

FINAL

PM₁₀ STATE IMPLEMENTATION PLAN
FOR THE PAUL SPUR GROUP I AREA



PREPARED BY

OFFICE OF AIR QUALITY
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
2005 NORTH CENTRAL, PHOENIX, ARIZONA 85004

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ACRONYMS

ADEQ	Arizona Department of Environmental Quality
Al	Aluminum
As	Arsenic
A.A.C.	Arizona Administrative Code
Ca	Calcium
Cd	Cadmium
CFR	Code of Federal Regulation
Cl	Chlorine
CMB	Chemical Mass Balance
Cr	Chromium
EPA	Environmental Protection Agency
ES	Engineering Science
F	Fahrenheit
Fe	Iron
ISCST	Industrial Source Complex Short Term
K	Potassium
Mn	Manganese
NAAQS	National Ambient Air Quality
Ni	Nickel
Pb	Lead
PM10	Particulate Matters of 10 microns or less in diameter
PSD	Prevention of Significant Deterioration
Sb	Antimony
SCE	Source Contribution Estimate
Si	Silica
SIP	State Implementation Plan
SSI	Size Selective Inlet
Ti	Titanium
TSP	Total Suspended Particulates
XRF	X-Ray Fluorescence
Zn	Zinc
$\mu\text{g}/\text{m}^3$	microgram per cubic meter

EXECUTIVE SUMMARY

In accordance with the mandates of sections 108 and 109 of the Clean Air Act, the Environmental Protection Agency (EPA) promulgated revised National Ambient Air Quality Standards (NAAQS) for particulate matter in July 1987. The new standards apply to particulates of 10 microns or less in diameter (PM_{10}) and supersede the previous Total Suspended Particulates (TSP) standards.

Section 110 of the Clean Air Act requires each state to develop or revise its State Implementation Plan (SIP) to provide for implementation, maintenance, and enforcement of the new PM_{10} NAAQS. This document is prepared to satisfy this requirement for the vicinity of Paul Spur, Arizona, where violations of these standards have been measured. The PM_{10} planning area for Paul Spur remains consistent with the TSP nonattainment area designation of T24S,R26E. (See 40CFR 81.303.) This document describes the steps taken to evaluate the PM_{10} pollution in the Paul Spur area; the control strategies necessary to cause the area to comply with the PM_{10} NAAQS; and the implementation procedures for each control strategy.

The Arizona Department of Environmental Quality (ADEQ) has operated a PM_{10} monitoring device in Paul Spur since the beginning of 1985. ADEQ had previously operated a TSP monitor at that site. ADEQ operated additional monitoring equipment in Paul Spur from September 10, 1987 through October 12, 1987 to obtain more detailed information needed for SIP development. Monitoring data indicated exceedances of both the annual arithmetic mean PM_{10} standard concentration of 50 microgram per cubic meter ($\mu g/m^3$), and the 24-hour PM_{10} standard of 150 $\mu g/m^3$. The maximum 24-hour PM_{10} concentration measured was 353 $\mu g/m^3$, which occurred in 1986. The same year witnessed the highest annual arithmetic mean concentration of 111 $\mu g/m^3$.

The PM_{10} SIP Development Guideline (EPA, 1986) approves the use of a receptor model along with rollback calculations to establish PM_{10} source-receptor relationships for SIP development. This procedure ensures that the major contributors to the ambient PM_{10} concentrations in the Paul Spur area are sufficiently identified. Table 1 lists the major contributing sources and their level of contribution.

For the purpose of receptor modeling, a PM₁₀ pollution source profile and a chemical profile of ambient PM₁₀ are necessary. Information obtained through the analysis of selected filters from the one month intensive sampling period, along with the information from the literature (EPA-450/4-85-002, November 1984) provided the needed database for the Chemical Mass Balance (CMB) receptor model calculations.

Paul Spur is an isolated source. The only other PM₁₀ source besides the lime plant is an unpaved public road that connects U.S. Highway 80 and Naco. Data collected during an intensive study in the summer of 1987 confirmed the expectation that the lime plant is the primary contributor to the PM₁₀ pollution in this area. Data analysis on the three highest PM₁₀ measurements indicated that lime dust made up 86 percent of the PM₁₀ mass (See Table 4.1.)

The emissions inventory and meteorological data for the design day were used as input to rollback modeling to estimate the source contribution and needed level of controls at Paul Spur. Control options were compiled and evaluated for each of the major sources, and selected options were formulated into control strategies. The impacts of maximum capacity operation, estimated to occur by 1990 were evaluated, as were the effects of the selected control strategies for the year 1998. (See Tables 2 & 3.)

The model results showed that the application of controls to major PM₁₀ source groups in the Paul Spur area would result in attainment of the PM₁₀ NAAQS by 1990, and maintain attainment status through 1998. Emission reductions would be achieved by the following control strategies:

- (1) Covering all screens;
- (2) Installing dust collectors at kiln 5 dust delivery;
- (3) Improving damper seal at kiln 5 and 6;
- (4) Enclosing drop points;
- (5) Installing dust collectors or covered conveyors for the kiln 4 dust removal;
- (6) Restricting off-road vehicular activity, and stabilizing open areas;
- (7) Removing or capping the material buildup;
- (8) Restricting driving to designated roads; and
- (9) Stabilizing the unpaved roads through application of dust suppressants.

Figures (1) and (2) show the 24-hour and the annual average design values as well as projected air quality reflecting the impact of growth and implementation of the control strategies.

This plan commits the Department to implement these control strategies through operating permits for the Chemstar Inc.'s Douglas Lime Plant and adoption of appropriate rules.

Table 1

PM₁₀ Emission Inventory

<u>Source</u>	<u>Level of Contribution</u> <u>grams per second (g/s)</u>
Kiln 5 Stack	2.69
5 Loading Stations at Bins	1.16
Kiln 6 Dampers (2)	1.09
Kiln 5 Damper	
Double Deck Screen	0.81
Kiln 6 Stack	0.55
Truck Loading Facility	0.52
Screen on Top of Kiln 6 Hopper	0.52
+ ½" Lime Delivery	0.45
Francisco Pit	0.43
Screen w/o Tarp	0.41
Kiln 5 Dust Delivery	0.35
Screen with Tarp	0.20
Drop Point 1	0.16
Screen Fines	0.14
Bucket	0.12
Drop pts. 3,4,5	0.16
Drop Point 2	0.11
Others**	0.28

Kiln 4 Dust Removal	7.50
Kiln 4 Stack	0.85
Conveyor to Kiln 4	0.67

SUBTOTAL (Point Sources)	18.50

Cleared Areas & scattered piles of lime dust (wind blown)	118.71
Unpaved Roads (wind blown)	59.36
Travel on Unpaved Roads	1.87

Total (Point and Area Sources)	198.44

Table 2

Demonstration of Attainment and Maintenance
of 24-hour PM₁₀ NAAQS through 1998

Actual & Projected 24-hour PM₁₀ Concentrations
for Paul Spur, Arizona

Year	Concentrations (ug/m ³)	
	W/O Controls	With Controls
1986	270 ¹	
	353 ¹	
	168 ¹	
1988	285 ¹	
	300 ¹	300
1990	315	122
1998	350	135

Note: ¹ Measured concentrations

Table 3

Demonstration of Attainment and Maintenance
of Annual PM₁₀ NAAQS through 1998

Actual & Projected Annual PM₁₀ Concentrations
for Paul Spur, Arizona

Year	Concentrations (ug/m ³)	
	W/O Controls	With Controls
1986	89 ¹	
	111 ¹	
1988	58 ¹	
	60 ¹	
1990	61 ¹	61
	62	37
1992	*	*
	*	*
1994	*	*
	*	*
1996	*	*
	*	*
1998	70	46

Note: ¹ Measured concentrations

* Presumed linear growth between 1990 and 1998

Projected 24-Hour PM10 Concentrations

For Paul Spur, Arizona

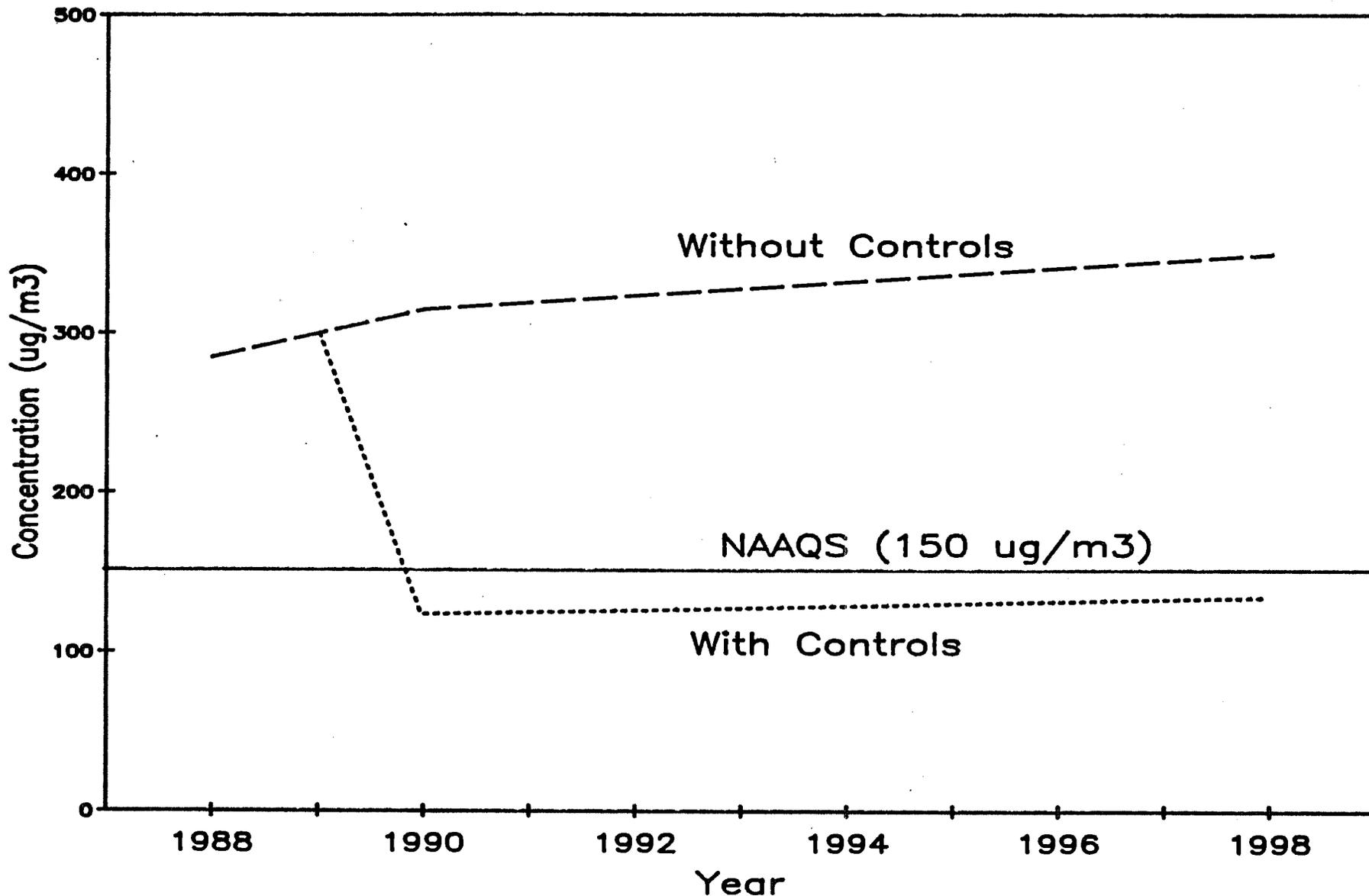
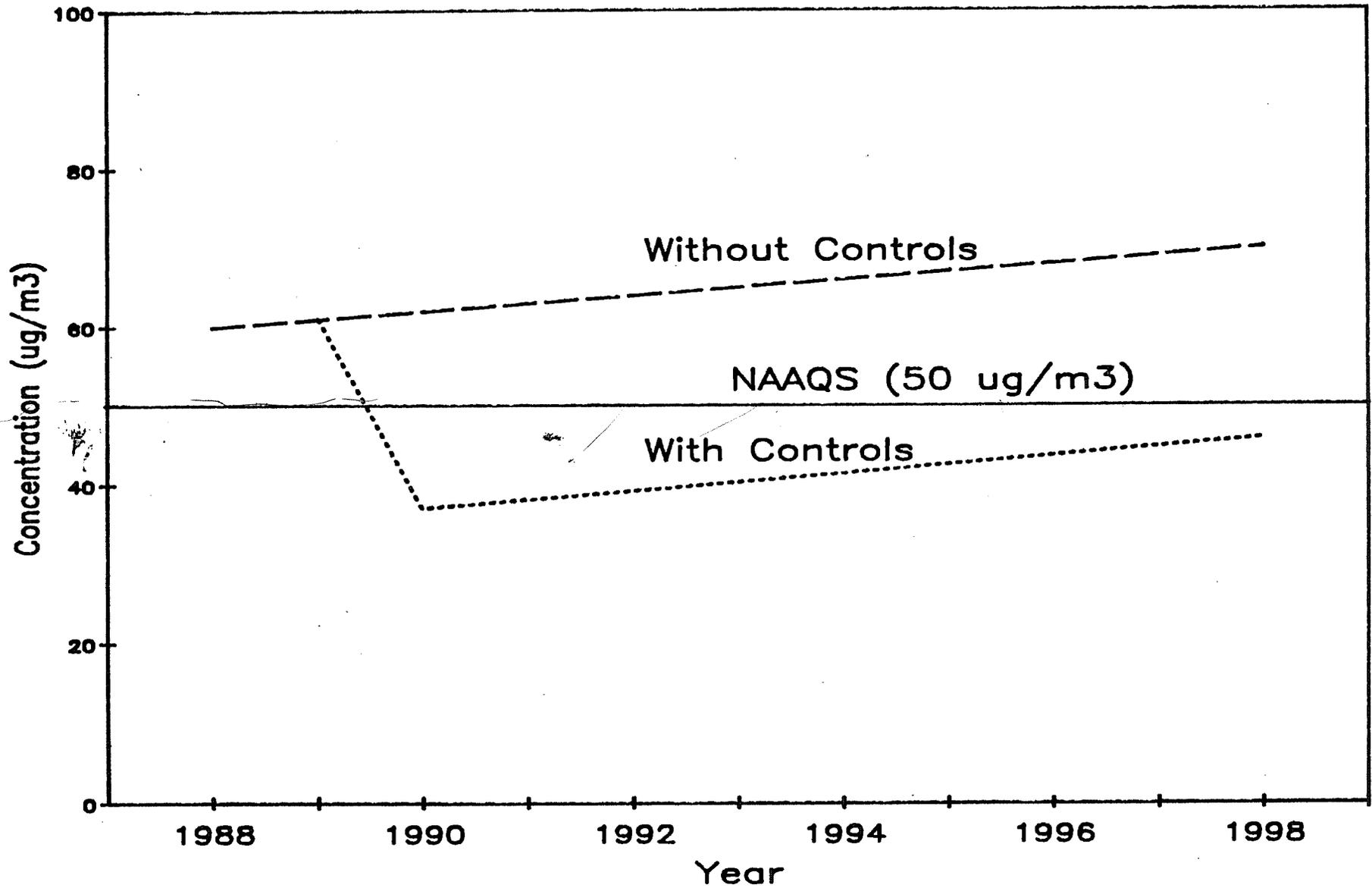


Figure 1

Projected Annual PM10 Concentrations

For Paul Spur, Arizona



AQM90 12-06-89

Figure 2

1.0 INTRODUCTION

1.1 Purpose

This is the State Implementation Plan (SIP) for the area of Paul Spur, Arizona, where violations of the new National Ambient Air Quality Standard (NAAQS) for particulate matter of 10 microns or less (PM₁₀) has been measured. The purpose of this document is to identify sources of PM₁₀ and describe strategies to control these emissions in order to achieve and maintain the PM₁₀ NAAQS in this area. This document contains information concerning the development of PM₁₀ emission inventories, ambient air quality data, and control strategies for into compliance with the federal Clean Air Act.

1.2 Background

The 1977 amendments to the Clean Air Act require the Environmental Protection Agency (EPA) at five year intervals to review and, if appropriate, revise the criteria on which each National Ambient Air Quality Standard (NAAQS) is based along with the NAAQS themselves. In response to these requirements, EPA reviewed the criteria upon which the particulate matter NAAQS were based, including information on health and welfare effects that had become available since the original criteria document was prepared in 1969. The Criteria Document was revised accordingly, and reissued on March 20, 1983.

After considering the information in the revised criteria document, EPA revised the NAAQS for particulate matter. Prior to this action the original particulate matter NAAQS included the size range of particles collected by the hi-volume sampler and referred to as total suspended particulates (TSP). The NAAQS for TSP were promulgated in 1971, with the primary standards of 75 $\mu\text{g}/\text{m}^3$ for the annual geometric average, and 260 $\mu\text{g}/\text{m}^3$ for the 24-hour average. The TSP secondary standard was 150 $\mu\text{g}/\text{m}^3$ for the 24-hour average. The revised primary and secondary NAAQS apply to particulate matter in an aerodynamic size range defined by the collection characteristics of a new ambient reference method that has a 50% collection efficiency (D50) at 10 micron. The material collected by the reference method is nominally below 10 microns and is referred to as "PM₁₀". The NAAQS for PM₁₀ are 50 $\mu\text{g}/\text{m}^3$ for the annual arithmetic average and 150 $\mu\text{g}/\text{m}^3$ for the 24-hour average. The effective date of the revised NAAQS was July 31, 1987.

Due to the lack or the unavailability of PM₁₀ data, EPA has developed a procedure for estimating the probability of nonattainment of PM₁₀ NAAQS, using total suspended particulates or PM₁₀ data. Based on the probability of exceeding PM₁₀ standards (24-hour and annual), EPA has designated three types of areas: Group I areas (95 percent or higher probability); Group II areas (20 percent to 95 percent probability or insufficient data to make firm determination); and Group III areas (less than 20 percent probability). Based on this criteria, Paul Spur, Arizona area has

been classified as Group I for the annual and 24-hour average PM₁₀ NAAQS. Section 110 of the Clean Air Act requires the State of Arizona to submit a revised State Implementation Plan (SIP) that demonstrates that the Paul Spur area will be in compliance with the PM₁₀ NAAQS by 12/31/90.

1.3 Study Area Definition

Paul Spur is located in the southern part of Cochise County, approximately twelve miles from Bisbee and Douglas along U.S. Highway 80. (See Figure 1.1.) For Paul Spur, it was determined that the PM₁₀ Group I area should remain consistent with the TSP nonattainment area designation, which the Code of Federal Regulations (40 CFR 81.303) lists as the 18 square mile township in T24S,R26E. (See Figure 1.2.) The main activities within the area are associated with a lime plant and a quarry are owned and operated by Chemstar Incorporated. The lime plant activities consist mainly of crushing, conveying, and associated facilities. (See Figure 1.3.) A complete description of these facilities is provided in section 3 of this document.

Figure 1.1

MAP OF ARIZONA IDENTIFYING GENERAL LOCATION
OF THE PAUL SPUR GROUP I AREA

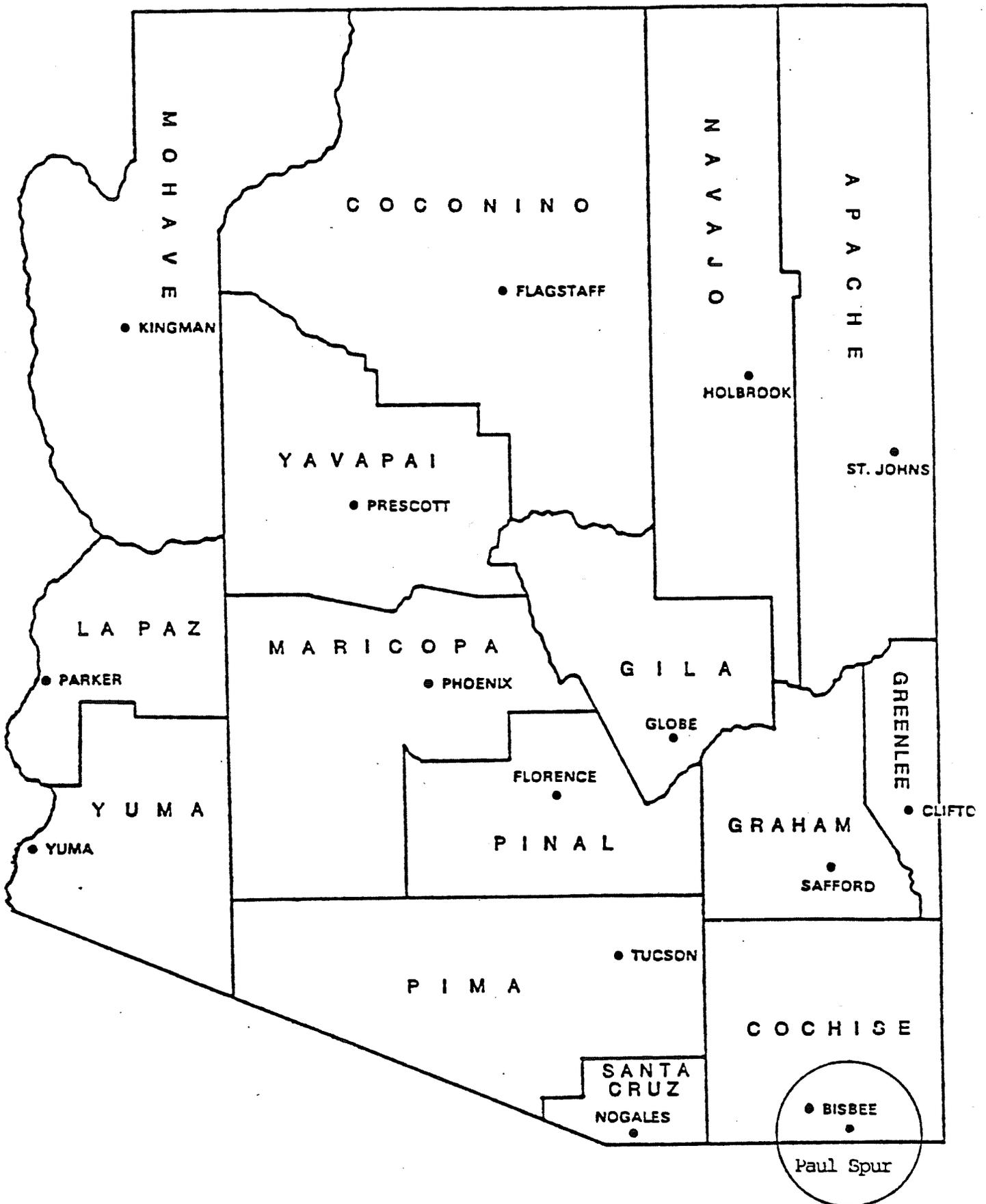
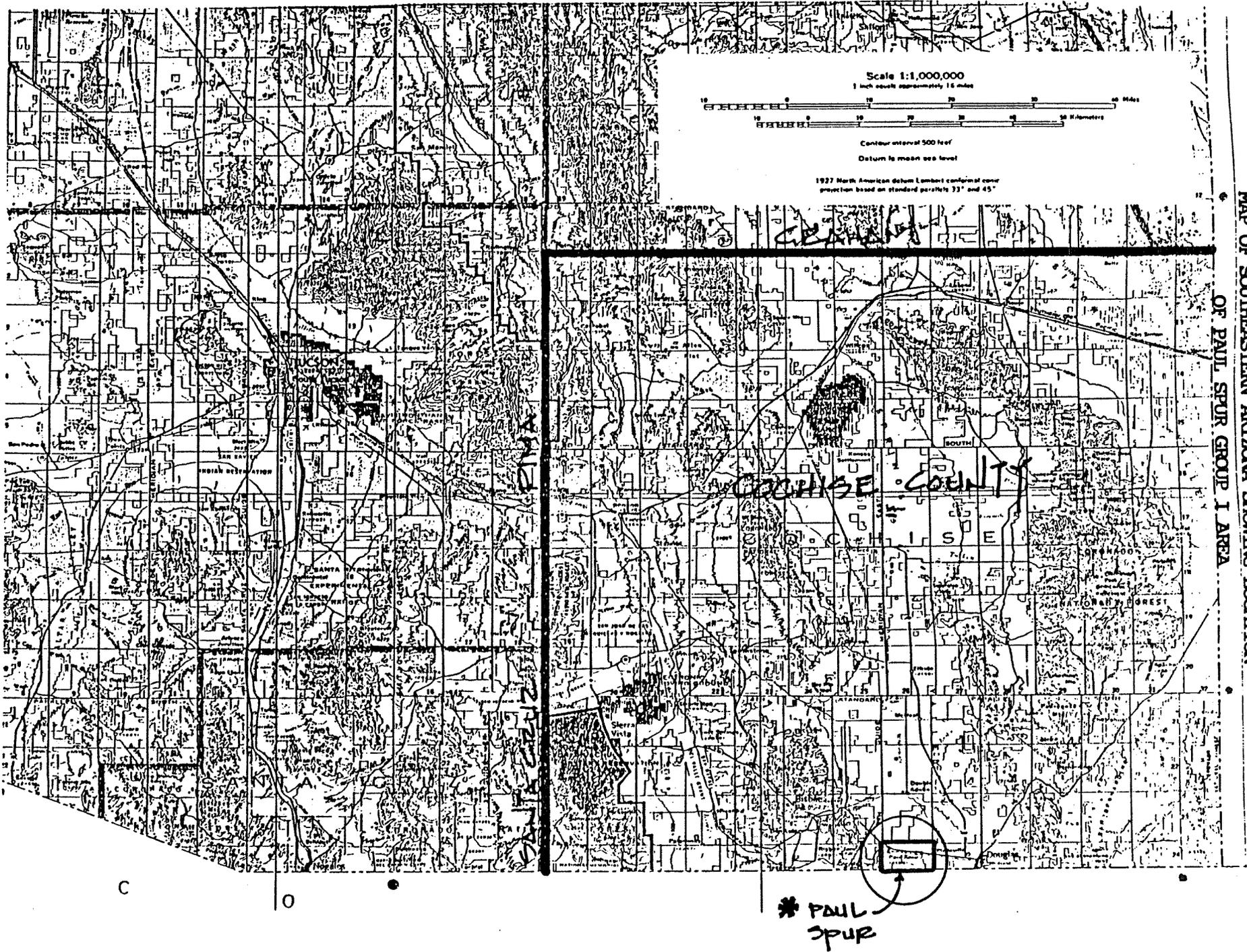


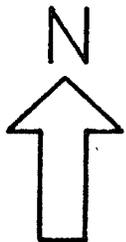
Figure 1.2

MAP OF SOUTHEASTERN ARIZONA SHOWING LOCATION OF PAUL SPUR GROUP I AREA

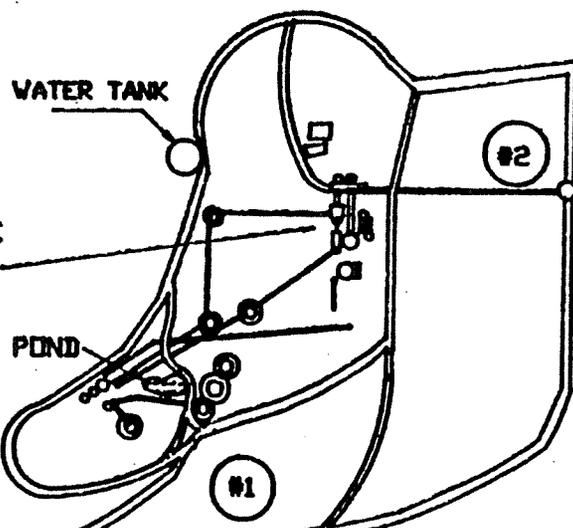


PAUL SPUR

PM10 Study Area



US ROUTE 80



PAUL SPUR ROAD

- #1 ORIGINAL TSP SAMPLER 1975-1977
- #2 1979-1982 TSP SAMPLER
- #3 NORTH SITE TSP & PM-10
- #4 SOUTH SITE PM-10

BORDER ROAD

Not to Scale

Figure 1.3

1.4 General SIP Approach

The basic approach of this plan is consistent with the PM₁₀ SIP Development Guideline Document (EPA, 1986, hereafter referred to as the Guideline Document): (1) presentation of air quality data; (2) inventory of the sources contributing to the problem; (3) determination of the areas where air quality needs improvement, with the aid of simulation models; (4) determination of the degree of improvement necessary; (5) strategies to reduce emissions sufficient to bring about attainment; (6) commitments to implement the strategies; and (7) steps necessary to ensure that NAAQS are not violated in the future.

1.5 Plan Contents

Section 2 of this document describes the air quality data bases used to determine the Group I status of the Paul Spur area, and discusses the ambient air quality of the area. It also describes the different information that were utilized in the receptor and rollback models. Section 2 also defines the meteorology of the area and the meteorological input to the rollback model.

Section 3 provides a discussion on the emission inventory and the lime plant operation processes.

Section ④ describes the chemical mass balance model and a summary of its results.

Section 5 shows the base year modeling results and reduction levels needed to attain the PM₁₀ NAAQS.

Section ⑥ discusses the methodology used to determine the needed control strategies at Paul Spur.

Section 7 describes the emission control alternatives.

Section ⑧ discusses the selected control strategies for each source.

Section 9 describes the projected PM₁₀ emissions.

The appendices contain the Chemstar Inc. operating permit for their Douglas Lime Plant, public hearing announcements, public comments, ADEQ's responsiveness summary, and other supporting documents.

2.0 Data Base Development

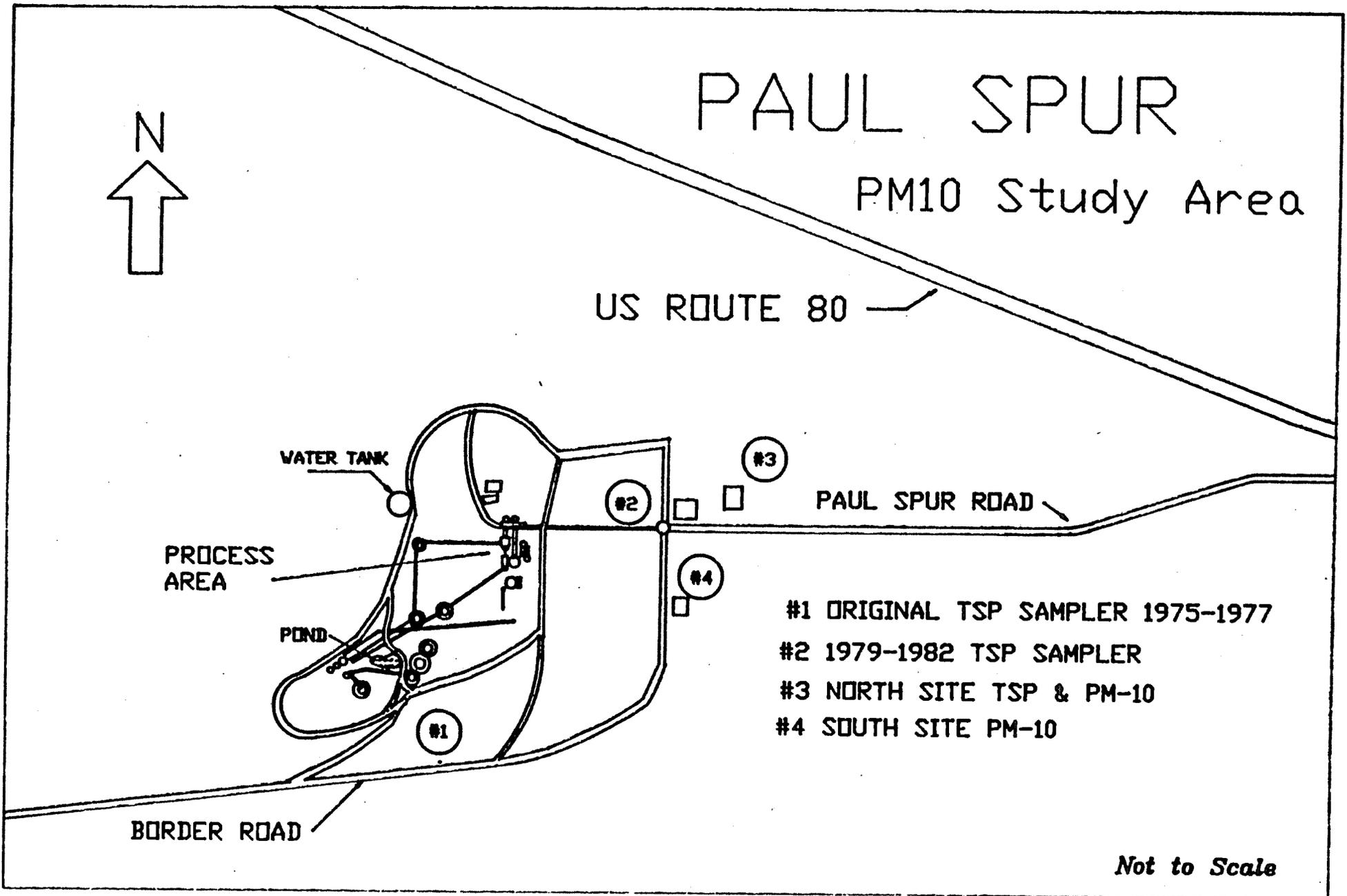
The historical ambient air monitoring data collected in the Paul Spur area determined the nonattainment status and the classification of Paul Spur as a Group I area, (described in Section 2 of the Guideline Document as an area shown to have a high probability of nonattainment). Data from a size selective inlet (SSI) PM₁₀ monitor and two dichotomous samplers added to the air quality data base. Source data were obtained from a source composition library (EPA-450/4-85-002, November, 1984). Meteorological data were obtained from the temporary ADEQ Paul Spur meteorological station located at the south air sampling site. (See Figure 2.1.)

The following subsections describe the existing ambient air quality, the contributing sources, and the meteorological data base developed for Paul Spur SIP.

2.1 Existing Air Quality Data

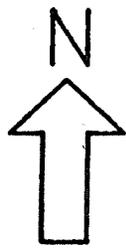
The Arizona Department of Environmental Quality (ADEQ) has operated air particulate samplers at four different sites in the Paul Spur area. (See Fig 2.1.) Table 2.1 shows PM₁₀ and TSP data from these sites. The monitoring results show exceedances of the PM₁₀ NAAQS of 50 $\mu\text{g}/\text{m}^3$, annual arithmetic mean, and 150 $\mu\text{g}/\text{m}^3$, 24-hour average, and also exceedances of the TSP annual geometric mean standard of 75 $\mu\text{g}/\text{m}^3$ and 24-hour standard of 260 $\mu\text{g}/\text{m}^3$.

Chapter 2 of the Guideline Document describes uncertainties in data measured with the Sierra Anderson SA321A PM₁₀ monitors, such as the monitor used at the Paul Spur site. As such, EPA does not consider that an exceedance of the NAAQS has occurred unless a measurement exceeds the standard by 20 percent. Even allowing for the 20 percent "gray zone", the Paul Spur measurements show exceedances of the NAAQS. Measurements of PM₁₀ concentrations in Paul Spur made since 1985 show that exceedances of the 24-hour average NAAQS for PM₁₀ occurred frequently, and the annual average NAAQS for PM₁₀ was violated every year. Using information from the EPA in the Procedures for Estimating Probability of Nonattainment of a PM₁₀ NAAQS Using Total Suspended Particulate or PM₁₀ Data, referenced in the Guideline Document, and the 0.47 PM₁₀ to TSP ratio in the Guideline Document, the measured TSP data also indicates exceedances of the NAAQS for PM₁₀. (See Table 2.1.)



