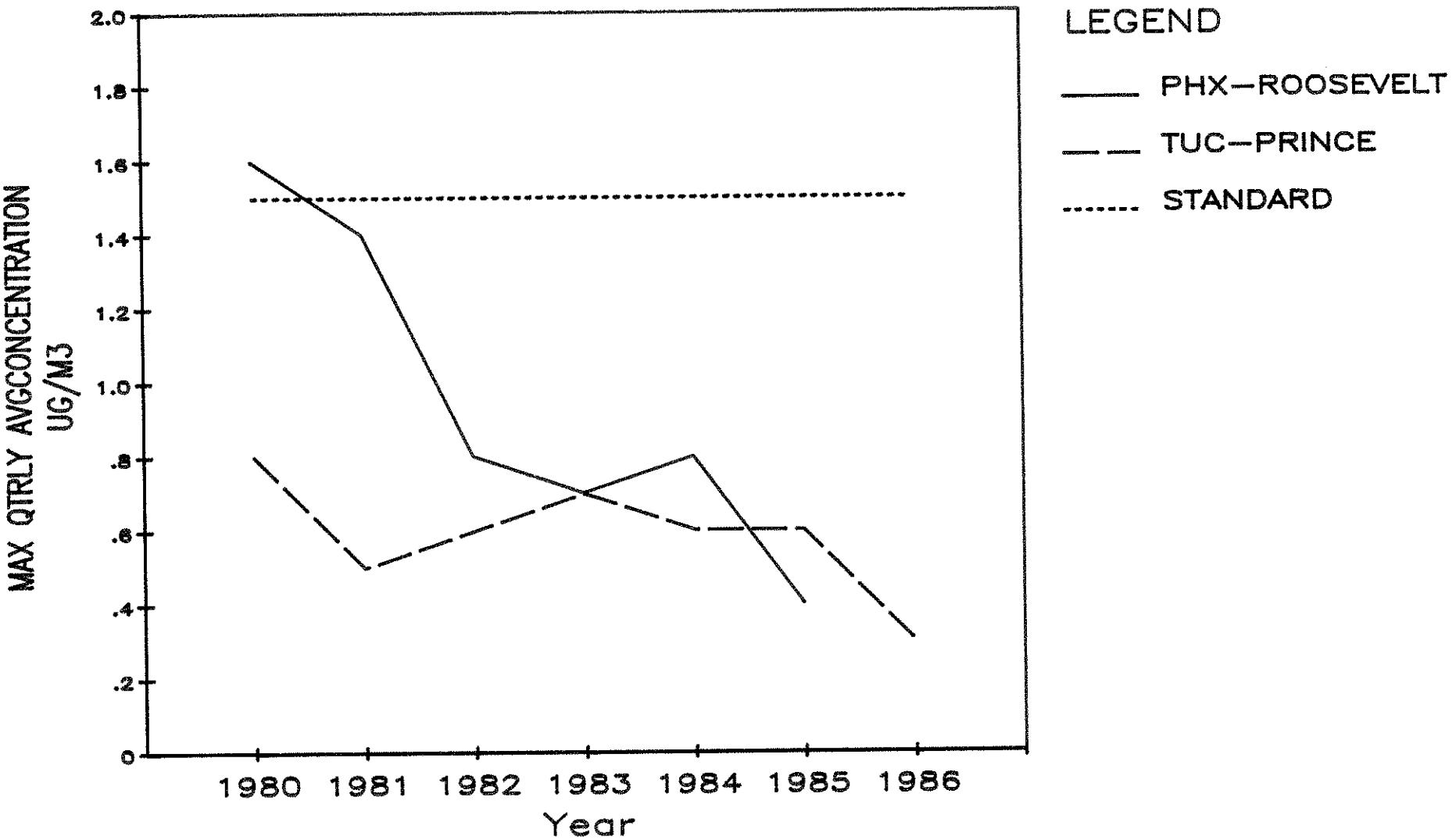
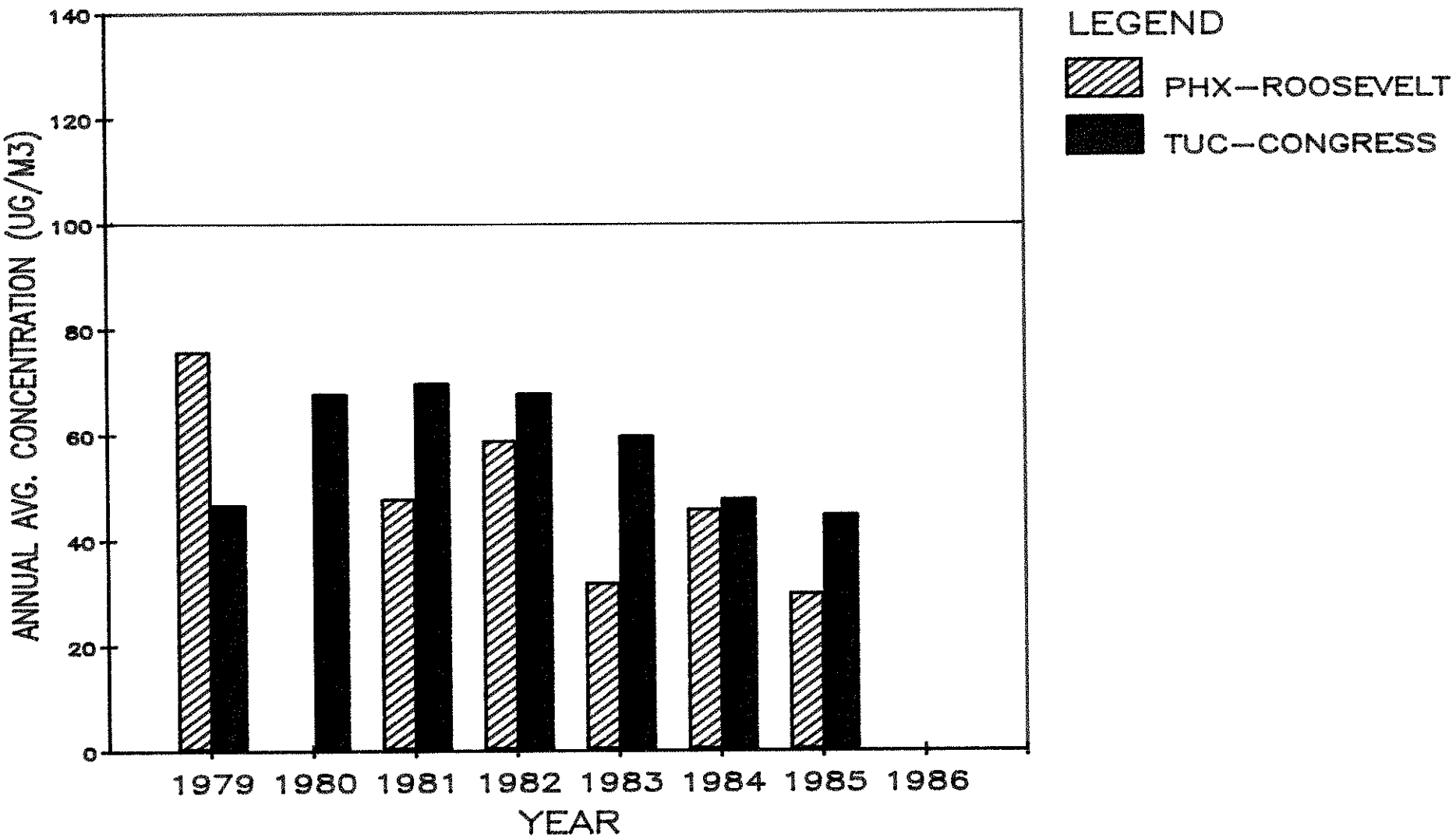