PAUL SPUR

PM10 Study Area



US ROUTE 80

WATER TANK

PROCESS AREA

POND

PAUL SPUR ROAD

BORDER ROAD

- #1 ORIGINAL TSP SAMPLER 1975-1977
- #2 1979-1982 TSP SAMPLER
- #3 NORTH SITE TSP & PM-10
- #4 SOUTH SITE PM-10

Not to Scale

Figure 2.1

Table 2.1

PAUL SPUR DATA FOR 1975 - 1987

YEAR	ANNUAL			NUMBER OF EXCEEDANCE			PM10**			NUMBER OF EXCEEDANCES	NUMBER OF SAMPLES
	24-HOUR AVERAGE	TSP MAX	2ND HI	PRIMARY	SECONDARY	NUMBER OF SAMPLES	ARITHMETIC MEAN	24-HOUR MAX	2ND HI		
1975	80	207	203	--	--	--	--	--	--	--	--
1976	84	331	306	--	--	--	--	--	--	--	--
1977	NO	SAMPLER	OPERATED	--	--	--	--	--	--	--	--
1978	NO	SAMPLER	OPERATED	--	--	--	--	--	--	--	--
1979 ⁺	395	1853	1652	39	44	51	--	--	--	--	--
1980	381	2483	2193	33	43	49	--	--	--	--	--
1981	352	1046	1034	32	42	45	--	--	--	--	--
1982	303	854	739	28	44	47	--	--	--	--	--
1983	284	1222	740	24	34	41	--	--	--	--	--
1984	NO	SAMPLER	OPERATED	--	--	--	--	--	--	--	--
1985 [!]	178	698	474	14	28	40	89	270	206	10	42
1986	193	765	642	22	36	53	111	353	322	11	49
1987	199	647	420	8	20	28	58	168	164	2	39
1988 ^{&}	---	---	---	--	--	--	60	301	285	2	38

- * 1985-86 data were collected with an Andersen 321B;
- # 1987-88 data were collected with an Andersen dichotomous sampler;
- & Preliminary results through November 5.
- + New sampler location.
- ! New sampler location.

2.2 Receptor Modeling Data Base

The type of receptor model selected determines the type of data base required. Chapter 4 of the Guideline Document discusses the considerations in model selection and the data bases needed for Chemical Mass Balance (CMB) receptor modeling. It also describes the air monitoring and sample collection data base best suited for use with the Chemical Mass Balance type receptor CMB model. Due to the nature of Chemical Mass Balance CMB model, which requires speciated, as well as size fractioned sampling data, dichotomous samplers were utilized at Paul Spur. ADEQ conducted the sample collection and analysis program and the receptor modeling for Paul Spur to support a CMB receptor modeling approach at Paul Spur.

2.2.1 Receptor Model Selection

The Guideline Document lists the several factors affecting the choice of receptor models and conditions when identifies Chemical Mass Balance which is considered the most advanced of the receptor methods as the only approved receptor model for PM₁₀ SIP development. Review of these factors relating to the conditions at Paul Spur resulted in selection of the CMB approach to best establish source receptor relationships.

2.2.2 Intensive Monitoring Program

Monitoring for the Paul Spur PM₁₀ study commenced in June, 1987, at which time a dichotomous (dichot) PM₁₀ sampler replaced the existing standard sampler (Sierra-Anderson SSI) at the permanent ADEQ sampling site (Site #3, Fig 2.1), referred to as the Paul Spur "north site" in this SIP. In addition, wind equipment was installed at a new site established for this SIP and is referred to as the Paul Spur "south site" (Site #4, Fig 2.1). The dichot and wind sensors at the south site operated for one year in order to build a data base for source apportionment evaluations for the annual and 24-hour PM₁₀ standards.

To aid in speciation analysis, dichotomous samplers (described in section 2.2.4) using Teflon filters collected size specific particulate data at the Paul Spur north and south sites from June 1987 through September 1988. One month of speciated data was subsequently used in the CMB model. Sampling for a full year period has allowed assessment of the impact of seasonal variations and meteorology.

Both the fine and coarse fraction dichotomous sampler filters from each location were desiccated and weighed to determine total mass. These filters were then examined using X-Ray Fluorescence Analysis (XRF) to determine the elemental composition. The elemental composition and mass for both coarse and fine fractions provided input to the CMB determinations. For mass PM₁₀ concentrations (determined from the sum of the fine and coarse dichotomous filter concentrations), the samples collected at the north site and the samples collected at the south site showed

arithmetic means of 57.4 $\mu\text{g}/\text{m}^3$ and 41.1 $\mu\text{g}/\text{m}^3$, respectively. One of the samples collected exceeded the 150 $\mu\text{g}/\text{m}^3$ 24-hour standard.

Additionally, daily (24 hour) sampling of PM_{10} was conducted from September 10, 1987 through October 12, 1987, and continuous every four-hour sampling was performed from October 7, 1987, through October 9, 1987.

2.2.2.1 North Site Sampler

The North site (#3, Fig 2.1) is located approximately 700 feet northeast of the Chemstar Douglas Lime Plant. This site was selected for compatibility with the TSP and PM_{10} sites that were previously used. The site is generally downwind of the lime plant and is thought to represent the maximum ambient PM_{10} concentrations to which a person in the area could be exposed. Measurements from this site were used to determine control requirements and will be used to track compliance.

The number of instruments, measurements, averaging periods and frequency of measurements at the Paul Spur north site are as follows:

Instrument Type	Number of Instrument	Measured Parameters	Averaging Period	Frequency Measurements
Dichot	1	PM_{10} Split Fine/Coarse	24-hours Midnight-Midnight	Every 6th day (June, 1987- Sep. 10, 1987; Oct. 12, 1987- Sep. 18, 1988)
		PM_{10} Split Fine/Coarse	24-hours Midnight-Midnight	Daily (Sep. 10, 1987- Oct. 12, 1987)
		PM_{10} Split Fine/Coarse	4-hours	Consecutive (October 7-9, 1987)
SSI	1	PM_{10}	24-hours Midnight-Midnight	Every 6th day Sep. 18, 1988 on.

The basis of the PM₁₀ study plan was the routine collection of midnight-to-midnight dichot samples at the north site. These measurements were used as input to the Chemical Mass Balance (CMB) model, in order to assess source apportionment.

The dichotomous (dichot) PM₁₀ sampler divides the ambient particulates into a coarse (2.5-10 μm) and a fine (0-2.5 μm) mode. Both the particulate mass and elemental speciation of these samples, collected on 37 millimeter Teflon filters, constitute the air quality inputs to the CMB model.

2.2.3 PM₁₀ Sampling

During the period October 7-12, 1987, intermittent time-lapse photography was conducted at the south site. The field of view generally included the time plant, as well as vehicular activity in the vicinity of those two locations. A hand-held 35mm camera was also utilized during the same time period to supplement the time-lapse information.

Data collected at both the north and the south sites during the one month of special sampling are summarized in Tables 2.2 and 2.3.

Instrument Type	Number of Instrument	Measured Parameters	Averaging Period	Frequency Measurements
Dichot	1	(Same as north site for the period Sep. 10 thru Oct. 9, 1987)	30-min.	Continuous
Anemometer/Wind Vane	1	Wind Speed / Direction		

The number of instruments, measurements, averaging periods and frequency of measurements at the Paul Spur south site are as follows:

The south site (#4, Fig 2.1) is located approximately 0.3 mile south of the north site. This site was selected mainly due to the availability of commercial power and proximity of the site to the unpaved road between Paul Spur and Naco, commonly known as the Border Road. It is in an open field with good exposure to wind and unobstructed dust loading. It is believed that data collected at this site represent background conditions relative to the north site, including the impact of the Border Road, which is the only significant local PM₁₀ emission source besides the time plant.

2.2.2.2 South Site Sampler

Table 2.2

Summary of Daily Midnight-to-Midnight
PM₁₀ Measurements ($\mu\text{g}/\text{m}^3$)
Paul Spur

Date (1987)	North Site				South Site			
	F	C	C/F	PM10	F	C	C/F	PM10
Sept. 10	10.5	85.7	8.2	96.2	10.2	57.4	5.6	67.6
11	15.4	111.2	7.2	126.6	8.8	46.7	5.3	55.5
12	11.1	87.4	7.9	98.5	20.4	22.0	1.1	42.4
13	7.8	29.8	3.8	37.6	5.8	17.9	3.1	23.7
14	11.8	98.1	8.3	109.9	5.7	42.6	7.4	48.3
15	13.7	65.3	4.8	79.0	11.7	62.2	5.3	73.9
16	13.5	59.2	4.4	72.7	12.3	42.8	3.5	55.1
17	11.1	67.4	6.1	78.5	8.9	37.4	4.2	46.3
18	7.6	18.8	2.5	26.4	4.5	4.6	1.0	9.1
19	8.1	27.0	3.3	35.1	6.9	13.7	2.0	20.6
20	7.9	28.4	3.6	36.3	6.8	14.1	2.1	16.2
21	7.5	39.9	5.2	47.4	--	--	--	--
22	5.5	16.7	3.0	22.2	6.6	39.5	6.0	46.1
23	2.6	2.7	1.0	5.3	5.9	23.0	3.9	28.9
24	--	--	--	--	9.0	38.7	4.3	47.7
25	9.4	47.6	5.1	57.0	8.6	17.0	2.0	25.6
26	11.8	56.1	4.8	67.9	8.2	10.7	1.3	18.9
27	10.1	59.1	5.9	69.2	7.1	16.0	2.3	23.1
28	8.8	37.3	4.2	46.1	11.2	47.5	4.2	58.7
29	9.0	19.7	2.2	28.7	9.3	43.6	4.7	136.9
30	5.2	11.7	2.2	16.9	5.9	26.6	4.5	32.5
Oct. 1	5.8	20.9	3.6	26.7	6.9	52.5	7.6	59.4
2	5.7	13.2	2.3	18.9	6.4	44.0	6.8	50.4
3	5.9	19.0	3.2	24.9	5.0	22.3	4.5	57.3
4	6.8	31.5	4.7	38.3	6.3	27.7	4.4	34.0
5	6.9	26.2	3.8	33.1	7.1	41.8	5.9	48.9
6	8.5	50.2	5.9	58.7	7.1	26.7	3.8	3.8
12	12.5	67.0	5.4	79.5	9.7	30.3	3.1	40.0
13	15.6	152.2	9.8	167.9	8.3	51.2	6.1	59.5
Avg.	9.2	48.2	--	57.4*	8.2	32.9	--	41.1

F= fine (0 - 2.5 μm)

C= coarse (2.5 - 10.0 μm)

* 28 days included

Table 2.3

Summary of Four-hour PM₁₀ Measurements
 (µg/m³)
 Paul Spur

(1987) Date	Start Hour	North Site				South Site			
		F	C	C/F	PM10	F	C	C/F	PM10
Oct. 7	07	13.9	58.7	4.2	72.6	15.8	102.4	6.5	118.2
7	11	10.6	7.7	0.7	18.3	6.1	11.6	1.9	17.7
7	15	10.0	29.2	2.9	39.2	5.8	13.6	2.3	19.4
7	19	18.9	103.1	5.5	122.0	7.5	15.5	2.1	23.0
7	23	19.7	162.1	8.2	181.8	8.9	38.0	4.3	46.9
8	03	10.8	42.1	3.9	52.9	12.2	57.4	4.7	69.6
8	07	13.1	45.6	3.5	58.7	13.9	46.3	3.3	60.2
8	11	17.8	111.0	6.2	128.8	10.3	58.6	5.7	68.9
8	15	15.8	87.7	5.5	103.5	4.7	26.7	5.7	31.4
8	19	20.0	143.4	7.2	163.4	6.7	19.0	2.9	25.7
8	23	15.3	68.1	4.5	83.4	13.9	47.3	3.4	61.2
9	03	16.1	67.0	4.2	83.1	11.9	33.5	2.8	45.4

F = fine particulates
 (0 - 2.5 µm)

C = coarse particulates
 (2.5 - 10.0 µm)

A period of daily sampling of PM₁₀ at both sites was started on September 10, 1987, and concluded on October 12, 1987. The purpose of the daily sampling was to compile a set of 24-hour samples from which CMB design day criteria could be ascertained. Additionally, consecutive 4-hour samples were collected during the period of October 7-9, 1987 in lieu of the daily samples in order to provide good correlation among dust generating activities in the study area, the PM₁₀ measurements and the concurrent meteorology. Every sixth-day sampling recommenced after midnight on October 12, 1987, and continued into September, 1988 at which time the sampler was changed to an SSI (Sierra Anderson 321B).

2.2.4 Laboratory Analysis of PM₁₀ Filter Samples

All sample filters were gravimetrically analyzed to determine PM₁₀ mass concentrations. All filters were also analyzed by X-Ray Fluorescence (XRF) for the elements listed in Table 2.4.

Prior to exposure in the field, each 37-millimeter teflon filter was conditioned in a standard temperature and relative humidity environment. Filters were then preweighed and assigned an identification number before shipment to ADEQ for subsequent field exposure. After sampling, the filters were returned to the analysis laboratory for weighing and chemical analysis. For this study the analysis laboratory was the Desert Research Institute, at Reno, Nevada.

The results of the gravimetric and XRF analysis were used to define one or more design days. In addition to filter loading, other design day selection criteria were wind speed, wind direction and atmospheric stability.

2.2.4.1 Data Analysis

A summary of the 24-hour fine (0-2.5 μm) and coarse (2.5-10.0 μm) PM₁₀ data collected at the two sites from September 10 through October 13, 1987, are presented in Table 2.2 and Figures 2.3 and 2.4. Without exception, the coarse particulate loading exceeded the fine loading on a daily basis. The fine loading averaged 16 percent of the total PM₁₀ at the north site and 20 percent of the total at the south site. Average concentrations in both size categories were greater at the north site compared to the south site (112 percent for fine particles and 147 percent for coarse particles). The total PM₁₀ at the north site exceeded that at the south site on approximately two-thirds of the study days.

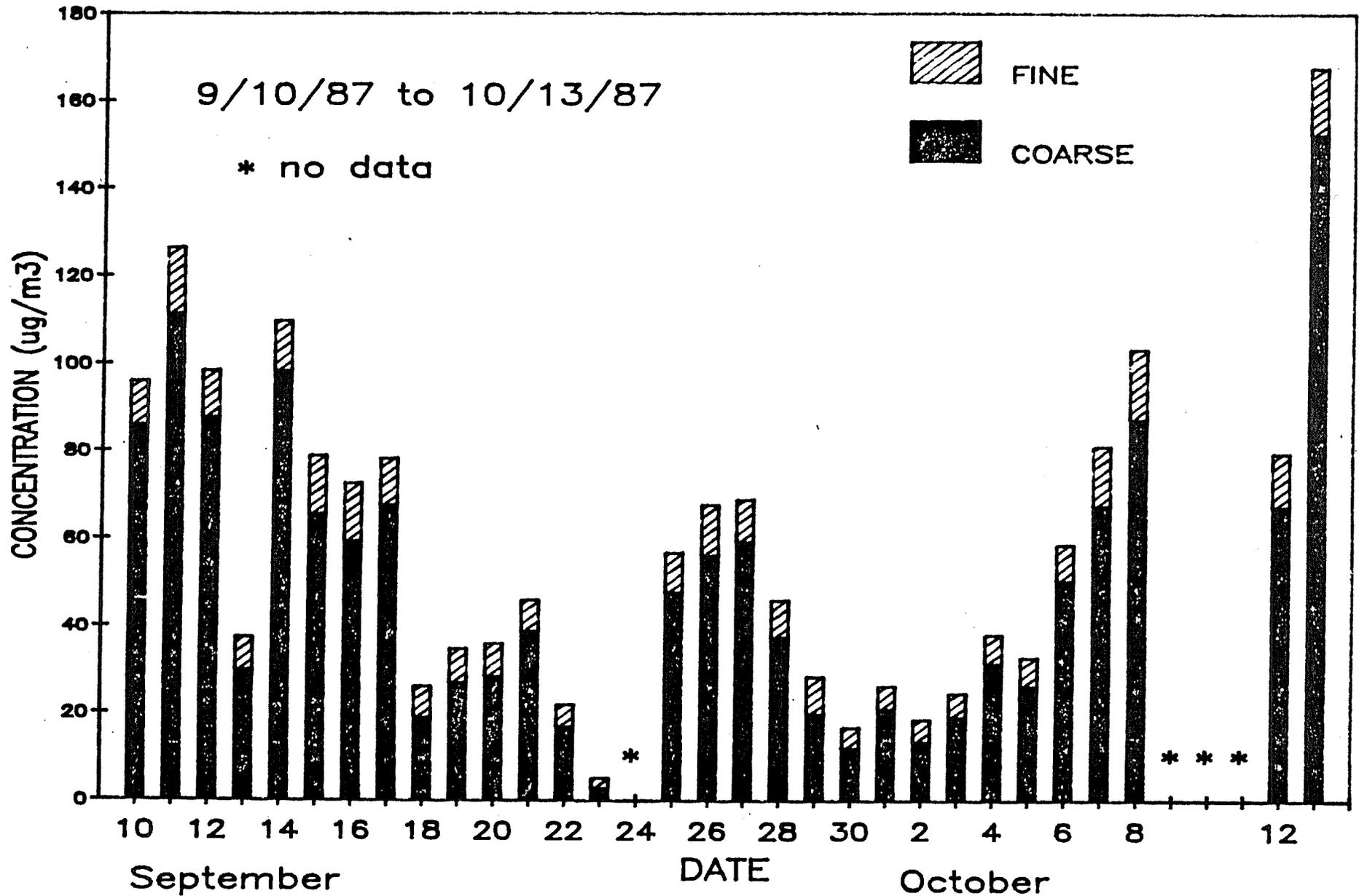
Data collected during sequential four-hour periods on October 7-9, 1987, are presented in Table 2.3 and Figures 2.5 and 2.6. Overall trends are similar to those seen in the daily samples; however, no clear diurnal trends are obvious. It can be seen that relatively sharp temporary increases occur in coarse particulate loadings at the north site at 1900 hours to 2300 hours on 10/7/87 and at 1900 hours on 10/8/87, a feature not seen in the south site

Table 2.4

Elements to be quantified by
X-ray fluorescence of dichot filters

Aluminum	Al
Antimony	Sb
Arsenic	As
Barium	Ba
Bromine	Br
Cadmium	Cd
Calcium	Ca
Chlorine	Cl
Chromium	Cr
Copper	Cu
Gallium	Ga
Indium	In
Iron	Fe
Lanthanum	La
Lead	Pb
Manganese	Mn
Mercury	Hg
Molybdenum	Mo
Nickel	Ni
Palladium	Pd
Phosphorous	P
Potassium	K
Rubidium	Rb
Selenium	Se
Silicon	Si
Silver	Ag
Strontium	Sr
Sulfur	S
Tin	Sn
Titanium	Ti
Vanadium	V
Yttrium	Y
Zinc	Zn
Zirconium	Zr

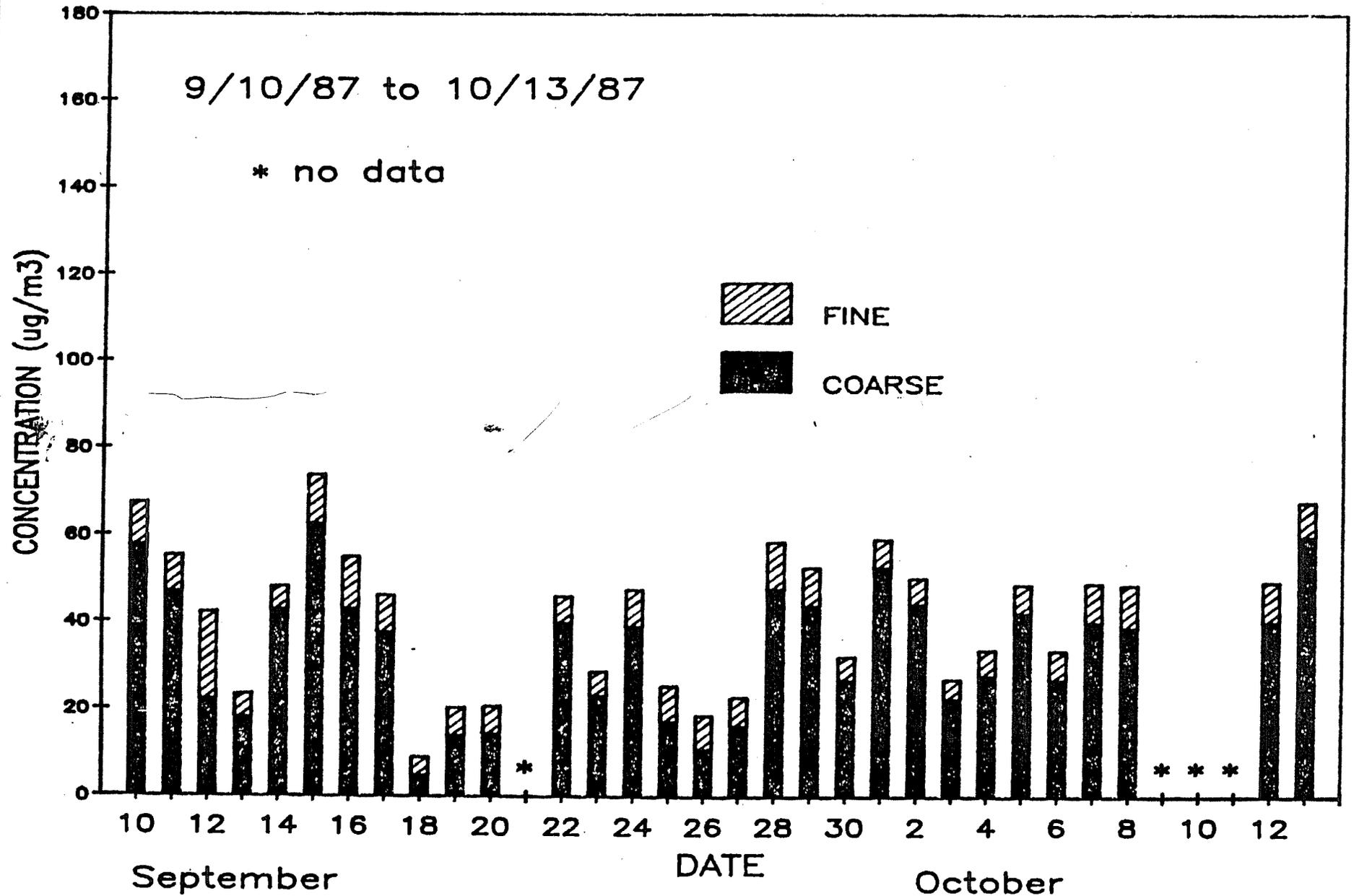
PAUL SPUR - NORTH SITE



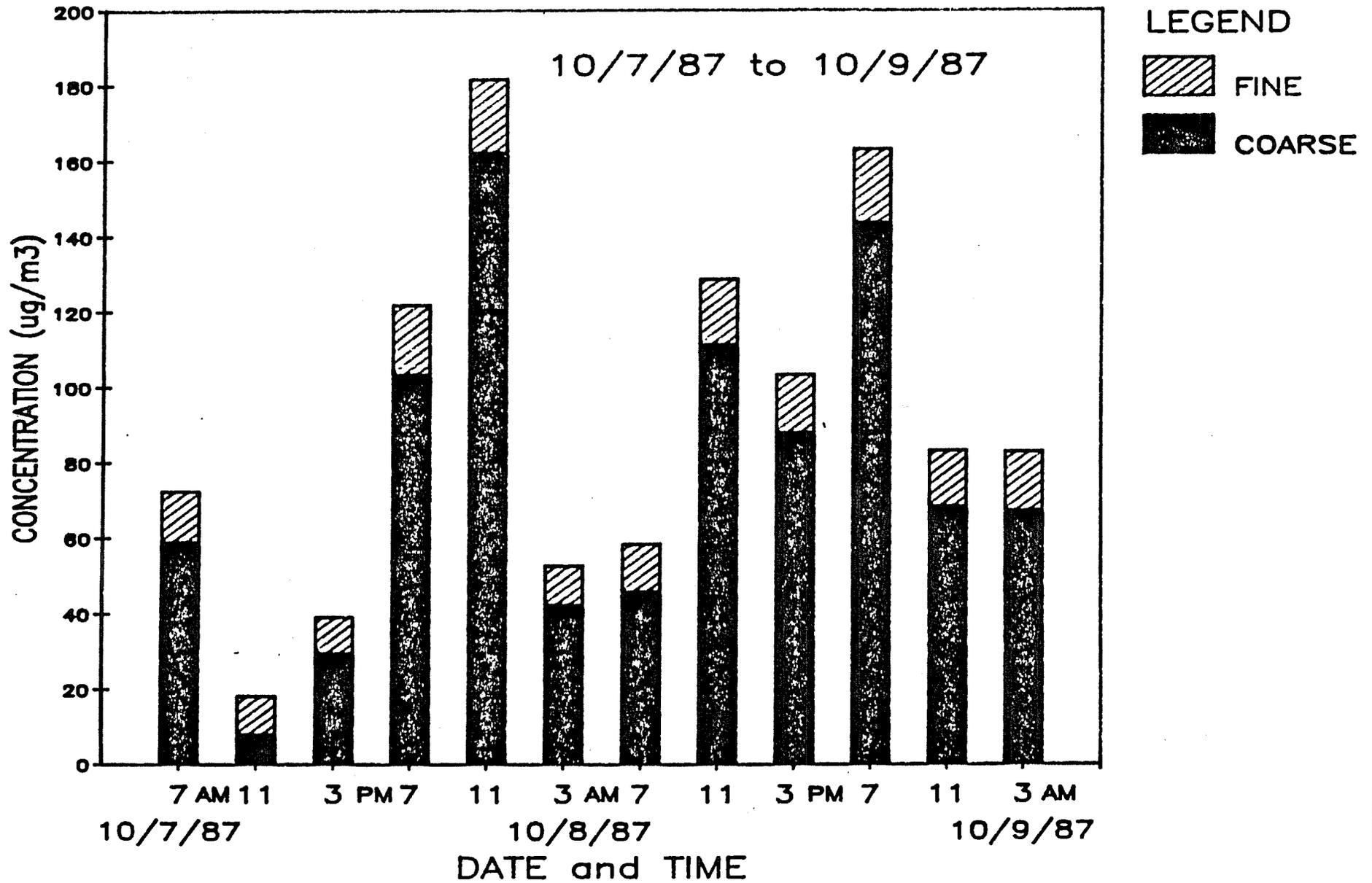
AQM54 10-9-89

Figure 2.3

PAUL SPUR - SOUTH SITE



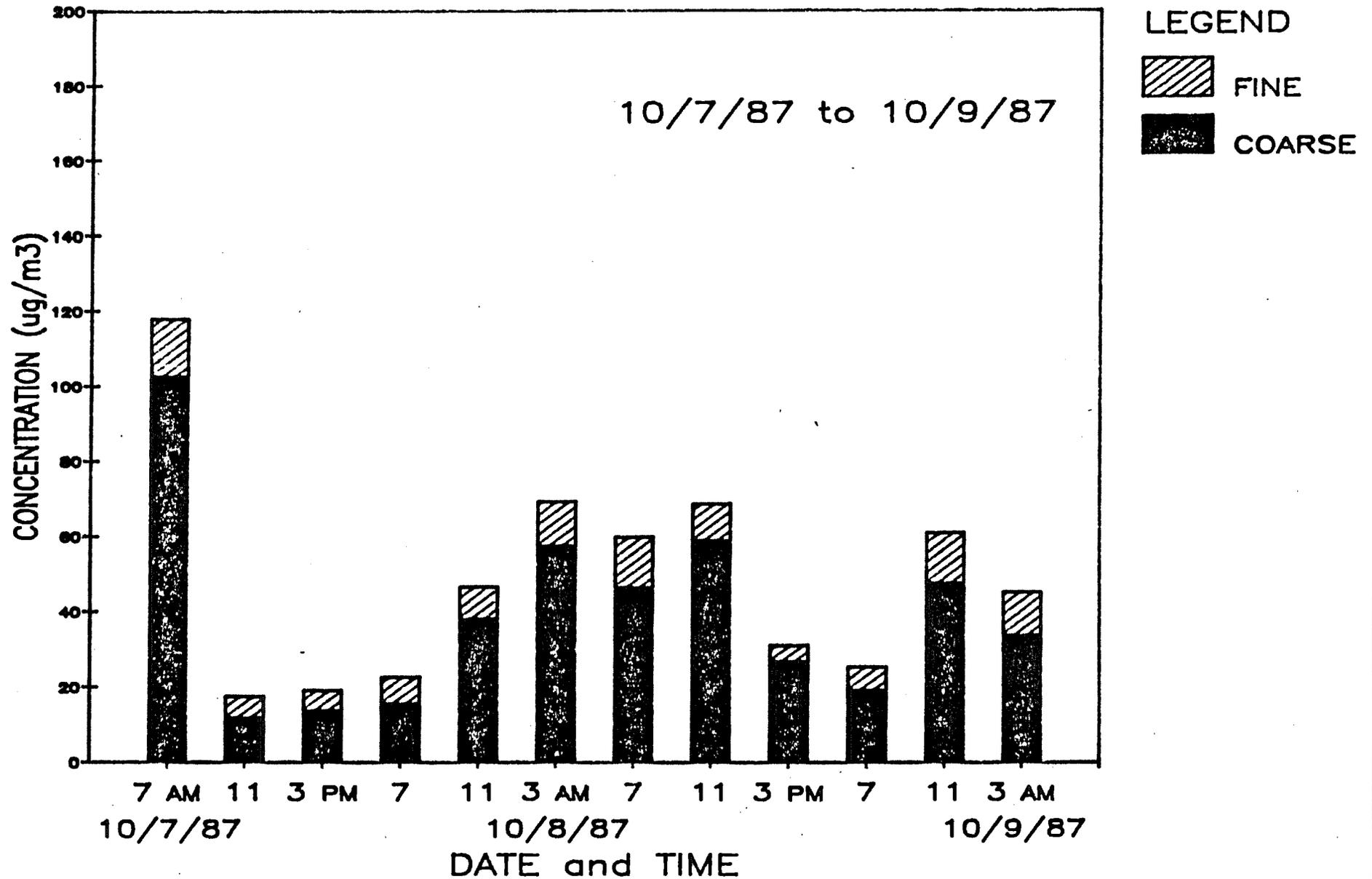
PAUL SPUR - NORTH SITE



AQM56 12-5-89

Figure 2.5

PAUL SPUR - SOUTH SITE



AQM57 12-5-89

data, with the exception of the first four-hour segment at 0700 hours on 10/7/87. Comparison of the data with wind information shows that these occurrences at the north site only happened in the presence of winds out of the southwest quadrant with relatively high speeds (i.e. 5-10 m.p.h.). The highest concentrations occurred during late night and early morning hours when human activity should normally be at a minimum.

2.2.5 Time Lapse Photography

The camera for this study was housed in a steel cabinet with a clean glass front and was located on top of the trailer at the south site. The camera was programmed to take one exposure every 12 seconds and was started at 7:00 a.m., October 7. The camera was also operated hand held in its continuous mode to photograph the visible dust cloud from a test vehicle.

2.2.6 Aerial Photography

An aerial reconnaissance of the Chemstar Douglas Lime Plant and the surrounding area including two Mexican lime processing plants and a Mexican copper smelter was undertaken. Approximately 100 photographs (50 prints & 50 slides) were taken during a two hour flight over the area.

2.3 Meteorological Measurements

Local meteorological measurements included wind speed and wind direction measured at the south site using sensors that were located 10 meters above ground level. Data were recorded continuously on both a strip chart recorder and electronically on a data pod recorder.

Study was made into particulate loading and associated meteorological parameters during the daily sampling period from September 10, 1987 through October 13, 1987. Data were first sorted to determine the 24-hour periods with the three highest and three lowest loadings of both fine and coarse particulates at both sampling sites. Common characteristics of instantaneous hourly wind speed and direction for these data subsets are described in the sections that follow.

* The days of highest particulate loading at the north site (September 11, 14 and October 13) were characterized by fairly persistent southwest winds with relatively high speeds. Wind speeds ranged from about 2 m.p.h. to more than 15 m.p.h. with the daytime average being approximately 10 m.p.h..

* Days with lowest particulate loading at the north site (September 22, 30 and October 2) were characterized by variable wind direction and somewhat lower average speeds than the highest loading days. Variability in the direction was greatest at night and was associated with low speeds, generally less than 5 m.p.h.; however, each of the three days were characterized by a rather abrupt shift to southeasterly winds at 8-9:00 a.m. (probably inversion breakup) with persistence of direction until 6-7:00 p.m. (inversion setup). With the southeasterly winds, speeds averaged around 10 m.p.h. with no peaks in excess of 15 m.p.h..

* Four days were identified for highest particulate loading at the south site (September 10, 15 and October 1, 13); both October 1 and 13 had nearly the same particulate concentration. However, the direction and speed characteristics for October 13th were dissimilar to the other three days due to the passage of a weather front, therefore, October 13th was not considered in this discussion. Of the remaining three days, two (Sept. 15 and Oct. 1) had variable winds with speeds of about 5 m.p.h. during nighttime hours. The September 10th had rather persistent southwesterly winds at night with average wind speed somewhat more than 5 m.p.h.. On all three days a shift in direction occurred from about 7:00 a.m. until about 1-2:00 p.m. On the 10th and 15th, the wind blew out of northeast quadrant during those hours and mostly out of the southeast quadrant on the 1st.

* Days with lowest PM₁₀ concentration at the south site (September 18, 19 and 26) were generally characterized by light and variable winds, except on the 26th, when southwest winds persisted during most of the nighttime hours. On these three days the hourly wind speed reached or exceeded 10 m.p.h. only twice.

The particulate data were segregated into two subsets, one for cases when the PM₁₀ concentration at the north site exceeded that at the south site and the other for cases when the opposite was true. Hourly average wind direction and speed were then determined to represent a "typical" diurnal cycle for both particulate matter loading scenarios. (See Table 2.5.) The data indicated that when the south site concentration was greater, the wind tended to blow out of the southwest quadrant from about 10:00 p.m. until about 6:00 a.m. with average speed less than 5 m.p.h.. From about 7:00 a.m. through about 9:00 p.m. the average wind direction appeared to shift through south to east-northeast by mid-afternoon and then back again to the southwest. Daytime average wind speed was in the 5-10 m.p.h. range. When the north site loading was greater the data indicated that the average wind direction was southwesterly from about 2:00 p.m. through about 7:00 a.m. During the remaining six hours the direction tended to be more southeasterly. Daytime average wind speed was similar to that in the previous scenario, but nighttime speeds appeared to be somewhat higher (i.e. about 6 m.p.h.).

Table 2.5

Average Diurnal Wind
Direction and Wind Speed

September 10 - October 13, 1987

Hour	South site loading > north site loading	North site loading > south site loading
	Direction/Speed (Degrees) (mph)	Direction/Speed (Degrees) (mph)
1	226 / 3.5	230 / 5.8
2	232 / 4.3	233 / 5.2
3	244 / 4.2	254 / 4.9
4	271 / 3.8	232 / 4.5
5	280 / 3.2	234 / 4.6
6	269 / 4.4	236 / 4.5
7	170 / 3.3	219 / 4.8
8	89 / 4.1	173 / 4.1
9	80 / 6.1	111 / 5.2
10	95 / 7.4	127 / 6.0
11	91 / 7.8	135 / 6.8
12	96 / 8.2	163 / 8.1
13	89 / 8.4	174 / 8.5
14	75 / 9.5	189 / 9.5
15	71 / 8.0	212 / 8.7
16	116 / 7.7	206 / 8.4
17	100 / 7.8	222 / 7.5
18	127 / 4.1	250 / 5.9
19	106 / 3.8	238 / 6.1
20	134 / 6.1	240 / 7.0
21	176 / 5.2	246 / 7.2
22	271 / 4.5	250 / 6.9
23	255 / 4.6	215 / 5.6
24	298 / 3.5	247 / 5.5
Average	--- / 5.6	--- / 6.3

Wind roses were developed for the two data sets described above. The two roses, with associated average wind speeds by direction, are presented in Figure 2.7. They show that when loading at the south site was greater, there was a tendency for a mix of wind direction with no dominant direction; average speed was highest with east-southeast winds (9.3 m.p.h.) and lowest with northwest winds (2.0 m.p.h.). When loading at the north site was greater, there was a high predominance of southwesterly winds; 60 percent of the hourly occurrences had a direction out of the south-southwest through west-southwest. Highest average speed (8.1 m.p.h.) was associated with westerly winds and the lowest average speed (3.3 m.p.h.) was associated with easterly winds.