FIGURE 11
LEAD CONCENTRATIONS
IN PHOENIX AND TUCSON



PHX 1986 NA

FIGURE 12
NITROGEN DIOXIDE CONCENTRATIONS IN PHOENIX AND TUCSON



PHX NA 1980 AND NOT MONITORED 1986 TUC NA 1986 STANDARD IS 100 UG/M3

Figure 13

Arizona Geographical Regions

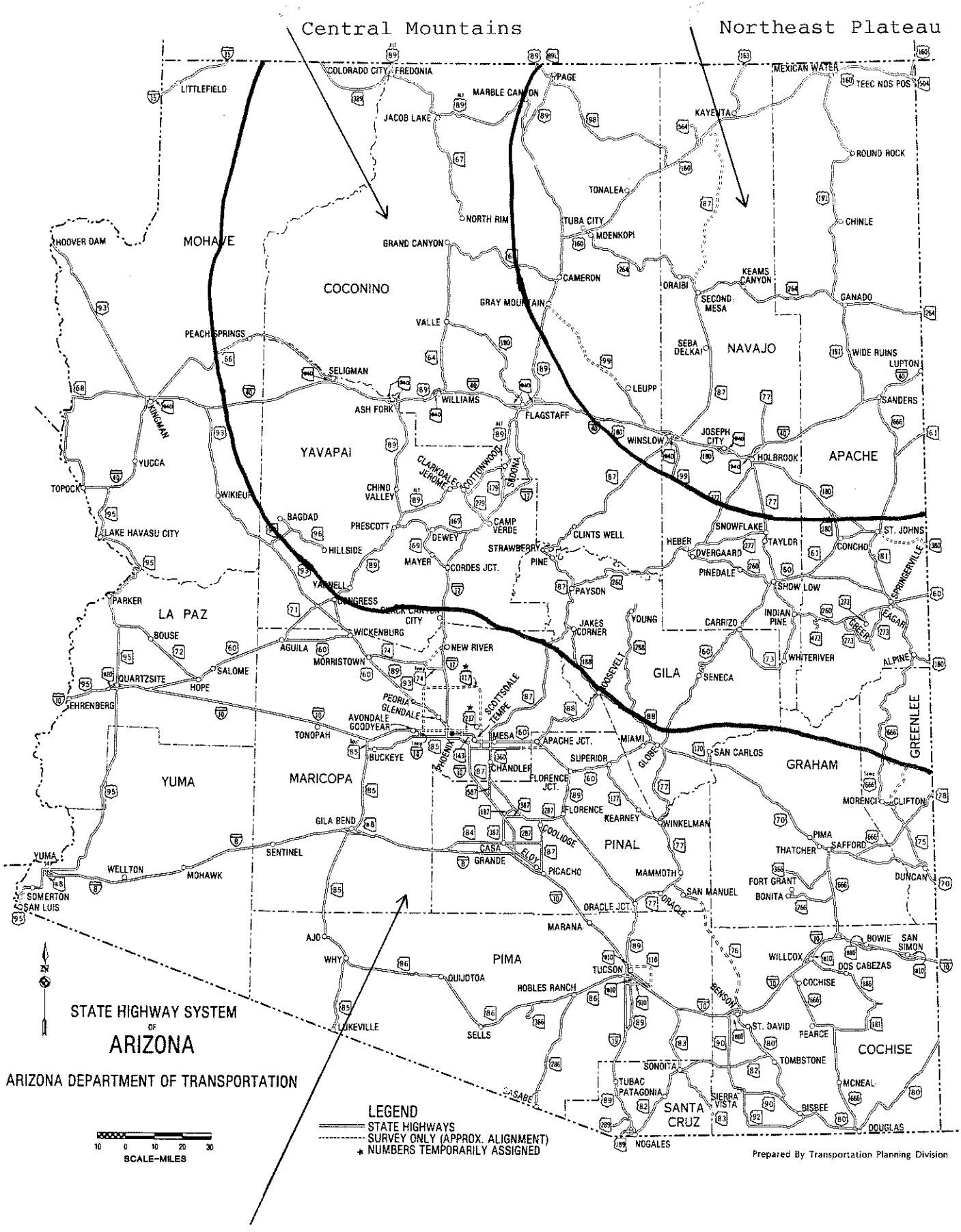


FIGURE 14
SULFUR DIOXIDE 3—HR EXCEEDANCES IN SMELTER TOWNS

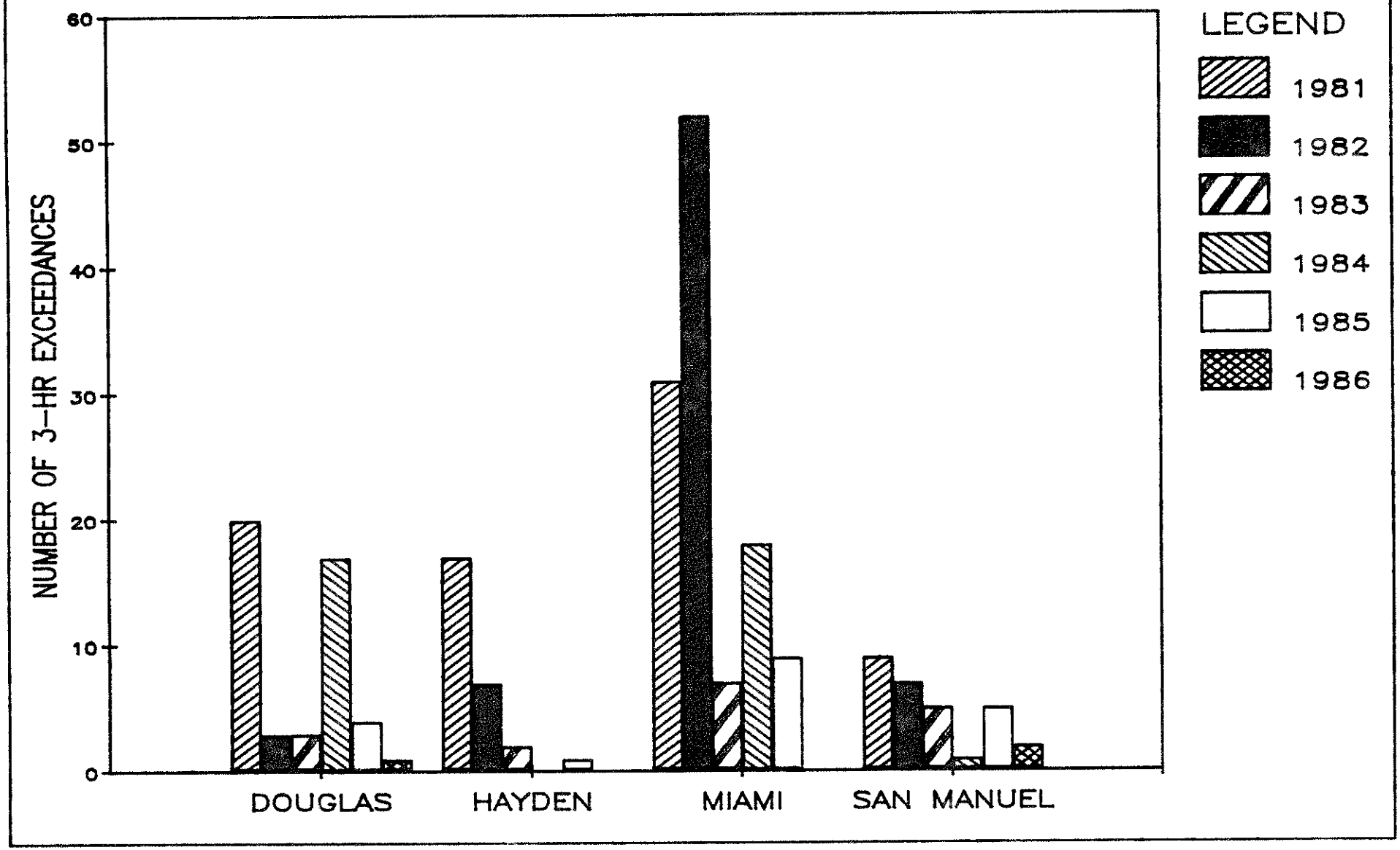


FIGURE 15
SULFUR DIOXIDE 24—HR EXCEEDANCES IN SMELTER TOWNS

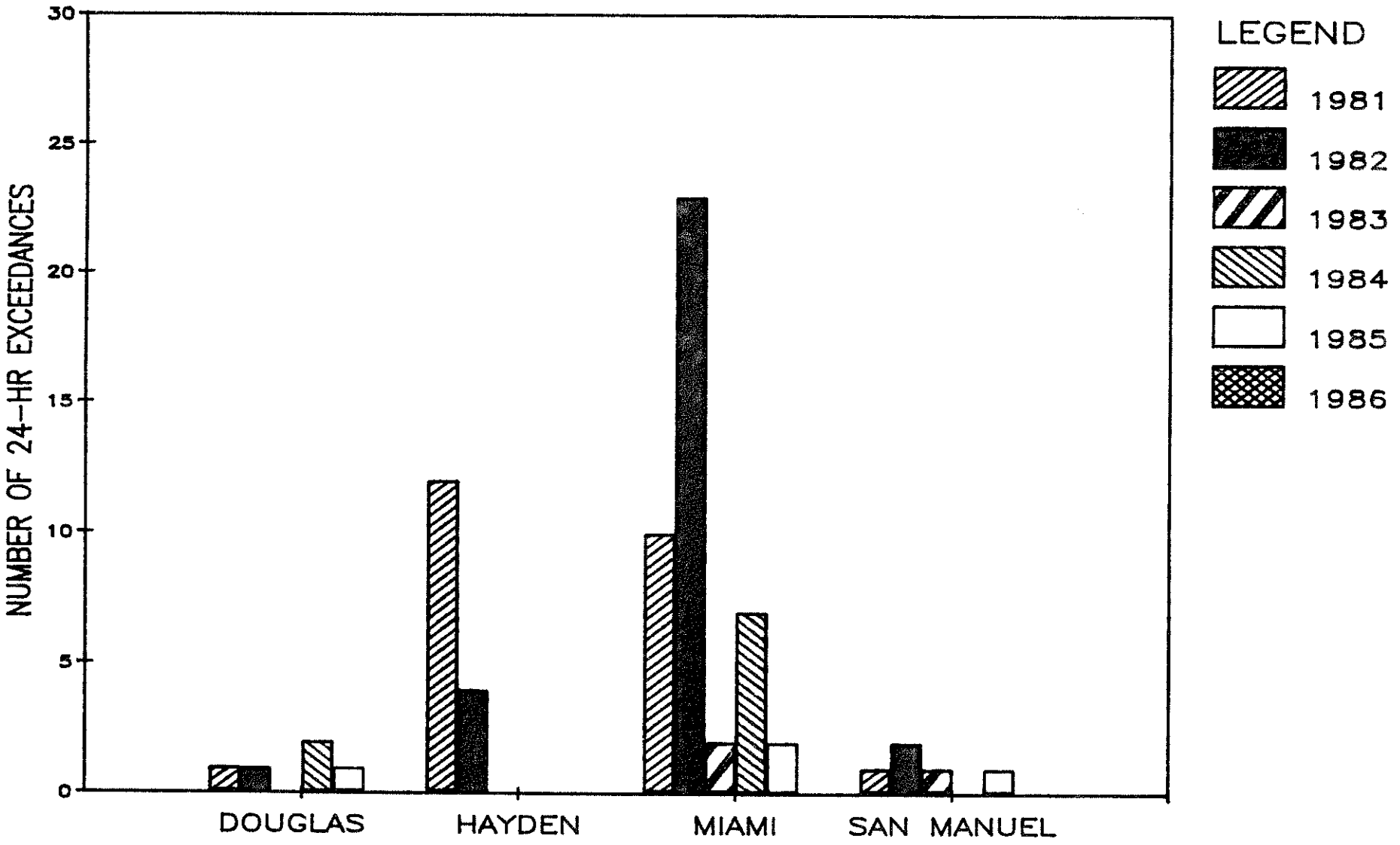
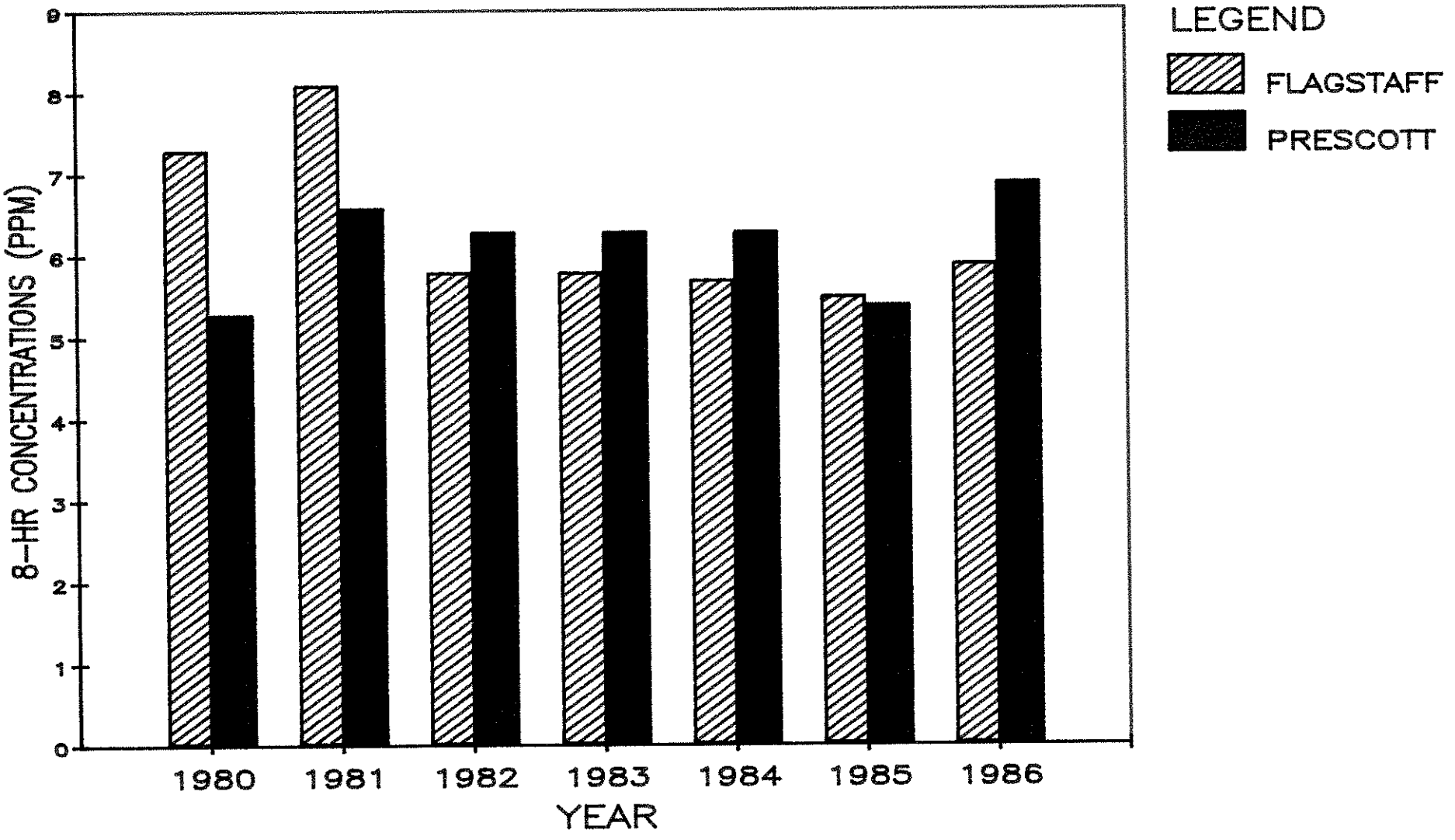


FIGURE 16
CARBON MONOXIDE CONCENTRATIONS IN FLAGSTAFF AND PRESCOTT



2ND HIGHEST CONCENTRATIONS STANDARD IS 9 PPM

IV. SPECIAL CONCERNS, PROBLEMS AND ACHIEVEMENTS

A. Budget/Staff Levels

Approximately 52 individuals staffed the air program in 1986. While the number of personnel remained about the same as in 1985, the requirements on the staff increased. The permitting program was impacted by major actions to bring the smelters in Douglas and San Manuel into compliance. The inspection/maintenance program issued 3,500 more waivers in 1986 due to legislative changes which increased the number of vehicles tested and changed the repair cost limit. Legal action taken by the Arizona Center for Law in the Public Interest precipitated revisions to plans for Maricopa and Pima Counties. Significant efforts were directed towards assisting the Maricopa Association of Governments in revising the carbon monoxide nonattainment area plans. In anticipation of EPA replacing the existing total suspended particulate standard with a more health related standard called PM_{10} (particulate matter less than ten microns in diameter), eight additional PM_{10} monitors were installed and operated in 1986. Five other monitoring sites were also operated during the year.

If addition funding is received, it will be used in two areas. The first is the improvement of the core program activities such as permit review and waiver issuance. Additional staff will help attain the goal of responding in a timely and thorough manner to core activities. Increased resources would also be devoted to developing programs for air toxics, acid rains, visibility and other air quality issues that need to be addressed.