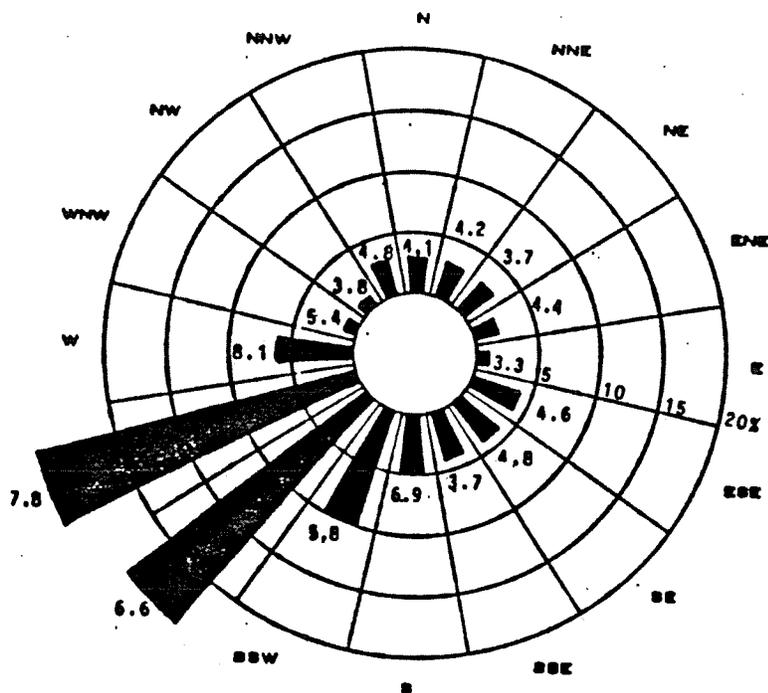
The percentage frequencies of wind direction for the period September 9, 1987 through September 23, 1988, as presented in Table 2.6, show that winds from the south-southwest through west occurred about 53 percent of the time. It is expected that the long-term average will approximate this percentage. The data also show that the highest average wind speeds were associated with winds out of the southwest quadrant. In particular, the highest averages, 7.7 and 8.2 miles per hour occurred with westerly and west-southwesterly winds, respectively.

Table 2.6

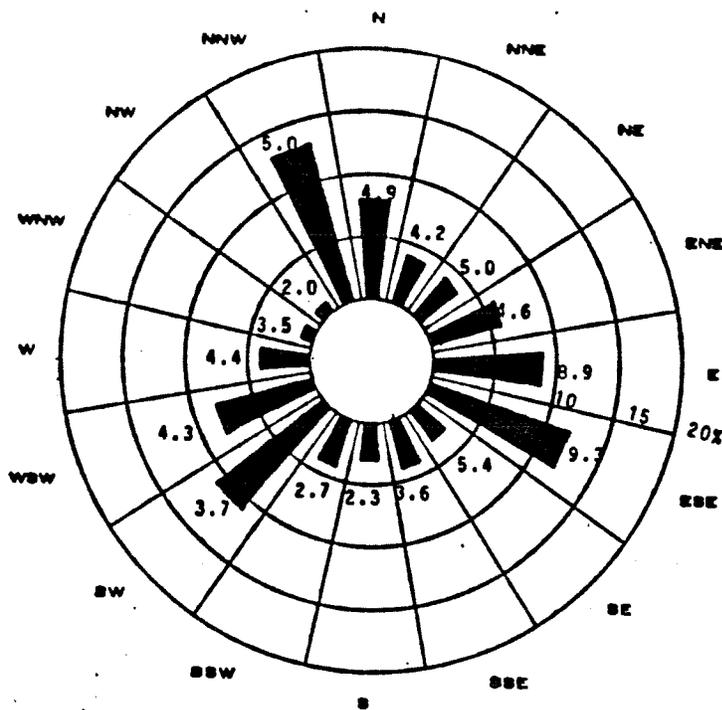
Percent Frequency of Direction and
Average Wind Speed by Direction
Paul Spur, Arizona
September 9, 1987 through September 23, 1988

	Relative Frequency (%)	Average Speed (m.p.h.)
N	6.6	5.0
NNE	4.2	4.3
NE	2.7	4.3
ENE	2.7	4.9
E	3.9	6.2
ESE	4.6	6.1
SE	4.3	5.2
SSE	3.5	4.9
S	4.8	6.5
SSW	7.9	5.6
SW	18.3	6.6
WSW	20.2	8.2
W	6.3	7.7
WNW	2.3	4.9
NW	2.6	5.2
NNW	5.1	5.3

Figure 2.7



a. North Site PM₁₀ Concentration Greater Than at South Site



b. South Site PM₁₀ Concentration Greater Than at North Site

Percent Frequency Occurrence of Wind Direction (Wind Rose Segment Length) and Associated Average Wind Speed (Number at End of Each Segment; MPH)

Precipitation can directly or indirectly affect particulate loading at a sampler. Deposition of particulates will occur sooner after emission when subject to precipitation than if no precipitation is occurring. Also, fugitive surface emissions are retarded by precipitation. Rainfall data from Douglas and an associated FAA airport, located about ten miles northeast of Paul Spur, were used to suggest the rainfall patterns in the study area. Measurable rainfall was recorded only during the period of September 17-26 with daily rainfall in excess of 0.15 inch being recorded only on the 22nd. A clear connection between low or high particulate loading at one site versus the other, relative to rainfall patterns, is not evident. Rather, precipitation consequences appear to be similar in effect for both sites.

2.4 Source Profiles

The Chemstar Douglas Lime Plant and surrounding area were observed frequently by ADEQ personnel during the one-and-a-half month study period. At least 20 point sources of dust were identified during this period. These sources are listed in Table 6.3 of this document. In addition, six fugitive dust sources were also identified: A) numerous piles of fugitive dust; B) Chemstar Douglas Lime Plant haulage roads, all unpaved; C) the unpaved Border Road; D) Paul Spur Road, the asphalt paved road connecting the Chemstar facility with the U.S. Highway 80; E) U.S. Highway 80, a concrete highway; and F) the dirt road paralleling Highway 80.

2.4.1 Fugitive Dust Piles

There were numerous piles of fugitive dust near the kilns and near transfer points which would emit large clouds of visible dust when subjected to gusty winds.

2.4.2 Chemstar Douglas Plant Haul Road

These roads were observed to be watered on a daily basis, but not on any regular schedule. The watering appeared to be effective for approximately 45 minutes. Much of the vehicular activity resulted in the emission of visible clouds of dust.

2.4.3 Border Road

This road is Cochise County Road #4182, which is a dirt road connecting the Paul Spur and Naco roads. The Cochise County Highway Planning Department was contacted in order to obtain traffic counts on this highway. The figures provided by that agency are as follows:

1984 - 20 vehicles per day south of Paul Spur road
1984 - 7 vehicles per day west of ranch turnoff
1987 - 58 vehicles per day south of Paul Spur road.

The 1987 data were collected during the period Sept. 15-21, 1987.

2.4.4 Paul Spur Road

This road is Cochise County Road #3024, which is an asphalt road connecting U.S. Highway 80 and Chemstar Douglas Lime Plant. It showed evidence of track-out and runoff deposits from the Chemstar Douglas Lime Plant as a result of road watering and heavy rainfall. The available traffic counts are as follows:

1984 - 58 vehicles per day
1987 - 92 vehicles per day (Sept. 15-20)

2.4.5 U.S. Highway 80

This concrete highway, located approximately one-half mile north of the Chemstar Douglas Lime Plant, carries 2,500 to 5,000 vehicles per day. There are no apparent dust sources (i.e. track-out or runoff erosion deposits) on this road as compared to the Paul Spur Road.

2.4.6 Dirt Road Along U.S. Highway 80

This is a dirt access road which runs parallel and 100 feet to the south of Highway 80. It comes within approximately 1 mile of the Chemstar Douglas Lime Plant. Once every evening it is dragged by the U.S. Border Patrol in order to detect illegal border crossings. The dragging operation creates a large cloud of dust in the vicinity of Highway 80 but has not been observed to blow towards the Chemstar Douglas Lime Plant.

2.4.7 Point Sources

The 20 point sources listed in Table 5.2 fall into 3 categories: A) Stack emissions, B) crusher emissions and C) transfer points. The point of greatest visible dust emissions is the large rectangular stack leading from the rock bed filter, followed by the truck loading area. Other points with high dust emissions are the crusher and the transfer belts to the storage piles. Section 3 of this document contains detail description of the aforementioned point sources.

3.0 Total Particulate Emission Inventory for Point and Area Sources

Baseline particulate emissions for major stationary sources and area sources in the Paul Spur Group I area are investigated in this section. The only major stationary source in the Paul Spur area is the Chemstar Douglas Lime Plant, which is owned and operated by Chemstar Inc. Sources, such as residential and commercial fuel combustion and motor vehicles, are minor contributors to particulate emissions in this area. There are only a few residential units and only one commercial establishment in the Paul Spur area. Therefore, emissions from these sources are considered negligible and will not be discussed.

3.1 Particulate Emissions at the Chemstar Douglas Lime Plant

This section describes the method used to estimate the magnitude of particulate emissions at the Chemstar Douglas Lime Plant. A description of the lime plant and its emission control systems are documented in Section 3.1.1. The method used to calculate emissions and the base-year emission inventory are provided in Section 3.1.2.

3.1.1 Description of Point Sources and Existing Emission Controls

A process flow diagram for the Chemstar Inc., Douglas Lime Plant is illustrated in Figure 3.1. Rock from the quarry is hauled by truck to a receiving bin at the crushing and screening plant. The limestone is reduced in size by jaw and cone crushers and size separated by shaker screens. Three individual conveyor systems carry the crushed limestone to three lime kilns. The by-products of the crushed limestone (approximately 25 percent by weight), are conveyed to storage piles. These materials are then loaded onto trucks and rail cars.

Fugitive dust emissions are generated by all of the above processes. The primary charge bin's lack of enclosure and the absence of any other methods to suppress fugitive dust is an example of this problem. Some of the dust generated by crushing and screening is vented to one of three baghouses or a wet scrubber for particulate matter removal. The limestone conveyor belts and transfer points have no controls for fugitive dust. The transfer points from the conveyor to the flux and chat storage piles are equipped with telescoping chutes to minimize fugitive dust.

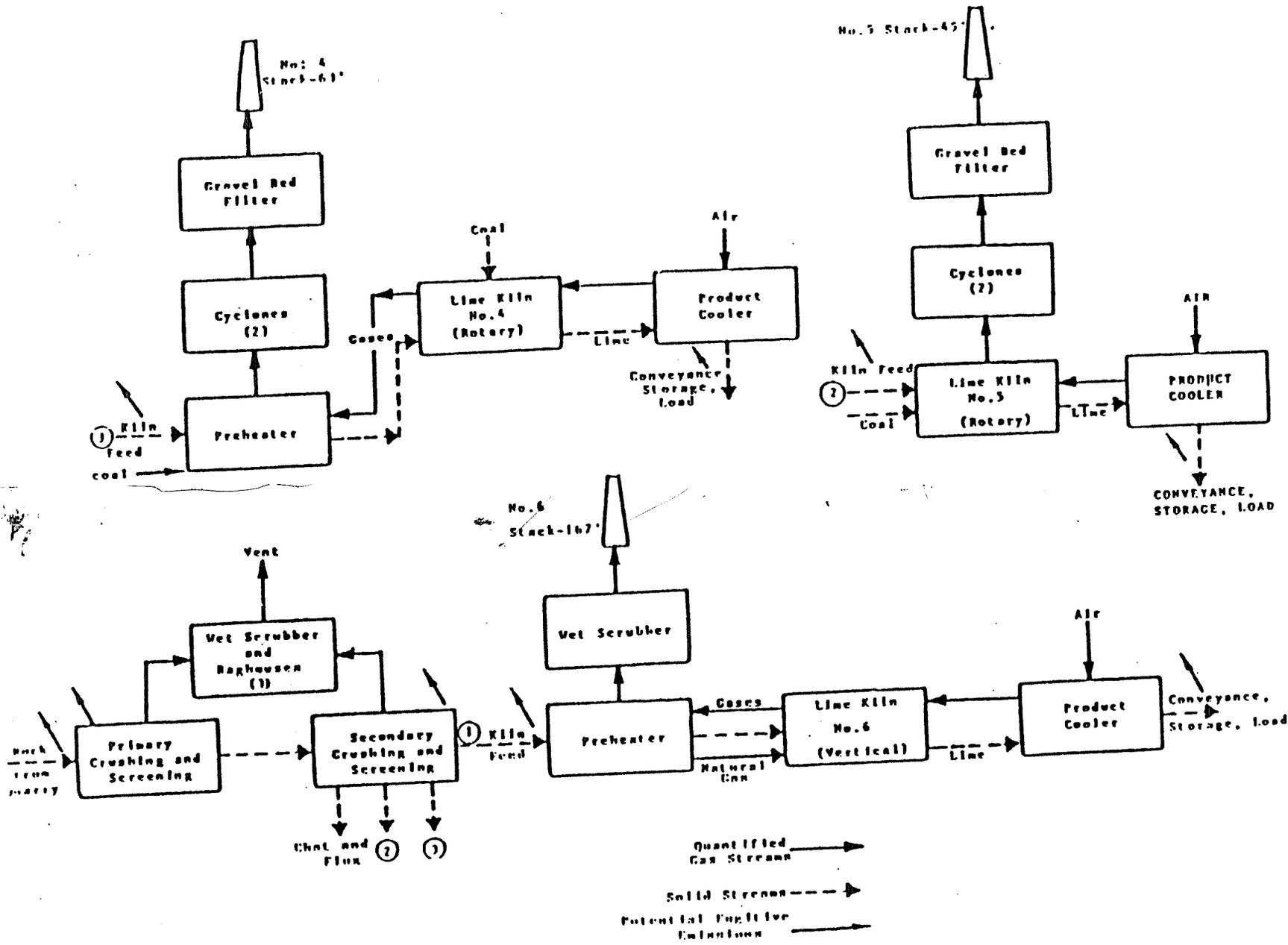


FIGURE 3.1

Process diagram of Chemstar Douglas Lime Plant

Two of the lime kilns (Kiln #4 and Kiln #5) are rotary kilns fired with coal from New Mexico. The capacities of Kiln #4 and Kiln #5 are 200-220 and 350-400 tons per day of lime product, respectively. As with most rotary kilns, the lime moves slowly through the long cylindrical furnace countercurrent to the flow of heat. After several hours of travel through the kiln, the lime drops into the cooler. Secondary combustion air cools the product to about 200°F. The lime is discharged to a conveyor belt and the product is crushed and then conveyed to lime storage bins.

Combustion gases from Lime Kiln #4 pass through a kiln preheater, a pair of cyclones, and a gravel bed filter before they exit through a 63-foot stack to the atmosphere. Off-gases from Lime Kiln #5 pass through a tempering air damper, a pair of cyclones, and a gravel bed filter before leaving a 45-foot stack. The gravel bed filter consists of 14 bins with an upper and lower bed containing silica rock for dust collection.

The third lime kiln (Kiln #6) is a vertical kiln, fired with natural gas. Its capacity is 400 tons per day of lime product. Batches of limestone are fed into two vertical columns connected by a crossover duct. Combustion gas from calcining limestone in one column is directed through the crossover duct to preheat the fresh limestone charge in the second column. After 12 minutes, the firing stops and the lime drops out of the kiln. The empty column is filled with fresh limestone and the cycle is reversed. The product lime is crushed and then conveyed to storage bins.

Combustion gases from Lime Kiln #6 flow into a wet scrubber and exit a 10-foot stack on top of the vertical kiln (the total height above ground level for this stack is 167 feet). Product lime crushing and conveying systems are enclosed. However, transfer points, from kiln to conveyor and conveyor to storage bins, are not controlled.

Approximately two-thirds of the lime produced at this plant is loaded onto hauling trucks; the remainder is loaded onto rail cars. All lime product storage silos are equipped with manually adjustable loading trunks to reduce fugitive emissions generated during truck and rail car loading.

3.1.2 Base Year Emission Estimates

An emission inventory for all significant PM₁₀ emission sources impacting the Paul Spur area were made for those sources located in the immediate vicinity of Paul Spur. More distant sources were assumed to contribute to background concentrations. These data were used to supplement existing emissions information from ADEQ permit files, data compiled by Engineering-Science, and in a previous TSP inventory produced by TRW.

The major suspected sources of particulate matter impacting the Paul Spur area include:

- * stack and fugitive emissions from the Chemstar Douglas Lime Plant;
- * fugitive emissions from vehicular traffic on Chemstar Douglas Lime Plant unpaved roads; and
- * fugitive emissions from vehicular traffic on other paved and unpaved roads.

3.1.2.1 Determination of Emission Rate Estimates

Estimated emission rates for the different sources were determined using measured rates, activity data, emission factors, (Compilation of Air Pollutant Emission Factors, US EPA-AP42) and various models. Emission rates from lime plant point sources were determined using previously documented emission rates used to prepare the ADEQ required emission inventories and daily hours of operation or production rates.

Emission estimates are based on emission factors developed from test data, Arizona compliance testing, which was performed in February 1987 on Lime Kiln #4 and 6 at the Chemstar Douglas Lime Plant. In January 1988, stack emissions compliance tests were performed on Lime Kiln #5 by Engineers Testing Laboratories, Inc. All test data used to calculate emission factors were obtained using test methods in accordance with EPA Method 5 procedures.

Since there are no test data at the Chemstar Douglas Lime Plant for the following process fugitive emission sources, these sources are best represented by published emission factors specific to the lime manufacturing industry: crushing and screening operations, transfer points and conveying, and truck and rail loading. The emission factors with their corresponding references are shown in Table 3.1.

Additional information used in determining emissions were wind data, traffic counts, and PM₁₀ soil content data in conjunction with emission factors cited in the literature.

Estimated emission rates for each source are based on the emission factors in Table 3.1 and on lime production data provided by Chemstar Inc. The relative contribution of particulate matter generated by each industrial process at the plant is also shown in Table 3.2. This table clearly shows that industrial process fugitive emissions are of primary concern. In particular, the greatest amount of particulate emissions are generated windblown dust from cleared areas and on-plant unpaved roads, kiln #4 dust removal stack emissions from Kiln #5 and #4, and travel on the lime plant unpaved roads.

Point Source Emissions - Attachment #2 - (Revised 7/10/89)

Pt. #	TSP	PM-10	Reference
43	0.864 Lb/Ton	0.605 Lb/Ton	Stack Test
53	0.600 Lb/Ton	0.300 Lb/Ton	AP42 Page 8.15-8, Fig. 8.15-3
40	0.160 Lb/Ton	0.120 Lb/Ton	AP42 8.19.1-3, Table 8.19.1-1
23	0.600 Lb/Ton	0.300 Lb/Ton	AP42 Page 8.15-8, Fig. 8.15-3
56	0.171 Lb/Ton	0.140 Lb/Ton	Stack Test
48	0.160 Lb/Ton	0.120 Lb/Ton	AP42 8.19.1-3, Table 8.19.1-1
2	1.500 Lb/Ton	0.750 Lb/Ton	AP42 8.15-5
25b	0.160 Lb/Ton	0.120 Lb/Ton	AP42 8.19.1-3, Table 8.19.1-1
44	0.600 Lb/Ton	0.300 Lb/Ton	AP42 Page 8.15-8, Fig. 8.15-3
55	1.000 Lb/Lb	0.820 Lb/Lb (0.5 Leak factor)	AP42 8.15-5 and Engineering judgement
25a	0.160 Lb/Ton	0.120 Lb/Ton (0.5 Severity)	AP42 8.19.1-3, Table 8.19.1-1
41b	0.034 Lb/Ton	0.016 Lb/Ton (3 Severity)	***
50	0.034 Lb/Ton	0.016 Lb/Ton (2 Severity)	***
41c	0.034 Lb/Ton	0.016 Lb/Ton (2 Severity)	***
41d,e,f	0.034 Lb/Ton	0.016 Lb/Ton (1 Severity)	***
59	0.001 Lb/Ton	0.001 Lb/Ton (1 Severity)	AP42 8.19.2
47	1.000 Lb/Lb	0.660 Lb/Ton	Stack Test (and engineering judgement)
46	0.439 Lb/Ton	0.290 Lb/Ton	Stack Test

*** "Control of Open Fugitive Dust Sources - Final Report" EPA - 450/3-88-008, p. 4-3, eqn. 4.1

Table 3.2

Major Sources of PM-10 at Chemstar, Inc. Douglas Lime Plant
On March 10, 1988 (Revised 10/13/89)

Point Sources: Pt #	PM10 Source Description	PM10 Emission (g/s) (3/10/88)	Max. PM10 Emission (g/s) (3/10/88)	Recommended Control Measures	% Control Over Existing Controls	Revised PM10 Emission (g/s)	Revised Max. PM10 Emission (g/s)	Permit Condition Emission (g/s)	PM10 Emission (g/s) (3/10/88)
43	Kiln 5 stack	2.42	2.69	Baghouse	90	0.24	0.27	-	2.69
24a	5 Loading stations at bins	1.04	1.16	Dry dust collector loading chute	90	0.10	0.12	-	1.16
55	Kiln 6 dampers (2) Kiln 5 damper	0.98	1.09	Improved damper seal	80	0.20	0.22	0.20	Permit
40	Double deck screen 5'x6', 3x3/8", 1"	0.73	0.81	Covering	50	0.37	0.41	-	0.81
56	Kiln 6 stack	0.49	0.55	No Change	0	0.49	0.55	-	0.55
53	Truck loading facility	0.47	0.52	Shroud, enclosure, collector	70	0.14	0.16	-	0.52
48	Screen on top of Kiln 6 hopper	0.47	0.52	Covering	50	0.23	0.26	-	0.52
23	+ 1/2" lime delivery	0.41	0.45	Shroud, enclosure, collector	70	0.12	0.14	-	0.45
2	Francisco pit	0.39	0.43	More frequent watering better work practice	30	0.27	0.30	-	0.43
25b	Screen w/o tarp, 1/2 x 5/8	0.37	0.41	Covering	50	0.18	0.20	-	0.41
44	Kiln 5 dust delivery	0.32	0.35	Dust collector	80	0.06	0.07	0.06	Permit
25a	Screen with tarp, 1/4 x 3/8	0.18	0.20	No change	0	0.18	0.20	-	0.20
41b	Drop pt. 1	0.15	0.16	Enclose	50	0.07	0.08	-	0.16
48a	Screen fines	0.13	0.14	Dry dust collector	90	0.01	0.01	-	0.14
50	Bucket	0.11	0.12	Enclose	50	0.06	0.06	-	0.12
41d,e,f	Drop pt. 3,4,5	0.15	0.16	Enclose	50	0.07	0.08	-	0.16
41c	Drop pt. 2	0.10	0.11	Enclose	50	0.05	0.05	-	0.11
	Others **	0.25	0.28	No Change	0	0.25	0.28	-	0.28
47	Kiln 4 dust removal	0 *	7.50	Dry dust collector, conveyor, delivery	95	0.00	0.38	0.38	Permit
46	Kiln 4 stack	0 *	0.85	Baghouse	50	0.00	0.43	-	0.85
30	Conveyor to kiln #4 preheater	0 *	0.67	Dry dust collector, loading chutes, enclosures	50	0.00	0.34	-	0.67
SUB-TOTAL (Point Sources)		9.13	18.50			3.11	4.25	0.63	10.22

* Were not functioning at typical capacity on 3/10/88;
Normally these are significant sources of PM10.

** all points with emissions below 0.10 are lumped as Others

Table 3.2 (Cont'd)

Major Sources of PM-10 at Chemstar, Inc. Douglas Lime Plant
On March 10, 1988 (Revised 10/13/89)

PM10 Source Description	PM10 Emission (g/s) (3/10/88)	Max. PM10 Emission (g/s) (3/10/88)	Recommended Control Measures	% Control Over Existing Controls	Revised PM10 Emission (g/s)	Revised Max. PM10 Emission (g/s)	Permit Condition Emission (g/s)	PM10 Emission (g/s) (3/10/88)
ACRES								
34 Windblown dust from cleared areas including piles of fugitive lime dust	112.78	118.71	Driveway restrictions, watering, revegetation, removal, capping	55 (30-70)	50.75	53.42	50.75	Can-Am
17 Windblown dust from unpaved roads on-plant	56.39	59.36	Driveway restrictions, watering, chemical stabilization	60 (50-70)	22.56	23.74	22.56	Can-Am
Travel on unpaved roads on-plant	1.68	1.87	Driveway restrictions, watering, chemical stabilization	60 (50-70)	0.67	0.75	0.67	Can-Am
Total (Area sources)	170.85	179.94			77.09	82.16	74.61	10.22
Total (point sources + area sources)	179.98	198.43	Maximum allowable emission rate to achieve compliance of ambient (PM10) standard		88.19		A Total A+B	B 84.84

Fugitive emissions are generated from area sources such as wind-blown dust from cleared areas (including numerous piles), windblown dust from roads, travel on unpaved roads and fugitive dust resulting when limestone, chat, and flux are dumped from conveyors onto storage piles and when vehicles move the piles. Emission estimates were calculated for these sources using emission factor formulas, which consider the silt content of the material stored, the climate of the source area, and other factors. Since these factors were not available for the Chemstar Douglas Lime Plant, best engineering judgments were necessary.

Based on the existing control systems of the lime kilns and on the nature of the gas streams, the majority of the particulate matter from the lime kiln stacks are assumed to have particle diameters less than 10 microns. Fugitive particulate emissions from limestone storage, handling, and transfer typically have mean particle diameters of 3-6 microns, 45-70 percent of which are less than 5 microns. (See Emission Inventory and Air Quality Modeling for the Paul Spur Nonattainment Area, TRW, May 1989.)

4.0 Modeling and Analysis

Preliminary on-site observation and emission inventories (ES and TRW) indicated that the lime plant and associated activities are the only PM₁₀ sources in the Paul Spur area, with the exception of the Border Road. This observation was confirmed by the findings of CMB analysis.

CMB modeling was performed on the PM₁₀ elemental profile obtained by XRF data from samples collected during the intensive study period, and analysis was done using EPA source composition library data and Lime Plant data provided by John Cooper of NEA, Inc. The general results of the analysis for the three days with highest/lowest PM₁₀ filter loading at both sites are summarized in Table 4.1. These data imply that the primary constituent of all PM₁₀ samples is lime dust, with the highest percentage occurring at the north site where the highest ambient PM₁₀ concentrations occurred. However, even with relatively low concentrations at the south site the lime dust contribution to total mass was 51 percent for this data set. Road dust was not represented in the high concentration samples at the north site; however, on the three lowest concentration days, road dust averaged 15 percent of the total mass.

4.1 Summary of PM₁₀ Sampling/CMB Modeling

Wind speed and direction and PM₁₀ concentrations have been measured from mid-September 1987 through mid September 1988. These data indicate that southwest winds are associated with occurrences of highest particulate loading at the north site and that particulate sources southwest of that site are the major contributors to that loading. Major sources affecting the south site monitor are not clearly indicated by meteorological data; even the unpaved highway is not clearly a suspect as a major source when loading is greater at the south site.

The CMB modeling results are in agreement with the meteorological implications of the lime plant as the primary source of ambient PM₁₀ concentrations in the area around the plant. Road dust is another, but less significant, contributor to PM₁₀ concentrations.

Table 4.1

Average Percent Contribution to Total Mass

<u>PM₁₀ Sample Constituent</u>	<u>3 Highest Days (North)</u>	<u>3 Lowest Days (North)</u>	<u>3 Highest Days (South)</u>	<u>3 Lowest Days (South)</u>
Lime Dust	86	57	67	51
Road Dust	0	23	22	15
(NH ₄) ₂ SO	0	8	3	18
Others	<u>14</u>	<u>12</u>	<u>18</u>	<u>16</u>
TOTAL	100	100	100	100

Others: Miscellaneous chemicals believed to be part of the background.

4.2 Proportional Rollback Modeling

Rollback calculations were used to determine the most effective way to reach the PM₁₀ goal of 50 µg/m³ (annual average) and 150 µg/m³ (24-hour max.).

According to the Guideline Document, proportional models may be used in conjunction with receptor modeling if the air quality problem is clearly associated with a few specific sources (EPA-450/2-86-001, pp. 4-10), which is clearly the case at Paul Spur.

A 24-hour PM₁₀ reading of 285 µg/m³ occurred on March 10, 1988, which was selected as a "design day" for control measure evaluation. This was not only because of the relatively high PM₁₀ loading but also because wind direction was persistently out of the southwest quadrant and wind speeds were high enough to result in surface soil erosion from disturbed areas during most of the day. (See Tables 4.2 and 4.3.) Measurement of ambient concentrations of PM₁₀ were used to estimate PM₁₀ emissions at the lime plant under a "design day" scenario.

In order to determine the amount of control needed to bring the Paul Spur PM₁₀ reading on March 10 to compliance level, a simple proportional rollback procedure was exercised, using the following equation:

$$R = [A-B/A-C] * [100]$$

Where:

R is the required percent reduction needed to achieve the air quality standard.

A is the air quality measurement which exceeds the established air quality standard and is identified as the design value for corrective plans.

B is the air quality standard for the pollutant in an averaging time corresponding to the measured concentration (A).

C is the estimated contribution to measurement A attributable to sources outside the study area (i.e. background concentration).

$$[135/266] * 100 = 51\%$$

For this exercise, the following variable values were set or determined:

A = 285

B = 150

C = 19 (i.e. the concurrent PM₁₀ reading for Organ Pipe National Monument).

R = 51%

As the above calculations indicate, the particulate emission reduction of 51% is needed to achieve the PM₁₀ NAAQS. Because emissions from the lime plant would have impacted the monitor for virtually the entire 24-hour period, it was assumed that the 51% reduction in plant emissions would accomplish the required reduction.

Control measures for various PM₁₀ point sources were considered and revisions to the emission rates were determined according to the respective controls. For vehicle-generated PM₁₀ from unpaved roads, before and after control, emission rates were determined by using Engineering-Science's (ES) inventory data (1987). The emission rates for windblown PM₁₀ from cleared areas and unpaved plant roads were determined by using the TRW Report (1982), and emission rates for windblown PM₁₀ from miscellaneous piles were calculated using Control of Open Fugitive Dust Sources (EPA, 1988).

Attainment of the 24-hour ambient PM₁₀ standard under "design day" conditions could be accomplished by applying controls shown in Table 5.2. Attainment of the annual PM₁₀ standard would also be accomplished since it is exceeded by a smaller margin. A complete discussion of the selected control strategies is provided in section 6 of this document.

Table 4.2

WIND DATA
 PAUL SPUR, ARIZONA
 March 10, 1988

<u>MONTH</u>	<u>DAY</u>	<u>TIME(mst)</u>	<u>DIRECTION</u>	<u>SPEED</u>
3	10	15	247.5	6.1
3	10	45	247.5	9.8
3	10	115	247.5	7.8
3	10	145	264.4	4.3
3	10	215	225.0	4.5
3	10	245	219.4	5.8
3	10	315	253.1	3.5
3	10	345	292.5	3.1
3	10	415	219.4	3.1
3	10	445	219.4	4.4
3	10	515	219.4	4.5
3	10	545	230.6	5.5
3	10	615	225.0	5.8
3	10	645	258.8	4.2
3	10	715	196.9	1.3
3	10	745	320.6	2.9
3	10	815	123.8	3.4
3	10	845	50.6	4.0
3	10	915	230.6	12.4
3	10	945	236.3	13.3
3	10	1015	253.1	11.7
3	10	1045	253.1	16.3
3	10	1115	253.1	24.4
3	10	1145	258.8	20.6
3	10	1215	264.4	19.1
3	10	1245	247.5	22.7
3	10	1315	258.8	23.8
3	10	1345	247.5	26.9
3	10	1415	247.5	26.6
3	10	1445	253.1	23.5
3	10	1515	253.1	25.2
3	10	1545	247.5	24.7
3	10	1615	258.8	22.3
3	10	1645	253.1	23.6
3	10	1715	253.1	25.3
3	10	1745	253.1	22.8
3	10	1815	253.1	20.0
3	10	1845	253.1	21.8
3	10	1915	253.1	21.0
3	10	1945	253.1	20.8
3	10	2015	253.1	18.9
3	10	2045	258.8	15.6
3	10	2115	264.4	14.6
3	10	2145	253.1	16.2
3	10	2215	258.8	17.8
3	10	2245	264.4	15.3
3	10	2315	253.1	15.6
3	10	2345	247.5	7.6

Table 4.3

WIND ROSE DATA
 PAUL SPUR, ARIZONA
 March 10, 1988

	RELATIVE FREQUENCY	AVERAGE SPEED
N	0.0	0.0
NNE	0.0	0.0
NE	2.1	4.0
ENE	0.0	0.0
E	0.0	0.0
ESE	2.1	3.4
SE	0.0	0.0
SSE	0.0	0.0
S	0.0	0.0
SSW	2.1	1.3
SW	18.8	6.6
WSW	62.5	18.2
W	8.3	13.3
WNW	2.1	3.1
NW	2.1	2.9
NNW	0.0	0.0

5.0 Determination of Control Strategies

Table 5.1 summarizes estimated categorical emissions on the selected day. Also presented are revised emissions after the effects of new controls were applied to the emission rates.

Table 5.1

Summary of PM₁₀ Emissions Data
Chemstar - Paul Spur
March 10, 1988

Design Day Estimated Emissions (grams/second):

Point Sources	9.13
Cleared areas & scattered piles of lime dust (wind blown)	112.78
Unpaved Roads (wind blown)	56.39
Travel on Unpaved Roads	1.68
TOTAL	179.98

Max. Estimated Emissions with New Controls (grams/second):

Point Sources	10.85
Cleared areas & scattered piles of fugitive lime dust (wind blown)	50.75
Unpaved Roads (wind blown)	22.56
Travel on Unpaved Roads	0.67
TOTAL	84.83

Emissions Level Required to Reach Attainment
(49% of 179.98) (grams/second) 88.19

After selection of the design day, process rates and PM₁₀ source status information were obtained from facility personnel, and a site visit was made by ADEQ air quality specialists to identify PM₁₀ sources and estimate their relative impact. Subsequently, a list of PM₁₀ sources and estimated emission rates for March 10 was prepared. (See Table 5.2.) Kiln 4 was not in operation on March 10, 1988, but is known to be a relatively significant PM₁₀ source, thus it was included in the column for maximum PM₁₀ emission. Screen modeling showed that had the kiln and the associated dust delivery system been in operation it would have contributed 67 $\mu\text{g}/\text{m}^3$ to the ambient reading.