B. Copper Smelters

Significant accomplishments were achieved in 1986 toward reduction of sulfur dioxide (SO_2) emissions from the Arizona and Mexican Copper smelters.

A negotiated consent decree was entered for the Phelps Dodge Douglas Reduction Works Smelter which provided for its cessation of smelting by January 15, 1987 and prohibitted the recommencement of smelting until it is capable of compliance with the EPA/Arizona New Source Performance Standards. The decree also provided penalties for past violations of ambient air quality standards for SO_2, for violations of interim short term peak concentrations designed to preclude adverse effects on asthmatics, and other failures to comply with the conditions of the decree.

The agreement with Phelps Dodge also facilited the negotiations with Mexico relative to the commitments for control of SO_2 emissions from the Mexican smelters at Cananea and Nacozari which with Douglas formed the Grey Triangle. Negotiations with the Mexicans were completed for an Annex to the Bilateral agreement for protection and improvement of the environment in the border area dealing with SO_2 emissions from the smelters. The proposed Annex provides assurances that the Mexicana de Cobre smelter at Nacozari will install an acid plant for reducing its SO_2 emissions by June 1, 1988, and that the Compania de Cananea smelter will not commence operations of expanded smelter facilities until it is equipped with like SO_2 emission control. Ground was broken in May of 1986 for the acid plant at Nacozari.

Negotiations were also initiated with the Magma Copper Company for a firm schedule leading to final compliance of its San Manuel smelter with the EPA-approved SO_2 emission standards for existing copper smelters.

C. Lawsuit

In 1985, the Center for Law in the Public Interest filed suit against EPA, the Federal Highway Administration, the State of Arizona, Pima County, Phoenix and Tucson to force compliance with the Clean Air Act requirements in Phoenix and Tucson.

The complaint alleged that:

The State had failed to promulgate adequate plans to control carbon monoxide and particulates in Phoenix and Tucson;

The adopted plans had not been implemented, for example:

- Cities had not improved transit service, nor met targets for increased ridership, two strategies included in both the Pima and Maricopa carbon monoxide plans;

- The Legislature, in amending the Inspection/ Maintenance Program in 1985, enacted a less stringent program than that called for in the 1982 Maricopa Carbon Monoxide Plan; and,

- Tucson and Pima County had not paved road shoulders, as called for in the Particulate Plan.

EPA had failed to sanction the State, as provided under the Clean Air Act, and failed to prepare acceptable plans.

The remedies sought by the lawsuit included:

Termination of air grant and highway funding;

EPA promulgation of new carbon monoxide and particulate plans;

Imposition of moratoria on construction on major sources of carbon monoxide and particulates;

Full implementation of commitments to increase the stringency of the I/M program, expand mass transit in the Phoenix and Tucson areas, and pave road shoulders in Pima County.

On February 18, 1986, the Center filed a federal court settlement on its lawsuit. The settlement which was between the Center and EPA called for the cutoff of federal highway funding if adequate plans were not developed by the Fall of 1986. The settlement also specified the kinds of provisions that the plans need to avoid highway funding sanctions. These included an enhanced inspection maintenance program and measures to reduce vehicle traffic such as mass transit and parking restrictions.

Draft carbon monoxide plans were prepared and submitted to EPA in late December, 1986 in response to the settlement. In January 1987 EPA notified the Center that progress on the development of the Phoenix and Tucson plans was adequate and that EPA would not initiate the process of withholding federal highway construction funds. Consequently, the Center reinstituted its lawsuit in July, 1987 which resulted in a Court ruling in August, 1987. The Court ruled that EPA must develop adequate plans within six months, but did not require EPA to impose sanctions.

D. Visibility

Visibility degradation is the most widely perceived effect of air pollution, and consequently, an issue of public concern. There are two basic areas in which this concern is focused, urban and pristine. Federal legislation and regulations have concentrated on pristine areas such as natural parks and wilderness areas referred to as Class I areas. For Arizona and 18 other states, EPA has promulgated rules for new source review and visibility monitoring. These regulations call for a cooperative EPA/FLM (Federal Land Manager) monitoring. They also require new sources to conduct background monitoring for areas not represented by the federal

network. In addition, these rules allow an interest party to petition EPA to assume authority to issue a visibility permit if the state fails to follow federal notification procedures for new source review.

Currently, visibility monitoring for Class I areas in Arizona is being conducted primarily by the National Park Service, the National Forest Service, and the Salt River Project (SRP). The state does not have the resources to perform this type of monitoring which is expensive, especially in remote areas. Moreover, methodology and procedures for monitoring visibility have not been standardized. Furthermore, because the Class I areas are managed by the National Park Service (NPS) and the National Forest Service (NFS), it is more appropriate for them to perform the monitoring. However the Arizona DEQ does plan to issue a visibility report, based on data from the NPS, NFS, and SRP monitors.

Based on surveillance conducted by federal agencies, visibility impairment has been identified in the following Class I areas in Arizona:

Grand Canyon National Park
Petrified Forest National Park
Saguaro Wilderness Area

Further monitoring studies are being conducted by EPA, NFS, and NPS to identify the sources of this impairment. Thus, EPA has deferred a decision on the necessity for BART (Best Available Retrofit Technology) and other control measures in the SIP's for Arizona and Utah.

In regard to urban visibility in Arizona, a brown haze is observed in Phoenix and Tucson, especially during the winter mornings. The Arizona Department of Health Studies and the University of Arizona conducted a monitoring study in 1983 which identified fine particulates as the cause of this haze. Elemental and organic carbon, ammonium nitrate, and ammonium sulfate were found to be the chief constituents of the fine particles. Subsequently, an analysis of the 1982 particulate emission inventory was performed to determine the sources of the four major visibility-reducing species. It was found that diesel and gasoline vehicles contributed the greatest to elemental and organic carbon emissions, 49% and 45%, respectively. They also accounted for a large portion of the nitrogen oxide and sulfur oxide emissions, precursors for ammonium nitrate and ammonium sulfate particles. Significant stationary sources of elemental and organic carbon emissions included fireplaces, structural fires, and miscellaneous sources (metallurgy, fuel combustion, and agriculture). Their primary impact was on organic carbon emissions, accounting for 48%.

In further investigation of the Phoenix visibility problem, the following activities should be included:

update the 1982 fine particulate emission inventory for Phoenix.

assess the impact of the CO, O_3, and PM_{10} nonattainment plans on visibility in Phoenix.

advocate the adoption of federal particulate emission standards for diesel vehicles.

develop control strategies to improve visibility, e.g., retrofitting and alternative fuels for mobile sources and controls for stationary sources.

develop and implement an acceptable method(s) to monitor visibility and evaluate long-term visibility trends.

establish standards or goals for urban visibility.

V. ORGANIZATIONAL STRUCTURE OF AIR QUALITY PROGRAM

A. Introduction

The Office of Air Quality (OAQ) within the Division of Environmental Health Services (DEHS) of the Arizona Department of Health Servides, has had primary responsibility for the control of air pollution at the state level. On July 1, 1987, however, the DEHS split off from Department of Health Services and became the Department of Environmental Quality (DEQ). Thus, OAQ's responsibility for management of the State air pollution control program continues within the DEQ. The OAQ has control of original state jurisdiction sources and sources in counties where jurisdiction has been asserted. Original jurisdiction sources include:

1. Statutory major sources, which are defined as those capable individually of generating more than 75 tons of air contaminants per day, or that are involved in copper smelting or the refining of crude oil.

2. Mobile sources, which are those capable of being operated in more than one county.

3. Activities of agencies of the State and its political subdivision.

The State has asserted jurisdiction for all air pollution control matters in Apache, Cochise, La Paz, Navajo, Santa Cruz, Yavapai, and Mohave Counties.

The purpose of the OAQ is to carry out the Legislature's intent "to exercise the police power of this State in a coordinated statewide program to control present and future sources of emission of air contaminants to the end that air polluting activities of every type shall be regulated in a manner that insures health, safety, and general welfare of all of the citizens of the State; protects property values; and, protects plant and animal life." The Rules and Regulations for Air Pollution Control provide for the attainment and maintenance of ambient air quality standards in accordance with the mandate of the Clean Air Act. To accomplish its purpose, the OAQ is supported by the Office of Program Planning and Development (OPPD) and the Office of Emergency Response and Environmental Analysis (OEREA). A chart indicating the organizational structure of the DEQ and the offices involved in the air quality program is presented in Figure 17. A discussion of the responsibilities of each section is given below.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

DIRECTOR
GERALD TELETZKE 257-2300

OFFICE OF DEPUTY ASSISTANT DIRECTOR
Fran Gonzalo 257-2307

OFFICE OF ADMINISTRATION
+VACANT

***

Accounting Section
*Jim Price 257-2366

Automation Section
*Terry Fields 255-1068

Budget & Federal Grants Section
*Beth Reely 257-2324

Hazardous Waste Section
*Beverly Westgaard 257-2307

Operations Support Section
*Robert Piceno 257-2314

Personnel Section
*Sue Fabyanic 257-2299

OFFICE OF AIR QUALITY
+Lee Lockie 257-2308

***

Permits & Compliance Section
*Carroll Dekle 257-2281
- Permits Unit
- Compliance Unit
  - Northern Regional Office
  - Southern Regional Office

Vehicle Emissions Section
*Bill Watson 255-1167
- Tucson Operations Unit
- Phoenix Operations Unit
- Quality Assurance Unit

Instrumentation Section
*John Hoffman 255-1146

OFFICE OF EMERGENCY RESPONSE AND ENVIRONMENTAL ANALYSIS
+Bill Blackman 257-2306

***

Air Quality Assessment Section
*VACANT
- Air Data Analysis Unit
- Air Quality Modeling Unit

Emergency & Remedial Section
*Phil King 257-2338
- Site Discovery & Hazard Evaluation Unit
- Emergency Response Coordination Unit
- Remedial Projects Unit
- Superfund Coordination Unit
- WQARF Administration Unit

Water Assessment Section
*Jack Bale 257-6804
- Pesticides Unit
  - Environmental Fate Analysis Team
  - Pesticides Monitoring Team
- Data Management Unit
  - Water Data Team
  - Pesticide Data Team
- AG BMP Unit
- Ambient Water Unit
  - Ambient Water Quality Analysis Team
  - Surface Water Quality Monitoring Team
  - Surface Water Quality Monitoring Field Office

Groundwater Hydrology Section
*Bill Wiley 257-2350
- Federal Permits Hydrology Unit
- State Permit Hydrology Unit
- Remedial Projects Hydrology Unit
- GW Monitoring/QA/QC Unit

OFFICE OF PLANNING AND PROGRAM DEVELOPMENT
+Norm Weiss 257-2313

***

Air Programs Coordination Section
*Stephanie Wilson 257-2321

Waste Program Planning Section
*Ira Domsky 257-2317

Water Quality Section
*Stephanie Ostrom 257-2319
- Planning Unit
- Program Development Unit

Regulation & Policy Development Section
*Doris Gates 257-6835
- Regulation Development Unit
- Planning Administration

OFFICE OF WASTE AND WATER QUALITY MANAGEMENT
+RON MILLER 257-2305

***

Construction Grants Section
*BILL SHAFER 257-2226
- Coordination Unit
- Grants Administration Unit
- Monitoring Unit

Plan Review & Permits Section
*Lyndon Hammon 257-2241
- Technical Review Unit
- RCRA Permits Unit
- Operator Certification Unit
- Water Permits Unit
  - Source Regulations & Existing Facilities
  - Groundwater Permits (New Facilities)
  - Drywells, NPDES Refuse, Data MGT

Compliance Section
*Sally Mapes 257-2215
- Water Permits/UST Compliance Unit
- Waste Compliance Unit
- Drinking Water Compliance Unit
- Compliance Tracking Unit

Field Services Section
*Bob Munari 257-2235
- Aquifer Protection Inspection Unit
- Central Regional Office Unit
- Nothern Regional Office Unit
- Southern Regional Office Unit
- Sedona Unit
- Hazardous & Solid Waste Unit
  - Hazardous Waste
  - Solid Waste

+Denotes Office Manager
*Denotes Section Manager/Acting Section Manager
4:tab-org 4/05/87

1. Permits and Compliance Section (in OAQ)

a. Permits Unit

Operation and administration of the State permit system is a vital function of the Permits Unit. This includes the review of applications for installation permits for new or modified sources and operating permits for existing sources. In the case of installation permits, technical data submitted with the application must be evaluated to assure that the planned facility is capable of meeting all regulations. In regards to operating permits, this Unit reviews emission tests and inspection reports to determine if the source is in compliance with rules and regulations.