Table 5.2

Major Sources of PM-10 at Chemstar, Inc. Douglas Lime Plant
On March 10, 1988 (Revised 10/13/89)

Point Sources: Pt #	PM10 Source Description	PM10 Emission (g/s) (3/10/88)	Max. PM10 Emission (g/s) (3/10/88)	Recommended Control Measures	% Control Over Existing Controls	Revised PM10 Emission (g/s)	Revised Max. PM10 Emission (g/s)	Permit Condition Emission (g/s)	PM10 Emission (g/s) (3/10/88)
43	Kiln 5 stack	2.42	2.69	Baghouse	90	0.24	0.27	-	2.69
24a	5 Loading stations at bins	1.04	1.16	Dry dust collector loading chute	90	0.10	0.12	-	1.16
55	Kiln 6 dampers (2) Kiln 5 damper	0.98	1.09	Improved damper seal	80	0.20	0.22	0.20	Permit
40	Double deck screen 5'x6', 3x3/8", 1"	0.73	0.81	Covering	50	0.37	0.41	-	0.81
56	Kiln 6 stack	0.49	0.55	No Change	0	0.49	0.55	-	0.55
53	Truck loading facility	0.47	0.52	Shroud, enclosure, collector	70	0.14	0.16	-	0.52
48	Screen on top of Kiln 6 hopper	0.47	0.52	Covering	50	0.23	0.26	-	0.52
23	+ 1/2" lime delivery	0.41	0.45	Shroud, enclosure, collector	70	0.12	0.14	-	0.45
2	francisco pit	0.39	0.43	More frequent watering better work practice	30	0.27	0.30	-	0.43
25b	Screen w/o tarp, 1/2 x 5/8	0.37	0.41	Covering	50	0.18	0.20	-	0.41
44	Kiln 5 dust delivery	0.32	0.35	Dust collector	80	0.06	0.07	0.06	Permit
25a	Screen with tarp, 1/4 x 3/8	0.18	0.20	No change	0	0.18	0.20	-	0.20
41b	Drop pt. 1	0.15	0.16	Enclose	50	0.07	0.08	-	0.16
48a	Screen fines	0.13	0.14	Dry dust collector	90	0.01	0.01	-	0.14
50	Bucket	0.11	0.12	Enclose	50	0.06	0.06	-	0.12
41d,e,f	Drop pt. 3,4,5	0.15	0.16	Enclose	50	0.07	0.08	-	0.16
41c	Drop pt. 2	0.10	0.11	Enclose	50	0.05	0.05	-	0.11
	Others **	0.25	0.28	No Change	0	0.25	0.28	-	0.28
47	Kiln 4 dust removal	0 *	7.50	Dry dust collector, conveyor, delivery	95	0.00	0.38	0.38	Permit
46	Kiln 4 stack	0 *	0.85	Baghouse	50	0.00	0.43	-	0.85
30	Conveyor to kiln #4 preheater	0 *	0.67	Dry dust collector, loading chutes, enclosures	50	0.00	0.34	-	0.67
SUB-TOTAL (Point Sources)		9.13	18.50			3.11	4.25	0.63	10.22

* Were not functioning at typical capacity on 3/10/88;
Normally these are significant sources of PM10.

** all points with emissions below 0.10 are lumped as Others

Table 5.2 (Cont'd)

Major Sources of PM-10 at Chemstar, Inc. Douglas Lime Plant
 On March 10, 1988 (Revised 10/13/89)

PM10 Source Description	PM10 Emission (g/s) (3/10/88)	Max. PM10 Emission (g/s) (3/10/88)	Recommended Control Measures	% Control Over Existing Controls	Revised PM10 Emission (g/s)	Revised Max. PM10 Emission (g/s)	Permit Condition Emission (g/s)	PM10 Emission (g/s) (3/10/88)
ACRES								
34 Windblown dust from cleared areas including piles of fugitive lime dust	112.78	118.71	Driveway restrictions, watering, revegetation, removal, capping	55 (30-70)	50.75	53.42	50.75	Can-Am
17 Windblown dust from unpaved roads on-plant	56.39	59.36	Driveway restrictions, watering, chemical stabilization	60 (50-70)	22.56	23.74	22.56	Can-Am
Travel on unpaved roads on-plant	1.68	1.87	Driveway restrictions, watering, chemical stabilization	60 (50-70)	0.67	0.75	0.67	Can-Am
Total (Area sources)	170.85	179.94			77.09	82.16	74.61	10.22
Total (point sources + area sources)	179.98	198.43	Maximum allowable emission rate to achieve compliance of ambient (PM10) standard		88.19		A B Total A+B	84.84

6.0 Selected Control Strategies for the Paul Spur Area

This section describes the selected control strategies for all major point and area sources at Paul Spur. Discussion on each source will be followed by a description of means of implementation.

POINT SOURCES

6.1 Transfer and Conveying

This SIP requires the Chemstar Inc. to enclose all conveyor belt transfer points or, alternatively, to enclose and control by using an exhaust system and dust collector, or by using dust suppression chemicals. No later than the fifteenth day of each calendar quarter, Chemstar Inc. shall submit a compliance report to the Director specifying the date of modification of each applicable transfer point and provide a short description of the change or modification. If the modification includes installation of dust collector and exhaust fan, the report shall specify: A) the date of purchase of this equipment and B) the date of completion of installation of this equipment. Chemstar Inc. is also required to comply with the mandates of A.A.C. R18-2-406.

6.1.1 Demonstration of Effectiveness

The effect of a decrease of 50% in the PM₁₀ emissions is demonstrated in Table 5.2.

6.1.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

6.2 Loading and Unloading

As it was discussed before, the truck loading facility at the Paul Lime plant is less than adequately controlled, and therefore, further mitigative measures are necessary to reduce the PM₁₀ emissions from this source. Chemstar Inc. has responded to this requirement by designing two new bulk lime storage and loading facilities to adequately control this source. They plan to construct these facilities in two phases. They have already requested a permit to construct the first facility and plan to construct the second facility in 1990. The facilities will be properly designed to reduce PM₁₀ emission through proper enclosures and application of Best Available Technology.

Furthermore, this SIP requires Chemstar Inc. to enclose all drop points at the Chemstar Douglas Lime Plant.

Douglas

Loading and unloading activities, as well as material delivery and handling, are also subject to the requirements of A.A.C. R18-2-405.B. and R18-2-406. Chemstar Inc. will take adequate measures to comply with these regulations. The reporting requirements for this source is identical to the one in section 7.1 of this document.

6.2.1 Demonstration of Effectiveness

The effect of a decrease of 70% in the PM_{10} emissions is demonstrated in Table 5.2.

6.2.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

6.3 Storage Piles

There are basically two types of material piles at the Paul Spur Lime Plant: those used as storage piles and those formed due material build up from leaky operation and generally poor housekeeping practices. Discussions on the second type of piles is contained in section 6.6 of this document.

In regard to the storage piles, this SIP requires that all stacking and reclaiming machinery, which operate at these piles, to be either adjustable in order to provide minimum fall on storage piles or to have sleeves. Regulations regarding storage piles are contained in A.A.C. R18-2-407.

6.3.1 Demonstration of Effectiveness

The effect of a decrease of 60% in the PM_{10} emissions is demonstrated in Table 5.2.

6.3.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

6.4 Enclosure of Screens and Improvement of Damper Seals

According to the emission inventory developed for the Paul Spur area, all screens need to be enclosed. In addition, the damper seals at kiln 5 and 6 need to be improved. This SIP requires Chemstar Inc. to cover all screens and to improve the damper seals at the two mentioned kilns, within 180 days after the issuance of their permit.

6.4.1 Demonstration of Effectiveness

The effect of a decrease in PM₁₀ emissions of 50% for the screens and of 80% for the seals is demonstrated in Table 5.2.

6.4.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

6.5 Lime Kilns

The emission inventory developed for the Paul Spur area indicates that Kiln 5 stack and Kiln 4 dust removal are two of the highest point source contributors to the PM₁₀ emissions in this Group I area. With a combined maximum contribution of 10.2 g/s, these two sources account for 55 percent of PM₁₀ emissions from all point sources but only 5 percent of all sources in the Paul Spur Group I area.

Within 30 days of issuance of this permit, Chemstar, Inc. shall submit an Application for Installation Permit to modify the existing dust transfer and storage system for the existing Rotary Lime Kiln Number 5 Dust Collector. Design of the system modification shall be subject to the requirements of R18-2-301. Design of the system shall be approved in advance by the Director and shall include all equipment necessary to collect, transport and dispose of the collected dust in such a manner that visible emissions are controlled to the maximum extent practicable. The degree of control will be stipulated in the Installation Permit. Construction of the system shall be completed within 120 days of issuance of the installation permit.

Within 30 days of Permit issuance, Chemstar, Inc. shall submit an Application for Installation Permit to install a dust transfer and storage system for the existing Rotary Lime Kiln Number 4 Dust Collector. Design of the system shall be subject to the requirements of R18-2-301. Design of the system shall be approved in advance by the Director and shall include the following requirements:

- a) Beginning at the current point of dust removal, the system shall include a fully enclosed screw-type or equivalent conveyor with fully enclosed transfer point(s);
- b) The system shall include all equipment necessary to collect, transport and dispose of the collected dust in such a manner that there are no visible emissions; and
- c) Construction of the system shall be completed within 120 days of issuance of the installation permit.

6.5.1 Demonstration of Effectiveness

The effect of a decrease of 95% in the PM₁₀ emissions is demonstrated in Table 6.3.

6.5.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

AREA SOURCES

PM₁₀ maximum emission contribution from area sources at Paul Spur is estimated to be 179.94 g/s. This is close to 91 percent of total PM₁₀ emission at this Group I Area. The windblown dust causes more than 99 percent of the total PM₁₀ emission from area sources.

The following sections will discuss each of the three area sources and their appropriate control strategies.

6.6 Cleared Areas Windblown Dust (including scattered piles of lime dust)

Vehicular activities within some portion of the Chemstar Douglas Lime Plant seem to not be limited to any designated road system. Therefore, these areas have become cleared of their vegetation and exposed to wind erosion. Fine lime dust deposits in these cleared areas is further aggravating the PM₁₀ pollution problem.

Furthermore, poor housekeeping has caused fine material build up (piles of fine lime dust) on catwalks and railings, plant buildings, around and under conveyors, around transfer points, and around process equipment. These piles were included in the cleared area (windblown) category in Table 5.2.

PM₁₀ maximum emission from the cleared areas (including scattered piles of lime dust) has been estimated at 118.71 g/s. This is approximately 66 percent of PM₁₀ emission from area sources and 60 percent of total PM₁₀ emission at Paul Spur area (including Kiln 4).

The watering and housekeeping practices at the plant seems to be inadequate, and therefore, this SIP requires the following:

- a) No later than 90 days after permit issuance, Chemstar Inc. shall operate and maintain a sufficient number of trucks for the reduction of emissions of particulate matter for the areas indicated in Figure 6.1. The water trucks shall utilize chemical dust stabilizers (e.g. magnesium chloride or sodium lignosulfonate). The water trucks shall operate in such a manner as to allow all the areas indicated in Figure 6.1 to be adequately

wetted to the extent that an additional 60 percent control of PM₁₀ emissions can be demonstrated by conductivity or silt testing.

- b) Within 90 days of permit issuance, Chemstar Inc. shall place all existing area water sprinklers located on the Chemstar's processing area on a timer to be operated to assure that surface areas under the influence of the sprinklers are moist at all times, or, if applicable, until the surface areas are revegetated. Chemical dust suppressants may be used to reduce the frequency of watering. The control method used shall be demonstrated, by silt testing, to provide an additional control of PM₁₀ emissions of not less than 60 percent.
- c) Within 90 days of permit issuance, Chemstar Inc. shall submit a written plan for the development and maintenance of a system of in-plant roads. The plan shall include the following aspects:
1. Establishment, posting, and enforcement of speed limits not to exceed 20 miles per hour on these roads;
 2. Establishment of driving restrictions and/or physical barriers to prevent off-road travel; and
 3. Periodic chemical stabilization and/or revegetation for the areas restricted from travel. The effective emission control of this stabilization technique shall be demonstrated to provide an additional control of PM₁₀ emissions of not less than 55 percent, according to silt testing in those areas not revegetated to at least the average percent local ground cover.

The plan shall be implemented within 90 days of written OAQ approval.

- d) Within 90 days of permit issuance, Chemstar Inc. shall begin a program to minimize particulate emissions from piles of process waste material and dust by removal of the piles, capping, or chemical stabilization. For piles that are chemically suppressed, the net effective emission control of PM₁₀ shall be demonstrated, by silt testing, to provide an additional control of not less than 55 percent.

Within 90 days of Permit issuance, Chemstar Inc. shall submit to the OAQ a plan for conductivity and silt testing that includes periodic testing subsequent to the application of chemical dust suppressants and prior to the reapplication of suppressants as stipulated above.

e) Within 90 days of Permit issuance, Chemstar Inc. shall submit a written plan to periodically remove all fine dust accumulated at the following areas:

1. On catwalks and railing,
2. On plant buildings,
3. On, around, and under conveyors,
4. Around transfer points, and
5. On and around process equipment.

The plan shall specify the method of removal of the dust from the above areas. The method of removal shall not allow the reentrainment of dust into the atmosphere during cleanup, and shall include the use of a vacuum truck or a mobile vacuum system, use of a spray hose with wipedown, or use of some other method which has been demonstrated to have an equivalent degree of effectiveness at removing the buildup of fine dust at the above areas. If a spray hose method is used, the runoff shall not cause the accumulation of particulates on or near the plant premises.

The plan shall specify the method of disposal of the dust. Disposal shall be done in such a manner that the dust is not reentrained into the atmosphere.

The plan shall describe a program to periodically continue to remove dust from the above areas including a specification of the frequency of cleanup. The frequency of cleanup shall be sufficient to adequately control fugitive emissions and may consider and reflect the deposition rates at each location. The plan shall demonstrate that the average depth of aerosolizable materials deposited on surface areas described above shall not exceed 1/32 inch.

The plan shall be implemented within 60 days of written approval by the OAQ.

The existing regulations regarding open areas and traffic generated particulates are contained in A.A.C. R18-2-404 and R18-2-405 and the regulations regarding the handling of material and storage piles are contained in A.A.C. R18-2-406 and R18-2-407.

6.6.1 Demonstration of Effectiveness

The following calculations demonstrate the effectiveness of controlling accumulated maximum average thickness dust in the following areas:

1. On catwalks and railings,
2. On plant buildings,
3. On, around and under conveyors,
4. Around transfer points, and
5. On and around process equipment.

Total PM₁₀ from Table 6.3

2,527 lb/day

2 acres * 2 severity factor * 3.32 g/sec for 24 hrs.

2 Acres total area

density = 0.8 (loose lime)

silt fraction 0.2

PM₁₀ / TSP ratio 0.5

average thickness of deposit 1/32 inch

Total PM₁₀ emission = 2 (acre) * 0.8 * 62.4 (lb/ft³) * 0.2 *
0.5 * 1/32 * 1/12 ft * 4.356 * 10⁴ (ft²/acre) = 1,133 lb/day.

This demonstrates a 55 percent control strategy:

$$\text{Control Efficiency} = 100 - [(1133/2527) * 100] = 55$$

6.6.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

6.7 Travel on Unpaved Roads

This source is estimated to contribute a maximum total of 1.87 g/s to the total PM₁₀ emission in Paul Spur. This is approximately 1 percent of all area sources and 0.9 percent of total PM₁₀ emission at this group I area.

The SIP requirements for controlling this source is included in section 6.6.

6.7.1 Demonstration of Effectiveness

The control of 60% can be obtained for the roads by maintaining a ground inventory of chemical suppressants at or above the level of 0.05 (gal/yd). [Ground inventory is a measure of residual effects from previous applications. It is found by adding together the total volume (per unit acre) of concentrate (not solution) since the start of the dust control season. (Control of Open Fugitive Dust Sources, EPA-450/3-88-008).] For a monthly application frequency this ground inventory value will give a dust reduction of about 60%.

6.7.2 Means of Implementation

These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

6.8 Roads, other than Cleared Areas

This is a source of windblown dust and is estimated to contribute a maximum total of 59.36 g/s to the total PM₁₀ emission in Paul Spur. This is approximately 33 percent of all area sources and 30 percent of total PM₁₀ emission at this group I area.

The SIP requirements for controlling this source is included in section 6.6.

6.8.1 Demonstration of Effectiveness

The effect of a decrease of 60% in the PM₁₀ emission is discussed in section 6.7.1.

6.8.2 Means of Implementation

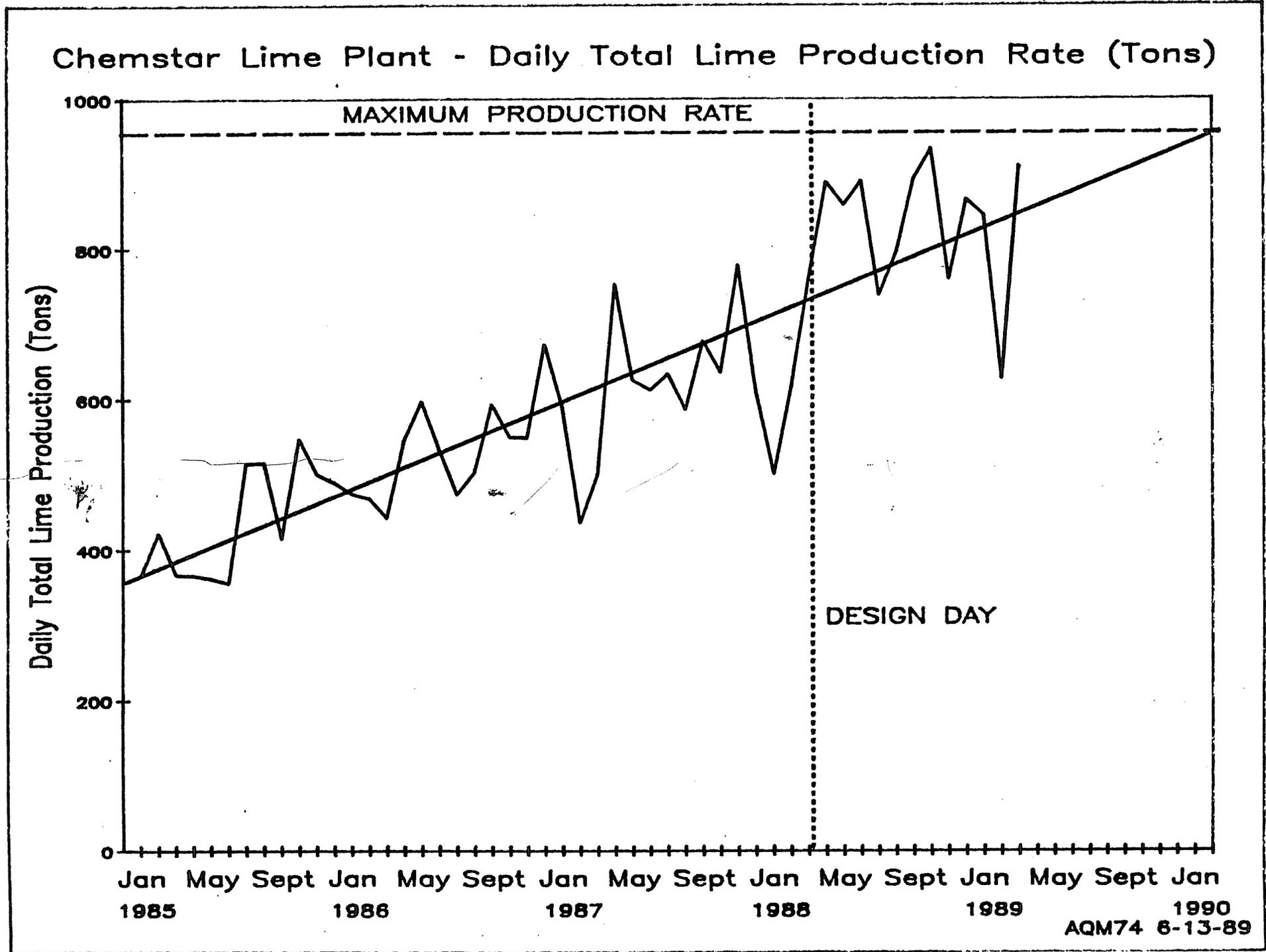
These controls will be implemented by conditions set forth in Chemstar's operating permit, to be issued within the third quarter of 1990.

7.0 Projected Particulate Emissions

In order to forecast particulate emission levels from the lime manufacturing plant, the emission projection methodology must consider the impact of prospective control modifications and regulations, plant process modifications, and plant production trends for each year under investigation. Trends at the Chemstar Douglas Lime Plant indicate that daily lime production will increase to its maximum level by January 1990 and thus remain through the year 1998. This assumption is based on extrapolation from production data provided by Chemstar Inc. personnel. (See Figure 7.1.)

7.1 Projected Annual and 24-hour Emission Levels

Projected emission estimates are based on the implementation of proposed control strategies (See section 7), and on the assumption that production will remain at the 1990 levels. Table 7.1 summarizes the revised PM_{10} emissions for all sources for 1990 and 1998. This table indicates that the PM_{10} standards can be achieved and maintained in the Paul Spur Group I area.



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Figure 7.1

Table 7.1

Demonstration of Attainment and Maintenance
of Annual PM₁₀ NAAQS through 1998

Actual & Projected Annual PM₁₀ Concentrations
for Paul Spur, Arizona

Year	Concentrations (ug/m ³)	
	W/O Controls	With Controls
1986	89 ¹	
	111 ¹	
1988	58 ¹	
	60 ¹	
1990	61 ¹	61
	62	37
1992	*	*
	*	*
	*	*
1994	*	*
	*	*
1996	*	*
	*	*
1998	70	46

Note: ¹ Measured concentrations

* Presumed linear growth between 1990 and 1998

8.0 Related Issues

8.1 Ambient Monitoring

The State will conduct ambient PM₁₀ sampling consistent with 40 C.F.R. Part 58 to monitor the effectiveness of the implemented control strategies.

9.0 Preconstruction Review

All new major sources and modifications to existing major sources in Arizona are subjected to state requirements for preconstruction review and permitting. (See A.A.C., Title 18, Chapter 2, Articles 1, 2 and 3.) All new major sources and modifications to existing major sources in Arizona are subject to the New Source Review (NSR) provisions of these rules, including Nonattainment Area Analysis (NAA) and Prevention of Significant Deterioration (PSD). The State Prevention of Significant Deterioration (PSD) NSR program was conditionally approved by EPA in 1982, and is undergoing revision at this time in order to acquire full approval.

The PM₁₀ PSD requirements for Arizona were not established at the time this report was drafted. This was due to unavailability of PM₁₀ increments at the federal level. Upon promulgation by EPA and within a reasonable time thereafter, the State will adopt necessary rules in order to have a PM₁₀ PSD program which meets the requirements of the Part 52 PSD regulations.

10.0 Contingency Plan

This plan has demonstrated the attainment and maintenance of PM₁₀ NAAQS through 1998. Since ambient monitoring will be the final proof for such an attainment, the State commits to reevaluate this SIP if ambient PM₁₀ concentrations after the implementation of this plan exceed that of NAAQS. The State commits to reevaluate this SIP and explore the implementation of additional control strategies in the event that:

- a) A violation of PM₁₀ NAAQS occurs;
- b) It is established that emission reductions committed to in the SIP have not been achieved; or
- c) A new source of PM₁₀ emissions is established in the Paul Spur Group I Area and the Department believes there is a probability that the additional emissions will result in a violation of the PM₁₀ NAAQS.

Some PM₁₀ control strategies that are reserved for future consideration are:

- a) paving or stabilizing the road to Naco (Cochise County Road #4182;
- b) requiring baghouse on Kiln 5 stack at the lime plant;

- c) requiring baghouse on Kiln 4 stack at the lime plant;
- d) requiring shroud, enclosure, or collector at the truck loading facility at the lime plant; and
- e) requiring better work practices at the Francisco Pit.

These measures will be implemented through revisions to the Arizona Administrative Codes, modifications to the Chemstar Inc.'s operating permit for the Douglas Lime Plant, and negotiation with responsible sources other parties responsible for PM10 emissions in the Paul Spur Group I Area.

11.0 Reasonable Further Progress Report

On an annual basis, the State will evaluate and demonstrate its progress in reaching the goal of attainment and maintenance of the PM₁₀ NAAQS through 1998. This will be achieved by the State by providing the following information in the form of an Annual Progress Report.

The first Annual Progress Report is due to EPA, Region 9, six months after the first full calendar year of implementation. The subsequent annual reports are due six months after the end of the calendar year.

For each control measure the State has committed to implement in this PM₁₀ SIP, the annual report will include:

- a) the names of each source affected;
- b) the current status of implementation of the control measure; this will include summarized information on the regulation development (if revision was necessary), negotiation with the sources and/or municipalities affected, project financing, engineering design and/or construction progress for the year, as appropriate.
- c) planned versus actual implementation and/or adoption dates of the control measure and/or regulation;
- d) planned versus actual effectiveness of the control measure;
- e) planned versus actual decrease/increase in contribution to ambient concentration;
- f) planned versus actual effect that area growth has had on the emissions reductions;
- g) brief explanation of shortfalls, where applicable; if shortfalls have occurred, the State will include a plan to develop a contingency plan or SIP revision which would be necessary to attain or maintain the NAAQS.

12.0 REFERENCES

PM₁₀ Emissions Inventory Data for the Paul Spur Planning Area, Engineering-Science, 1987, personal communication from Don Holtz to Anthony Leverock.

Workbook on Estimation of Emissions and Sources, Document P-A857, Environmental Research and Technology, Inc., 1981, Prepared for Utility Air Regulatory Group.

Control of Open Fugitive Dust Sources, US Environmental Protection Agency, EPA-450/3-88-008, Research Triangle Park, North Carolina, 1988.

Receptor Model Source Composition Library, US Environmental Protection Agency, EPA-450/4-85-002, Research Triangle Park, North Carolina, 1984.

PM₁₀ SIP Development Guideline, US Environmental Protection Agency, OAQPS, EPA-450/2-86-001, Research Triangle Park, North Carolina, June 1987.

Emission Inventory and Air Quality Modeling for the Paul Spur Nonattainment Area, TRW Preliminary Report, Contract No. 68-02-3515, May 1982.

APPENDIX A

Operating Permit for
Chemstar Douglas Lime Plant

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF AIR QUALITY
2005 North Central Avenue ■ Phoenix, AZ 85004 ■ Phone (602) 257-2285

OPERATING PERMIT

(As required by Title 49, Chapter 3, Article 2, Section 49-426, Arizona Revised Statutes)

This permit does not relieve applicant of responsibility for meeting all air pollution regulations.

1. PERMIT TO BE ISSUED TO (Business License Name of Organization that is to receive permit) _____
Chemstar, Inc.

2. NAME (OR NAMES) OF OWNER OR PRINCIPALS DOING BUSINESS AS THE ABOVE ORGANIZATION _____
Chemstar, Inc.

3. MAILING ADDRESS _____ Rt 1 Box 110
NUMBER STREET
Douglas Arizona 85607
CITY OR COMMUNITY STATE ZIP CODE

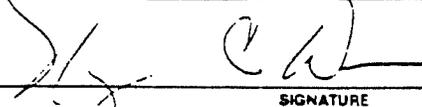
4. EQUIPMENT LOCATION ADDRESS _____ 10 miles west of Douglas on Paul Spur Road
NUMBER STREET
CITY OR COMMUNITY STATE ZIP CODE

5. FACILITIES OR EQUIPMENT DESCRIPTION _____
Three kilns; crushing, conveying, milling, and associated air pollution control
equipment and facilities for quarrying limestone, and
the manufacture of quick lime, as described on "Attachment B-Equipment List";
along with associated ancilliary facilities, equipment, and activities.

6. THIS PERMIT ISSUED SUBJECT TO THE FOLLOWING _____ See Attachment A & C

7. ADEQ PERMIT NUMBER _____ 0368-93 EXPIRATION DATE _____ June 23, 1993

ISSUED THIS _____ 23 DAY OF _____ June _____, 19 90


SIGNATURE

Assistant Director
TITLE

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR POLLUTION CONTROL
OPERATING PERMIT NUMBER 0368-93

Has been issued to Chemstar, Inc.

10 miles west of Douglas on Paul Spur Road

For operation of Manufacture of lime

Subject to terms and conditions therein and all applicable Arizona Revised Statutes and the Arizona Administrative Code.

Number 0368-93

Issued June 23, 1990

Expires June 23, 1993



ASSISTANT DIRECTOR

TO BE FRAMED AND DISPLAYED IN A CONSPICUOUS PLACE

ATTACHMENT A

CHEMSTAR, INCORPORATED - DOUGLAS PLANT
OPERATING PERMIT CONDITIONS FOR PERMIT #0368-93

I. FACILITIES OPERATION

Chemstar, Incorporated (hereinafter referred to as the Permittee) shall operate this stationary source, the Douglas Plant ("Source"), in compliance with all the applicable provisions of the Arizona Administrative Code (A.A.C.), Title 18, Chapter 2, R18-2-520 (kiln 4 & 5), R18-2-801 (kiln 6), R18-2-405, R18-4-406, and R18-4-407.

Issuance of this Permit shall not relieve the Source from compliance with any other local, State, or Federal laws or regulations.

All equipment, facilities, and systems used to achieve compliance with the terms and conditions of this Permit shall at all times be maintained in good working order and be operated as efficiently as possible so as to minimize air pollutant emissions.

II. MALFUNCTION

The Office of Air Quality (OAQ) shall be immediately notified at phone number (602) 257-2276 when any failure of air pollution control equipment or abnormal operation of any facility results in an increase in emissions above the limits established in Sections I or X of these conditions. This notification shall include the following information:

- A. The identity of the stack and/or other emission points where the excess emissions occurred.
- B. The magnitude of the excess emissions expressed in the units of the applicable emission limitation and the operating data and calculations used in determining the magnitude of the excess emissions.
- C. The time and duration or expected duration of the excess emissions.
- D. The identity of the equipment causing the excess emissions.
- E. The nature and cause of such emissions.
- F. If the excess emissions were the result of a malfunction, steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunctions.

- G. The steps that were or are being taken to limit the excess emissions. If the operating permit contains procedures governing source operation during periods of start-up or malfunction, the report shall contain a list of the steps taken to comply with the permit procedures.

III. RIGHT TO ENTER

Authorized representatives of the OAQ shall be permitted:

- A. At reasonable times, to enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this Permit.
- B. At reasonable times, to have access to and copy any records required to be kept under the terms and conditions of this Permit.
- C. To inspect any equipment, operation, or method required in this Permit.
- D. To sample emissions from the source.

IV. TRANSFER OF OWNERSHIP

This Permit shall not be transferable, whether by operation of law or otherwise, from one piece of equipment to another or from one person to another.

V. POSTING OF PERMIT

Permittee shall firmly affix this Permit, an approved facsimile of this Permit, or other approved identification bearing the permit number, upon such equipment for which the permit is issued in such a manner as to be clearly visible and accessible. In the event that such equipment is so constructed or operated that such permit cannot be so placed, the permit shall be mounted so as to be clearly visible in an accessible place within a reasonable distance of such equipment or maintained readily available at all times on the operating premises.

VI. PERMIT REVOCATION

This Permit may be revoked for the following reasons:

- A. The Director has reasonable cause to believe the permit was obtained by fraud or misrepresentation.

- B. The person applying for the permit failed to disclose a material fact required by the permit application form or the regulation applicable to the permit of which the applicant had or should have had knowledge at the time the application was submitted.
- C. The terms and conditions of the permit have been or are being violated.

VII. VIOLATIONS

In addition to permit revocation, if the terms and conditions of this Permit are violated, the Director may serve an Order of Abatement pursuant to A.R.S. §49-434, or may file a complaint alleging violation pursuant to A.R.S. §49-451, or both.

VIII. RENEWAL OF PERMIT

An application for a renewal of this Permit must be submitted to this department within sixty (60) days of the expiration of this Permit.

IX. REPORTING AND WRITTEN NOTIFICATION

A. Quarterly Production Reporting:

Permittee shall submit quarterly compliance reports by no later than the twentieth day following each calendar quarter. The quarterly report shall contain the following information:

1. For the limestone crushing plant:
 - a. For each month, the number of days in which the crushing plant crushed rock.
 - b. For each month, the quantity of rock (in tons) crushed by the crushing plant.
2. For each Lime Kiln:
 - a. For each month, the number of days in which the lime kiln produced lime.
 - b. For each month, the quantity of lime (in tons) produced by each lime kiln.

B. Quarterly Excess Emissions Reporting

Beginning after certification of the continuous opacity monitoring system required by Condition X.B, below, and by no later than the twentieth day following each calendar quarter, the Permittee shall submit a quarterly excess emissions report.

1. The quarterly excess emissions report shall provide, for each continuously monitored emission point, the following information:

- a. The total number of hours of operation of the kiln,
- b. For each opacity monitor, and using the form provided in Attachment E to this Permit, the number and duration of the monitor downtime incidents in total and totalized for each of the following standard causes:
 - i. Monitor equipment malfunction,
 - ii. Non-monitor equipment malfunction,
 - iii. Quality assurance,
 - iv. Other known cause,
 - v. Unknown cause.
- c. For opacity, and using the form provided in Attachment 2 to this Permit, the number and duration of periods of excess emissions (i.e. periods in which the monitor records an average six-minute opacity in excess of forty percent) in total and totalized for each of the following standard causes:
 - i. Start-up,
 - ii. Shutdown,
 - iii. Control equipment failure,
 - iv. Process problems,
 - v. Fuel problems,
 - vi. Other known cause,
 - vii. Unknown cause.

2. The quarterly excess emissions report shall include an attachment containing the following information:

- a. The magnitude of the six-minute periods during which emissions exceed forty percent opacity, including any conversion factor(s) used; date, starting and ending times, nature, cause, and corrective action taken for each excess emission, and a specific identification of each period of excess emissions that occurred during start-ups, shutdowns, and malfunctions and the corrective action taken.

- b. The date, starting and ending times of each instance when any monitor was inoperative (except for zero and span checks, etc.), and the description of the nature, cause, and corrective action taken for each such period.
3. The quarterly excess emissions report shall contain an attachment providing, for each lime kiln, a summary of all periods in which the bypass dampers are opened, or when the scrubber pressure drop is less than 1.3 inches of water (gauge). The summary shall include the starting period and duration of each period.

C. Quarterly Compliance Reporting.

By no later than the twentieth day following each calendar quarter, Permittee shall submit a compliance report to the Director.

1. For the continuous opacity monitoring system(s) (COMS) required to be installed pursuant to Condition X.B.1 of this Permit, the report shall specify:
 - a. The date of purchase of the COMS,
 - b. The date of completion of installation of the COMS,
 - c. The first scheduled date of performance specification testing.
2. For the Kiln 5 dust collection system required by Condition X.D of this Permit, the report shall specify:
 - a. The date of purchase of the equipment required for modification of the system,
 - b. The date of completion of installation of the equipment necessary for modification of the system.
3. For the Kiln 4 waste dust handling system required by Condition X.E of this Permit, the report shall specify:
 - a. The date of purchase of the system,
 - b. The date of completion of installation of the system.
4. For the material transfer requirements specified in Condition X.C of this Permit, the report shall specify the date of modification of each applicable transfer point and provide a short description of the change or modification. If the modification includes installation of a dust collector and exhaust fan, the report shall specify:
 - a. The date of purchase of this equipment,
 - b. The date of completion of installation of this equipment.

5. For modifications and changes made to all screening units in accordance with Condition X.F, the report shall specify the date of of modification of each applicable screen and provide a short description of the change or modification.
6. The report shall include a summary of the activities required by Condition X.G.
7. The report shall include a summary of the activities required by Condition X.H.1, X.H.3, and X.H.4. The report shall specify the times of application of control measures and any tests for efficiency.

X. OTHER CONDITIONS

A. Lime Kilns, Control Systems, and Bypass Monitoring

1. The Permittee shall maintain damper seals for each lime kiln in such a manner that they do not emit fugitive particulate emissions with an opacity in excess of five (5) percent as measured by reference method number 9.
2. Within 180 days of permit issuance, Permittee shall install a system to provide a written record of the initial time and duration of all bypasses of each positive control device for each lime kiln.

B. Continuous Opacity Monitoring Systems (COMS)

For Rotary Lime Kilns Number 4 and 5 and their dust collection systems, the following conditions apply:

1. Within 180 days of permit issuance, Permittee shall install, calibrate, maintain, and operate a continuous opacity monitoring system (COMS) to monitor and provide written record of the opacity of the gases discharged into the atmosphere from each rotary lime kiln.
2. No sooner than seven days and no later than thirty days following completion of installation of the COMS specified in X.B.1 above, Permittee shall demonstrate the performance of the COMS in accordance with Performance Specification Test Number 1 as referenced in the Arizona Testing Manual For Air Pollutant Emissions.
 - a. Permittee shall submit for the Director's approval a test plan no sooner than 14 days prior to the date of the test.
 - b. Within 60 days of completion of the tests, the Permittee shall furnish the Director with two written reports of the results of these tests.