As a part of the permitting activity, the Permits Unit maintains the master file for all sources under State permit. Also, the Unit keeps abreast of the state of the art in air pollution control equipment by inspection of newly-constructed facilities and by literature surveys.

Tax relief certification is another responsiblity which involves certification of equipment as air pollution control devices for the purpose of special amortization.

The Permits Unit develops and maintains a statewide emissions inventory of all criteria pollutants; that is, pollutants for which there are ambient air quality standards.

Environmental impact statements for federally-funded construction projects, such as sewage treatment plants, airports, and highways are reviewed to assure that applicable regulations will be met.

b. Compliance Unit

Determining the capability of sources to comply with rules and regulations is a major responsibility of the Compliance Unit. This is done by conducting or evaluating mass emissions tests or observing visible emissions for each source. Compliance with applicable regulations must be demonstrated in these tests before a source can obtain an operating permit. Conditions deemed necessary to assure continuing compliance may be included in the operating permit.

In addition to checking emissions, the Compliance Unit must evaluate each source's impact on air quality to verify compliance. This entails the review of air quality data obtained by State and industrial monitoring stations. Also, the Unit performs quality assurance checks on the monitors to validate the data.

If a source is found to be violating regulations, the Compliance Unit initiates enforcement action by the issuance of a Notice of Violation (NOV) to the source operator. An effort is made to obtain voluntary action by the operator to correct the non-complying conditions.

Beyond this, a number of forms of enforcement action appropriate to the case may be taken such as:

1. Referral of the NOV to the responsible officer of the source with a written request for corrective action and response.

2. Administrative conferences designed to obtain voluntary corrective action commitments from the source.

3. Permit denial.

4. Modification of permit conditions to require additional pollution controls or improved work practices.

5. Orders of Abatement imposing conditions designed to resolve or mitigate the noncompliance condition(s). These orders are subject to appeal to the Air Pollution Control Hearing Board which may dismiss, uphold or modify the terms of the order.

6. Injunctive relief from the Superior Court of the county concerned may be sought against any source in violation of the terms of an Order of Abatement.

Misdemeanor criminal charges may be filed against a noncomplying source which would subject the sources to fines of up to $1,000 per day for each day that violations are proven. In any case where evidence of air pollution which presents an imminent and substantial endangerment to the health of persons is developed, the Director may request the Attorney General to petition the appropriate Superior Court for an injunction requiring any contributor to immediately stop emitting and to undertake such other actions as may be necessary.

The Compliance Unit trains and certifies visible emissions observers from control agencies and industry in accordance with the approved method for determining the opacity of industrial plumes.

Above and beyond the enforcement remedies available to DEQ in Arizona law, a source is also subject to federal enforcement of the provisions of the approved State Implementation Plan under the Clean Air Act.

Federal enforcement remedies include:

Civil penalties up to $25,000 per day of violation.

Criminal penalties up to $50,000 per day of violation and up to two years imprisonment.

Noncompliance penalties up to the economic value of noncompliance with interim or final emission control requirements.

Enforcement action may be initiated in the federal court by DEQ, the Environmental Protection Agency (EPA) or jointly under the provisions of an Arizona-EPA Cooperative Air Enforcement Agreement.

2. Instrumentation Section (in OAQ)

The operation of the State air quality monitoring network is the basic task of the Instrumentation Section. Included in this task are the procurement, installation, calibration and servicing of monitoring instruments, plus auxiliary equipment and housing. The monitoring instruments include anemometers, wind vanes, temperature differential sensors, continuous gas analyzers, particulate samplers, and data recording devices.

Data quality assurance is an important part of the monitoring network operation. In meeting this need, technicians of the Section perform calibrations, audits, and precision, span and operational checks on the monitors. Subsequently, the recorded data charts and magnetic tapes are brought in for analysis and report preparation.

In support of field calibration and quality assurance activities, Instrumentation maintains a laboratory which provides standards for flow, temperature, mass, pressure, voltage, and pollutant concentrations. These standards are traceable to the National Bureau of Standards or other recognized agencies.

Instrumentation is also responsible for the support engineering associated with the office's automated data acquisition systems, including systems design, equipment procurement, and programming.

3. Inspection and Maintenance Section (in OAQ)

The Inspection and Maintenance Section of the Office of Air Quality Management oversees an annual emissions inspection of 1967 and newer model gasoline-fueled vehicles registered in the urban nonattainment areas (carbon monoxide and ozone) of Pima and Maricopa Counties. Also, a tampering inspection was added to the program in 1986 for all 1975 and newer model vehicles which failed the emissions test.

Included in the tampering inspection were:

Visual check for presence of a catalytic convertor.

Visual check for presence of fuel inlet restrictor.

Plumbtesmo test for absence of lead in the tailpipe.

The tampering inspection has been strengthened in 1987 by adding:

Visual check for the presence of an air pump on vehicles originally equipped with this device.

Tampering inspection on all 1975 and newer model gasoline-fueled vehicles prior to emissions inspection.

Other additions to the I/M program in 1987 are emissions inspection of diesel vehicles and increased waiver limit requirements of:

Pre 1975	- $ 50.00
1975 - 1979	- 100.00
1980 and newer	- 300.00

These inspections are conducted at nine contractor-operated inspection stations.

In addition, government and company-owned vehicles are inspected by the fleet operators. Section personnel assure the quality of emission measurements at both contractor-operated and fleet inspection facilities. Also, they instruct and train automotive repair mechanics in proper tune-up procedures.

During the inspection, exhaust concentration of carbon monoxide and hydrocarbons are measured and compared to standards established by the Department. These standards vary in stringency with emission control technologies mandated by the federal government. Vehicles identified as excessive polluters are required to be repaired and reinspected.

In support of the OAQ, the Office of Program Planning and Development (OPPD) and the Office of Emergency Response and Environmental Analysis (OEREA) within the DEQ perform two vital functions--air quality planning and data analysis. These activities are discussed below.

4. Air Programs Coordination Section (in OPPD)

The Air Programs Coordination Section of OPPD has the responsibility for the management of the State Implementation Plan (SIP). The SIP, which is required by federal law, is composed of state and county rules and regulations and nonattainment area plans that control air pollution.

The Air Programs Coordination Section assists the Office of Air Quality in processing regulations through the State procedure. Once the regulations have been certified by the Attorney General's Office and filed with The Secretary of State, the Section prepares the SIP revision request to EPA.

The other major component of the SIP is the nonattainment area plans (NAPs). Nonattainment areas are areas that exceed the ambient air quality standards. The NAPs contain control strategies and implementation schedules that will result in the area attaining and maintaining the air quality standards. The plans are developed in coordination with counties, councils of government, local officials and the Environmental Protection Agency (EPA).

Reasonable Further Progress (RFP) reports are prepared annually for those areas that have NAPs to determine the effectiveness of the control strategies. The Air Programs Coordination Section reviews the RFP reports prepared by the Maricopa and Pima County Health Departments.

5. Air Quality Assessment Section (in OEREA)

The processing and analysis of ambient air quality data from the State, Counties, and industrial monitoring networks is a key function of this Section. Based on such analyses, the compliance status of each monitored area is determined. These analyses are also used to assess air quality trends and progress towards attainment of the standards.

Air quality modeling, both of industrial and urban areas, is another major responsibility of this Section. This involves evaluating the effectiveness of various control strategies for urban and industrial areas. Also, the capability of proposed and existing industrial sources to meet air quality standards is determined by modeling.

The Air Quality Assessment Section provides information to the public concerning ambient air quality and special issues such as acid rain, visibility, and indoor air quality.

The management and coordination of emergency episode prevention activities is the responsibility of this Section. This entails close observation of air quality and meteorological conditions, forecasting air quality, issuing air pollution alerts, and determining necessary control measures.

It should be noted, however, that this organizational structure of the Arizona DEQ will be changed. Effective October 1, 1987 OEREA will be abolished and the Air Quality Assessment Section becomes part of OAQ.

APPENDIX A

1986 Air Quality Data

Air Quality Data

Table 1 lists the counties and towns monitored in the state, including the pollutants monitored.

1986 data summaries which are tabulated in Tables 2 through 9 consist of annual mean and maximum and second highest short-term average concentrations, numbers of exceedances of short-term air quality standards, and numbers of samples collected or hours monitored. The following abbreviations and footnotes were used in these data summaries:

GENERAL

NA	Not Applicable
NR	Not Reported

OPERATORS

AEPCO	Arizona Electric Power Cooperative, Inc.
Alam	Alamito Corporation
APS	Arizona Public Service Company
ICCC	Inspiration Consolidated Copper Company
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
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 Environmental Quality
TEP	Tucson Electric Power Company

EQUIPMENT

Carbon Monoxide	
NDIR	Non-dispersive infrared
Nitrogen Dioxode	
Chem	Chemiluminescent

EQUIPMENT (Cont'd)

Ozone	
Chem	Chemiluminescent
UV	Ultraviolet absorption
TSP	
Hi-Vol	High volume air sampler
PM_{10}	
SA	Sierra Anderson type hi-vol
Wed	Wedding type hi-vol
Sulfur Dioxide	
Coul	Coulometric
Flame	Flame photometric
Fluor	Fluorescent

Footnotes:

a. New site.
b. Site terminated or method discontinued.
c. Mean value based on a limited number of samples.
d. Site operated on a seasonal schedule.
e. Site operated on windy conditions.

Table 2

1986 Counties and Towns Monitored

COUNTY AND TOWN	CARBON MONOXIDE	LEAD	NITROGEN DIOXIDE	OZONE	PM_{10}	TSP	SULFUR DIOXIDE
APACHE:							
St. Johns			X	X		X	X
Springerville			X			X	X
COCHISE:							
Bisbee		X			X	X	X
Douglas		X			X	X	X
Dragoon						X	X
Kansas Settlement				X		X	X
Lazy K J Ranch		X				X	X
McNeal						X	X
Naco		X				X	X
Palominos		X				X	
Paul Spur					X	X	
Sierra Vista						X	X
COCONINO:							
Flagstaff	X				X	X	
Grand Canyon						X	
Page			X	X		X	X

Table 2 (Cont'd)

1986 Counties and Towns Monitored

COUNTY AND TOWN	CARBON MONOXIDE	LEAD	NITROGEN DIOXIDE	OZONE	PM_{10}	TSP	SULFUR DIOXIDE
GILA:							
Hayden		X			X	X	X
Miami		X			X	X	X
Miami (Jones Ranch)							X
Payson						X	
Roosevelt						X	
Winkelman							X
GRAHAM:							
Safford					X	X	
GREENLEE:							
Morenci		X				X	
MARICOPA:							
Glendale	X			X		X	
Mesa	X			X		X	
Phoenix	X			X	X	X	
Scottsdale	X			X		X	

Table 2 (Cont'd)

1986 Counties and Towns Monitored

COUNTY AND TOWN	CARBON MONOXIDE	LEAD	NITROGEN DIOXIDE	OZONE	PM_{10}	TSP	SULFUR DIOXIDE
MOHAVE:							
Bullhead City			X			X	X
Davis Dam						X	X
Riviera						X	X
NAVAJO:							
Joseph City						X	
Show Low					X	X	
PIMA:							
Ajo		X			X	X	
Corona de Tucson						X	
Green Valley						X	
Organ Pipe (NM)					X		
Rillito					X	X	
Sahuarita						X	
Tucson		X	X		X	X	
PINAL:							
Apache Junction						X	

Table 2 (Cont'd)

1986 Counties and Towns Monitored

COUNTY AND TOWN	CARBON MONOXIDE	LEAD	NITROGEN DIOXIDE	OZONE	PM_{10}	TSP	SULFUR DIOXIDE
PINAL (Cont'd):							
Mammoth						X	X
Marana						X	
Oracle						X	X
San Manuel		X			X	X	X
Stanfield						X	
SANTA CRUZ:							
Nogales		X			X	X	
YAVAPAI:							
Clarkdale						X	
Montezuma Castle (NM)		X				X	
Nelson						X	
Prescott						X	
YUMA:							
Yuma				X	X	X	