C. Material Transfer

1. All conveyor belt transfer points shall either be enclosed to the maximum extent possible or, in the alternative, be enclosed and controlled by using an exhaust system and dust collector, or by use of dust suppressant chemicals applied with sprays as approved by the Director so as to prevent particulate matter from becoming airborne.
2. All stacking and reclaiming machinery at storage piles shall be adjusted to provide minimum fall on storage piles and/or shall have sleeves installed so as to prevent particulate matter from becoming airborne.

D. Rotary Lime Kiln Number 5 - Collected Dust Transfer System

Within 30 days of issuance of this permit, Permittee shall submit an Application for Installation Permit to modify the existing dust transfer and storage system for the existing Rotary Lime Kiln Number 5 Dust Collector. Design of the system modification shall be subject to the requirements of R18-2-301. Design of the system shall be approved in advance by the Director and shall include all equipment necessary to collect, transport and dispose of the collected dust in such a manner that visible emissions are controlled to the maximum extent practicable. The degree of control will be stipulated in the Installation Permit. Construction of the system shall be completed within 120 days of issuance of the installation permit.

E. Rotary Lime Kiln Number 4 - Collected Dust Transfer System

Within 30 days of Permit Issuance, Permittee shall submit an Application for Installation Permit to install a dust transfer and storage system for the existing Rotary Lime Kiln Number 4 Dust Collector. Design of the system shall be subject to the requirements of R18-2-301. Design of the system shall be approved in advance by the Director and shall include the following requirements:

1. Beginning at the current point of dust removal, the system shall include a fully enclosed screw-type or equivalent conveyor with fully enclosed transfer point(s).
2. The system shall include all equipment necessary to collect, transport and dispose of the collected dust in such a manner that there are no visible emissions.
3. Construction of the system shall be completed within 120 days of issuance of the installation permit.

F. Screens

Within 180 days of permit issuance, Permittee shall install covers over each screening unit. Alternatively, the Permittee may install enclosures around each screening unit in order to reduce the emissions of particulate matter.

G. Housekeeping Plan

Within ninety days of permit issuance, Permittee shall submit a written plan to periodically remove all fine dust accumulated at the following areas:

1. On catwalks and railing,
2. On plant buildings,
3. On, around, and under conveyors,
4. Around transfer points, and
5. On and around process equipment.

The plan shall specify the method of removal of the dust from the above areas. The method of removal shall not allow the re-entrainment of dust into the atmosphere during cleanup; the method shall include the use of a vacuum truck or mobile vacuum system, use of a spray hose with wipedown, or use of some other method which has been demonstrated to have an equivalent degree of effectiveness at removing the buildup of fine dust at the above areas. If a spray hose method is used, the runoff shall not cause the accumulation of particulates on or near the plant premises.

The plan shall also specify the method of disposal of the dust. Disposal shall be done in such a manner that the dust is not reentrained into the atmosphere.

The plan shall describe a program to periodically continue to remove dust from the above areas including a specification of the frequency of cleanup. The frequency of cleanup shall be sufficient to adequately control fugitive emissions and may consider and reflect the deposition rates at each location. The plan shall demonstrate that the depth of aerosolizable materials deposited on surface areas described above shall not exceed 1/32 inch.

The plan shall be implemented within 60 days of written approval by the OAO.

H. Control of Roads and Cleared Areas

1. Beginning not later than 90 days after permit issuance, Permittee shall at all times operate and maintain a sufficient number of water trucks for the reduction of emissions of particulate matter for the areas indicated in Attachment

Fig. 6.1 to this Permit. The water trucks shall utilize chemical dust stabilizers (e.g. magnesium chloride or sodium lignosulfonate). The water trucks shall operate in such a manner as to allow all the areas indicated on Attachment Fig. 6.1 to this Permit to be adequately wetted to the extent that an additional 60 percent control of PM10 emissions can be demonstrated by conductivity or silt testing.

2. Within 90 days of Permit issuance, Permittee shall place all existing area water sprinklers located on the Permittee's processing area on a timer to be operated to assure that surface areas under the influence of the sprinklers are moist at all times, or, if applicable, until the surface areas are revegetated. Chemical dust suppressants may be used to reduce the frequency of watering. The control method used shall be demonstrated, by silt testing, to provide an additional control of PM10 emissions of not less than 60 percent.
3. Within 90 days of Permit issuance, Permittee shall submit a written plan for the development and maintenance of a system of in-plant roads. The plan shall include the following aspects:
 - a. Establishment and posting of speed limits not to exceed 20 miles per hour on these roads,
 - b. Establishment of driving restrictions and/or physical barriers to prevent off-road travel, and
 - c. Periodic chemical stabilization and/or revegetation for the areas restricted from travel. The effective emission control of this stabilization technique shall be demonstrated to provide an additional control of PM10 emissions of not less than 55 percent, according to silt testing in those areas not revegetated to at least the average percent local ground cover.

The plan shall be implemented within 90 days of written OAQ approval.

4. Within 90 days of Permit issuance, Permittee shall begin a program to minimize particulate emissions from piles of process waste material and dust by removal of the piles, capping, or chemical stabilization. For piles that are chemically suppressed, the net effective emission control of PM10 shall be demonstrated, by silt testing, to provide an additional control of not less than 55 percent.
5. Within 90 days of Permit issuance, Permittee shall submit to the OAQ a plan for conductivity and silt testing that includes periodic testing subsequent to the application of chemical dust suppressants and prior to the reapplication of suppressants as stipulated above.

I. Emissions Testing of Lime Kilns

1. Within 180 days after Permit issuance, Permittee shall conduct performance tests on each lime kiln for total particulate emissions. EPA Reference Methods 1, 2, 3, 4, and 5, as contained in the Arizona Testing Manual For Air Pollutant Emissions shall be used to demonstrate compliance.

Not later than 14 days prior to each test, Permittee shall submit a written test plan in accordance with the Office of Air Quality Source Test Plan Requirements (Attachment F).

For each kiln test, a written report summarizing the results of each test shall be submitted not later than 30 days after completion of each test.

2. Within 540 to 600 days after Permit issuance, Permittee shall conduct performance tests on each lime kiln for total particulate emissions. EPA Reference Methods 1, 2, 3, 4, and 5, as contained in the Arizona Testing Manual For Air Pollutant Emissions shall be used to demonstrate compliance.

Not later than 14 days prior to each test, Permittee shall submit a written test plan in accordance with the Office of Air Quality Source Test Plan Requirements.

For each kiln test, a written report summarizing the results of each test shall be submitted not later than 30 days after completion of each test.

3. Within 180 to 240 days prior to the expiration of this Permit, Permittee shall conduct performance tests on each lime kiln for total particulate emissions. EPA Reference Methods 1, 2, 3, 4, and 5, as contained in the Arizona Testing Manual For Air Pollutant Emissions shall be used to demonstrate compliance.

Not later than 14 days prior to each test, Permittee shall submit a written plan in accordance with the Office of Air Quality Source Test Plan Requirements.

For each kiln test, a written report for the test results shall be submitted not later than 30 days after completion of each test.

J. Future Enforcement

The foregoing conditions shall not be modified or amended in any way prior to the adoption of the State Implementation Plan (SIP) for the Paul Spur PM10 area by the U.S. Environmental Protection Agency, and after such adoption, the foregoing

conditions shall not be modified or amended in any way without the SIP being first amended to reflect or allow such modification or amendment.

- K. Issuance of this permit shall not absolve the applicant from the requirement to operate this plant in a manner which complies with any other applicable statutes, rules and regulations of the governing federal, state, and local agencies.
- L. The total emissions of air contaminants from any of the sources shall not exceed the values stated on Attachment "C" entitled "Emission Sources - Maximum Allowable Emission Rates."

ATTACHMENT B - Equipment List

Chemstar, Inc. - Permit #0368-93

QUARRY

Quan.	Description	Type	Pollution Control
1	Primary Crusher	KVS 42x48 Jaw	Water
1	Secondary Crusher	El Jay 54" Cone	Water
1	Screen-Primary	Simplicity 6'x16' 3 deck	Baghouse Dust Collector
4	Screen-Secondary	1-Simplicity 6'x16' 3 deck 3-Seco 1 - 4x12 2 deck 2 - 4x10 2 deck	Baghouse Dust Collector Baghouse Dust Collector
13	Conveyor belts	Open	-----

KILNS

Quan.	Description	Type	Pollution Control
1	#4 Kiln System	Coal-fired KVS Rotary	Rexnord Gravel Bed Filter
1	#5 Kiln System	Coal-fired Fuller Rotary	Rexnord Gravel Bed Filter
1	#6 Kiln System	Gas-fired Maerz Vertical	Ducon Wet Scrubber
1	Dust Storage Loadout System	Enclosed Bin/Chute	Baghouse Dust Collector

LIMESTONE FEED

Quan.	Description	Type	Pollution Control
1	Kiln 4 Feed Screen	Kohlberg 4'x8' 1 Deck	---
1	Kiln 5 Feed Screen	6'x6' 2 Deck	---
1	Kiln 6 Feed Screen	Kohlberg 3'x6' 1 Deck	---
9	Conveyor Belts	Open	---

LIMEHANDLING

Quan.	Description	Type	Pollution Control
1	Rotary Kiln Lime Crusher	Gundlach Single Roll	---
1	Rotary Kiln Lime Screen	Homemade 3'x3' 1 Deck	---
1	Rotary Kiln Lime Screen	Colemen 3'x6' 1 Deck	---
1	Vertical Kiln Lime Crusher	Gundlach Double Roll	---
1	Vertical Kiln Lime Screen	Kohlberg 3'x6' 1 Deck	---
1	Vertical Kiln Loadout System	Enclosed Belt	---
1	Rotary Kiln Loadout System	Open Belt	---
22	Conveyor Belts	Open	---

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

This table lists all sources of air contaminants on applicant's property emitted by the facilities covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANT DATA

EMISSION RATES*

EMISSION POINT ID (1)	SOURCE NAME (2)	VOC (3)		NOx (4)		SO2 (5)		PART (6)		CO (7)		(7)	
		N/HR	T/Y	N/HR	T/Y	N/HR	T/Y	N/HR	T/Y	N/HR	T/Y	N/HR	T/Y
43	Kiln 5 stack			43.4	190.1	338.4	1482.2	37.9	166	31.0	135.8		
46	Kiln 4 stack			23.8	104.2	174.6	764.7	28.3	124	17.0	74.5		
61	Crushing Plant (Total for 3 stacks)							58.3	255				
56	Kiln 6 stack			48.6	212.9			5.0	22	34.7	152.0		

1. Emission point identification - either specific equipment designation or emission point number from plot plan.
2. Specific point source name. For fugitive sources use area name or fugitive source name.
3. Volatile organic compounds as defined in A.C.C. R18-2-101.170.
4. Total oxides of nitrogen.
5. Sulfur dioxide.
6. Particulate matter.
7. Other contaminants not listed; should be specific.

*Emission rates are based on the following operating schedule:
 Hrs/day 24 Days/week 7 Weeks/year 52 or Hrs/year 8760

Arizona Department of Environmental Quality
Office of Air Quality
Source Test Plan Requirements

The information specified below must be submitted to the Compliance Unit of the Office of Air Quality at least 14 days prior to the scheduled test date. This information is required in order to insure that proper test methods and procedures are utilized. The Compliance Unit will review the test plan, and in the event of any deficiencies or comments concerning the plan, will contact the company to arrange a meeting to discuss the test procedures. Submittal of this information will minimize the possibility of a test being rejected as a result of improper sampling or data collection procedures.

All testing shall be performed in strict accordance with the specified procedures.

A satisfactory test shall consist of three runs. Any variations in the sampling or analytical procedures must receive approval from this office prior to testing. Appropriate chain of custody procedures must be followed during the sampling and analysis.

The following information should be included in the source test plan:

1. Source Information:
 - A. Name (including serial number of equipment), address, and location of the facility being tested.
 - B. Responsible persons at the facility and telephone number.
2. Testing Firm Information:
 - A. Name and address of the firm conducting the testing.
 - B. Responsible person at the testing firm and telephone number.
3. Sampling Equipment:
 - A. A description of the emission sampling equipment including a schematic diagram of the sampling train.
4. Procedures:
 - A. Types of pollutants to be sampled.
 - B. A description of the sampling analysis procedures.
 - C. Documentation for any proposed variations from the specified procedures.

5. Emission Point Information:

- A. A sketch with dimensions indicating the flow of exhaust gases from the process through the control equipment and associated duct work to the stack.
- B. A diagram of the stack showing the dimensions and the configuration of the sampling location, and the distances to the nearest upstream and downstream flow interferences.
- C. A cross-sectional sketch of the stack at the sampling location, showing the locations of the sampling traverse points.
- D. Estimated flue gas conditions at the sampling location, including temperature, moisture content, and velocity.

6. Process Equipment:

- A. A description of the process operation, including a process flow sheet.
- B. Type and quantity of raw materials, catalysts, and products being used or produced in the process.
- C. Maximum rated capacity of the process.
- D. Actual maximum operating capacity of the process.
- E. Operating capacity during the previous six months period.
- F. Process data to be monitored and recorded to insure representative operation during the test and the sampling interval for recording.
- G. Normal process operating schedule during a 24-hour operating period.
- H. Normal maintenance schedule for this process.
- I. Type of feed stock or fuel that causes the greatest individual emissions, and the percent of annual production for which these materials are used.

7. Control Equipment:

- A. Description of emission control system, including the types of control equipment, manufacturer of control equipment, the rated capacity and efficiency of the control equipment.
- B. Data to be monitored and recorded to insure representative operation of the control equipment during testing and the sampling period for recording.
- C. Minimum acceptable values of all control device parameters, such as flow rates, pressure drops, temperature, and voltage of electrical input.
- D. Description of any conditioning of gases prior to control device.
- E. Normal maintenance schedule on control equipment for the previous year.

8. Data Sheets:

- A. Copies of all field data sheets to be used during the test, including data sheets to record process and control equipment parameters.

9. Chain of Custody:

- A. A description of the procedures that will be followed to maintain the integrity of the samples collected.
- B. copies of chain of custody seals and data sheets.

10. Quality Control:

(The following items should be available to the source test observer prior to the start of the test.)

- A. Calibration sheets for the dry gas meter, pitot tube, nozzle, and other equipment that requires calibration.
- B. Quality assurance control charts for the analytical procedures to be used in the analysis of the test samples.
- C. A list of preweighted filters to be used during particulate emissions testing.

PROCESS OPERATING PARAMETERS TO BE RECORDED AT LEAST EVERY HALF HOUR

ASPHALT PLANTS

Process Rate
Recycle Rate
Drum Temperature

POWER PLANTS

Generation Rate
Coal Feed Rate
Opacity, SO₂, NO_x and % CO₂ or % O₂ from CEM's (at least every 10 minutes)
Coal Analysis

OTHER SOURCES

Process Rate
Other parameters as applicable

IONIZED EQUIPMENT OPERATING PARAMETERS TO BE RECORDED AT LEAST EVERY HOURESP

Operating voltage (per field)
Operating current (per field)
Spark rate
Cleaning cycle
Fan current or speed

SCRUBBER

Pressure drop
Water flow rate
Water supply pressure
Fan speed or current

BAGHOUSE

Pressure drop (total)
Pressure drop (each compartment)
Number, type, and temperature range of bags
Damper position
Fan current or speed
Cleaning cycle

APPENDIX B

Related Arizona Administrative Code

ARTICLE 1. DEFINITIONS

R18-2-101. Definitions

In these Rules the following definitions in this Section shall govern, unless the context otherwise requires, and unless in conflict with a definition given in A.A.C. Title 9, Ch. 3, Article 8, New Source Performance Standards, or in Article 9, Hazardous Air Pollutant Standards. In such case, the definitions given in Articles 8 or 9 shall apply only to sources covered by those Articles, and the definitions given in this Section shall govern elsewhere.

1. "Acid mist" means sulfuric acid mist as measured by Method 8 in the Arizona Stack Testing Manual.
2. "Act" means the Clean Air Act, 42 U.S.C.A. § 7401 *et seq.*
3. "Actual emissions" means the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with Subparagraphs a. through c. below.
 - a. In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. The Director may allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored or combusted during the selected time period.
 - b. Lacking specific information to the contrary, the Director may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit.
 - c. For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.
4. "Administrator" means the Administrator of the United States Environmental Protection Agency.
5. "Affected facility" means, with reference to a stationary source, any apparatus to which a standard is applicable.
6. "Air pollution control equipment" means equipment used to eliminate, reduce or control the emission of air pollutants into the ambient air.
7. "Air quality control region" (AQCR) means an area so designated by the Administrator pursuant to Section 107 of the Federal Clean Air Act as amended, and includes:
 - a. Maricopa Intrastate Air Quality Control Region which is comprised of the County of Maricopa in Arizona.
 - b. Pima Intrastate Air Quality Control Region which is comprised of the County of Pima in Arizona.
 - c. Northern Arizona Intrastate Air Quality Control Region which encompasses the counties of Apache, Coconino, Navajo and Yavapai in Arizona.

d. Mojave-Yuma Intrastate Air Quality Control Region which encompasses the counties of Mohave and Yuma in Arizona.

e. Central Arizona Intrastate Air Quality Control Region which encompasses the counties of Gila and Pinal in Arizona.

f. Southeast Arizona Intrastate Air Quality Control Region which encompasses the counties of Cochise, Graham, Greenlee and Santa Cruz in Arizona.

8. "Allowable emissions" means the emission rate of a stationary source calculated using the maximum rated capacity of the source (unless the source is subject to Federally enforceable limits which restrict the operating rate, or hours of operation, or both) and the most stringent of the following:

a. The applicable new source performance standards or National Emission Standards for Hazardous Air Pollutants, as contained in A.A.C. Title 9, Ch. 3, Articles 8 or 9;

b. The applicable existing source performance standard, as approved for the Arizona SIP and contained in Article 5 of these Rules; or,

c. The emissions rate specified in any Federally promulgated rule or Federally enforceable permit conditions applicable to the State of Arizona.

9. "Alternative method" means any method of sampling and analyzing for an air pollutant which is not a reference or equivalent method but which has been demonstrated to the Director's satisfaction to, in specific cases, produce results adequate for the Director's determination of compliance.

10. "Ambient air" means that portion of the atmosphere, external to buildings, to which the general public has access.

11. "Architectural coating" means a coating used commercially or industrially for residential, commercial or industrial buildings and their appurtenances, structural steel and other fabrications such as, but not limited to, storage tanks, bridges, beams and girders.

12. "Arizona Testing Manual" means the Arizona Testing Manual for Air Pollutant Emissions.

13. "ASME" means American Society of Mechanical Engineers. All ASME test methods referenced as guides in these Rules shall be those methods adopted on or before June 1, 1980.

14. "Asphalt concrete plant" means any facility, as described in R18-2-508, used to manufacture asphalt concrete by heating and drying aggregate and mixing with asphalt cements.

15. "ASTM" means American Society for Testing and Materials. All ASTM test methods referenced as guides in these Rules shall be those methods adopted on or before June 1, 1980.

16. "Attainment area" means an area so designated by the Administrator acting pursuant to Section 107 of the Act as having ambient air pollutant concentration equal to or less than national primary or secondary ambient air quality standards for a particular pollutant or pollutants.

17. "Baseline area" means any area, within any intrastate area (and every part thereof) designated as attainment or unclassifiable in which the major

source or major modification establishing the baseline date would construct or would have an air quality impact equal to or greater than 1 ug/m^3 (annual average) of the pollutant for which the baseline date is established. Area redesignations under Section R18-2-217 cannot intersect or be smaller than the area of impact of any new major source or major modification which:

- a. Establishes a baseline date; or
- b. Is subject to 40 CFR 52.21 (or Section R18-2-304 after approval by the Administrator for inclusion in the Arizona SIP), and would be constructed in Arizona.

18. "Baseline concentration" means that ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and shall include:

- a. The actual emissions representative of sources in existence on the applicable baseline date, except as provided in Subparagraph c., below;
- b. The allowable emissions of major stationary sources which commenced construction before January 6, 1975, but were not in operation by the applicable baseline date;
- c. The following will not be included in the baseline concentration and will affect the applicable maximum allowable increase(s):
 - i. Actual emissions from any major stationary source on which construction commenced after January 6, 1975; and
 - ii. Actual emissions increases and decreases at any stationary source occurring after the baseline date.

19. "Baseline date" means the earliest date after August 7, 1977, that:

- a. A major stationary source or major modification submits a complete permit application to the Administrator under 40 CFR 52.21; or,
- b. A major stationary source or major modification submits a complete permit application to the Director under the applicable portions of Article 3 and Appendix 1 subsequent to their approval by the Administrator and integration into the Arizona SIP.
- c. The baseline date is established for each pollutant for which increments or other equivalent measure have been established if:
 - i. The area in which the proposed source or modification would construct is designated as attainment or unclassifiable on the date of its complete application under Subparagraph a: or b., above, as applicable; and,
 - ii. In the case of a major stationary source, the pollutant would be emitted in significant amounts, or in the case of a major modification, there would be a significant net emissions increase of the pollutant.

20. "Begin actual construction" means, in general, initiation of physical on-site construction activities on an emissions unit which are of a permanent nature. Such activities include, but are not limited to, installation of building supports and foundations, laying of underground pipework, and construction of permanent storage structures. With respect to a change in method of operation this

term refers to those on-site activities, other than preparatory activities, which mark the initiation of the change.

21. "Best available control technology" (BACT) means an emission limitation (including a visible emissions standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Director, on a case-by-case basis, taking into account energy, environmental and economic impact and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques, for control of such pollutant. In no event shall such application of BACT result in emissions of any pollutant, which would exceed the emissions allowed by any applicable new source performance standard or National Emission Standard for Hazardous Air Pollutants under A.A.C. Title 9, Ch. 3, Articles 8 and 9. If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.

22. "Black liquor" means waste liquor from the brown stock washer and spent cooking liquor which have been concentrated in the multiple effect evaporator system.

23. "Btu" means British thermal unit which is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.

24. "Bureau" means the Office of Air Quality within the Department of Environmental Quality.

25. "Calcine" means the solid materials produced by a roaster.

26. "Calorie" means the quantity of heat required to raise the temperature of one gram of water one degree Celsius.

27. "Capacity factor" means the ratio of the average load on a machine or equipment for the period of time considered to the capacity rating of the machine or equipment.

28. "Capture system" means the equipment (including ducts, hoods, fans, dampers, etc.) used to capture or transport particulate matter or gases generated by a process source to the air pollution control device.

29. "Categorical sources" means the following classes of sources:

- a. Coal cleaning plants (with thermal dryers);
- b. Kraft pulp mills;
- c. Portland cement plants;
- d. Primary zinc smelters;

- e. Iron and steel mills;
- f. Primary aluminum ore reduction plants;
- g. Primary copper smelters;
- h. Municipal incinerators capable of charging more than 250 tons of refuse per day;
- i. Hydrofluoric, sulfuric, or nitric acid plants;
- j. Petroleum refineries;
- k. Lime plants;
- l. Phosphate rock processing plants;
- m. Coke oven batteries;
- n. Sulfur recovery plants;
- o. Carbon black plants (furnace process);
- p. Primary lead smelters;
- q. Fuel conversion plants;
- r. Sintering plants;
- s. Secondary metal production plants;
- t. Chemical process plants;
- u. Fossil-fuel boilers (or combination thereof) totaling more than 250 million Btu's per hour heat input;
- v. Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels;
- w. Taconite preprocessing plants;
- x. Glass fiber processing plants;
- y. Charcoal production plants;
- z. Fossil fuel-fired steam electric plants of more than 250 million Btu's per hour heat input.

30. "CFR" means Code of Federal Regulations. Standard references in these Rules and Regulations is by Title and Part, i.e., "40 CFR 51" means "Title 40 of the Code of Federal Regulations, Part 51".

31. "Charge" means the addition of metal bearing materials, scrap, or fluxes to a furnace, converter or refining vessel.

32. "Coal" means all solid fossil fuels classified as anthracite, bituminous, subbituminous, or lignite by ASTM Designation D-388-66.

33. "Combustion" means the burning of matter.

34. "Commence" as applied to construction of a major stationary source or major modification, means that the owner or operator has all necessary preconstruction approvals or permits and either has:

a. Begun, or caused to begin, a continuous program of actual on-site construction of the source, to be completed within a reasonable time; or

b. Entered into binding agreements or contractual obligations, which cannot be cancelled or modified without substantial loss to the owner or operator, to undertake a program of actual construction of the source to be completed within a reasonable time.

35. "Complete" means, in reference to an application for a permit, that the application contains all the information necessary for processing the application. Designating an application complete for purposes of permit processing does not preclude the Director from requesting or accepting any additional information.

36. "Condensate stripper system" means a column, and associated condensers used to strip, with air or steam, TRS compounds from condensate streams from various processes within a kraft pulp mill.

37. "Construction" means any physical change or change in the method of operation (including fabrication, erection, installation, demolition, or modification of an emissions unit) which would result in a change in actual emissions.

38. "Continuous monitoring system" means the total equipment, required under the emission monitoring Subsections in applicable Sections, used to sample and condition (if applicable), to analyze, and to provide a permanent record of emission or process parameters.

39. "Control device" means the air pollution control equipment used to remove particulate matter or gases generated by a process source from the effluent gas stream.

40. "Copper concentrate" means enriched copper ore recovered from the froth flotation process.

41. "Copper concentrate dryer" means any facility in which a copper sulfide ore concentrate charge is heated in the presence of air to eliminate a portion of the moisture from the charge, provided less than five (5) percent of the sulfur contained in the charge is eliminated in the facility.

42. "Copper concentrate roaster" means any facility in which a copper sulfide ore concentrate is heated in the presence of air to eliminate a significant portion (five percent or more) of the sulfur contained in the charge.

43. "Copper converter" means any vessel to which copper matte is charged and oxidized to copper.

44. "Copper matte" means a metallic sulfide made by smelting copper sulfide ore concentrate or the roasted product of copper sulfide ores.

45. "Copper reverberatory smelting furnace" means any vessel in which the smelting of copper sulfide ore concentrates or calcines is performed and in which the heat necessary for smelting is provided primarily by combustion of a fossil fuel.

46. "Copper smelting" means processing techniques for the smelting of a copper sulfide ore concentrate or calcine charge leading to the formation of separate layers of molten slag, molten copper, and/or copper matte.

47. "Copper smelting furnace" means any vessel in which the smelting of copper sulfide ore concentrates or calcines is performed and in which the heat necessary for smelting is provided by an electric current, rapid oxidation of a portion of the sulfur contained in the concentrate as it passes through an oxidizing atmosphere, or the combustion of a fossil fuel.

48. "Department" means the Department of Environmental Quality.

49. "Director" means the Director of the Department of Environmental Quality.

50. "Discharge" means the release or escape from the source of an effluent into the atmosphere.

51. "Dispersion technique" means any technique which attempts to affect the concentration of a pollutant in the ambient air by using that portion of a stack which exceeds good engineering practice stack height, varying the rate of emission of a pollutant according to atmospheric conditions of ambient concentrations of that pollutant, or by addition of a fan or reheater to obtain a less stringent emission limitation. The preceding sentence does not include:

a. The reheating of a gas stream, following use of a pollution control system, for the purpose of returning the gas to the temperature at which it was originally discharged from the facility generating the gas stream;

b. The use of smoke management in agricultural or silvicultural programs;

c. Combining the exhaust gases from several stacks into one stack.

52. "Dust" means finely divided solid particulate matter occurring naturally or created by mechanical processing, handling or storage of materials in the solid state.

53. "Dust suppressant" means a chemical compound or mixture of chemical compounds added with or without water to a dust source for purposes of preventing air entrainment.

54. "Effluent" means any air contaminant which is emitted and subsequently escapes into the atmosphere.

55. "Elevated terrain" means terrain which exceeds the top elevation of the good engineering practice stack as calculated under Definition 76 of this Section.

56. "Emission" means an air contaminant or gas stream or the act of discharging an air contaminant or a gas stream, visible or invisible.

57. "Emission standard" means a regulation (or portion thereof) setting forth an allowable rate of emissions, level of opacity, or prescribing equipment or fuel specifications that result in control of air pollution emissions.

58. "Emissions unit" means any part of a stationary source which emits or would have the potential to emit any pollutant subject to regulation under this Chapter.

59. "Equivalent method" means any method of sampling and analyzing for an air pollutant which has been demonstrated to the Director's satisfaction to have a consistent and quantitatively known relationship to the reference method, under specified conditions.

60. "Excess emissions" or "emissions in excess of an emission limitation" means emissions of an air pollutant in excess of an emission standard as measured by the compliance test method applicable to such emission standard.

61. "Excessive concentrations" for the purpose of determining good engineering practice stack height in a fluid model or field study means a maximum concentration due to downwash, wakes, or eddy effects produced by structures

or terrain features which is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects.

62. "Existing source" means any source which commenced replacement, erection, installation or making a major alteration of the type described in R18-2-301 (installation permit) prior to May 14, 1979.

63. "Existing source performance standards" means emission standards applicable to existing sources.

64. "Facility" means an identifiable piece of stationary process equipment along with all associated air pollution equipment.

65. "Federal Land Manager" means, with respect to any lands in the United States, the Secretary of the department with authority over such lands.

66. "Federally enforceable" means all limitations and conditions which are enforceable by the Administrator. This includes but is not limited to the requirements of the New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants contained in A.A.C. Title 9, Ch. 3, Articles 8 and 9; the requirements of such other State or County rules or regulations approved by the Administrator for inclusion in the Arizona SIP; and the requirements of any Federal regulation promulgated by the Administrator as part of the Arizona SIP.

67. "Fixed capital cost" means the capital needed to provide all the depreciable components.

68. "Fossil fuel-fired steam generator" means a furnace or boiler used in the process of burning fossil fuel for the primary purpose of producing steam by heat transfer.

69. "FR" means Federal Register. Standard reference in these Rules and Regulations is by Volume, Page and Date, i.e., "43 FR 46246, October 5, 1978" means "Volume 43 of the Federal Register of October 5, 1978 at page 46246".

70. "Fuel" means any material which is burned for the purpose of producing energy.

71. "Fuel burning equipment" means any machine, equipment, incinerator, device or other article, except stationary rotating machinery, in which combustion takes place.

72. "Fugitive dust" means fugitive emissions of particulate matter.

73. "Fugitive emissions" means those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening.

74. "Fume" means solid particulate matter resulting from the condensation and subsequent solidification of vapors of melted solid materials.

75. "Gasoline" means any petroleum distillate having a Reid vapor pressure of four (4) pounds or more.

76. "Good engineering practice (GEP) stack height" means the greater of:

- a. 213.25 feet (65 meters);
- b. Other stacks;

i. For stacks in existence on January 12, 1979 and for which the owner or operator had obtained all applicable preconstruction permits or approvals required under 40 CFR Parts 51 and 52 and A.A.C. R18-2-301, $H_g = 2.5H$,

ii. For all other stacks,

$H_g = H + 1.5L$, where

H_g = good engineering practice stack height, measured from the ground-level elevation at the base of the stack,

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack,

L = lesser dimension (height or projected width) of nearby structure(s);

c. The height demonstrated by a fluid model or a field study approved by the reviewing agency, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, structures, or terrain obstacles.

77. "Hazardous air pollutant" means an air pollutant to which no Arizona ambient air quality standard is applicable and which in the judgment of the Director causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.

78. "Hearing Board" means the Air Pollution Control Hearing Board.

79. "Heat input" means the quantity of heat in terms of Btu's generated by fuels fed into the fuel burning equipment under conditions of complete combustion.

80. "High terrain" means any area having an elevation of nine hundred (900) feet or more above the base of the stack of a source.

81. "Incinerator" means any equipment, machine, device, contrivance or other article and all appurtenances thereof used for the combustion of refuse, salvage materials or any other combustible material except fossil fuels. Such combustion shall be for the purpose of reducing the volume of material.

a. Multiple chamber incinerator: A multiple chamber incinerator consists of three or more refractory-lined combustion chambers in series, physically separated by refractory walls and interconnected by gas passage ports or ducts.

b. Controlled atmosphere incinerator: A controlled atmosphere incinerator consists of one or more refractory-lined chambers in which complete combustion is promoted by recirculation of gases by mechanical means.

c. Wood waste burner: A wood waste burner is an incinerator designed and used exclusively for the burning of wood wastes consisting of wood slabs, scraps, shavings, barks, sawdust or other wood material. Generation of steam as a by-product shall not affect the classification of the device as an incinerator.

d. Air curtain destructor: An air curtain destructor is an incineration device designed and used to secure, by means of a fan generated air curtain, controlled combustion of only wood waste and slash materials in an earthen trench or refractory-lined pit or bin.

e. **Afterburner:** An afterburner is an incinerator installed in the secondary combustion chamber or stack for the purpose of incinerating smoke, fumes, gases, unburned carbon, and other combustible material not consumed during primary combustion.

f. **Fume incinerator:** A fume incinerator is a device similar to an afterburner installed for the purpose of incinerating fumes, gases and other finely divided combustible particulate matter not previously burned.

82. **"Indian governing body"** means the governing body of any tribe, band, or group of Indians subject to the jurisdiction of the United States and recognized by the United States as possessing power of self-government.

83. **"Indian reservation"** means any Federally recognized reservation established by Treaty, Agreement, Executive Order, or Act of Congress. . .

84. **"Innovative control technology"** means any system of air pollution control that has not been adequately demonstrated in practice, but would have a substantial likelihood of achieving greater continuous emissions reduction than any control system in current practice or of achieving at least comparable reductions at lower cost in terms of energy, economics, or nonair quality environmental impacts.

85. **"Isokinetic sampling"** means sampling in which the linear velocity of the gas entering the sampling nozzle is equal to that of the undisturbed gas stream at the sample point.

86. **"Kraft pulp mill"** means any stationary source which produces pulp from wood by cooking (digesting) wood chips in a water solution of sodium hydroxide and sodium sulfide (white liquor) at high temperature and pressure. Regeneration of the cooking chemicals through a recovery process is also considered part of the kraft pulp mill.

87. **"Kraft pulp mill digester system"** means each continuous digester or each batch digester used for the cooking of wood in the white liquor, and associated flash tank(s), blow tank(s), chip streamer(s), and condenser(s).

88. **"Lead"** means elemental lead or alloys in which the predominant component is lead.

89. **"Lime hydrator"** means a unit used to produce hydrated lime product.

90. **"Lime kiln"** means a unit used to calcine lime rock or kraft pulp mill lime mud which consists primarily of calcium carbonate, into quicklime, which is calcium oxide.

91. **"Lime manufacturing plant"** includes any plant which produces a lime product from limestone by calcination. Hydration of the lime product is also considered to be part of the source.

92. **"Lime product"** means the product produced by the calcination process including, but not limited to, calcitic lime, dolomitic lime, and deadburned dolomite.

93. **"Lowest achievable emission rate" (LAER)** means, for any source, the more stringent rate of emissions based on the following:

a. The most stringent emissions limitation which is contained in the SIP of any state for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or,

b. The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source. In no event shall the application of this term permit a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance as contained in A.A.C. Title 9, Chapter 3, Articles 8 and 9.

94. "Low terrain" means any area other than high terrain.

95. "Major modification" means any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under this Chapter.

a. Any net emissions increase that is significant for volatile organic compounds shall be considered significant for ozone.

b. For the purposes of this definition the following shall not be considered a physical change or change in the method of operation:

i. Maintenance, repair and replacement which the Director determines to be routine.

ii. Use of an alternative fuel or raw material by reason of an order under Sections 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (or any superseding legislation) or by reason of a natural gas curtailment plan pursuant to the Federal Power Act;

iii. Use of an alternative fuel by reason of an order or rule under Section 125 of the Act;

iv. Use of an alternative fuel at a steam generating unit to the extent that the fuel is generated from municipal solid waste;

v. Use of an alternative fuel or raw material by a stationary source which:

(1) The source was capable of accommodating before January 6, 1975, unless such change would be prohibited under any Federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.21, or under R18-2-302 or R18-2-304 subsequent to their approval by the Administrator as part of the Arizona SIP.

(2) The source is approved to use under any permit issued under 40 CFR 52.21, or under R18-2-302 or R18-2-304 subsequent to their approval by the Administrator as part of the Arizona SIP.

vi. An increase in the hours of operation or in the production rate, unless such change would be prohibited under any Federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.21, or

under R18-2-302 or R18-2-304 subsequent to their approval by the Administrator as part of the Arizona SIP.

vii. Any change in ownership at a stationary source.

c. In these Rules and Regulations the terms "major modification" and "major alteration" are synonymous and interchangeable.

96. "Major stationary source" means:

a. Any stationary source located in a nonattainment area which emits, or has the potential to emit, 100 tons per year or more of any pollutant subject to regulation under the Act; or,

b. Any stationary source located in an attainment or unclassifiable area which emits, or has the potential to emit, 100 tons per year or more of any pollutant subject to regulation under the Act if the source is classified as a Categorical Source, or 250 tons per year or more of any pollutant subject to regulation under the Act if the source is not classified as a Categorical Source; or,

c. Any change to a minor source which would increase its emissions to the qualifying levels specified under Subparagraphs a. or b., above.

d. A major stationary source that is major for volatile organic compounds shall be considered major for ozone.

e. In these Rules and Regulations the terms "major stationary source" and "major source" are synonymous and interchangeable unless the context otherwise requires.

97. "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or a process to operate in a normal and usual manner. Failures that are caused by poor maintenance, careless operation or any other upset condition or equipment breakdown which could have been prevented by the exercise of reasonable care shall not be considered malfunctions.

98. "Minor source" means a source of air pollution which is not a major source and over which the Director, acting pursuant to A.R.S. § 36-1706.B, has asserted jurisdiction.

99. "Miscellaneous metal parts and products" for purposes of industrial coating mean:

a. Large farm machinery (harvesting, fertilizing and planting machines, tractors, combines, etc.);

b. Small farm machinery (lawn and garden tractors, lawn mowers, rototillers, etc.);

c. Small appliances (fans, mixers, blenders, crock pots, dehumidifiers, vacuum cleaners, etc.);

d. Commercial machinery (office equipment, computers and auxiliary equipment, typewriters, calculators, vending machines, etc.);

e. Industrial machinery (pumps, compressors, conveyor components, fans, blowers, transformers, etc.);

f. Fabricated metal products (metal covered doors, frames, etc.); and

g. Any other industrial category which coats metal parts or products under the Standard Industrial Classification Code of Major Group 33 (primary metal industries), Major Group 34 (fabricated metal products), Major Group 35 (non-electric machinery), Major Group 36 (electrical machinery), Major Group 37 (transportation equipment), Major Group 38 (miscellaneous instruments), and Major Group 39 (miscellaneous manufacturing industries), except:

- i. Automobiles and light-duty trucks;
- ii. Metal cans;
- iii. Flat metal sheets and strips in the form of rolls or coils;
- iv. Magnet wire for use in electrical machinery;
- v. Metal furniture;
- vi. Large appliances;
- vii. Exterior of airplanes;
- viii. Automobile refinishing;
- ix. Customized top coating of automobiles and trucks, if production is less than 35 vehicles per day; and,
- x. Exterior of marine vessels.

100. "Mobile or portable sources" mean combustion engines, machinery, and equipment which are capable of being operated in more than one county. The Director shall have original jurisdiction over these sources unless delegated in writing and shall be the sole arbiter in defining mobile or portable sources.

101. "Molybdenum roaster" means any facility in which a molybdenum sulfide ore concentrate charge is heated in the presence of air to eliminate a significant portion (5 percent or more) of the sulfur contained in the charge.

102. "Monitoring device" means the total equipment, required under the monitoring of operations sections in applicable subparts, used to measure and record (if applicable) process parameters.

103. "Motor vehicle" means any self-propelled vehicle designed for transporting persons or property on public highways.

104. "Multiple-effect evaporator system" means the multiple-effect evaporators and associated condenser(s) and hotwell(s) used to concentrate the spent cooking liquid that is separated from the pulp (black liquor).

105. "Nearby" as used in the GEP definition is that distance up to five times the lesser of the height or the width dimension of a structure but not greater than 0.8 km (one-half mile). The height of the structure is measured from the ground-level elevation at the base of the stack.

106. "Necessary preconstruction approvals or permits" means those permits or approvals required under Federal air quality control laws and regulations and those air quality control laws and regulations which are part of the Arizona SIP.

107. "Net emissions increase" means the amount by which the sum of the following exceeds zero:

- a. Any increase in actual emissions from a particular physical change or change in the method of operation at a stationary source; and

b. Any other increases and decreases in actual emissions at the source that are contemporaneous with the particular change and are otherwise creditable.

c. An increase or decrease in actual emissions is contemporaneous with the increase from the particular change only if it occurs between:

i. The date five years before construction on the particular change commences; and

ii. The date that the increase from the particular change occurs.

d. An increase or decrease in actual emissions is creditable only if the Director has not relied on it in issuing an installation or operating permit, which permit is in effect when the increase in actual emissions from the particular change occurs.

e. An increase or decrease in actual emissions of sulfur dioxide or particulate matter which occurs before the applicable baseline date is creditable only if it is required to be considered in calculating the amount of maximum allowable increases remaining available.

f. An increase in actual emissions is creditable only to the extent that the new level of actual emissions exceeds the old level.

g. A decrease in actual emissions is creditable only to the extent that:

i. The old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions;

ii. It is Federally enforceable at and after the time that actual construction on the particular change begins; and,

iii. It has approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change.

h. An increase that results from a physical change at a source occurs when the emissions unit on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed 180 days.

108. "Neutral sulfite semichemical pulping operation" means any operation in which pulp is produced from wood by cooking (digesting) wood chips in a solution of sodium sulfite and sodium bicarbonate, followed by mechanical defibrating (grinding).

109. "New source" means any major stationary source of air pollution, the construction or modification of which was commenced after May 14, 1979.

110. "New source performance standards" means the emission limitations or other performance requirements for sources or major alterations contained in A.A.C. Title 9, Chapter 3, Article 8 (New Source Performance Standards).

111. "Nitric acid plant" means any facility producing nitric acid 30 to 70 percent in strength by either the pressure or atmospheric pressure process.

112. "Nitrogen oxides" means all oxides of nitrogen except nitrous oxide, as measured by test methods set forth in the Arizona Testing Manual.

113. "Nonattainment area" means an area so designated by the Administrator acting pursuant to Section 107 of the Act (42 U.S.C.A. § 7401) as

exceeding national primary or secondary ambient air standards for a particular pollutant or pollutants.

114. "Nonpoint source" means a source of air contaminants which lacks an identifiable plume or emission point.

115. "Opacity" means the degree of obscuration of transmitted light.

116. "Operation" means any physical or chemical action resulting in the change in location, form, physical properties or chemical character of a material.

117. "Owner or operator" means any person who owns, leases, operates, controls, or supervises an affected facility or a stationary source of which an affected facility is a part.

118. "Particulate matter" means for mass emissions testing, any finely divided liquid or solid material, other than uncombined water, as measured by the test methods and procedures described in R18-2-310.

119. "Percent opacity" means the degree to which an effluent plume or other emission obscures the transmission of light.

120. "Person" includes any public or private corporation, company, partnership, firm, association or society of persons, the Federal government and any of its departments or agencies, the State and any of its agencies, departments or political subdivisions, as well as a natural person.

121. "Petroleum liquids" means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery but does not mean Number 2 through Number 6 fuel oils as specified in ASTM D-396-69, gas turbine fuel oils Numbers 2-GT through 4-GT as specified in ASTM D-2880-71, or diesel fuel oils Numbers 2-D and 4-D as specified in ASTM D-975-68.

122. "Photochemically reactive solvent" means a solvent with an aggregate of more than twenty percent of its total volume composed of the chemical compounds classified below or which exceeds any of the following percentage composition limitations, referred to the total volume of solvent:

a. A combination of the following types of compounds having an olefinic or cyclo-olefinic type of unsaturation — hydrocarbons, alcohols, aldehydes, esters, ethers, or ketones: five percent;

b. A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: eight percent;

c. A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichlorethylene or toluene: twenty percent,

d. Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one of the above groups or organic compounds, it shall be considered as a member of the most reactive chemical group, that is, that group having the least allowable percent of the total volume of solvents.

123. "Plume" means visible effluent.

124. "Plume impaction" means concentrations measured or predicted to occur when the plume interacts with elevated terrain.

125. "Pollutant" means an air contaminant the emission or ambient concentration of which is regulated pursuant to these Rule and Regulations.

126. "Potential to emit" or "potential emission rate" means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is Federally enforceable. Secondary emissions do not count in determining the potential to emit of a stationary source.

127. "Primary ambient air quality standards" means the ambient air quality standards which define levels of air quality which the Administrator judges are necessary, with an adequate margin of safety, to protect the public health.

128. "Process" means one or more operations, including equipment and technology, used in the production of goods or services or the control of by-products or waste.

129. "Process source" means the last operation or process which produces an air contaminant resulting from

- a. The separation of the air contaminants from the process material, or
- b. The conversion of constituents of the process materials into air contaminants and which is not an air pollution abatement operation.

130. "Process weight" means the total weight of all materials introduced into a process source, including fuels, where these contribute to pollution generated by the process.

131. "Process weight rate" means a rate established as follows:

- a. For continuous or long run, steady-state process sources, the total process weight for the entire period of continuous operation or for a typical portion thereof, divided by the number of hours of such period or portion thereof.
- b. For cyclical or batch process sources, the total process weight for a period which covers a complete operation or an integral number of cycles, divided by the hours of actual process operation during such period.
- c. The total process weight from all similar units employing a similar type process shall be used in determining the maximum allowable emission of particulate matter.

132. "Proportional sampling" means sampling at a rate that produces a constant ratio of sampling rate to stack gas flow rate.

133. "Reasonably available control technology" (RACT) equals for facilities subject to an existing source performance standards the emissions limitation of the existing source performance standard.

134. "Reclaiming machinery" means any machine, equipment device or other article used for picking up stored granular material and depositing this material on a conveyor or reintroducing this material into the process.

135. "Reconstruction" of sources located in nonattainment areas will be presumed to have taken place where the fixed capital cost of the new

components exceeds 50 percent of the fixed capital cost of a comparable entirely new stationary source. Any final decision as to whether reconstruction has occurred shall be made in accordance with the provisions of 40 CFR 60.15(f)(1)-(3). A reconstructed stationary source will be treated as a new stationary source for purposes of nonattainment area source review. In determining lowest achievable emission rate for a reconstructed stationary source, the provisions of 40 CFR 60.15(f)(4) shall be taken into account in assessing whether a new source performance standard is applicable to such stationary source.

136. "Recovery furnace" means the unit used for burning black liquor to recover chemicals consisting primarily of sodium carbonate and sodium sulfide. The recovery furnace includes the direct-contact evaporator for a conventional furnace. "Old design furnaces" are those without welded wall construction or emission-control designed air systems. "New design furnaces" include both welded wall construction and emission-control design air systems. "Cross recovery furnaces" burn combined neutral sulfite waste liquor and black liquor.

137. "Reference method" means the methods of sampling and analyzing for an air pollutant as described in the Arizona Testing Manual.

138. "Reid vapor pressure" is the absolute vapor pressure of volatile crude oil and volatile non-viscous petroleum liquids, except liquified petroleum gases, as determined by ASTM-D-323-59 (reapproved 1968).

139. "Resource recovery facility" means any facility at which solid waste is processed for the purpose of extracting, converting to energy, or otherwise separating and preparing solid waste for reuse. Energy conversion facilities must utilize solid waste to provide more than 50 percent of the heat input to be considered a resource recovery facility under this Chapter.

140. "Rotary lime kiln" means a unit with an included rotary drum which is used to produce a lime product from limestone by calcination.

141. "Run" means the net period of time during which an emission sample is collected. Unless otherwise specified, a run may be either intermittent or continuous within the limits of good engineering practice.

142. "Secondary ambient air quality standards" means the ambient air quality standards which define levels of air quality which the Administrator judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

143. "Secondary emissions" means emissions which would occur as a result of the construction or operation of a major stationary source or major modification, but do not come from the major stationary source or major modification itself. For the purpose of these Regulations, secondary emissions must be specific, well defined, quantifiable, and impact the same general area as the stationary source or modification which causes the secondary emissions. Secondary emissions may include, but are not limited to:

a. Emission from trains coming to or from the new or modified stationary source; and,

b Emissions from any offsite support facility which would not otherwise be constructed or increase its emissions as a result of the construction or operation of the major stationary source or major modification.

144. "Shutdown" means the cessation of operation of any air pollution control equipment or process equipment for any purpose, except routine phasing out of process equipment.

145. "Significance levels" means the following ambient concentrations for the enumerated pollutants:

Pollutant	Annual	Averaging Time			
		24-Hour	8-Hour	3-Hour	1-Hour
SO ₂	2 ug/m ³	5 ug/m ³		25 ug/m ³	
TSP	5 ug/m ³	10 ug/m ³			
NO ₂	2 ug/m ³				
CO			0.5 mg/m ³		3 mg/m ³

Except for the annual poll concentrations, exceedance of significance levels shall occur when the ambient concentrations of the above pollutants will be exceeded more than once per year at any one location. Significance levels shall be deemed not to have been exceeded for any of the above-enumerated pollutants if such concentrations occur at a specific location and at a time when Arizona ambient air quality standards for such pollutant would not be violated.

146. "Significant" means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

Pollutant	Emissions Rate
Carbon monoxide	100 tons per year (tpy)
Nitrogen oxides	40 tpy
Sulfur dioxide	40 tpy
Particulate matter	25 tpy
Ozone	40 tpy (VOC)
Lead	0.6 tpy
Asbestos	0.007 tpy
Beryllium	0.0004 tpy
Mercury	0.1 tpy
Vinyl chloride	1 tpy
Fluorides	3 tpy
Sulfuric acid mist	7 tpy
Hydrogen sulfide (H ₂ S)	10 tpy
Total reduced sulfur (including H ₂ S)	10 tpy
Reduced sulfur compounds (including H ₂ S)	10 tpy

"Significant" means, in reference to a net emissions increase or the potential of a source to emit a pollutant subject to regulation under this Chapter that is not listed above, any emission rate. Notwithstanding the emission amount listed above, "significant" means any emissions rate or any net emissions increase associated with a major stationary source or major modification, which would construct within 10 kilometers of a Class I area and have an impact on the ambient air quality of such area equal to or greater than 1 ug/m^3 (24-hour average).

147. "Slag" means the more or less completely fused and vitrified matter separated during the reduction of a metal from its ore.

148. "Smelt dissolving tank" means a vessel used for dissolving the smelt collected from the kraft mill recovery furnace.

149. "Smelter feed" means all materials utilized in the operation of a copper smelter including metals or concentrates, fuels and chemical reagents and shall be calculated as the aggregate sulfur content of all fuels and other feed materials whose products of combustion and gaseous by-products are emitted to the atmosphere.

150. "Smoke" means particulate matter resulting from incomplete combustion.

151. "Soot" means the carbonaceous particulate product of incomplete combustion which may be a component of smoke.

152. "Stack" means any point in a source designated to emit solids, liquids, or gases into the air, including a pipe or duct but not including flares.

153. "Standard" means a standard of performance promulgated under these Rules.

154. "Standard conditions" means a temperature of 293K (68°F or 20°C) and a pressure of 101.3 kilopascals (29.92 in. Hg or 1013.25mb).

155. "Start-up" means the setting into operation of any air pollution control equipment or process equipment for any purpose except routine phasing in of process equipment.

156. "State implementation plan" (SIP) means the plan adopted by the State of Arizona which provides for implementation, maintenance, and enforcement of such primary and secondary ambient air quality standards as are adopted by the administrator. —

157. "Stationary rotating machinery" means any gas engine, diesel engine, gas turbine, or oil fired turbine operated from a stationary mounting and used for the production of electric power or for the direct drive of other equipment.

158. "Stationary source" means any building, structure, facility or installation which emits or may emit any air pollutant subject to regulation under this Chapter.

a. The following are not considered stationary sources for purposes of these Regulations:

i. Motor vehicles.

ii. Fuel burning equipment which, in the aggregate with such other equipment of the applicant at the same location of property, other than a one or two family residence, is rated at less than 500,000 Btu's per hour.

iii. Agricultural vehicles or agricultural equipment used in normal farm operations.

b. "Building", "structure", "facility", or "installation" means, for sources located in attainment areas, all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same first two digit code) as described in the "Standard Industrial Classification Manual, 1972", as amended by the 1977 Supplement (U.S. Government Printing Office stock numbers 4101-0066 and 003-005-00176-0, respectively).

c. "Building", "structure", or "facility" means, for sources located in non-attainment areas, all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two digit code) as described in the "Standard Industrial Classification Manual, 1972", as amended by the 1977 Supplement (U.S. Government Printing Office stock numbers 4101-0066 and 003-005-00176-0, respectively).

d. "Installation" means, for sources located in nonattainment areas, an identifiable piece of process equipment.

159. "Statutory major source" means a stationary source which is capable of generating more than 75 tons of uncontrolled air contaminants per day or, having less emissions, has been designated as a class by the Director to be a major source. The following classifications have been so designated by the Director:

- a. The smelting of copper ore.
- b. The refining of crude oil.

160. "Sulfuric acid plant" means any facility producing sulfuric acid by the contact process by burning elemental sulfur, alkylation acid, hydrogen sulfide, or acid sludge, but does not include facilities where conversion to sulfuric acid is utilized as a means of preventing emissions of sulfur dioxide or other sulfur compounds to the atmosphere.

161. "Supplementary control system" (SCS) means a system by which sulfur dioxide emissions are curtailed during periods when meteorological conditions conducive to ground-level concentrations in excess of ambient air quality standards for sulfur dioxide either exist or are anticipated.

162. "Total reduced sulfur" (TRS) means the sum of the sulfur compounds, primarily hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl

disulfide, that are released during the kraft pulping operation and measured by Method 16 in the Arizona Testing Manual.

163. "Unclassified area" means an area which the Administrator, because of a lack of adequate data, is unable to classify as an attainment or nonattainment area for a specific pollutant. For purposes of this Chapter unclassified areas are to be treated as attainment areas.

164. "Uncombined water" means condensed water containing analytical trace amounts of other chemical elements or compounds.

165. "Urban or suburban open area" means an unsubdivided tract of land surrounding a substantial urban development of a residential, industrial, or commercial nature and which, though near or within the limits of some city or town, may be used for agriculture, be uncultivated, or lie fallow.

166. "Vacant lot" means a subdivided residential or commercial lot which contains no buildings or structures of a temporary or permanent nature.

167. "Vapor" means the gaseous form of a substance normally occurring in a liquid or solid state.

168. "Vapor pressure" means the pressure exerted by the gaseous form of a substance in equilibrium with its liquid or solid form.

169. "Visible emissions" means any emissions which are visually detectable without the aid of instruments and which contain particulate matter.

170. "Volatile organic compound" (VOC) means any organic compound (except the compounds enumerated below) that, when released into the atmosphere, can remain long enough to participate in photochemical reactions. Methane; Ethane; 1,1,1-Trichloroethane (Methyl Chloroform); Trichlorotrifluoroethane (Freon 113); and Methelene Chloride are not considered to be volatile organic compounds for purposes of regulation under this Chapter.

171. "Volatility" means the capability of a substance to vaporize or change to the vapor form.

Historical Note

Former Section R9-3-101 repealed, new Section R9-3-101 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Editorial correction, Paragraph 133. (Supp. 80-1). Editorial correction, Paragraph 58. (Supp. 80-2). Amended eff. July 9, 1980. Amended by adding new Paragraphs 24., 55., 102., 115. and renumbering accordingly, eff. Aug. 29, 1980 (Supp. 80-4). Amended eff. May 28, 1982 (Supp. 82-3). Amended eff. Sept. 22, 1983 (Supp. 83-5). Amended Paragraph 133., added Paragraph 156. and renumbered accordingly eff. Sept. 28, 1984 (Supp. 84-5). Amended Paragraph 29. by deleting aa. and bb. eff. Aug. 9, 1985 (Supp. 85-4). Former Section R9-3-101 renumbered without change as R18-2-101 (Supp. 87-3).

ARTICLE 2. AMBIENT AIR QUALITY STANDARDS

R18-2-201. Particulate matter

A. The primary ambient air quality standards for particulate matter are:

1. 75 micrograms per cubic meter — annual geometric mean.
2. 260 micrograms per cubic meter — maximum 24-hour concentration not to be exceeded more than once per year.

B. The secondary ambient air quality standards for particulate matter are:

1. 60 micrograms per cubic meter — annual geometric mean, as a guide to be used in assessing implementation plans to achieve the 24-hour standard.
2. 150 micrograms per cubic meter — maximum 24-hour concentration not to be exceeded more than once per year.

Historical Note

Amended eff. Dec. 22, 1976 (Supp. 76-5). Former Section R9-3-201 repealed, new Section R9-3-201 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Editorial correction, Subsection E. (Supp. 80-2). Amended eff. Aug. 29, 1980 (Supp. 80-4). Amended B.1., deleted C. through E. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-201 renumbered without change as Section R18-2-201 (Supp. 87-3).

R18-2-202. Sulfur oxides (sulfur dioxide)

A. The primary ambient air quality standards for sulfur oxides, measured as sulfur dioxide, are:

1. 80 micrograms per cubic meter (0.03 ppm) — annual arithmetic mean.
2. 365 micrograms per cubic meter (0.14 ppm) — maximum 24-hour concentration not to be exceeded more than once per year.

B. The secondary ambient air quality standard for sulfur oxides measured as sulfur dioxide is 1300 micrograms per cubic meter (0.5 ppm) maximum 3-hour concentration not to be exceeded more than once per year.

Historical Note

Amended eff. Dec. 22, 1976 (Supp. 76-5). Former Section R9-3-202 repealed, new Section R9-3-202 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. Aug. 29, 1980 (Supp. 80-4). Amended Subsection B. eff. May 28, 1982 (Supp. 82-3). Amended by deleting Subsections C. through E. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-202 renumbered without change as Section R18-2-202 (Supp. 87-3).

R18-2-203. Reserved**R18-2-204. Ozone**

The primary and secondary ambient air quality standard for ozone is 0.12 ppm (235 micrograms per cubic meter). The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm (235 micrograms per cubic meter) is equal to or less than one (1), as determined by 40 CFR 50, Appendix H.

Historical Note

Amended eff. Dec. 22, 1976 (Supp. 76-5). Former Section R9-3-204 repealed, new Section R9-3-204 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. Aug. 29, 1980 (Supp. 80-4). Amended by deleting Subsections B. through D. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-204 renumbered without change as Section R18-2-204 (Supp. 87-3).

R18-2-205. Carbon monoxide

The primary and secondary ambient air quality standards for carbon monoxide are:

1. 10 milligrams per cubic meter (9 ppm) — maximum 8-hour concentration not to be exceeded more than once per year.
2. 40 milligrams per cubic meter (35 ppm) — maximum 1-hour concentration not to be exceeded more than once per year.

Historical Note

Amended eff. Dec. 22, 1976 (Supp. 76-5). Former Section R9-3-205 repealed, new Section R9-3-205 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. Aug. 29, 1980 (Supp. 80-4). Amended by deleting Subsections B. through D. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-205 renumbered without change as Section R18-2-205 (Supp. 87-3).

R18-2-206. Nitrogen dioxide

The primary and secondary ambient air quality standard for nitrogen dioxide is 100 micrograms per cubic meter (0.05 ppm) — annual arithmetic mean.

Historical Note

Amended eff. Dec. 22, 1976 (Supp. 76-5). Former Section R9-3-206 repealed, new Section R9-3-206 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. Aug. 29, 1980 (Supp. 80-4). Amended by deleting Subsections B. through D. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-206 renumbered without change as Section R18-2-206 (Supp. 87-3).

R18-2-207. Lead

The primary and secondary ambient air quality standard for lead and its compounds, measured as elemental lead, is 1.5 micrograms per cubic meter, maximum arithmetic mean averaged over a calendar quarter.

Historical Note

Former Section R9-3-207 repealed eff. May 14, 1979 (Supp. 79-1). New Section R9-3-207 adopted eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. Aug. 29, 1980 (Supp. 80-4). Amended by deleting Subsections B. through D. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-207 renumbered without change as Section R18-2-207 (Supp. 87-3).

R18-2-208.

Reserved

R18-2-214.

R18-2-215. Ambient air quality monitoring methods and procedures

A. Only those methods which have been either designated by the Administrator as reference or equivalent methods or approved by the Director shall be used to monitor ambient air.

B. Quality assurance, monitor siting, and sample probe installation procedures shall be in accordance with procedures described in "Air Quality Monitoring Procedures Manual", Arizona Department of Health Services, September, 1982 (adopted herewith and on file with the Office of the Secretary of State). The Director may approve other procedures upon a finding that the proposed procedures are substantially equivalent or superior to procedures in the Manual. The Manual shall not apply to continuous sulfur dioxide monitoring performed by copper smelters which operate supplementary control systems because such monitoring is subject to the requirements of R18-2-704.

Historical Note

Adopted eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-215 renumbered without change as Section R18-2-215 (Supp. 87-3).

R18-2-216. Interpretation of ambient air quality standards and evaluation of air quality data

A. Unless otherwise specified, interpretation of all ambient air quality standards contained in this Article shall be in accordance with 40 CFR 50 as in effect on June 18, 1980.

B. The evaluation of air quality data in terms of procedure, methodology, and concept is to be consistent with methods described in Appendix 10 to this Chapter.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-216 repealed, new Section R9-3-216 adopted eff. Aug. 29, 1980 (Supp. 80-4). Former Section R9-3-216 renumbered without change as Section R18-2-216 (Supp. 87-3).

R18-2-217. Attainment areas; classification and standards

A. Designation and classification of attainment areas.

1. All attainment and unclassified areas or parts thereof shall be classified as either Class I, Class II or Class III.

2. All of the following areas which were in existence on August 7, 1977, shall be Class I areas irrespective of attainment status and may not be redesignated:

- a. International parks;
 - b. National wilderness areas which exceed 5,000 acres in size;
 - c. National memorial parks which exceed 5,000 acres in size; and
 - d. National parks which exceed 6,000 acres in size.
3. The following areas may be designated only as Class I or II:

APPENDIX C

Public Hearing Announcements

a. An area which as of August 7, 1977, exceeds 10,000 acres in size and is a national monument, a national primitive area, a national preserve, a national recreational area, a national wild and scenic river, a national wildlife refuge, a national lakeshore or seashore.

b. A national park or national wilderness area established after August 7, 1977, which exceeds 10,000 acres in size.

4. All other areas shall be Class II areas unless redesignated under Sub-paragraph 5. or 6.

5. The Governor or his designee may redesignate areas of the State Class I or Class II, provided that:

a. At least one public hearing is held in or near the area affected;

b. Other states, Indian governing bodies and Federal Land Managers, whose land may be affected by the proposed redesignation are notified at least 30 days prior to the public hearing.

c. A discussion of the reasons for the proposed redesignation including a description and analysis of health, environmental, economic, social and energy effects of the proposed redesignation is prepared by the Governor or his designees and is made available for public inspection at least 30 days prior to the hearing and the notice announcing the hearing contains appropriate notification of the availability of such discussion.

d. In redesignating any area under this Section with respect to which any Federal Land Manager has submitted written comments and recommendations, the Governor or his designee shall publish a list of any inconsistency between such redesignation and such recommendations, together with the reasons for making such redesignation against the recommendation of the Federal Land Manager.

e. The proposed redesignation is based on the record which must reflect the basis for the proposed redesignation, including consideration of

i. Growth anticipated in the area,

ii. The social, environmental, health, energy and economic effects of such redesignation and upon other areas and states,

iii. Any impacts of such proposed redesignation upon regional or national interests, and

iv. Testimony submitted at the public hearing.

f. The redesignation is proposed after consultation with the elected leadership of local and other substate general purpose governments in the area covered by the proposed redesignation.

6. The Governor or his designee may redesignate areas of the State Class III if:

a. Such redesignation meets the requirements of Paragraph 5. of this Section;

b. Such redesignation has been approved after consultation with the appropriate committee of the legislature if it is in session or with the leadership of the legislature if it is not in session, and if the general purpose units of local

government representing a majority of the residents of the area so redesignated concur in the redesignation;

c. Such redesignation will not cause, or contribute to, concentration of any air pollutant which exceeds any maximum allowable increase or maximum allowable concentration permitted under the classification of any area;

d. Prior to any public hearing on redesignation of any area, there shall be available insofar as is practicable for public inspection any specific plans for any new major stationary source or modification of such source which may be permitted to be constructed and operated only if the area in question is redesignated as Class III.

B. Limitation of pollutants in classified attainment areas.

1. Areas designated as Class I, II, or III shall be limited to the following increases in air pollutant concentrations occurring over the baseline concentration; provided that for any period other than an annual period, the applicable maximum allowable increase may be exceeded once per year at any one location.

CLASS I

**Maximum Allowable Increase
(Micrograms per cubic meter)**

Particulate matter:	
Annual geometric mean	5
24-hour maximum	10
Sulfur dioxide:	
Annual arithmetic mean	2
24-hour maximum	5
3-hour maximum	25

CLASS II

Particulate matter:	
Annual geometric mean	19
24-hour maximum	37
Sulfur dioxide:	
Annual arithmetic mean	20
24-hour maximum	91
3-hour maximum	512

CLASS III

Particulate matter:	
Annual geometric mean	37
24-hour maximum	75
Sulfur dioxide:	
Annual arithmetic mean	40
24-hour maximum	182
3-hour maximum	700

2. The maximum allowable concentration of any air pollutant in any area to which the preceding Paragraph applies shall not exceed a concentration for each pollutant equal to the concentration permitted under the Arizona State Ambient Air Quality Standards contained in this Article (Article 2).

3. For purposes of determining compliance with the maximum allowable increases in ambient concentrations of an air pollutant, the following concentrations of such pollutant shall not be taken into account:

a. Concentration of such pollutant attributable to the increase in emissions from major and stationary sources which have converted from the use of petroleum products, or natural gas, or both, by reason of natural gas curtailment order which is in effect under the provisions of Sections 2(a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (15 U.S.C. § 792) (or any subsequent legislation which supersedes such provisions) over the emissions from such sources before the effective date of such order;

b. The concentration of such pollutant attributable to the increase in emissions from major and stationary sources which have converted from using gas by reason of a natural gas curtailment plan in effect pursuant to the Federal Power Act (U.S.C.A., Title 16, Chapter 12) over the emissions from such sources before the effective date of such plan;

c. Concentrations of particulate matter attributable to the increase in emissions from construction or other temporary activities of a new or altered source;

d. The increase in concentrations attributable to new sources outside the United States over the concentrations attributable to existing sources which are included in the baseline concentration;

e. Concentrations attributable to the temporary increase in emissions of sulfur dioxide or particulate matter from major stationary sources when the following conditions are met:

i. The operating permit(s) issued to such sources specifies the time period during which the temporary emissions increase of sulfur dioxide or particulate matter would occur. Such time period shall not be renewable and shall not exceed two years unless a longer period is specifically approved by the Director.

ii. No emissions increase will be approved which would:

(1) Impact any portion of any Class I area or any portion of any other area where an applicable incremental ambient standard is known to be violated in that portion; or

(2) Cause or contribute to the violation of a State ambient air quality standard.

iii. The operating permit(s) issued to such sources specify that at the end of the time period described in Subdivision i., above, the emissions levels from the sources would not exceed the levels occurring before the temporary emissions increase was approved.

f. The exception granted with respect to increment consumption under 3.a. and b. of this Section shall not apply more than five years after the effective date of the order or plan on which the exception is based.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Editorial correction, Subsection A., Paragraph 5., Subparagraph d. (Supp. 80-2). Amended eff. May 28, 1982 (Supp. 82-3). Former Section R9-3-217 renumbered without change as Section R18-2-217 (Supp. 87-3).

R18-2-218. Violations

One exceedance per year of the ambient air quality standards in this Article, except for the annual and quarterly standards, and the standard for ozone, shall be allowed for each pollutant at each monitoring site. Each additional exceedance at each site shall constitute a violation of ambient air quality standards.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-218 repealed, new Section R9-3-218 adopted eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-218 renumbered without change as Section R18-2-218 (Supp. 87-3).

R18-2-219. Air pollution emergency episodes

A. Procedures shall be implemented by the Director in order to prevent the occurrence of ambient air pollutant concentrations which would cause significant harm to the health of persons. These concentrations are listed in the table at the end of this Section.

B. The following stages are identified by air quality criteria in order to provide for sequential emissions reductions, public notification and increased Department monitoring and forecast responsibilities. The declaration of any stage, and the area of the State affected, shall be based on air quality measurements and meteorological analysis and forecast. The procedures and actions required for each stage are described in the current edition of the Department's Manual entitled "Procedures for Prevention of Emergency Episodes".

1. **STAGE I – ALERT.** An air pollution alert shall be declared when any of the alert level concentrations listed in the table at the end of this Section are exceeded at any monitoring site and when meteorological conditions indicate that there will be a continuance or recurrence of alert level concentrations for the same pollutant(s) during the subsequent 24-hour period. If, 48 hours after an alert has been initially declared, air pollution concentrations and meteorological conditions do not improve, the warning stage control actions shall be implemented but no warning shall be declared, unless air quality has deteriorated to the extent described in B.2. below.

2. **STAGE II – WARNING.** An air pollution warning shall be declared when any of the warning level concentrations listed in the table at the end of this Section are exceeded at any monitoring site and when meteorological conditions indicate that there will be a continuance or recurrence of concentrations of the

same pollutant(s) exceeding the warning level during the subsequent 24-hour period. If, 48 hours after a warning has been initially declared, air pollution concentrations and meteorological conditions do not improve, the emergency stage shall be declared and its control actions implemented.

3. **STAGE III – EMERGENCY.** An air pollution emergency shall be declared when any of the emergency level concentrations listed in the table at the end of this Section are exceeded at any monitoring site and when meteorological conditions indicate that there will be a continuance or recurrence of concentrations of the same pollutant(s) exceeding the emergency level during the subsequent 24-hour period.

4. Summary of emergency episode and significant harm levels

Pollutant	Averaging Time	Alert	Warning	Emergency	Significant Harm
Carbon monoxide	1-hr	—	—	—	144
	4-hr	—	—	—	86.3
	8-hr	17	34	46	57.5
Nitrogen dioxide	1-hr	1,130	2,260	3,000	3,750
	24-hr	282	565	750	938
Ozone	1-hr	.2	.4	.5	.6
Particulates	24-hr	375	625	875	1,000
Sulfur dioxide	24-hr	800	1,600	2,100	2,620
Sulfur dioxide and particulates combined	24-hr	65,000	261,000	393,000	490,000

Note: Units are $\mu\text{g}/\text{m}^3$ except for carbon monoxide which has units of mg/m^3 sulfur dioxide and particulates combined which has units of $(\mu\text{g}/\text{m}^3)^2$, and ozone, which has units of parts per million (ppm).

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Editorial correction, Subsection B. Paragraph 2. (Supp. 80-1). Editorial correction, Subsection A. (Supp. 80-2). Former Section R9-3-219 repealed, new Section R9-3-219 adopted eff. May 28, 1982 (Supp. 82-3). Former Section R9-3-219 renumbered without change as Section R18-2-219 (Supp. 87-3).

ARTICLE 3. PERMITS

R18-2-301. Installation permits: general

A. No person shall commence construction of a new major or minor source or any stationary source that will emit 5 or more tons of lead per year, or the major alteration of a source or the construction or modification of air pollution control equipment, or alteration of a point source that emits 5 or more tons of lead per year without first obtaining an installation permit from the Director.