Table 3

1986 Carbon Monoxide Data (in ppm)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	1-HR. AVERAGE MAX.	1-HR. AVERAGE 2ND HIGH	8-HR. AVERAGE MAX.	8-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 8-HR. STANDARD DAYS	NO. OF EXCEEDANCES OF 8-HR. STANDARD TIMES	NO. OF SAMPLES
COCONINO:										
Flagstaff[d]	2501 N. 4th St.	State	NDIR	18	15	7	6	0	0	4325
MARICOPA:										
Glendale	6000 W. Olive	Maricopa	NDIR	12	10	8	7	0	0	6764
Mesa	B'way & Brooks	Maricopa	NDIR	14	12	6	6	0	0	8315
Phoenix	4732 S. Central	Maricopa	NDIR	14	14	7	7	0	0	6386
Phoenix	8531 N. 6th St.	Maricopa	NDIR	18	16	11	7	1	1	7522
Phoenix	1845 E. Roosevelt	Maricopa	NDIR	20	19	14	13	15	15	8693
Phoenix	3315 W. Indian School Rd.	Maricopa	NDIR	24	22	18	16	62	78	8653
Phoenix	3847 W. Earll	Maricopa	NDIR	25	22	12	12	18	18	8374
Scottsdale	2857 N. Miller	Maricopa	NDIR	19	18	12	11	2	2	8482
Scottsdale	13665 N.Scottsdale	Maricopa	NDIR	10	9	5	5	0	0	8394

Table 3 (Cont'd)

1986 Carbon Monoxide Data (in ppm)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	1-HR. AVERAGE MAX.	1-HR. AVERAGE 2ND HIGH	8-HR. AVERAGE MAX.	8-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 8-HR. STANDARD DAYS	NO. OF EXCEEDANCES OF 8-HR. STANDARD TIMES	NO. OF SAMPLES
PIMA:										
Tucson	151 W. Congress	Pima	NDIR	Not Reported						
Tucson	22nd & Craycroft	Pima	NDIR	"	"					
Tucson	22nd & Alvernon	Pima	NDIR	"	"					
Tucson[a]	Broadway & Craycroft	PAG	NDIR	15	15	10	9	1	1	384[c]
YAVAPAI:										
Prescott[d]	Co. Maint. Yard	State	NDIR	21	18	7	7	0	0	4032

STATE AND FEDERAL STANDARD (ppm): 1-Hour Average 35; 8-Hour Average 9

Table 4

1986 Lead Data
High Volume Sampler (in ug/m^3)
In TSP or PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	QUARTERLY AVERAGE 1	2	3	4	NO. OF SAMPLES 1	2	3	4
COCHISE:											
Bisbee	Anderson Residence	State	TSP			.03[c]	.03			1	15
			PM_{10}		.04[c]	.01[c]			9	10	
Douglas	1.2 mi.N. of Smelter	State	TSP	.10	.10	.07[c]		14	14	8	
Douglas	City Park	State	TSP		.20[c]			8			
			PM_{10}		.12	.10[c]			12	8	
Lazy K Ranch[a]	2 miles E of M.P. #152	State	TSP	.06	.02	.03[c]		11	15	8	
Naco[a,b]	Federal Border Station	State	PM_{10}		.00[c]	.03[c]		1	8		
Palominas[a]	Los Palominas School	State	TSP	.05[c]	.03	.04[c]		10	14	6	
GILA:											
Hayden	164 Fourth Ave.	JCC	TSP	.24	.17	.15	.17	14	15	14	14
Hayden	Jail	State	TSP	.33				15			
			PM_{10}		.22	.16[c]			13	8	
Miami	Fire Station	State	TSP	.16				15			
			PM_{10}		.16c	.04[c]			9	9	
GREENLEE:											
Morenci[b]	Stargo	State	TSP	.05[c]	.01	.02[c]		8	11	8	

Table 4 (Cont'd)

1986 Lead Data
High Volume Sampler (in ug/m^3)
In TSP or PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	QUARTERLY AVERAGE 1	2	3	4	NO. OF SAMPLES 1	2	3	4
MARICOPA:											
Glendale	6000 W. Olive	Maricopa		Not Reported							
Mesa	Broadway & Brooks	Maricopa		"		"					
Phoenix	1845 E. Roosevelt	Maricopa		"		"					
Phoenix	8531 N. 6th St.	Maricopa		"		"					
Phoenix	4732 S. Central	Maricopa		"		"					
Phoenix	1826 W. McDowell	Maricopa		"		"					
Phoenix	3847 W. Earll	Maricopa		"		"					
Scottsdale	13665 N.Scottsdale Rd.	Maricopa		"		"					
Scottsdale	2857 N. Miller Rd.	Maricopa		"		"					
PIMA:											
Ajo	Well Rd.	State	TSP	.03[C]				10			
			PM_{10}		.01[C]				6		
Organ Pipe (NM)	Visitors' Center	State	PM_{10}	.02	.01	.01[C]		15	14	4	
Tucson	1016 W. Prince Rd.	Pima	TSP	.25	.14	.15	.27	15	14	15	14
Tucson	Broadway & Swan	Pima	TSP	.16	.11	.09	.15	12	10	15	14
Tucson	1/2 mile east of Irvington & Alvernon	TEP	PM_{10}	.05	.03	.03	.04	29	27	26	22

Table 4 (Cont'd)

1986 Lead Data
High Volume Sampler (in ug/m^3)
In TSP or PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	QUARTERLY AVERAGE 1	2	3	4	NO. OF SAMPLES 1	2	3	4
PINAL:											
San Manuel	L.D.S. Church	State	TSP	.05	.03	.04[C]		15	13	6	
SANTA CRUZ:											
Nogales	U.S. Post Office	State	TSP	.39				13			
			PM_{10}		.16[C]	.11[C]			10	7	
YAVAPAI:											
Montezuma Castle (NM)	Maint. Bldg.	State	TSP	.04	.01	.07[C]		13	15	3	

STATE AND FEDERAL STANDARD (ug/m^3): Calendar Quarter Average
(Primary and Secondary) 1.5

Table 5

1986 Nitrogen Dioxide Data (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	AVERAGE	MAXIMUM 1-HOUR	MAXIMUM 24-HOUR	NO. OF 1-HOUR SAMPLES
APACHE:							
St. Johns	Mesa Parada	SRP	Chem.	3	82	23	6793
Springerville	Airport	Alam	Chem.	1.1	38	9	8231
Springerville	4 mi. NE of Town	Alam	Chem.	0.9	21	15	8086
Springerville	1 mi. NNE of Unit 1 Stack	Alam	Chem.	0.9	66	31	8076
Springerville	1 mi. ESE of Unit 1 Stack	Alam	Chem.	0.8	41	7	8165
Springerville	1 mi. SSE of Unit 1 Stack	Alam	Chem.	1.1	41	7	8060
Springerville	12.2 mi. SE of Unit 1 Stack	Alam	Chem	0.4	28	5	7938
COCONINO:							
Page	Glen Canyon Dam	SRP	Chem.	6	50	18	6199
MOHAVE:							
Bullhead City	224 N. Main St.	SCE	Chem.	38	167	86	8375
PIMA:							
Tucson	22nd & Craycroft	Pima	Chem.	Not Reported			
Tucson	151 W. Congress	Pima	Chem.	"	"		

STATE AND FEDERAL STANDARD (ug/m^3): Annual Average
(Primary and Secondary) 100

Table 6

1986 Ozone Data (in ppm)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	1-HR. AVERAGE MAX.	1-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF STD.	COMPLIANCE STATUS EXCEEDANCES	NO. OF SAMPLES
APACHE:								
St. Johns	Mesa Parada	SRP	U.V.	.08	.08	0	0	7674
COCHISE:								
Kansas Settlement	1 mi. W of Cotton Gin	AEPCO	U.V.	.05	.05	0	0	6260
COCONINO:								
Page	Glen Canyon Dam	SRP	U.V.	.10	.09	0	0	8736
MARICOPA:								
Glendale	6000 W. Olive	Maricopa	U.V.	.12	.11	0	1.3	8007
Mesa	Broadway & Brooks	Maricopa	U.V.	.12	.11	0	0	5170
Phoenix	3315 W. Indian School Rd.	Maricopa	U.V.	.11	.10	0	.7	3035
Phoenix	1845 E. Roosevelt	Maricopa	U.V.	.14	.14	2	3.3	8666
Phoenix	8531 N. 6th St.	Maricopa	U.V.	.13	.13	2	1.7	6757
Phoenix	3847 W. Earll	Maricopa	U.V.	.13	.13	1	1.0	6280
Phoenix	4732 S. Central	Maricopa	U.V.	.11	.10	0	0	7823

Table 6 (Cont'd)

1986 Ozone Data (in ppm)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	1-HR. AVERAGE MAX.	1-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF STD.	COMPLIANCE STATUS EXCEEDANCES	NO. OF SAMPLES
MARICOPA (Cont'd):								
Scottsdale	2857 N. Miller Rd.	Maricopa	U.V.	.12	.11	0	.7	8193
Scottsdale	13665 N. Scottsdale Rd.	Maricopa	U.V.	.13	.13	2	1.0	6727
PIMA:								
Saguaro NM E	Visitors' Center	Pima	U.V.	Not Reported				
Tucson	151 W. Congress	Pima	U.V.	"	"			
Tucson	22nd & Craycroft	Pima	U.V.	"	"			
Tucson	4591 N. Pomona	Pima	U.V.	"	"			
YUMA:								
Yuma[d]	1485 2nd Ave.	State	U.V.	.10	.10	0	0	3635

STATE AND FEDERAL STANDARD: (Primary and Secondary) The standard is .12 ppm (235 ug/m^3) for the maximum daily 1-hour concentration. Compliance status is determined by computing the average number of days that the 1-hour standard has been exceeded per year for the past three years. No more than 1.0 exceedances per year over the last three years is permitted.

Table 7

1986 TSP Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL GEOMETRIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL PRIMARY	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL SECONDARY	NO. OF SAMPLES
APACHE:								
St. Johns	Airport	SRP	18	88	45	0	0	62
St. Johns	Mesa Parada	SRP	9	30	30	0	0	61
St. Johns	Patterson Wellfield	SRP	11	34	33	0	0	61
Springerville	Airport	Alam	16	63	58	0	0	430
Springerville	4 mi. NE of Town	Alam	1	39	35	0	0	113
Springerville	1 mi. NE of Unit 1 Stack	Alam	14	89	89	0	0	116
Springerville	12.2 mi. SE of Unit 1 Stack	Alam	9	49	49	0	0	111
COCHISE:								
Bisbee	Lynn Anderson Res.	State	21[c]	53	48	0	0	37
Douglas	1.2 mi. N. of Smelter	State	52	154	149	0	1	59
Douglas	City Park	State	98	296	252	1	14	55
Dragoon	N. Dragoon Mtns.	AEPCO	27	99	84	0	0	253
Kansas Settlement	1 mi. W. of Cotton Gin	AEPCO	31	121	110	0	0	265
Lazy K Ranch[a]	2 mi. E. of M.P. #152	State	49	148	131	0	0	50
McNeal[a,b]	2.6 mi. SW of Town	State	37[c]	64	62	0	0	19

Table 7 (Cont'd)

1986 TSP Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL GEOMETRIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL PRIMARY	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL SECONDARY	NO. OF SAMPLES
COCHISE (Cont'd):								
Palominas[a]	Los Palominas School	State	37[c]	160	88	0	1	49
Paul Spur	Housing Area	State	193	765	642	22	36	53
Sierra Vista	Bartow Drive	State	49[c]	117	80	0	0	44
COCONINO:								
Flagstaff CAC	Cherry St. & Agassiz	State	55	222	120	0	1	59
Flagstaff E[b]	5400 N. Dodge Ave.	State	172	842	628	19	33	57
Flagstaff NRO[b]	2501 N. Fourth St.	State	60	155	146	0	1	60
Page	Glen Canyon Dam	SRP	14	39	34	0	0	59
Grand Canyon	Hopi Point	State	10	31	28	0	0	54
Page	Airport	SRP	39	143	133	0	0	59
Page	Airport	State	31	119	102	0	0	59
Sedona	Post Office	State	37[c]	70	64	0	0	39
GILA:								
Hayden	164 Fourth Ave.	JCC	105	390	337	3	15	57
Hayden	Jail	State	158	418	372	10	33	61
Miami	Fire Station	State	72	171	134	0	1	56

Table 7 (Cont'd)