B. There shall be three classes of installation permits:

1. Class A permits shall be issued to persons proposing to commence construction of a new major source or make a major alteration to a major source, or the construction or alteration of a stationary source emitting 5 or more tons of lead per year.

2. Class B permits shall be issued to persons proposing solely to commence construction or an alteration of any air pollution control equipment.

3. Class C permits shall be issued to persons proposing to commence construction of or make a modification to a minor source. Minor sources which do not have the potential to emit any uncontrolled pollutant at greater than or equal to an emissions rate defined herein as "significant" shall not require an installation permit, except that, stationary rotating machinery of greater than 325 brake horsepower and fuel burning equipment or incinerators that are fired at a sustained rate of more than 500,000 Btu per hour for more than an eight-hour period shall require installation permits as herein specified.

C. No Class A installation permit shall be issued to a person proposing to commence construction of a new major source or make a major alteration to a major source unless one of the following conditions is met:

1. A new major source or major alteration to a major source that is classified as a major source under this Chapter and not because the source has controlled emissions of 100 or 250 tons per year (as applicable) of any single pollutant regulated under this Chapter, shall meet the following requirements:

a. The source or alteration shall comply with the general Class A installation permit requirements in Subsection D.;

b. The source or alteration shall comply with the installation permit application requirements in Subsection E.

c. The source or alteration shall comply with the more stringent of the applicable new source performance standards in Article 8 or the existing source performance standards in Article 5; or,

2. A new stationary source or alteration to a stationary source that emits 5 or more tons of lead per year, and not regulated under Paragraph 1. above shall meet the following requirements:

a. The source or alteration shall comply with all applicable provisions of Sections R18-2-302 through R18-2-305.

b. The source or alteration shall comply with the general Class A installation permit requirements of Subsection D.

c. The source or alteration shall comply with the installation permit application requirements of Subsection E.

D. No Class A installation permit shall be issued to a person unless that person can demonstrate to the Director that:

1. The new major source or major alteration will be in compliance with whatever emission limitation, design, equipment, work practice or operational standard, or combination thereof is applicable to the source or alteration.

a. The degree of emission limitation required for control of any pollutant under this Article shall not be affected in any manner by:

i. So much of the stack height of any source as exceeds good engineering practice, or,

ii. Any other dispersion technique.

b. Subparagraph D.1.a. of this Section shall not apply with respect to stack heights in existence before December 31, 1970, or to dispersion techniques implemented before then.

2. The new major source or major alteration will not exceed the applicable standards for hazardous air pollutants contained in Article 9.

3. The new major source or major alteration will not exceed the limitations, if applicable, on emission from nonpoint sources contained in Article 4.

4. A stationary source that will emit 5 or more tons of lead per year will not violate the ambient air quality standards for lead as contained in Section R18-2-207.

E. An application for a Class A installation permit shall be made on forms prescribed by the Director, and shall be signed by the applicant. An application shall contain, at a minimum, the information required by Appendix 1. In addition, the application shall contain such information or data as is necessary to demonstrate compliance with Subsection C. of this Section.

F. Except for assessing air quality impacts within Class I areas, the air impact analysis required to be conducted in connection with the filing for a Class A installation permit shall initially consider only the geographical area located within a fifty (50) kilometer radius from the new major source or major alteration's point of greatest emissions. The Director (on his own initiative or upon receipt of written notice from any person) shall have the right at any time to request an enlargement of the geographical area for which an air quality impact analysis is to be performed by giving the person applying for the installation permit written notice thereof, specifying the enlarged radius to be so considered. In performing an air impact analysis for any geographical area with a radius of more than fifty (50) kilometers, the person applying for the installation permit may use monitoring or modeling data obtained from major sources having comparable emissions or having emissions which are capable of being accurately used in such demonstration, and which are subjected to terrain and atmospheric stability conditions which are comparable or which may be extrapolated with reasonable accuracy for use in such demonstration.

G. The application for a Class B installation permit shall be made on forms prescribed by the Director, and shall be signed by the applicant. An application shall contain, at a minimum, the information required by Appendix 1.

H. No Class C installation permit shall be issued to a person proposing to commence construction of a minor source unless that person can demonstrate that the source:

1. Will not violate the standards of performance contained in Articles 5 or 6 of this Chapter, or Article 8 in A.A.C. Title 9, Chapter 3. Where more than one standard of performance is applicable to a minor source, the more stringent standard shall apply.

2. Will not violate the visible emission standards of R18-2-501.

3. Will not violate the nonpoint source emission standards of Article 4 of these Rules.

I. Upon receipt of an application, the Director shall make a preliminary determination whether the permit should be approved or disapproved and whether, if approved, conditions should be attached to such approval.

J. The Director shall make available in at least one location in each air quality control region in which the proposed major source or major alteration (or the proposed construction or alteration of a stationary source emitting 5 or more tons of lead per year) would be constructed, a copy of all materials submitted with an application for a Class A installation permit, a copy of the preliminary determination, a brief summary of the basis for the preliminary determination, and, to the maximum extent practicable, a copy or summary of all other materials to be considered in making a final determination on the application.

K. The Director shall notify the public within five days of receipt of an application for a Class A installation permit, by advertisement in a newspaper of general circulation in each air quality control region in which the proposed major source or major alteration would be constructed, of the application. Such notification shall include a summary of the application, the Director's preliminary determination, the degree of increment consumption expected from operation of the new major source or major alteration, and a statement informing the public of the opportunity for written comment and the time frame, which shall not be less than thirty days, within which comments are to be submitted.

L. A copy of the notice required by Subsection K. shall be sent to the permit applicant, to the Administrator, and to the officials and agencies having cognizance over the location where the proposed major source or major alteration would occur.

M. Within twenty days after receipt of an application for a Class A installation permit, or any addition to such application, the Director shall advise the applicant of any deficiency in the application or in the information submitted. In the event of such a deficiency, the date of receipt of the application shall be, for the purpose of this Section, the date on which the Director received all required information.

N. The Director may require the applicant to provide additional information or to provide and maintain such facilities or perform such air impact modeling procedures as are necessary to secure information that will disclose the nature, extent, quantity or effects of air contaminants discharged into the atmosphere from the major source or facility described in the application.

O. The Director shall take final action on the application within thirty days of the proper filing of the completed application. The Director shall notify the applicant in writing of his approval or denial. Such notification shall be made available for public inspection in at least one location in the air quality control region in which the major source is located.

P. An installation permit shall remain in effect until the operating permit for such major source is granted, the operating permit for a major source is amended to reflect the installation of air pollution control equipment, or the installation permit is cancelled.

Q. The Director may cancel an installation permit issued under this Section if the proposed construction or major alteration is not begun within 18 months of issuance, or if during the construction or major alteration, work is suspended for more than 18 months.

Historical Note

Amended eff. Aug. 7, 1975 (Supp. 75-1). Amended as an emergency eff. Dec. 15, 1975 (Supp. 75-2). Amended eff. May 10, 1976 (Supp. 76-3). Amended eff. Apr. 12, 1977 (Supp. 77-2). Amended eff. Mar. 24, 1978 (Supp. 78-2). Former Section R9-3-301 repealed, new Section R9-3-301 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. July 9, 1980 (Supp. 80-4). Amended eff. May 28, 1982 (Supp. 82-3). Amended Subsections B. and C. eff. Sept. 22, 1983 (Supp. 83-5). Amended Subsection B. Paragraph 3. eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-301 renumbered without change as Section R18-2-301 (Supp. 87-3).

R18-2-302. Installation permits for sources located in nonattainment areas

A. Except as provided in Subsections C. through I. below, no Class A installation permit shall be issued to a person proposing to construct a new major source or make a major alteration to a source located in any nonattainment area for the pollutant(s) for which the source is classified as a major source or the alteration is classified as a major alteration unless:

1. The person demonstrates that the new major source or the major alteration will meet an emission limitation which is the lowest achievable emission rate (LAER) for that source for that specific pollutant(s).

2. The person certifies that all existing major sources owned or operated by that person (or any entity controlling, controlled by, or under common control with that person) in the State are in compliance with all conditions contained in the operating or conditional permits of each of the sources and all other applicable emission limitations and standards under the Clean Air Act.

3. The person demonstrates that emission reductions for the specific pollutant(s) from source(s) in existence in the allowable offset area of the new

major source or major alteration (whether or not under the same ownership) meet the offset and net air quality benefit requirements of R18-2-303.

B. No Class A installation permit shall be issued to a person proposing to construct a new major source for volatile organic compounds or carbon monoxide (or both) or make a major alteration for volatile organic compounds or carbon monoxide (or both) to a major source located in a nonattainment area for photochemical oxidants or carbon monoxide (or both) unless:

1. The person performs an analysis of alternative sites, sizes, production processes and environmental control techniques for such new major source or major alteration; and

2. The Director determines that the analysis demonstrates that the benefits of the new major source or major alteration outweigh the environmental and social costs imposed as a result of its location, construction or alteration.

C. At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as restriction on hours of operation, then the requirements of this Section shall apply to the source or modification as though construction had not yet commenced on the source or modification.

D. Secondary emissions shall not be considered in determining a new source or modification's potential to emit and therefore whether the new source or modification is major. However, if a new source or modification is subject to this Section on the basis of its direct emissions, permit to construct the new source or modification shall be denied unless the conditions specified in Paragraphs 1. and 2. of Subsection A. of this Section are met for reasonably quantifiable secondary emissions caused by the new source or modification.

E. A permit to construct a new source or modification shall be denied unless the conditions specified in Paragraphs 1., 2., and 3. of Subsection A. of this Section are met for fugitive emissions caused by the new source or modification. However, these conditions shall not apply to a new major source or major alteration that would be a major source or major alteration only if fugitive emissions, to the extent quantifiable, are considered in calculating the potential emissions of the source or alteration, and the source is not either among the Categorical Sources listed in R18-2-101 or belongs to the category of sources for which New Source Performance Standards under A.A.C. Title 9, Chapter 3, Article 8 or Hazardous Air Pollutant Standards under A.A.C. Title 9, Chapter 3, Article 9 were adopted prior to August 7, 1980.

F. The requirements of this Section shall not apply to a new major source or major alteration to a major source if an application for an installation permit for the new source or alteration was received before May 15, 1982. In such a case the new major source or major alteration shall be subject to the requirements contained in its installation permit and the regulations in effect on the date on which the permit was issued.

G. The requirements of A.3. of this Section shall not apply to temporary emission sources, such as pilot plants and portable sources, which are only temporarily located in the nonattainment area, are otherwise regulated by an installation or operating permit, and are in compliance with the conditions of that permit.

H. The requirements of A.3. of this Section shall not apply to emissions of a pollutant from a new major source or major alteration to be located in a nonattainment area for that pollutant, if the person applying for an installation permit under this Section can demonstrate that emissions of that pollutant from the new major source or major alteration will not exceed the allowance plan adopted pursuant to Sections 172 and 173 of the Act.

I. The requirements of A.3. of this Section shall not apply to new resource recovery projects burning municipal solid waste and sources which must switch fuels due to lack of adequate fuel supplies or where a source is required to be modified as a result of EPA regulations, if the owner or operator of the source or alteration can demonstrate that:

1. He made his best efforts to meet the requirements of A.3. and such efforts were unsuccessful; and
2. All available emission offsets have been or will be secured; and
3. He will continue to seek offsets and apply them when they become available.

Historical Note

Amended eff. Aug. 7, 1975 (Supp. 75-1); Former Section R9-3-302 repealed, new Section R9-3-302 adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-302 repealed, new Section R9-3-302 adopted eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-302 repealed, new Section R9-3-302 adopted eff. May 28, 1982 (Supp. 82-3). Former Section R9-3-302 renumbered without change as Section R18-2-302 (Supp. 87-3).

R18-2-303. Offset and net air quality benefit standards

A. Increased emissions by a new major source or a major alteration subject to this Section must be offset by reductions in the emission of each pollutant for which the area has been designated as nonattainment and for which the source is classified as a major source or the alteration of the source is classified as a major alteration. Such offset may be obtained by reductions in emissions from the major source or major alteration or from any other source (including but not limited to nonmajor stationary sources, mobile sources, non-point sources and major sources) in existence or projected, on the startup date of the new major source or major alteration, to be located in the allowable offset area.

1. Credit for an emissions offset can be used only if it has not been relied upon in demonstrating attainment or reasonable further progress, and if it has not been relied upon previously in issuing a permit pursuant to Sections R18-2-301 and R18-2-302.

B. An offset will not be sufficient unless total emissions for the particular pollutant for which the offset is required in the allowable offset area after the

new major source or major alteration commences operation will be less than the baseline of the total emissions for that pollutant and such reductions are sufficient to satisfy the Director that emissions from the new major source or major alteration together with the offset will result in reasonable further progress for that pollutant in the allowable offset area.

1. Only intrapollutant emission offsets shall be allowed. Intrapollutant emission offsets for ozone (or photochemical oxidants) and nitrogen dioxide shall include offset reductions in emissions of volatile organic compounds and oxides of nitrogen, respectively.

C. For purposes of this Section, "reasonable further progress" shall mean annual incremental reductions in emissions of the applicable air pollutant which are sufficient in the judgment of the Director to provide for attainment of the applicable air quality standards by the date required under Section 172 of the Act. Reasonable further progress shall be deemed to occur if the offset reductions are sufficient to satisfy the Director that the construction of the new major source or major alteration together with the offset will result in a net air quality benefit.

1. For purposes of this Section, "net air quality benefit" shall mean that during similar time periods either a. or b. below, is applicable:

a. A reduction in the number of violations of the applicable Arizona ambient air quality standard within the allowable offset area has occurred and the following mathematical expression is satisfied:

$$\sum_{i=1}^N \frac{x_i - C}{N} \leq \sum_{j=1}^K \frac{x_j - C}{K}$$

where:

C = The applicable Arizona ambient air quality standard

x_i = The concentration level of the violation at the i^{th} receptor for such pollutant after offsets.

N = The number of violations for such pollutant after offsets ($N \leq K$).

x_j = The concentration level of the violation at the j^{th} receptor from such pollutant before offsets.

k = The number of violations for such pollutant before offsets.

b. The average of the ambient concentrations within the allowable offset area following the implementation of the contemplated offsets will be less than the average of the ambient concentrations within the allowable offset area without the offsets.

D. Baseline further defined:

1. For the purpose of this Section, the baseline of total emissions from any sources in existence or sources which have obtained an installation permit (regardless of whether or not such sources are in actual operation at the time of

filing of the Class A installation permit application for any particular pollutant) will be the total emissions allowed by the regulatory emission limitations in effect at the time the application is filed. In addition, the baseline of total emissions will consist of all emission limitations included as conditions on Federally enforceable permits except that the offset baseline shall be the actual emissions of the source from which offset credit is obtained where:

- a. No emission limitations are applicable to a source from which offsets are being sought; or
- b. The demonstration of reasonable further progress and attainment of ambient air quality standards is based upon the actual emissions of sources located within a designated nonattainment area.

2. Where the emission limitations for a particular pollutant allow greater emissions than the potential emission rate of the source for that pollutant, the baseline shall be the potential emission rate at the time the permit application is filed and emissions offset credit shall be allowed only for control below the potential emission rate.

E. For an existing fuel combustion source, offset credit shall be based on the allowable emissions under the regulations or permit conditions applicable to the source for the type of fuel being burned at the time the installation permit application is filed. If an existing source commits to switch to a cleaner fuel at some future date, emissions offset credit based on the allowable (or actual) emissions for the fuels involved shall not be acceptable unless:

1. The source's operating permit specifically requires the use of a specified alternative control measure which would achieve the same degree of emissions reduction should the source switch back to a dirtier fuel at some later date; and,

2. The source demonstrates to the satisfaction of the Director that it has secured an adequate long-term supply of the cleaner fuel.

F. Offsets shall be made on either a pounds-per-hour, pounds-per-day, or tons-per-year basis, whichever is applicable, when all facilities involved in the emission offset calculations are operating at their maximum expected or allowed production rate and, except as otherwise provided in Subsection E. of this Section, utilizing the type of fuel burned at the time the permit application is filed. A tons-per-year basis shall not be used if the new or modified source or the source of the offsets is not expected to operate throughout the entire year. No emissions credit may be allowed for replacing one hydrocarbon compound with another of lesser reactivity, except for Methane, Ethane, 111 - Trichloroethane (Methyl Chloroform), and Trichlorotrifluoroethane (Freon 113).

G. Emissions reductions achieved by shutting down an existing source or permanently curtailing production or operating hours below baseline levels may be credited, provided that the work force to be affected has been notified of the proposed shutdown or curtailment. Source shutdowns and curtailments in production or operating hours occurring prior to the date the new major source or major alteration application is filed generally may not be used for emissions

offset credit. However, where an applicant can establish that it shut down or curtailed production after August 7, 1977, or less than one year prior to the date of permit application, whichever is earlier, and the proposed new major source or major alteration is a replacement for the shutdown or curtailment, credit for such shutdown or curtailment may be applied to offset emissions from the new source or alteration.

H. The allowable offset area shall refer to the geographical area in which are located the sources whose emissions are being sought for purposes of offsetting emissions from a new major source or major alteration. For the pollutants sulfur dioxide, particulate and carbon monoxide, the allowable offset area shall be any area in which Arizona ambient air quality standards for such pollutants are violated and in which the significance levels described in R18-2-101 are exceeded due to the emissions from such new major source or major alteration. The area shall be determined by atmospheric dispersion modeling. If the emission offsets are obtained from a source on the same premises or in the immediate vicinity of the new major source or major alteration, and the pollutants disperse from substantially the same effective stack height, atmospheric dispersion modeling shall not be required. The allowable offset area for all other pollutants shall be the nonattainment areas for those pollutants within which the new major source or major alteration is to be located and those portions of attainment areas located within 50 kilometers of such nonattainment areas.

I. An emission reduction may only be used to offset emissions if the reduced level of emissions will continue for the life of the new source or alteration and if the reduced level of emissions is legally enforceable. It will be considered legally enforceable if the following conditions are met:

1. The emission reduction is included as a condition in the operating permit of the source relied upon to offset the emissions from the new major source or major alteration, or in the case of reductions from sources controlled by the applicant, is included as a condition of the installation permit for the new major source or major alteration, or is adopted as a part of these Rules or comparable rules and regulations of any other governmental entity or is contractually enforceable by the Department;
2. The permit conditions or regulations containing the emission reduction have been submitted to the Administrator for inclusion in the State Implementation Plan adopted pursuant to Section 110 of the Act.

Historical Note

Amended eff. Aug. 7, 1975 (Supp. 75-1). Amended eff. Aug. 6, 1976 (Supp. 76-4). Former Section R9-3-303 repealed, new Section R9-3-303 adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-303 repealed, new Section R9-3-303 adopted eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. May 28, 1982 (Supp. 82-3). Amended Subsection D. Paragraph 1. eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-303 renumbered without change as Section R18-2-303 (Supp. 87-3).

R18-2-304. Installation permit requirements for sources located in attainment and unclassifiable areas

A. Except as provided in Subsections B. through G. below and R18-2-307, innovative control technology, no Class A installation permit shall be issued to a person proposing to construct a new major source or make a major alteration to a major source (or to construct or modify a stationary source that emits 5 or more tons of lead per year) that would be constructed in an area designated as attainment or unclassifiable for any pollutant and for which construction commenced after May 15, 1982 unless the source or alteration meets the following conditions:

1. A new major source shall apply best available control technology for each pollutant subject to regulation under this Chapter that it would have the potential to emit in significant amounts.

2. A major alteration shall apply best available control technology for each pollutant subject to regulation under this Chapter for which the alteration would result in a significant net emissions increase at the source. This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit.

3. For phased construction projects, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source.

4. The person applying for the permit performs an air impact analysis and monitoring as specified in R18-2-305 and such analysis demonstrates that allowable emission increases from the proposed new major source or major alteration, in conjunction with all other applicable emission increases or reductions (including secondary emissions):

a. Would not cause or contribute to air pollution in violation of any applicable maximum allowable increase over the baseline concentration in R18-2-217.B. for any attainment or unclassified area; or

b. Would not contribute to an increase in ambient concentrations for a pollutant by an amount in excess of the significance level for such pollutant in any area in which Arizona primary or secondary ambient air quality standards for that pollutant are being violated. A new major source of volatile organic compounds or a major alteration to a major source of volatile organic compounds will be presumed to contribute to violations of the Arizona ambient air quality standards for ozone if it will be located within fifty (50) kilometers of a nonattainment area for ozone. The presumption may be rebutted for a new major source or major alteration if it can be satisfactorily demonstrated to the Director that emissions of volatile organic compounds from the new major

source or major alteration will not contribute to violations of the Arizona ambient air quality standards for ozone in adjacent nonattainment areas for ozone. Such a demonstration shall include a showing that topographical, meteorological or other physical factors in the vicinity of the new major source or major alteration are such that transport of volatile organic compounds emitted from the source are not expected to contribute to violations of the ozone standards in the adjacent nonattainment areas.

5. Air quality models:

a. All estimates of ambient concentrations required under this Section shall be based on the applicable air quality models, data basis, and other requirements specified in the "Guideline on Air Quality Models" (OAQPS 1.2-080, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C. 27711, April 1978).

b. Where an air quality impact model specified in the "Guideline on Air Quality Models" is inappropriate, the model may be modified or another model substituted. Such a change must be subject to notice and opportunity for public comment. Written approval of the EPA Administrator must be obtained for any modification or substitution. Methods like those outlined in the "Workbook for the Comparison of Air Quality Models" (U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C. 27711, May 1978) should be used to determine the comparability of air quality models.

B. The requirements of this Section shall not apply to a new major source or major alteration to a major source if an installation permit for the new source or alteration was received before May 15, 1982. In such a case the new major source or major alteration shall be subject to the requirements contained in its installation permit and the regulations in effect on the date on which the permit was issued.

C. The requirements of this Section shall not apply to a new major source or major alteration to a source with respect to a particular pollutant if the person applying for the permit demonstrates that, as to that pollutant, the source or alteration is located in an area designated as nonattainment for the pollutant.

D. The requirements of this Section shall not apply to a new major source or major alteration to a source when the owner of such source is a nonprofit health or educational institution.

E. The requirements of this Section shall not apply to a new major source or major alteration of a source if such source or alteration would be a major source or major alteration only if fugitive emissions, to the extent quantifiable, are considered in calculating the potential emissions of the source or alteration, and the source is not either among the Categorical Sources listed in R18-2-101 or belongs to the category of sources for which New Source Performance Standards under A.A.C. Title 9, Chapter 3, Article 8 or Hazardous Air Pollutant Standards under A.A.C. Title 9, Chapter 3, Article 9 were adopted prior to August 7, 1980.

F. The requirements of this Section shall not apply to a new major source which is classified as a major source solely because the source is capable of generating more than a total of seventy-five tons per day of air pollutants regulated under this Chapter and not because the source has potential emissions of 100 or 250 tons per year (as applicable) of any single pollutant regulated under this Chapter

G. The requirements of this Section shall not apply to a portable source which would otherwise be a new major source or major alteration to an existing source if such portable source is under an installation or operating permit issued under this Chapter, is in compliance with the conditions of that permit, and the emissions from the source will not impact a Class I area nor an area where an applicable increment is known to be violated.

H. Special rules applicable to Federal Land Managers:

1. Notwithstanding any other provision of this Section, a Federal Land Manager may present to the Director a demonstration that the emissions attributed to such new major source or major alteration to a source will have significant adverse impact on visibility or other specifically defined air quality related values of any Federal Mandatory Class I area designated in R18-2-217.A.2, regardless of the fact that the change in air quality resulting from emissions attributable to such new major source or major alteration to a source in existence will not cause or contribute to concentrations which exceed the maximum allowable increases for a Class I area. If the Director concurs with such demonstrations, the permit shall be denied.

2. If the owner or operator of a proposed new major source or a source for which major alteration is proposed demonstrates to the Federal Land Manager that the emissions attributable to such major source or major alteration will have no significant adverse impact on the visibility or other specifically defined air quality related values of such areas and the Federal Land Manager so certifies to the Director, the Director may issue a permit notwithstanding the fact that the change in air quality resulting from emissions attributable to such new major source or major alteration will cause or contribute to concentrations which exceed the maximum allowable increases for a Class I area. Such a permit shall require that such new major source or major alteration comply with such emission limitations as may be necessary to assure that emissions will not cause increases in ambient concentrations greater than the following maximum allowable increases over baseline concentrations for such pollutants:

Maximum Allowable Increase
(Micrograms per cubic meter)

Sulfur Oxide

Period of exposure

Low terrain areas:

24-hour maximum 36

3-hour maximum 130

High terrain areas:

24-hour maximum 62

3-hour maximum 221

Historical Note

Amended eff. Aug. 7, 1975 (Supp. 75-1). Former Section R9-3-304 repealed, new Section R9-3-304 formerly Section R9-3-305 renumbered and amended eff. Aug. 6, 1976 (Supp. 76-4). Former Section R9-3-304 repealed, new Section R9-3-304 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-304 repealed, new Section R9-3-304 adopted eff. May 28, 1982 (Supp. 82-3). Former Section R9-3-304 renumbered without change as Section R18-2-304 (Supp. 87-3).

R18-2-305. Air quality impact analysis and monitoring requirements

A. Any application for an installation permit to construct a new major source or major alteration to a major source shall contain an analysis of ambient air quality in the area that the new major source or major alteration would affect for each of the following pollutants:

1. For the new source, each pollutant that it would have the potential to emit in a significant amount;

2. For the alteration, each pollutant for which it would result in a significant net emissions increase.

B. With respect to any such pollutant for which no Arizona ambient air quality standard exists, the analysis shall contain shall air quality monitoring data as the Director determines is necessary to assess ambient air quality for that pollutant in any area that the emissions of the pollutant would affect.

C. With respect to any such pollutant (other than nonmethane hydrocarbons) for which such a standard does exist, the analysis shall contain continuous air quality monitoring data gathered for purposes of determining whether emissions of that pollutant would cause or contribute to a violation of the standard or any maximum allowable increase.

D. In general, the continuous air quality monitoring data that is required shall have been gathered over a period of at least one year and shall represent at least the year preceding receipt of the application, except that, if the Director determines that a complete and adequate analysis can be accomplished with monitoring data gathered over a period shorter than one year (but not to be less than four months), the data that is required shall have been gathered over at least that shorter period.

E. For any application which becomes complete, except as to the requirements of Subsection C., prior to February 9, 1982, the data that Subsection C. requires shall have been gathered over at least the period from February 9, 1981, to the date the application becomes otherwise complete, except that:

1. If the new source or alteration would have been major for that pollutant under R18-2-304 as in effect on October 2, 1979, any monitoring data shall have been gathered over at least the period required by those regulations.

2. If the Director determines that a complete and adequate analysis can be accomplished with monitoring data over a shorter period (not to be less than four months), the data that Subsection C. requires shall have been gathered over that shorter period.

3. If the monitoring data would relate exclusively to ozone and would not have been required under R18-2-304 as in effect on October 2, 1979, the Director may waive the otherwise applicable requirements of this Subsection to the extent that the applicant shows that the monitoring data would be unrepresentative of air quality over the full year.

F. The owner or operator of a proposed stationary source or modification to a source of volatile organic compounds who satisfies all conditions of 40 CFR 51, Appendix S, Section IV, may provide post-approval monitoring data for ozone in lieu of providing preconstruction data as required under Subsection B., C., and D., above.

G. Post-construction monitoring. The owner or operator of a new major source or major alteration shall, after construction of the source or alteration, conduct such ambient monitoring as the Director determines is necessary to determine the effect emissions from the new source or alteration may have, or are having, on air quality in any area.

H. Operations of monitoring stations. The owner operator of a new major source or major alteration shall meet the requirements of 40 CFR 58, Appendix B, during the operation of monitoring stations for purposes of satisfying Subsections B. through G. above.

I. The requirements of Subsections B. through H., above shall not apply to a new major source or major alteration to an existing source with respect to monitoring for a particular pollutant if:

1. The emissions increase of the pollutant from the new source or the net emissions increase of the pollutant from the alteration would cause, in any area, air quality impacts less than the following amounts:

- Carbon monoxide — 575 $\mu\text{g}/\text{m}^3$, 8-hour average;
- Nitrogen dioxide — 14 $\mu\text{g}/\text{m}^3$, annual average;
- Total suspended particulate — 10 $\mu\text{g}/\text{m}^3$, 24-hour average;
- Sulfur dioxide — 13 $\mu\text{g}/\text{m}^3$, 24-hour average;
- Lead — 0.1 $\mu\text{g}/\text{m}^3$, 24-hour average;
- Mercury — 0.25 $\mu\text{g}/\text{m}^3$, 24-hour average;
- Beryllium — 0.0005 $\mu\text{g}/\text{m}^3$, 24-hour average;
- Fluorides — 0.25 $\mu\text{g}/\text{m}^3$, 24-hour average;

Vinyl chloride - 1.5 ug/m³, 24-hour average;
Total reduced sulfur - 10 ug/m³, 1-hour average;
Hydrogen sulfide - 0.04 ug/m³, 1-hour average;
Reduced sulfur compounds - 10 ug/m³, 1-hour average;
Ozone - increased emissions of less than 100 tons per year of volatile organic compounds; or,

2. The concentrations of the pollutant in the area that the new source or alteration would affect are less than the concentrations listed in Paragraph 1. above.

J. Any application for an installation permit to construct a new major source or major alteration to a source shall contain:

1. An analysis of the impairment to visibility, soils and vegetation that would occur as a result of the new source or alteration and general commercial, residential, industrial and other growth associated with the new source or alteration. The applicant need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.

2. An analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the new source or alteration.

Historical Note

Amended eff. Aug. 7, 1975 (Supp. 75-1). Amended as an emergency eff. Dec. 15, 1975 (Supp. 75-2). Amended eff. May 10, 1976 (Supp. 76-3). Former Section R9-3-306 renumbered as Section R9-3-305 eff. Aug. 6, 1976. References changed to conform (Supp. 76-4). Amended eff. Apr. 12, 1977 (Supp. 77-2). Amended eff. Mar. 24, 1978 (Supp. 78-2). Former Section R9-3-305 repealed, new Section R9-3-305 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-305 repealed, new Section R9-3-305 adopted eff. May 28, 1982 (Supp. 82-3). Former Section R9-3-305 renumbered without change as R18-2-305 (Supp. 87-3).

R18-2-306. Operating permits

A. Except as provided in this Section or R18-2-1101 (Jurisdiction and Authority), no person shall operate any major or minor source or other stationary source that emits 5 or more tons of lead per year without first obtaining an operating permit from the Director. When an installation permit is required to commence construction of a new major source or major alteration of an existing major source or construction or major alteration of a source capable of emitting 5 or more tons of lead per year an operating permit shall not be issued to the new major source or for the major alteration until such time as the installation permit has been obtained. In the event a person operating any major source or other stationary source capable of emitting 5 or more tons of lead per year, unintentionally commences construction or major alteration activities for which an installation permit is required pursuant to Chapter 2 without obtaining such installation permit, such person shall be required to present to the Director all necessary information which is required to be submitted by an applicant for an

installation permit and the new major source or major alteration (or other stationary source capable of emitting 5 or more tons of lead per year) shall be made to conform to all applicable standards.

No operating permit need be issued to any minor source which does not have the potential to emit any uncontrolled pollutant at greater than or equal to an emissions rate defined herein as "significant" and no such permit need be issued to any stationary rotating machinery operated at less than or equal to 325 brake horsepower, nor to any fuel burning equipment or incinerator that is not fired at a sustained rate of greater than 500,000 Btu per hour for an 8-hour period.

B. No operating permit will be issued unless:

1. The applicant demonstrates that the source will be in compliance with all applicable requirements of this Chapter.

2. For any major source operating in a nonattainment area for any pollutant(s) for which the source is classified as a major source, the owner or operator demonstrates compliance with reasonably available control technology.

3. The person applying for an operating permit demonstrates that the major or minor source or major alteration will not emit pollutants in excess of the applicable hazardous air pollutant standards contained in A.A.C. Title 9, Chapter 3, Article 9 (Hazardous Air Pollutant Standards).

4. The person applying for an operating permit demonstrates that the major or minor source or major alteration will not emit pollutants in excess of the applicable emission limitation for nonpoint sources contained in Article 4.

C. Applications for operating permit:

1. An application for an operating permit shall be made on forms furnished by the Director.

2. A separate application is required for each major or minor source.

3. Each application shall be signed by the applicant.

4. Each application for an initial operating permit shall be accompanied by plans, descriptions, specifications and drawings showing the design of the source or major alteration, stack data, and the nature and amount of emissions. An application for a renewal of an operating permit shall be accompanied by plans, descriptions, specifications and drawings showing any changes in the source's configuration from that which existed on the date of issuance of the most recent operating permit.

5. Each application shall include information concerning compliance with any conditions on any prior permit.

6. The application shall include such information as is required by Appendix 2 and such other information as the Director or applicable provisions of these Rules shall prescribe.

7. The Director may waive the submission by the applicant of any of the data or information required by this Section if he shall deem such data to be inappropriate or unnecessary.

D. Within twenty days after the receipt of an application, the Director shall advise the applicant of any additional information or testing required. No

application shall be considered complete and properly filed until the applicant has submitted such information or test results.

E. The Director may require the applicant to provide additional information or to provide and maintain such ambient air monitoring facilities or ambient air impact modeling as necessary to secure information that will disclose the effect emissions from the major source will have on maintenance and attainment of ambient air quality standards. An item of equipment not covered by an operating permit may be operated for purposes of testing, including accomplishment of new source performance testing under A.A.C. Title 9, Chapter 3, Article 8, only if specific written permission has been obtained from the Director designating the dates of such operation for testing.

F. The Director shall take final action on the application within thirty days of the proper filing of the completed application. The Director shall notify the applicant in writing of his approval, conditional approval or denial. Such notification shall be made available for public inspection in at least one location in the air quality control region in which the major source is located.

G. Each operating permit issued under these Rules shall include the following provisions:

1. A description of the facility and equipment covered and its location, or for a mobile source, the area in which it may operate.
2. The name and address of the owner or operator of the source.
3. The date the permit is issued and the date it will expire.
4. The terms and conditions specified in R18-2-308.

H. The issuance of an operating permit shall not relieve the owner or operator from compliance with any local, State or Federal law or regulations, nor does any other law, regulation or permit relieve the owner or operator from obtaining a permit required under this Chapter.

I. Any owner or operator who fails to obtain an operating permit required by this Chapter, or who fails to comply with a permit as approved and conditioned by the Director, shall be subject to enforcement action under the provisions of A.R.S. §§ 36-1709 (Order of Abatement), 36-1715 (Injunctive Relief), and 36-1720 (Misdemeanor).

J. Operating permits issued pursuant to this Section shall be issued for a period of one year except that operating permits in the form of primary nonferrous smelter orders authorized under Section 119 of the Act as amended may be issued for the periods provided for therein.

Historical Note

Adopted eff. Aug. 7, 1975 (Supp. 75-1). Former Section R9-3-307 renumbered as Section R9-3-306 eff. Aug. 6, 1976. Reference changed to conform (Supp. 76-4). Former Section R9-3-306 repealed, new Section R9-3-306 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Amended eff. July 9, 1980 (Supp. 80-4). Amended Subsection A. eff. May 28, 1982 (Supp. 82-3). Amended Subsection A. eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-306 renumbered without change as R18-2-306 (Supp. 87-3).

R18-2-307. Innovative control technology

A. Notwithstanding the provisions of R18-2-304.A.1., R18-2-304.A.2., and R18-2-304.A.3. the owner or operator of a proposed new major source or major alteration may request that the Director approve a system of innovative control technology rather than the best available control technology requirements otherwise applicable to the new source or alteration.

B. The Director shall approve the installation of a system of innovative control technology if the following conditions are met:

1. The owner or operator of the proposed source or alteration satisfactorily demonstrates that the proposed control system would not cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation or function;

2. The owner or operator agrees to achieve a level of continuous emissions reduction equivalent to that which would have been required under R18-2-304.A.2. by a date specified in the source's installation permit. Such date shall not be later than four years from the time of start-up or seven years from permit issuance;

3. The source or alteration would meet requirements equivalent to those in R18-2-304.A. based on the emissions rate that the stationary source employing the system of innovative control technology would be required to meet on the date specified in the installation permit.