1986 TSP Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL GEOMETRIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL PRIMARY	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL SECONDARY	NO. OF SAMPLES
GILA (Cont'd):								
Payson	County Courthouse	P-G	216[c]	736	652	8	15	40
Roosevelt	Ranger Station	P-G	28[c]	78	61	0	0	42
GRAHAM:								
Safford	523 10th Ave.	State	84	337	168	1	4	54
GREENLEE:								
Morenci[b]	Stargo	State	63[c]	182	154	0	4	27
MARICOPA:								
Glendale	6000 W. Olive Ave.	Maricopa	86	265	185	1	4	57
Mesa	Broadway & Brooks	Maricopa	81	276	210	1	5	56
Phoenix	1845 E. Roosevelt	Maricopa	119	303	249	1	16	58
Phoenix	1826 W. McDowell	Maricopa	210	1139	743	21	44	58
Phoenix	8531 N. 6th St.	Maricopa	99	247	214	0	6	57
Phoenix	4732 S. Central	Maricopa	123	284	248	1	13	60
Phoenix	3847 W. Earll	Maricopa	95	209	208	0	4	58
Scottsdale	2857 N. Miller Rd.	Maricopa	85	194	166	0	2	56
Scottsdale	13665 N. Scottsdale	Maricopa	77	267	150	1	1	58

Table 7 (Cont'd)

1986 TSP Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL GEOMETRIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL PRIMARY	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL SECONDARY	NO. OF SAMPLES
MOHAVE:								
Bullhead City	224 N. Main St.	SCE	80	154	154	0	3	53
Davis Dam	Katherine Landing	SCE	21	94	74	0	0	59
Riviera	Ft. Mohave	SCE	40	182	107	0	1	55
NAVAJO:								
Joseph City	3.25 mi. SE of Town	State	25	189	110	0	1	50
Joseph City	3rd St. N. & Tanner	APS	33	245	228	0	6	216
Joseph City	Met Tower	APS	19	195	165	0	2	200
Show Low	Deuce of Clubs Ave.	State	51	162	142	0	1	51
PIMA:								
Ajo	Well Rd.	State	40[c]	150	139	0	0	35
Corona de Tucson	22000 S. Houghton Rd.	Pima	20	49	48	0	0	51
Green Valley	245 W. Esperanza	Pima	39	142	90	0	0	52
Rillito	Gremmler Residence	State	92	245	244	0	5	57
Sahuarita[e]	Sahuarita Junior High	Pima	31	156	118	0	1	60
Sahuarita[e]	Sahuarita Elementary	State	131[c]	284	230	1	4	7
Tucson	2181 S. Harrison Rd.	Pima	43	140	95	0	0	59

Table 7 (Cont'd)

1986 TSP Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL GEOMETRIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL PRIMARY	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL SECONDARY	NO. OF SAMPLES
PIMA (Cont'd):								
Tucson	3401 W.Orange Grove Rd.	Pima	86	253	249	0	4	58
Tucson	1016 W. Prince Rd.	Pima	93	259	224	0	6	58
Tucson	1810 S. 6th Ave.	Pima	95	250	232	0	5	60
Tucson	2nd St. & Palm Ave.	Pima	82	236	201	0	5	50
Tucson	Broadway & Swan	Pima	62	120	109	0	0	51
Tucson	½ mi.E of Irvington & Alvernon	TEP	56	142	109	0	0	86
PINAL:								
Apache Junction	County Yard	P-G	60[C]	135	126	0	0	42
Mammoth	County Courthouse	P-G	47[C]	118	78	0	0	40
Marana	Pinal Air Park	P-G	12[C]	27	23	0	0	41
San Manuel	Dormsite	Magma	28	66	60	0	0	57
San Manuel	Golf Course	Magma	24	58	56	0	0	55
San Manuel	L.D.S. Church	State	34	76	70	0	0	56
San Manuel	Townsite	Magma	30	89	59	0	0	56

Table 7 (Cont'd)

1986 TSP Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL GEOMETRIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL PRIMARY	NO. OF EXCEEDANCES OF 24-HR. STANDARDS STATE AND FEDERAL SECONDARY	NO. OF SAMPLES
PINAL: (Cont'd)								
Stanfield	County Courthouse	P-G	86[C]	314	245	1	10	42
SANTA CRUZ:								
Nogales	U.S. Post Office	State	119	410	320	4	17	59
YAVAPAI:								
Clarkdale	Fire Station	State	56	140	110	0	0	52
Montezuma Castle (NM)	Maintenance Bldg.	State	23	84	75	0	0	50
Nelson	.3 mi. W. of Lime Plant	State	72	279	257	1	10	47
Prescott	County Maint. Yd.	State	73[C]	152	144	0	1	45
YUMA:								
Yuma	201 S. 2nd Ave.	State	104	218	196	0	8	49

STATE AND FEDERAL STANDARDS (ug/m^3):	Annual Geometric Mean	24-Hr. Average
Primary	75	260
Secondary	60	150

Table 8

1986 PM_{10} Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL ARITHMETIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF: $150ug/m^3$	NO. OF SAMPLES
COCHISE:							
Bisbee	Lynn Anderson	State	21[c]	31	27	0	19
Douglas	City Park	State	59	163	142	1	47
Naco[a,b]	Federal Border Sta.	State	25[c]	33	30	0	9
Paul Spur	Housing Area	State	111	353	322	11	49
COCONINO:							
Flagstaff	Cherry St. & Agassiz	State	38	99	75	0	51
Miami	Fire Station	State	28[c]	48	41	0	36
GILA:							
Hayden	Jail	State	80[c]	243	151	2	46
GRAHAM:							
Safford	523 10th Ave.	State	40	105	99	0	54
MARICOPA:							
Phoenix	4732 S. Central	Maricopa	70	187	182	5	326
Phoenix	1845 E. Roosevelt	Maricopa	66	177	164	2	57
NAVAJO:							
Show Low	Deuce of Clubs Ave.	State	32[c]	78	52	0	22
PIMA:							
Ajo	Well Rd.	State	36[c]	102	94	0	37

Table 8 (Cont'd)

1986 PM_{10} Data
High Volume Sampler (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	ANNUAL ARITHMETIC MEAN	24-HR. AVERAGE MAX.	24-HR. AVERAGE 2ND HIGH	NO. OF EXCEEDANCES OF: 150ug/m³	NO. OF SAMPLES
PIMA: (Cont'd)							
Organ Pipe (NM)	Visitors Center	State	16	65	45	0	54
Rillito	Gremmler Residence	State	55	123	98	0	56
Tucson	1/2 mi. E. of Irvington & Alvernon	TEP	29	62	59	0	104
Tucson	3401 W. Orange Grove	Pima	43	124	114	0	51
PINAL:							
Casa Grande[a]	401 Marshall Rd.	State	60[c]	138	97	0	12
San Manuel	Townsite	Magma	18	52	37	0	54
SANTA CRUZ:							
Nogales	U.S. Post Office	State	76[c]	209	162	3	41
YUMA:							
Yuma	201 S. 2nd Ave.	State	56[c]	112	105	0	46

FEDERAL STANDARDS (ug/m^3): Annual Arithmetic Mean — 24-Hr. Average

Primary: 50 — 150

Table 9

1986 Sulfur Dioxide Data (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	ANNUAL AVERAGE	MAX. 3-HR.	AVERAGE 24-HR.	NO. OF EXCEEDANCES OF STANDARDS 3-HR. DAYS	3-HR. TIMES	24-HR. TIMES	NO. OF 1-HR. SAMPLES
APACHE:										
St. Johns	Mesa Parada	SRP	Flour.	7	65	43	0	0	0	7858
Springerville	4 mi. NE of Town	Alam	Flour.	0.3	56	6	0	0	0	8094
Springerville	Airport	Alam	Flour.	0.0	21	6	0	0	0	7972
Springerville	1 mi. NNE of Unit 1 Stack	Alam	Flour.	0.3	66	9	0	0	0	7972
Springerville	1 mi. ESE of Unit 1 Stack	Alam	Flour.	1.0	39	7	0	0	0	8171
Springerville	1 mi. SSE of Unit 1 Stack	Alam	Flour.	1.3	95	12	0	0	0	8084
Springerville	12.2 mi. SE of Unit 1 Stack	Alam	Flour.	0.3	39	11	0	0	0	7953
COCHISE:										
Bisbee	Tombstone Canyon	PD	Coul	3	251	65	0	0	0	8209
Douglas	0.75mi.N of Smelter	PD	Coul	42	1065	217	0	0	0	8712
Douglas	Curtis	PD	Coul	22	987	165	0	0	0	8713
Douglas	Fir	PD	Coul	24	742	168	0	0	0	8715
Douglas	F. Ave. & 9th St.	PD	Coul	25	629	159	0	0	0	8718
Douglas	Queen	PD	Coul	31	1135	310	0	0	0	8698

Table 9 (Cont'd)

1986 Sulfur Dioxide Data (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	ANNUAL AVERAGE	MAX. 3-HR.	AVERAGE 24-HR.	NO. OF EXCEEDANCES OF STANDARDS 3-HR. DAYS	3-HR. TIMES	24-HR. TIMES	NO. OF 1-HR. SAMPLES
COCHISE (Cont'd):										
Douglas[a]	Mexb	PD	Coul	20	384	108	0	0	0	2207
Douglas	Mobile IV	PD	Coul	28	1135	274	0	0	0	8710
Douglas	SEAMC Hospital	PD	Coul	46	1406	242	1	1	0	8712
Douglas	Pirtleville	PD	Coul	31	1249	178	0	0	0	8706
Douglas	1.2 mi. N of Smelter	State	Fluor.	45	1277	226	0	0	0	7870
Douglas[b]	SEAMC Hospital	State	Fluor.	47	1324	249	1	1	0	8680
Douglas	1.2 mi. N of Smelter	PD	Coul	34	1144	194	0	0	0	8707
Dragoon	N. Dragoon Mtns.	AEPCO	Flame	0	35	11	0	0	0	5489
Kansas Settlement	1 mi. W of Cotton Gin	AEPCO	Flame	0	29	8	0	0	0	4261
Lazy KJ Ranch[a,b]	2 mi. E of M.P. #152	State	Fluor.	13	1011	129	0	0	0	8678
McNeal[d]	2 mi. W of Town	PD	Coul	4	520	88	0	0	0	3216
Naco	Customs House	State	Fluor.	16	1059	208	0	0	0	8693
Sierra Vista[b]	Fry Blvd.	State	Fluor.	13[c]	473	97	0	0	0	2001
COCONINO:										
Page	Glen Canyon Dam	SRP	Fluor.	7	112	32	0	0	0	8405
GILA:										
Hayden	Town Hall	JCC	Coul	17	976	202	0	0	0	8525

Table 9 (Cont'd)

1986 Sulfur Dioxide Data (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	ANNUAL AVERAGE	MAX. 3-HR.	AVERAGE 24-HR.	NO. OF EXCEEDANCES OF STANDARDS 3-HR. DAYS	3-HR. TIMES	24-HR. TIMES	NO. OF 1-HR. SAMPLES
GILA (Cont'd):										
Hayden	Jail	JCC	Coul	15	697	117	0	0	0	8561
Hayden	Hayden Junction	JCC	Coul	11	507	155	0	0	0	8564
Hayden	Montgomery Ranch	JCC	Fluor.	34	1183	242	0	0	0	8505
Hayden	Jail	State	Fluor.	24	707	139	0	0	0	8380
Miami	Cities Serv. Bldg.	State	Fluor.	13	306	90	0	0	0	8146
Miami	Jones Ranch	State	Fluor.	17	524	144	0	0	0	7988
Miami	Jones Ranch	ICCC	Fluor.	17	540	150	0	0	0	8760
Miami	SE of Smelter	State	Fluor.	5	174	50	0	0	0	7837
Miami	Burch Pump Station	ICCC	Fluor.	18	613	110	0	0	0	8760
Miami	Town Site	ICCC	Fluor.	17	260	100	0	0	0	8760
Winkelman	School	JCC	Coul	3	621	92	0	0	0	8665
Winkelman	1 mi. N of Jct. 77 & 177	JCC	Fluor.	40	1270	325	0	0	0	8553

Table 9 (Cont'd)

1986 Sulfur Dioxide Data (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	ANNUAL AVERAGE	MAX. 3-HR.	AVERAGE 24-HR.	NO. OF EXCEEDANCES OF STANDARDS 3-HR. DAYS	3-HR. TIMES	24-HR. TIMES	NO. OF 1-HR. SAMPLES
MARICOPA:										
Phoenix	1845 E. Roosevelt	Maricopa	Coul	Not Reported						
MOHAVE:										
Bullhead City	224 N. Main St.	SCE	Flame	8	162	37	0	0	0	8447
Davis Dam	Katherine Landing	SCE	Fluor.	8	222	34	0	0	0	8347
Riviera	Ft. Mohave	SCE	Fluor.	13	198	42	0	0	0	8502
PIMA:										
Tucson	1721 N Tanque Verde	Pima	Fluor.	Not Reported						
Tucson	22nd & Craycroft	Pima	Fluor.	"	"					
PINAL:										
Mammoth	Courthouse	Magma	Fluor.	8	476	70	0	0	0	8686
Oracle	Courthouse	Magma	Fluor.	12	937	156	0	0	0	8709
San Manuel	Townsite	Magma	Fluor.	57	1772	291	1	1	0	8719
San Manuel	Golf Course	Magma	Fluor.	60	937	211	0	0	0	8713
San Manuel	Dormsite	Magma	Fluor.	59	971	256	0	0	0	8715

Table 9 (Cont'd)

1986 Sulfur Dioxide Data (in ug/m^3)

COUNTY AND CITY	SITE LOCATION	OPERATOR	METHOD	ANNUAL AVERAGE	MAX. 3-HR.	AVERAGE 24-HR.	NO. OF EXCEEDANCES OF STANDARDS 3-HR. DAYS	3-HR. TIMES	24-HR. TIMES	NO. OF 1-HR. SAMPLES
PINAL:										
San Manuel	Minesite	Magma	Fluor.	50	1171	242	0	0	0	8716
San Manuel	L.D.S. Church	State	Fluor.	44	1499	282	1	1	0	8449
San Manuel	L.D.S. Church	Magma	Fluor.	46	1189	236	0	0	0	8705
Winkelman	1 mi. S of Jct. 77 & 177	JCC	Coul	3	278	55	0	0	0	8571

STATE AND FEDERAL STANDARDS (ug/m^3):	Annual Average	24-Hr. Average	3-Hr. Average
Primary	80	365	----
Secondary	--	---	1300

Table 10

1986 Sulfates Data
High Volume Sampler (in ug/m^3)
in TSP & PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	ANNUAL AVERAGE	24-HOUR AVERAGE MAX.	24-HOUR AVERAGE 2ND HIGH	NO. OF SAMPLES
APACHE:							
Springerville	Airport	Alam	TSP	2	7	6	429
Springerville	4 mi. NE of Town	Alam	TSP	2	11	3	113
Springerville	1 mi. NNE of Unit 1 Stack	Alam	TSP	2	9	9	116
Springerville	12.2 mi. SE of Unit 1 Stack	Alam	TSP	1	11	9	111
COCHISE:							
Bisbee[a]	Lynn Anderson Res.	State	TSP	7[c]	17	11	19
			PM_{10}	4[c]	13	12	19
Douglas	1.2 mi. N of Smelter	State	TSP	10	26	24	59
Douglas	City Park	State	TSP	9[c]	13	13	8
			PM_{10}	6[c]	22	13	40
Lazy KJ Ranch[a]	2 mi. E. of M.P. #152	State	TSP	8	21	18	50
McNeal[a,b]	2.6 mi. WSW of Town	State	TSP	10[c]	17	17	18
Naco[a,b]	Federal State Border	State	PM_{10}	5[c]	7	7	9
Palominas[a]	Los Palominas School	State	TSP	8	20	15	49
Paul Spur	Housing Area	State	PM_{10}	5[c]	16	12	40
Sierra Vista	Bartow Dr.	State	TSP	8[c]	16	16	44

Table 10 (Cont'd)

1986 Sulfates Data
High Volume Sampler (in ug/m^3)
In TSP & PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	ANNUAL AVERAGE	24-HOUR AVERAGE MAX.	24-HOUR AVERAGE 2ND HIGH	NO. OF SAMPLES
COCONINO:							
Flagstaff	Cherry St. & Agassiz	State	TSP	3[c]	5	5	15
			PM_{10}	2[c]	7	6	25
Grand Canyon	Hopi Point	State	TSP	3[c]	6	6	34
Page	Airport	State	TSP	4	8	7	59
GILA:							
Hayden	Jail	State	TSP	10[c]	17	14	15
			PM_{10}	5[c]	16	14	32
Miami	Fire Station	State	TSP	10[c]	15	12	19
			PM_{10}	4[c]	12	11	35
GRAHAM:							
Safford	523 10th Ave.	State	TSP	5[c]	9	7	15
			PM_{10}	3[c]	13	9	39
GREENLEE:							
Morenci[b]	Stargo	State	TSP	6[c]	10	9	27
MARICOPA:							
Glendale	6000 W. Olive Ave.	Maricopa	Not Reported				
Mesa	Broadway & Brooks	Maricopa	"	"			
Phoenix	1845 E. Roosevelt	Maricopa	"	"			

Table 10 (Cont'd)

1986 Sulfates Data
High Volume Sampler (in ug/m^3)
In TSP & PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	ANNUAL AVERAGE	24-HOUR AVERAGE MAX.	24-HOUR AVERAGE 2ND HIGH	NO. OF SAMPLES
MARICOPA:(Cont'd)							
Phoenix	4732 S. Central	Maricopa	"	"			
Phoenix	8531 N. 6th St.	Maricopa	"	"			
Phoenix	1826 W. McDowell	Maricopa	"	"			
Scottsdale	2857 N. Miller Rd.	Maricopa	"	"			
Scottsdale	13665 N. Scottsdale Rd.	Maricopa	Not Reported				
NAVAJO:							
Joseph City	3.25 mi. SE of Town	State	TSP	6	16	9	50
Show Low	Deuce of Clubs Ave.	State	TSP	4[C]	6	3	36
			PM_{10}	2[C]	6	5	22
PIMA:							
Ajo	Well Rd.	State	TSP	3[C]	5	5	10
			PM_{10}	3[C]	8	7	26
Corona de Tucson	22000 S. Houghton	Pima	Not Reported				
Green Valley	245 W. Esperanza	Pima	"	"			
Organ Pipe (NM)	Visitors' Center	State	PM_{10}	2	6	6	54
Rillito	Gremmler Residence	State	TSP	6[C]	17	9	13
			PM_{10}	4[C]	13	12	42

Table 10 (Cont'd)

1986 Sulfates Data
High Volume Sampler (in ug/m^3)
In TSP & PM_{10}

COUNTY AND CITY	SITE LOCATION	OPERATOR	IN	ANNUAL AVERAGE	24-HOUR AVERAGE MAX.	24-HOUR AVERAGE 2ND HIGH	NO. OF SAMPLES
PIMA: (Cont'd)							
Tucson	1810 S. 6th Ave.	Pima	Not Reported				
Tucson	3401 W. Orange Grove Rd.	Pima	"	"			
Tucson	1016 W. Prince Rd.	Pima	"	"			
Tucson	½ mi.E of Irvington & Alvernon	TEP	TSP	3	9	6	86
PINAL:							
Casa Grande[a]	401 Marshall Rd.	State	PM_{10}	5[c]	12	9	12
San Manuel	L.D.S. Church	State	TSP	10	27	16	55
SANTA CRUZ:							
Nogales	U.S. Post Office	State	TSP	6[c]	8	8	13
			PM_{10}	4[c]	15	9	36
YAVAPAI:							
Clarkdale	Fire Station	State	TSP	2[c]	9	6	28
Montezuma Castle (NM)	Maintenance Bldg.	State	TSP	3	11	8	50
Nelson	1 mi. N of Lime Plant	State	TSP	2	6	5	47
Prescott	County Maint. Yard	State	TSP	4[c]	7	6	35
YUMA:							
Yuma	201 S. 2nd Ave.	State	TSP	5[c]	6	6	12
			PM_{10}	3[c]	7	5	38

APPENDIX B

Summary of Air Quality Standards and Emergency Episode Levels

SUMMARY OF AMBIENT AIR QUALITY STANDARDS - STATE AND FEDERAL STDS.(a)

In ug/m^3 (and ppm)

Pollutant	Averaging Time	Primary	Secondary
Carbon Monoxide	1-hour	40 (35)	40 (35)[b]
	8-hour	10 (9)	10 (9)[b]
Nitrogen Dioxide	Annual	100 (.05)	100 (.05)
Ozone	1-hour	235 (.12)	235 (.12)
TSP[b]	24-hour, Annual	260,75	150,60
PM_{10}[c]	24-hour, Annual	150,50	150,50
Sulfur Dioxide	3-hour	--	1300 (.5)
	24-hour	365 (.14)	--
	Annual	80 (.03)	--
Lead	Calendar Quarter	1.5 (-)	1.5 (-)

SUMMARY OF EMERGENCY EPISODE LEVELS - STATE AND FEDERAL

In ug/m^3 (and ppm)

Pollutant	Averaging Time	Alert	Warning	Emergency	Significant Harm
Carbon Monoxide[b]	1-hour	--	--	--	(125)
	4-hour	--	--	--	(75)
	8-hour	(15)	(30)	(40)	(50)
Nitrogen Dioxide	1-hour	1130 (.6)	2260 (1.2)	3000 (1.6)	3750 (2.0)
	24-hour	282 (.15)	565 (.3)	750 (.4)	938 (.5)
Ozone	1-hour	400 (.2)	800 (.4)	1000 (.5)	1200 (.6)
TSP[b]	24-hour	375 (-)	625 (-)	875 (-)	1000 (-)
PM_{10}	24-hour	350 (-)	420 (-)	500 (-)	600 (-)
Sulfur Dioxide	24-hour	800 (.3)	1600 (.6)	2100 (.8)	2620 (1.0)
Sulfur Dioxide[b][d] & Particulates combined	24-hour	65000 (-)	261000 (-)	393000 (-)	490000 (-)

(a) Standards are not to be exceeded more than once per year with two exceptions. In the case of ozone and PM_{10}, compliance is determined by the number of days on which the O_3 or PM_{10} standard is exceeded. The number of exceedance days per year, based on a 3-year running average, is not to exceed 1.0.

(b) State

(c) Federal

(d) In $(ug/m^3)^2$

APPENDIX C

Air Quality Permits Issued By The State of Arizona in 1986

ARIZONA OFFICE OF AIR QUALITY

PERMITS ISSUED DURING SECOND QUARTER FY-86

Source	Facility Description	Permit Type	Permit Number	Date
AZ Portland Cement	Bulk load dust collect	I	1186	Jan. 22, 1986
AZ Portland Cement	PH DC 3,4	I	1187	Jan. 22, 1986
All American Pipeline	Pump Station	I	25009	Jan. 29, 1986
All American Pipeline	Pump Station	I	65007	Jan. 29, 1986
CALMAT	Crushing & Screening	I	2220	Jan. 17, 1986
REDCO	Mining	I	1188	Feb. 3, 1986
The Ashton Co.	Crushing & Screening	I	2215	Feb. 6, 1986
SRP-Coronado Unit 3	Power Plant	I	1084 - Amended	Jan. 31, 1986
Genstar Lime Co.	Lime Plant	0	0344-86	Jan. 3, 1986
SRP-Coronado Units 1&2	Power Plant	0	0346-87	Jan. 9, 1986
AZ Crushers, Inc.	Crushing & Screening	0	3833-87	Jan. 14, 1986
Superior Companies	Crushing & Screening	0	3831-86	Jan. 14, 1986
Amcon Materials Co.	Crushing & Screening	0	3832-86	Jan. 14, 1986
SRP - Navajo	Power Plant	0	0343-87	Jan. 16, 1986
McCulloch Corp.	Chain Saw Mfg.	0	64039-87	Feb. 5, 1986
Union Rock & Materials	Crushing & Screening	0	3836-87	Feb. 5, 1986
Ball, Ball & Brosamer	Cement Plant	0	3842-87	Feb. 14, 1986
Reidhead Sand & Rock	Crushing & Screening	0	3843-87	Feb. 14, 1986
Western Quarries	Crushing & Screening	0	3844-87	Feb. 14, 1986
Earth Products	Crushing & Screening	0	3845-87	Feb. 14, 1986
E Z Transmix	Crushing & Screening	0	3846-87	Feb. 14, 1986

Source	Facility Description	Permit Type	Permit Number	Date
Phoenix Redi-Mix	Cement Plant	0	3838-86	Feb. 3, 1986
Brimhall Sand & Rock	Crushing & Screening	0	3834-87	Mar. 4, 1986
AZ Dept. of Transportation	Crushing & Screening	0	3835-87	Mar. 4, 1986
Navapache Hospital	Incinerator	0	34038-87	Mar. 21, 1986
Producers Cotton Oil Co.	Cotton Gin	0	64039-87	Feb. 5, 1986
Ironite Products Co.	Fertilizer	0	54086-87	Mar. 17, 1986
R. H. Sieminski Co.	Cement Plant	0	3841-87	Mar. 17, 1986
Sierra Ready Mix	Asphalt	0	3847-87	Mar. 17, 1986
Sierra Ready Mix	Crushing & Screening	0	3848-87	Mar. 17, 1986
R. A. Hatch Constr.	Asphalt	0	3850-87	Mar. 17, 1986
Asphalt Paving & Supply	Asphalt	0	3856-86	Mar. 17, 1986
Ball, Ball & Brosamer	Concrete Batch Plant	0	3840-87	Mar. 31, 1986
The Tanner Companies	Crushing & Screening	0	3852-86	Mar. 28, 1986
Huachuca	Concrete Batch Plant	0	3861-87	Mar. 31, 1986

ARIZONA OFFICE OF AIR QUALITY

Permits Issued During Third Quarter - FY-86

Source	Facility	Permit Type	Permit Number	Date
Pinto Valley Copper Co.	Wet Scrubber	I	1189	May 8
Pinto Valley Copper Co.	Wet Scrubber	I	1190	May 14
Shank-Artukovich	Concrete Batch	I	2222	May 8
Allied Concrete	Concrete Batch	0	3862-87	April 4
M. M. Sundt Construction	Concrete	0	3849-87	April 4
W. R. Skousen	Asphalt Plant	0	3867-87	April 4
Wheeler Construction	Asphalt Plant	0	3857-87	April 6
The Tanner Companies	Asphalt Plant	0	3855-86	April 10
Verde Asphalt	Asphalt Plant	0	3869-87	April 18
Baseline Materials	Crushing & Screening	0	3837-87	April 18
Massey Sand & Rock	Crushing & Screening	0	3859-87	April 18
City of Douglas	Asphalt Plant	0	3863-87	April 18
The Tanner Companies	Asphalt Plant	0	3853-86	April 18
A. J. Gilbert	Crushing & Screening	0	3839-87	April 29
Yavapai Regional Hospital	Incinerator	0	54087-87	April 30
Western Cotton	Cotton Gin	0	74004-87	April 30
Desert Construction	Crushing & Screening	0	3870-87	May 8
Material Supplies	Crushing & Screening	0	3871-87	May 8
Apache Powder	Nitric Acid	0	24112-87	May 12
Arizona Crushing	Crushing & Screening	0	3874-87	June 4
R. E. Miller	Crushing & Screening	0	3872-87	June 4

ARIZONA OFFICE OF AIR QUALITY

PERMITS ISSUED DURING FOURTH QUARTER FY-86

Source	Facility Description	Permit Type	Permit Number	Date
CALMAT	Concrete Batch Plant	I	2224	July 31, 1986
R. H. Sieminski & Co.	Soil Plant	0	3841-87	July 23, 1986
University of Arizona	Incinerator	0	0349-87	Aug. 28, 1986
Joy T. Pearce Construction	Asphalt	0	3854-87	Aug. 28, 1986
Four Corners Pipe Line Co. - Tonalea	Pump Station	0	54088-87	Aug. 28, 1986
Four Corners Pipe Line Co. - Oatman	Pump Station	0	64040-87	Aug. 28, 1986
W. R. Skousen, Contractor	Crushing & Screening	0	3866-87	Sept. 11, 1986
Hatch Construction Co.	Crushing & Screening	0	3873-87	Sept. 11, 1986
Magma Copper Co.	Mine	0	0350-87	Sept. 17, 1986
Joy T. Pearce Construction	Crushing & Screening	0	3878-87	Sept. 17, 1986
Century Materials, Inc.	Crushing & Screening	0	3880-87	Sept. 17, 1986

ARIZONA OFFICE OF AIR QUALITY

PERMITS ISSUED DURING FIRST QUARTER FY-87

Source	Facility Description	Permit Type	Permit Number	Date
M. M. Sundt Construction Co.	Crushing & Screening	0	3877-87	October 8, 1986
Century Materials, Inc.	Asphalt Plant	0	3881-87	October 20, 1986
Black Rock Construction, Inc.	Crushing & Screening	0	3865-87	October 28, 1986
Kingman Regional Hospital	Incinerator	I	65008	December 10, 1986
Action Redi-Mix, Inc.	Concrete Plant	I	2225	December 18, 1986
Mountain View Cemetery, Inc.	Crematorium	I	55011	December 18, 1986
Staker Paving & Construction Co., Inc.	Asphalt Plant	I	2228	December 18, 1986
Alamito Company	Generating Station	0	0354-87	December 30, 1986
AARID Construction Company	Asphalt Plant	0	3890-87	December 31, 1986
Black Rock Construction, Inc.	Asphalt Plant	0	3892-87	December 31, 1986
McCormick Construction Co.	Crushing & Screening	0	3893-87	December 31, 1986

APPENDIX D

Compliance Actions Taken By The State of Arizona in 1986

ORDERS OF ABATEMENT

NUMBER	DATE	SOURCE	REASON
A 80-001	4-11-80	Peter Kiewit	Excess opacity - Asphalt Plant
A 80-019	8-18-80	Hatch Construction	No Operating Permit - Crusher
A 80-020	9-03-80	W.R. Skousen	Excess opacity - Asphalt Plant
A 80-021	9-20-80	APS Cholla	Open Burning
A 80-022	11-14-80	W.R. Skousen	Excess opacity - Asphalt Plant
A 79-017	2-10-83	Inspiration	Amended Order of Abatement
A 83-026	5-04-83	Gila Redi-Mix	Excess opacity - Asphalt Plant
A 83-024	5-06-83	PD Morenci	NAAQS Violations
A 83-023	6-03-83	Kyle Asbestos	NESHAPS Violations
A 83-025	5-04-83	Valley Concrete	No Permit/excess opacity
A 84-028	12-07-84	Ron Lewis Construction	No Permit
A 85-134	1-04-85	Inspiration	NAAQS Violations
Letter	7-10-86	PD Douglas	NAAQS Violations

NOTICES OF VIOLATION

No.	Date	Issued To	Reason	Regulation
1704	1-28-86	AMAROK	Fugitives - haul roads	406
1705	1-28-86	AMAROK	Fugitives - material handling	405
1073	2-5-86	Phelps Dodge	Opacity violation	515
1707	3-4-86	Baseline Materials	Excessive opacity	406
1074	2-26-86	Kasler Corp.	No move notice	317
1602	2-18-86	Massey Sand & Rock	No permit - asphalt plant	308
1603	2-18-86	Massey Sand & Rock	Opacity	807
1604	2-18-86	Massey Sand & Rock	No Permit - crushing and screening	306
1605	3-14-86	Thunderbird Design	No Permit - crushing and screening	306
1606	4-8-86	Staker Construction	Smoke - greater than allowed	807
1138	1-29-86	W.R.Skousen Contractors	Fugitive dust opacity 100%	405/501
1142	2-14-86	City of Bisbee	Unlawful burning	402
1144	3-5-86	G&A Sand & Gravel Co.	Fugitive dust	522
1145	3-7-86	USA Ft. Huachuca	Friable asbestos	40 CFR 60
1146	4-1-86	W. R. Skousen	Excees 40% opacity and no copy of Permit	522
1140	1-24-86	R. E. Miller	Crusher fugitive dust exceeded 40% opacity	522
1130	1-27-86	M.M. Sundt Co.	Does not have an Operating Permit	306/501
1141	2-13-86	AZ Dept. of Transportation	Not controlling fugitive dust	405
1149	9-3-86	Cletus Frei Concrete Batch Plant	Operating equipment without Operating Permit	306

NOTICES OF VIOLATION

No.	Date	Issued To	Reason	Regulation
1150	9-8-86	Granite Construction Co.	Operating Permit not posted	315
1148	5-16-86	Sierra Ready Mix	40% opacity	501
1575	12-4-86	The Ashton Company	Operating Permit not posted	315
1504	8-15-86	Duke City Lumber	Excess opacity	504
1501	7-31-86	Show Low Construction	Improper asbestos removal	912
1137	1-17-86	Red Rock Redi Mix	No Operating Permit	301
1075	3-25-86	Arizona Crushers, Inc.	Dust from haul road	405
1625	3-28-86	Sun Materials	Dust from haul roads/crushing	405/522
1709	4-4-86	Desert Sage Contracting	No prior notice for asbestos removal	913
1626	5-23-86	Baseline Materials	Permit not posted	315
1627	5-28-86	General Rock & Sand	opacity, fugitive dust	501/405/406
1724	6-16-86	Tanner Companies #12-511	Haul road dust and 100% opacity from cement storage hopper	405/406
1710	6-23-86	Shank-Artukovich-Ohbayashi	No water truck	405
1712	6-26-86	Sacred Heart Catholic Community	Asbestos removal without notification	913
1713	8-5-86	Duke City Lumber (Windlow)	60% opacity (Tee Pee Burner)	501
1628	8-7-86	Magma Copper Co.	100% opacity	513
1629	8-20-86	ACCO	No water on haul road	405
1715	10-20-86	Arizona Crushers, Inc.	80% opacity - no water	522

NOTICES OF VIOLATION

No.	Date	Issued To	Reason	Regulation
1716	10-22-86	Arizona Crushers, Inc.	75% opacity - no water	522
1717	10-23-86	Arizona Portland Cement	60%-80% opacity from crew cleanup	406
1718	10-23-86	Gold Canyon Materials,Inc.	100% opacity - screening without water	406
1719	10-23-86	Gold Canyon Materials,Inc.	No Operating Permit	306
1720	11-11-86	Wheeler Construction	Recycling asphalt without Permit	308
1721	11-11-86	Tanner Companies	Recycling asphalt without Permit	308
1321	11-12-86	M.M.Sundt Construction Co.	Excess opacity of stack emissions	508
1322	11-12-86	M.M.Sundt Construction Co.	Uncontrolled dust	406
1708	11-19-86	A. J. Gilbert	No moye notice and Permit not posted	308
1607	4-8-86	Tanner Companies	Hot plant at Lake Hayasu - no Permit	306
1608	4-9-86	Ramhed Mining	No valid Operating Permit	306
1609	5-20-86	W. R. Skousen	Asphalt plant moyed without notice	308
1611	6-5-86	Mobile Asphalt	Scalping Screen creating dust	406
1614	6-23-86	A. J. Gilbert	Crusher operated with excess of opacity	406
1615	6-24-86	Ted's Truck Stop	Yard area excessiyely dusty	404
1618	7-1-86	Francis Day & Son	Crusher operated with excess dust	406
1619	7-7-86	Calvery Chapel	Asbestos removed without notification	912
1620	7-15-86	Yavadat Regional Medical Center	Incinerator emitting excess smoke	504
1503	8-11-86	Mobile Asphalt/Kingman Airport	Opacity exceeded law	406

NOTICES OF VIOLATION

No.	Date	Issued To	Reason	Regulation
1502	8-11-86	Mobile Asphalt	Permit condition violation	308
1612	6-9-86	Corn Construction	Crusher dust exceeding law	406
1613	6-23-86	A. J. Gilbert	Crusher operated without water	308
1616	6-26-86	Ramhed Mining	TUFA operated without Permit	306
1617	6-26-86	Ramhed Mining	TUFA emitting dust exceeding law	406
1504	8-15-86	Duke City Lumber	Tee Pee Burner emitting smoke in excess of law	504
1501	8-4-86	Show Low Construction Co.	Asbestos removed without proper notification/procedures	912
1621	7-29-86	Duke City Lumber	Tee Pee Burner emitting smoke in excess of law	
1505	9-16-86	Southwest Forest Industries	Recovery Boiler west stack emitting too much smoke	501
1507	11-17-86	James L. Fann	Prescott - CMI hot plant operated without demister stack	306
1622	7-30-86	Hatch Construction & Paving	Emitting smoke in excess of law	508
1623	7-30-86	Hatch Construction & Paving	Asphalt plant moved without prior notice	308
1624	7-31-86	Ganado Primary School	Asbestos removed without proper notice/procedures	912
1508	12-3-86	Southwest Forest Industries	Open burning of trash	402
1509	12-4-86	Hatch Construction & Paving	Operating without Permit	306
1620	7-15-86	Yavapai Regional Med.Center	Excess opacity	504
1708	11-26-86	A.J.Gilbert Construction Co.	Permit not posted and no move notice	308
1722	12-2-86	The Ashton Company,Inc.	40% opacity during recycle asphalt emission test	807
1723	12-2-86	A.J.Gilbert Construction Co.	70% opacity from crusher	522

APPENDIX E

Vehicular Inspection and Maintenance Summary - 1986

Vehicular Inspection and Maintenance Summary - 1986

Number of initial emission tests:	1,361,393
Number of tampering inspections:	238,064
Number of vehicles tested by Fleet operators:	ca.120,000
Number of mechanics trained in proper tune-up procedures:	ca.1,400

Improvement in idle emissions of vehicles identified as not meeting standards and required to be repaired:

49% in CO

49% in HC