4. Before the date specified in the installation permit, the source or alteration would not:

a. Cause or contribute to any violation of an applicable State ambient air quality standard; or,

b. Impact any portion of any Class I area; or

c. Impact any portion of any other area where an applicable ambient incremental standard is known to be violated in that portion.

5. All other applicable requirements, including those for public participation contained in R18-2-301.I. through R18-2-301.Q., have been met.

C. The Director shall withdraw any approval to employ a system of innovative control technology made under this Section if:

1. - The proposed system fails by the specified date to achieve the required continuous emissions reduction rate; or,

2. The proposed system fails before the specified date also as to contribute to an unreasonable risk to public health, welfare, or safety; or,

3. The Director decides at any time that the proposed system is unlikely to achieve the required level of control or to protect the public health, welfare, or safety.

D. If the new source or major alteration fails to meet the required level of continuous emissions reduction within the specified time period, or if the approval is withdrawn in accordance with Subsection C. above, the Director may allow the owner or operator of the source or alteration up to an additional three

years to meet the requirement for the application of best available control technology through use of a demonstrated system of control.

Historical Note

Adopted eff. Aug. 7, 1975 (Supp. 75-1). Former Section R9-3-307 renumbered as Section R9-3-306 eff. Aug. 6, 1976 (Supp. 76-4). New Section R9-3-307 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-307 repealed, new Section R9-3-307 adopted eff. May 28, 1982 (Supp. 82-3). Amended B.4.b. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-307 renumbered without change as R18-2-307 (Supp. 87-3).

R18-2-308. Permit conditions

An installation or operating permit shall contain such terms and conditions as the Director deems necessary to assure a source's compliance with the requirements of Article 1, Chapter 14 of Title 36 of the Arizona Revised Statutes and the provisions of this Chapter. The Director may include, but is not limited to permit conditions which require:

1. Compliance with emission limitations.
2. Compliance with design, equipment, work practice or operations standards if emission limitations are not feasible.
3. Recordkeeping and reporting. Such requirements shall be consistent with the provisions of A.R.S. § 36-1708.
4. Ambient air quality monitoring.
5. Emissions monitoring.
6. Notification to the Director of such events as the commencement of construction, initial startup and performance testing.
7. Preventive maintenance of air pollution control equipment.
8. Maintenance and calibration of ambient air quality and emissions monitoring equipment.

Historical Note

Adopted eff. Aug. 7, 1975 (Supp. 75-1). Former Section R9-3-308 repealed, new Section R9-3-308 adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-308 renumbered without change as R18-2-308 (Supp. 87-3).

R18-2-309. Excess emissions

A. Emissions in excess of an applicable emission limitation contained in these Rules or in the terms of an installation, operating, or conditional permit shall constitute a violation. However, further enforcement action will not be taken if the owner or operator of the facility has complied with the reporting requirements of R18-2-314 in a timely manner, and has demonstrated to the Director's satisfaction that:

1. The excess emissions resulted from a sudden and unavoidable breakdown of the process or the control equipment; resulted from unavoidable conditions during startup or shutdown; resulted from unavoidable conditions during

an upset of operations, or that greater or more extended excess emissions will result unless scheduled maintenance is performed.

2. The air pollution control equipment, process equipment, or processes were at all times maintained and operated, to the maximum extent practicable, in a manner consistent with good practice for minimizing emissions;

3. Where repairs were required, such repairs were made in an expeditious fashion when the person knew or should have known that applicable emission limitations were being exceeded. Off-shift labor and overtime were utilized where practical to insure that such repairs were made as expeditiously as possible. If off-shift labor and overtime were not utilized, the person satisfactorily demonstrated that such measures were impractical;

4. The amount and duration of the excess emissions (including any bypass operation) were minimized to the maximum extent practicable during periods of such emissions;

5. All feasible steps were taken to minimize the impact of the excess emissions on potential violations of ambient air quality standards;

6. The excess emissions are not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and,

7. During the period of excess emissions there were no measured violations of the ambient air quality standards established in Article 2 of this Chapter which could be attributed to the emitting facility.

B. It shall be the burden of the owner or operator of the facility to demonstrate, through submission of the data and information required by this Rule, that all reasonable and practicable measures within his control were implemented to prevent the occurrence of excess emissions.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amendment filed Sept. 18, 1979, eff. following the adoption of Article 7. Nonferrous Smelter Orders. Amended eff. Oct. 2, 1979 (Supp. 79-5). Article 7. Nonferrous Smelter Orders adopted eff. Jan. 8, 1980. Amendment filed Sept. 18, 1979 eff. Jan. 8, 1980 (Supp. 80-2). Amended eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-309 renumbered without change as R18-2-309 (Supp. 87-3).

R18-2-310. Test methods and procedures

A. Except as otherwise specified in these Rules, the applicable testing procedures contained in the Department's *Arizona Testing Manual for Air Pollutant Emissions* (January 1, 1987 Edition), incorporated herein by reference and on file with the Office of the Secretary of State and the Department of Environmental Quality, shall be used to determine compliance with the standards established in this Chapter or contained in installation or operating permits issued pursuant to this Chapter.

B. The opacity of visible emissions shall be determined by Reference Method 9 of the *Arizona Testing Manual* in all cases.

C. The heat content of solid fuel shall be determined according to ASTM method D-3176-74, "ultimate analysis of coal or coke" and ASTM method D-2015, "gross calorific value of solid fuel by the adiabatic bomb calorimeter".

D. A variance from the approved test procedures in any test plan submitted for Department approval may be granted for the duration of that plan by the Director provided that:

1. The methodology or procedure to be substituted is substantially equivalent to the procedures established in Subsections A. and C. above.
2. Granting the variance will not adversely affect the public health, safety and welfare.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. June 19, 1981 (Supp. 81-3). Amended *Arizona Testing Manual for Air Pollutant Emissions*, eff. Sept. 22, 1983 (Supp. 83-5). Amended *Arizona Testing Manual for Air Pollutant Emissions*, as of Sept. 15, 1984, eff. Aug. 9, 1985 (Supp. 85-4). Amended eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-310 renumbered without change as R18-2-310 (Supp. 87-3). Amended eff. Feb. 26, 1988 (Supp. 88-1).

R18-2-311. Air quality models

A. Where the Director requires a person requesting an installation or operating permit under this Chapter to perform air quality impact modeling to obtain such permit, the modeling shall be performed in a manner consistent with the *Guideline on Air Quality Models* (hereinafter called the "Guideline") issued by the United States Environmental Protection Agency in April 1978.

B. Where the person requesting an installation or operating permit can demonstrate that an air quality impact model specified in the Guideline is inappropriate, the model may be modified or another model substituted. However, before such modification or substitution can occur the Director must make a written finding that:

1. No model in the Guideline is appropriate for a particular permit under consideration, or,
2. The data base required for the appropriate model in the Guideline is not available; and,
3. The model proposed as a substitute or modification is likely to produce results equal or superior to those obtained by models in the Guideline; and,
4. The model proposed as a substitute or modification has been approved by the Administrator.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. July 9, 1980 (Supp. 80-4). Amended eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-311 renumbered without change as R18-2-311 (Supp. 87-3).

(The next page is 54.1.)

R18-2-312. Performance tests

A. Within 60 days after a source or facility subject to the installation and operating permit requirements of this Article has achieved the capability to operate at its maximum production rate on a sustained basis but no later than 180 days after initial start-up of such source or facility and at such other times as may be required by the Director, the owner or operator of such source or facility shall conduct performance tests and furnish the Director a written report of the results of the tests.

(The next page is 55.)

B. Performance tests shall be conducted and data reduced in accordance with the test method and procedures contained in the Arizona Testing Manual unless the Director:

1. Specifies or approves, in specific cases, the use of a reference method with minor changes in methodology,
2. Approves the use of an equivalent method,
3. Approves the use of an alternative method the results of which he has determined to be adequate for indicating whether a specific source is in compliance, or
4. Waives the requirement for performance tests because the owner or operator of a source has demonstrated by the other means to the Director's satisfaction that the source or facility is in compliance with the standard.
5. Nothing in this Section shall be construed to abrogate the Director's authority to require testing.

C. Performance tests shall be conducted under such conditions as the Director shall specify to the plant operator based on representative performance of the source or facility. The owner or operator shall make available to the Director such records as may be necessary to determine the conditions of the performance tests. Operations during periods of start-up, shutdown, and malfunction shall not constitute representative conditions of performance tests unless otherwise specified in the applicable standard.

D. The owner or operator of a permitted source shall provide the Director two weeks prior notice of the performance test to afford the Director the opportunity to have an observer present.

E. The owner or operator of a permitted source shall provide, or cause to be provided, performance testing facilities as follows:

1. Sampling ports adequate for test methods applicable to such facility.
2. Safe sampling platform(s).
3. Safe access to sampling platform(s).
4. Utilities for sampling and testing equipment.

F. Each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For the purpose of determining compliance with an applicable standard, the arithmetic mean of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the Director's approval, be determined using the arithmetic mean of the results of the two other runs.

G. Except as provided in Subsection H. compliance with the emission limits established in this Chapter or as prescribed in permits issued pursuant to this Chapter shall be determined only by the performance tests specified in this Section.

H. In addition to performance tests specified in this Section, compliance with specific emission limits may be determined by:

1. Opacity tests; and
2. Emission limit compliance tests specifically designated as such in the regulation establishing the emission limit to be complied with.

I. Nothing in this Section shall be so construed as to prevent the utilization of measurements from emissions monitoring devices or techniques not designated as performance tests as evidence of compliance with applicable good maintenance and operating requirements.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Sept. 28, 1984 (Supp. 84-5). Former Section R9-3-312 renumbered without change as R18-2-312 (Supp. 87-3).

R18-2-313. Existing source emission monitoring

A. Every source subject to an existing source performance standard as specified in this Chapter shall install, calibrate, operate, and maintain all monitoring equipment necessary for continuously monitoring the pollutants and other gases specified in this Section for the applicable source category.

1. Applicability.

a. Fossil fuel-fired steam generators as specified in C.1. of this Section, shall be monitored for opacity, nitrogen oxides emissions, sulfur dioxide emissions, and oxygen or carbon dioxide.

b. Fluid bed catalytic cracking unit catalyst regenerators, as specified in C.4. of this Section, shall be monitored for opacity.

c. Sulfuric acid plants, as specified in C.3. of this Section, shall be monitored for sulfur dioxide emissions.

d. Nitric acid plants, as specified in C.2. of this Section, shall be monitored for nitrogen oxides emissions.

2. Exemptions.

a. The provisions of this Section shall not apply to any source which is scheduled for retirement prior to August 29, 1982, provided that adequate evidence and guarantees are provided that clearly show that the source will cease operations prior to such date.

b. Emission monitoring shall not be required when the source of emissions is not operating.

3. Variations.

a. The Director may approve, on a case-by-case basis, alternative monitoring requirements different from the provisions of this Section if the installation of a continuous emission monitoring system cannot be implemented by a source due to physical plant limitations or extreme economic reasons. Alternative monitoring procedures will be specified by the Director on a case-by-case basis and must include as a minimum, annual manual stack tests for the pollutants

identified for each type of source in this Section. Examples of such special cases include, but are not limited to, the following:

b. Alternative monitoring requirements may be prescribed when installation of a continuous monitoring system or monitoring device specified by this Section would not provide accurate determinations of emissions (e.g., condensed, uncombined water vapor may prevent an accurate determination of opacity using commercially available continuous monitoring systems).

c. Alternative monitoring requirements may be prescribed when the affected facility is infrequently operated (e.g., some affected facilities may operate less than one month per year).

d. Alternative monitoring requirements may be prescribed when the Director determines that the requirements of this Section would impose an extreme economic burden on the source owner or operator.

e. Alternative monitoring requirements may be prescribed when the Director determines that monitoring systems prescribed by this Section cannot be installed due to physical limitations at the facility.

4. Monitoring system malfunction: A temporary exemption from the monitoring and reporting requirements of this Section may be provided during any period of monitoring system malfunction, provided that the source owner or operator shows to the satisfaction of the Director that the malfunction was unavoidable and is being repaired as expeditiously as practicable.

B. Installation and performance testing required under this Section shall be completed and monitoring and recording shall commence within 18 months of the effective date of this Section.

C. Minimum monitoring requirements:

1. Fossil-fuel fired steam generators: Each fossil-fuel fired steam generator, except as provided in the following Subparagraphs, with an annual average capacity factor of greater than 30 percent, as reported to the Federal Power Commission for calendar year 1976, or as otherwise demonstrated to the Department by the owner or operator, shall conform with the following monitoring requirements when such facility is subject to an emission standard for the pollutant in question.

a. A continuous monitoring system for the measurement of opacity which meets the performance specifications of this Section shall be installed, calibrated, maintained, and operated in accordance with the procedures of this Section by the owner or operator of any such steam generator of greater than 250 million Btu per hour heat input except where:

i. Gaseous fuel is the only fuel burned, or

ii. Oil or a mixture of gas and oil are the only fuels burned and the source is able to comply with the applicable particulate matter and opacity Regulations without utilization of particulate matter collection equipment, and where the source has never been found to be in violation through any administrative or judicial proceedings, or accepted responsibility for any violation of any visible emission standard.

b. A continuous monitoring system for the measurement of sulfur dioxide which meets the performance specifications of this Section shall be installed, calibrated, using sulfur dioxide calibration gas mixtures or other gas mixtures approved by the Director, maintained and operated on any fossil-fuel fired steam generator of greater than 250 million Btu per hour heat input which has installed sulfur dioxide pollutant control equipment.

c. A continuous monitoring system for the measurement of nitrogen oxides which meets the performance specification of this Section shall be installed, calibrated, using nitric oxide calibration gas mixtures or other gas mixtures approved by the Director, maintained and operated on fossil-fuel fired steam generators of greater than 1000 million Btu per hour heat input when such facility is located in an air quality control region where the Director has specifically determined that a control strategy for nitrogen dioxide is necessary to attain the ambient air quality standard specified in R18-2-206, unless the source owner or operator demonstrates during source compliance tests as required by the Department that such a source emits nitrogen oxides at levels 30 percent or more below the emission standard within this Chapter.

d. A continuous monitoring system for the measurement of the percent oxygen or carbon dioxide which meets the performance specifications of this Section shall be installed, calibrated, operated, and maintained on fossil-fuel fired steam generators where measurements of oxygen or carbon dioxide in the flue gas are required to convert either sulfur dioxide or nitrogen oxides continuous emission monitoring data, or both, to units of the emission standard within this Chapter.

2. Nitric acid plants: Each nitric acid plant of greater than 300 tons per day production capacity, the production capacity being expressed as 100 percent acid located in an air quality control region where the Director has specifically determined that a control strategy for nitrogen dioxide is necessary to attain the ambient air quality standard specified in R18-2-206, shall install, calibrate, using nitrogen dioxide calibration gas mixtures, maintain, and operate a continuous monitoring system for the measurement of nitrogen oxides which meets the performance specifications of this Section for each nitric acid producing facility within such plant.

3. Sulfuric acid plants: Each sulfuric acid plant as defined in R18-2-101A., of greater than 300 tons per day production capacity, the production being expressed as 100 percent acid, shall install, calibrate, using sulfur dioxide calibration gas mixtures or other gas mixtures approved by the Director, maintain and operate a continuous monitoring system for the measurement of sulfur dioxide which meets the performance specifications of this Section for each sulfuric acid producing facility within such a plant.

4. Fluid bed catalytic cracking unit catalyst regenerators at petroleum refineries. Each catalyst regenerator for fluid bed catalytic cracking units of greater than 20,000 barrels per day fresh feed capacity shall install, calibrate, maintain and operate a continuous monitoring system for the measurement of

opacity which meets the performance specifications of this Section for each regenerator within such refinery.

D. Minimum specifications: Owners or operators of monitoring equipment installed to comply with this Section, except as provided in D.2. below, shall demonstrate compliance with the following performance specifications.

1. The performance specifications set forth in Appendix B of 40 CFR 60 are incorporated herein by reference, and shall be used by the Director to determine acceptability of monitoring equipment installed pursuant to this Section. However where reference is made to the Administrator in Appendix B of 40 CFR 60, the term "Director" should be inserted for the purpose of this Section. Also, where reference is made to the "Reference Method" in Appendix B of 40 CFR 60, the Director may allow the use of either the State approved reference method or the Federally approved reference method as published in 40 CFR 60. The performance specifications to be used with each type of monitoring system are listed below.

a. Continuous monitoring systems for measuring opacity shall comply with performance specification 1.

b. Continuous monitoring systems for measuring nitrogen oxides shall comply with performance specification 2.

c. Continuous monitoring systems for measuring sulfur dioxide shall comply with performance specification 2.

d. Continuous monitoring systems for measuring oxygen shall comply with performance specification 3.

e. Continuous monitoring systems for measuring carbon dioxide shall comply with performance specification 3.

2. Exemptions: Any source which has purchased an emission monitoring system(s) prior to September 11, 1974, may be granted an exemption by the Director from meeting such test procedures prescribed in D.1. above for a five-year period ending on August 29, 1982.

3. Calibration gases: Span and zero gases should be traceable to National Bureau of Standards reference gases whenever these reference gases are available. Every six months from date of manufacture, span and zero gases shall be reanalyzed by conducting triplicate analyses using the reference methods in Appendix A. Part 60, Chapter 1, Title 40, CFR as amended: For sulfur dioxide, use Reference Method 6; for nitrogen oxides, use Reference method 7; and for carbon dioxide or oxygen, use Reference Method 3. The gases may be analyzed at less frequent intervals if longer shelf lives are guaranteed by the manufacturer.

4. Cycling time: Time includes the total time required to sample, analyze and record an emission measurement.

a. Continuous monitoring systems for measuring opacity shall complete a minimum of one cycle of sampling and analyzing for each successive six-minute period.

b. Continuous monitoring systems for measuring oxides of nitrogen, carbon dioxide, oxygen, or sulfur dioxide shall complete a minimum of one cycle of

operation (sampling, analyzing, and date recording) for each successive 15-minute period.

5. **Monitor location:** All continuous monitoring systems or monitoring devices shall be installed such that representative measurements of emissions of process parameter (i.e., oxygen, or carbon dioxide) from the affected facility are obtained. Additional guidance for location of continuous monitoring systems to obtain representative samples are contained in the applicable performance specifications of Appendix B of 40 CFR 60.

6. **Combined effluents:** When the effluents from two or more affected facilities of similar design and operating characteristics are combined before being released to the atmosphere through more than one point, separate monitors shall be installed.

7. **Zero and drift:** Owners or operators of all continuous monitoring systems installed in accordance with the requirements of this Section shall record the zero and span drift in accordance with the method prescribed by the manufacturer's recommended zero and span check at least once daily, using calibration gases specified in Subsection C. as applicable, unless the manufacturer has recommended adjustments at shorter intervals, in which case such recommendations shall be followed; shall adjust the zero span whenever the 24-hour zero drift or 24-hour calibration drift limits of the applicable performance specifications in Appendix B of Part 60, Chapter 1, Title 40 CFR are exceeded; and shall adjust continuous monitoring systems referenced by D.2. of this Section whenever the 24-hour zero drift or 24-hour calibration drift exceed 10 percent of the emission standard.

8. **Span:** Instrument span should be approximately 200 percent of the expected instrument data display output corresponding to the emission standard for the source.

E. Minimum data requirement: The following Paragraphs set forth the minimum data reporting requirements for sources employing continuous monitoring equipment as specified in this Section. These periodic reports do not relieve the source operator from the reporting requirements of Section R18-2-314.

1. The owners or operators of facilities required to install continuous monitoring systems shall submit to the Director a written report of excess emissions for each calendar quarter and the nature and cause of the excess emissions, if known. The averaging period used for data reporting must correspond to the averaging period specified in the emission standard for the pollutant source category in question. The required report shall include, as a minimum, the data stipulated in this Subsection.

2. For opacity measurements, the summary shall consist of the magnitude in actual percent opacity of all six-minute opacity averages greater than any applicable standards for each hour of operation of the facility. Average values may be obtained by integration over the averaging period or by arithmetically averaging a minimum of four equally spaced, instantaneous opacity measurements per

minute. Any time periods exempted shall be deleted before determining any averages in excess of opacity standards.

3. For gaseous measurements the summary shall consist of emission averages in the units of the applicable standard for each averaging period during which the applicable standard was exceeded.

4. The date and time identifying each period during which the continuous monitoring system was inoperative, except for zero and span checks and the nature of system repair or adjustment shall be reported. The Director may require proof of continuous monitoring system performance whenever system repairs or adjustments have been made.

5. When no excess emissions have occurred and the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be included in the report.

6. Owners or operators of affected facilities shall maintain a file of all information reported in the quarterly summaries, and all other data collected either by the continuous monitoring system or as necessary to convert monitoring data to the units of the applicable standard for a minimum of two years from the date of collection of such data or submission of such summaries.

F. Data reduction: Owners or operators of affected facilities shall use the following procedures for converting monitoring data to units of the standard where necessary.

1. For fossil-fuel fired steam generators the following procedures shall be used to convert gaseous emission monitoring data in parts per million to g/million cal (lb/million Btu) where necessary.

a. When the owner or operator of a fossil-fuel fired steam generator elects under C.1.d. of this Rule to measure oxygen in the flue gases, the measurements of the pollutant concentration and oxygen concentration shall each be on a consistent basis (wet or dry).

i. When measurements are on a wet basis, except where wet scrubbers are employed or where moisture is otherwise added to stack gases, the following conversion procedure shall be used:

$$EQ = C_{ws}F_w \left(\frac{20.9}{20.9(1-B_{ws}) - \%O_{2ws}} \right)$$

ii. When measurements are on a wet basis and the water vapor content of the stack gas is determined at least once every fifteen minutes the following conversion procedure shall be used:

$$EQ = C_{ws}F \left(\frac{20.9}{20.9(1-B_{ws}) - \%O_{2ws}} \right)$$

Note: This equation is approved in principle. Approval for actual practice is contingent upon demonstrating the ability to accurately determine B_{ws} such that

any absolute error in B_{ws} will not cause an error of more than ± 1.5 percent in the term.

$$\left(\frac{20.9}{20.9(1-B_{ws})-\%O_{2ws}} \right)$$

iii. When measurements are on a dry basis, the following conversion procedure shall be used:

$$EQ = CF \left[\frac{20.9}{20.9-\%O_{2ws}} \right]$$

b. When the owner or operator elects under C.1.d. of this Section to measure carbon dioxide in the flue gases, the measurement of the pollutant concentration and the carbon dioxide concentration shall each be on a consistent basis (wet or dry) and the following conversion procedure used;

$$EQ = CF_c \left[\frac{100}{\%CO_2} \right]$$

c. The values used in the equations under F.1. above are derived as follows:

EQ = pollutant emission, g/million cal (lb/million Btu)

C = pollutant concentration, g/dscm (lb/dscf), determined by multiplying the average concentration (ppm) for each hourly period by 4.16×10^{-5} M g/dscm per ppm (2.64×10^{-9} M lb/dscf per ppm) where M = pollutant molecular weight, g/g-mole (lb/lb-mole), $M = 64$ for sulfur dioxide and 46 for oxides of nitrogen.

C_{ws} = pollutant concentrations at stack conditions, g/wscm (lb/wscf), determined by multiplying the average concentration (ppm) for each one-hour period by 4.15×10^{-5} M g/wscm per ppm (2.59×10^{-5} M lb/wscf per ppm) where M = pollutant molecular weight, g/g mole (lb/lb mole). $M = 64$ for sulfur dioxide and 46 for nitrogen oxides.

$\%O_2, \%CO_2$ = Oxygen or carbon dioxide volume (expressed as percent) determined with equipment specified under D.1.d. of this Section.

F, F_c = A factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted (F), a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted (F_c), respectively. Values of F and F_c are given in § 60.45(f) of Part 60, Chapter 1, Title 40, Code of Federal Regulations.

F_w = A factor representing a ratio of the volume of wet flue gases generated to the caloric value of the fuel combusted. Values of F_w are given in Reference Method 19 of the Arizona Testing Manual.

B_{wa} = Proportion by volume of water vapor in the ambient air. Approval may be given for determination of B_{wa} by on-site instrumental measurement provided that the absolute accuracy of the measurement technique can be demonstrated to be within ± 0.7 percent water vapor. Estimation methods for B_{wa} are given in Reference Method 19 of the Arizona Testing Manual.

B_{ws} = Proportion by volume of water vapor in the stack gas.

2. For sulfuric acid plants as defined in R18-2-101 the owner or operator shall:

a. Establish a conversion factor three times daily according to the procedures of § 60.84(b) of Chapter 1, Title 40, Code of Federal Regulations;

b. Multiply the conversion factor by the average sulfur dioxide concentration in the flue gases to obtain average sulfur dioxide emissions in Kg/metric ton (lb/short ton); and

c. Report the average sulfur dioxide emission for each averaging period in excess of the applicable emission standard in the quarterly summary.

3. For nitric acid plants the owner or operator shall:

a. Establish a conversion factor according to the procedures of § 60.73(b) of Chapter 1, Title 40, Code of Federal Regulations;

b. Multiply the conversion factor by the average nitrogen oxides concentration in the flue gases to obtain the nitrogen oxides emissions in the units of the applicable standard;

c. Report the average nitrogen oxides emission for each averaging period in excess of applicable emission standard in the quarterly summary.

4. The Director may allow data reporting or reduction procedures varying from those set forth in this Section if the owner or operator of a source shows to the satisfaction of the Director that his procedures are at least as accurate as those in this Section. Such procedures may include but are not limited to the following:

a. Alternative procedures for computing emission averages that do not require integration of data (e.g., some facilities may demonstrate that the variability of their emissions is sufficiently small to allow accurate reduction of data based upon computing averages from equally spaced data points over the averaging period).

b. Alternative methods of converting pollutant concentration measurements to the units of the emission standards.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Editorial correction, Subsection C., Paragraph 1., Subparagraph d. (Supp. 80-2). Amended eff. July 9, 1980 (Supp. 80-4). Former Section R9-3-313 renumbered without change as R18-2-313 (Supp. 87-3).

R18-2-314. Excess emissions reporting

A. The owner or operator of any source issued an installation, conditional or operating permit shall report to the Director or his designated representative

any emissions in excess of the limits established by this Chapter or the applicable installation or operating permit. Such report shall be in writing and shall be submitted within fifteen working days of the date on which the excess emissions occurred.

B. The excess emissions report shall contain the following information:

1. The identity of the stack and/or other emission points where the excess emissions occurred.
2. The magnitude of the excess emissions expressed in the units of the applicable emission limitation and the operating data and calculations used in determining the magnitude of the excess emissions.
3. The time and duration or expected duration of the excess emissions.
4. The identity of the equipment causing the excess emissions.
5. The nature and cause of such emissions.
6. If the excess emissions were the result of a malfunction, steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunctions.
7. The steps that were or are being taken to limit the excess emissions. If the source's operating permit contains procedures governing source operation during periods of start-up or malfunction and the excess emissions resulted from start-up or malfunction, the report shall contain a list of the steps taken to comply with the permit procedures.

C. Information required to be submitted by this Rule shall be summarized and reported in writing to the Director in accordance with provisions contained in the applicable installation or operating permit issued pursuant to the requirements of this Chapter.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. July 9, 1980 (Supp. 80-4). Former Section R9-3-314 renumbered without change as R18-2-314 (Supp. 87-3).

R18-2-315. Posting of permit

A person who has been granted an operating permit shall firmly affix such permit, an approved facsimile of such permit, or other approved identification bearing the permit number upon such equipment for which the permit is issued in such a manner as to be clearly visible and accessible. In the event that such equipment is so constructed or operated that such permit cannot be so placed, the permit shall be mounted so as to be clearly visible in an accessible place within a reasonable distance of such equipment or maintained readily available at all times on the operating premises.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. July 9, 1980 (Supp. 80-4). Former Section R9-3-315 renumbered without change as R18-2-315 (Supp. 87-3).

R18-2-316. Notice by building permit agencies

All agencies of the county or political subdivisions of the county that issue or grant building permits or approvals shall examine the plans and specifications submitted by an applicant for a permit or approval to determine if an air pollution installation permit will possibly be required under the provisions of the rules and regulations in this Chapter. If it appears possible that such installation permit will be required, the agency shall give written notice to such applicant to contact the Director and shall furnish a copy of such notice to the Director.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-316 renumbered without change as R18-2-316 (Supp. 87-3).

R18-2-317. Permit nontransferable; exception

A. An installation permit or an operating permit shall not be transferable, whether by operation of law or otherwise, either from one location to another, from one piece of equipment to another, or from one person to another.

B. This Rule shall not apply to mobile or portable machinery or equipment which is transferred from one location to another provided that the owner or operator of such equipment notifies the Director in writing of the transfer at least thirty days before the transfer. The notification required under this Subsection shall include:

1. A description of the equipment is to be transferred including the operating permit number for such equipment.
2. A description of the present location;
3. A description of the location to which the equipment is to be transferred, including the availability of all utilities, such as water and electricity, necessary for the proper operation of all control equipment;
4. The date on which the equipment is to be moved; and
5. The date on which operation of the equipment will begin at the new location.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-317 renumbered without change as R18-2-317 (Supp. 87-3).

R18-2-318. Denial or revocation of an installation or operating permit

A. The Director shall deny an installation or operating permit to a person applying for such permit if that person does not demonstrate that the source for which the permit is sought is so designed, controlled, or equipped with such air pollution control equipment that the source may be expected to comply with the provisions of Article 1, Chapter 14, Title 36 of the Arizona Revised Statutes, the provisions of the regulations in this Chapter or the provisions of its permit.

B. The Director may revoke an installation or operating permit issued pursuant to this Chapter if:

1. The Director has reasonable cause to believe that the permit was obtained by fraud or misrepresentation.
 2. The person applying for the permit failed to disclose a material fact required by the permit application form or the regulation applicable to the permit, of which the applicant had or should have had knowledge at the time the application was submitted.
 3. The terms and conditions of the permit have been or are being violated.
- C. If the Director denies or revokes an operating permit under this Section, the notice of such denial or revocation shall be served on the applicant or permittee by certified mail, return receipt requested. The notice shall be a statement detailing the grounds for the action sought.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-318 renumbered without change as R18-2-318 (Supp. 87-3).

R18-2-319. Permit fees

- A. Prior to issuance of an installation or operating permit or renewal of an operating permit for any source for which a permit is required under this Chapter, the applicant for the permit shall pay to the Director a fee in the amount set forth in Appendix 4.
- B. The fee charged for an installation or operating permit shall be sufficient to cover:
 1. The reasonable cost of reviewing and acting upon the application for the permit, and
 2. The reasonable costs of implementing and enforcing the terms and conditions of the permit (not including any court costs or other costs associated with any enforcement action).

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-319 renumbered without change as R18-2-319 (Supp. 87-3).

R18-2-320. Reserved

R18-2-321. Operating permits containing the terms and conditions of primary nonferrous smelter orders (NSO) or Federal delayed compliance orders (DCO)

- A. An operating permit containing the terms and conditions of either a DCO or NSO may be issued for a period of greater than one year corresponding to the life of the NSO or DCO. The Director may alter or amend the terms and conditions of an NSO or DCO operating permit as required for consistency with the Federal Clean Air Act, as amended.
- B. The owner or operator of such a source shall be required to furnish the Director with a quarterly report of the status of the source and construction

progress. Reporting by the owner of a source having an NSO or DCO shall conform as a minimum to Sections R18-2-703, R18-2-704, R18-2-705, and if applicable, R18-2-706. In addition, the Director shall receive copies of any reports to EPA under these orders. Certain additional reporting requirements and conditions may be specified by the Director in operating permits issued under this Section.

C. For the purpose of this Chapter, sources operating under a consent decree issued by a Federal court shall meet the same requirements as these with a DCO.

Historical Note

Adopted eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-321 renumbered without change as R18-2-321 (Supp. 87-3).

R18-2-322. Temporary conditional permits

Temporary conditional permits may be issued by the Director in accordance with A.R.S. § 36-1711.

Historical Note

Adopted eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-322 renumbered without change as R18-2-322 (Supp. 87-3).

R18-2-323. Stack height limitation

A. The limitations set forth herein shall not apply to stacks or dispersion techniques used by the owner or operator prior to December 31, 1970, for which the owner or operator had:

1. Begun, or caused to begin, a continuous program of physical on-site construction of the stack;

2. Entered into building agreements or contractual obligations, which could not be cancelled or modified without substantial loss to the owner or operator, to undertake a program of construction of the stack to be completed in a reasonable time; or

3. Coal fired steam electric generating units, subject to the provisions of Section 118 of the Federal Clean Air Act which commenced operation before July 1, 1975, with stacks constructed under a construction contract awarded before February 8, 1974.

B. The degree of emission limitation required of any source after the respective date given in Subsection A. above for control of any pollutant must not be affected by so much of any source's stack height that exceeds good engineering practice or by any other dispersion technique.

C. The good engineering practice (GEP) stack height for any source seeking credit because of plume impaction which results in concentrations in violation of national ambient air quality standards or applicable prevention of significant deterioration increments can be adjusted by determining the stack height necessary to predict the same maximum air pollutant concentration on

any elevated terrain feature as the maximum concentration associated with the emission limit which results from modelling the source using the GEP stack height as determined herein and assuming the elevated terrain features to be equal in elevation to the GEP stack height. If this adjusted GEP stack height is greater than stack height the source proposes to use, the source's emission limitation and air quality impact shall be determined using the proposed stack height and the actual terrain heights.

D. Before the State issues a permit to a source based on a good engineering practice stack height that exceeds the height allowed by Subparagraphs a. and b. of the GEP definition given herein, the State must notify the public of the availability of the demonstration study and must provide opportunity for public hearing on it.

Historical Note

Adopted eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-323 renumbered without change as R18-2-323 (Supp. 87-3).

**ARTICLE 4. EMISSIONS FROM EXISTING
AND NEW NONPOINT SOURCES****R18-2-401. General**

For purposes of this Article, any source of air contaminants which due to lack of an identifiable emission point or plume cannot be considered a point source, shall be classified as a nonpoint source. In applying this criteria, such items as air-curtain destructors, heater-planners, and conveyor transfer points shall be considered to have identifiable plumes. Any affected facility subject to regulation under Article 5 of this Chapter or A.A.C. Title 9, Chapter 3, Article 8, shall not be subject to regulation under this Article.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-401 renumbered without change as Section R18-2-401 (Supp. 87-3).

R18-2-402. Unlawful open burning

A. Notwithstanding the provisions of any other Rule in this Chapter, it is unlawful for any person to ignite, cause to be ignited, permit to be ignited, or suffer, allow or maintain any open outdoor fire.

B. "Open outdoor fire", as used in this Rule, means any combustion of combustible material of any type outdoors, in the open where the products of combustion are not directed through a flue. "Flue", as used in this Rule, means any duct or passage for air, gases or the like, such as a stack or chimney.

C. The following fires are excepted from the provisions of this Rule:

1. Fires used only for cooking of food or for providing warmth for human beings or for recreational purposes or the branding of animals or the use of orchard heaters for the purpose of frost protection in farming or nursery operations.

2. Any fire set or permitted by any public officer in the performance of official duty, if such fire is set or permission given for the purpose of weed abatement, the prevention of a fire hazard, or instruction in the methods of fighting fires.

3. Fires set by or permitted by the State entomologist or county agricultural agents of the county for the purpose of disease and pest prevention.

4. Fires set by or permitted by the Federal government or any of its departments, agencies or agents, the State or any of its agencies, departments or political subdivisions, for the purpose of watershed rehabilitation or control through vegetative manipulation.

D. Permission for the setting of any fire given by a public officer in the performance of official duty under Paragraphs 2., 3., or 4. of Subsection C., shall be given, in writing, and a copy of such written permission shall be transmitted immediately to the Director of the Department of Environmental Quality and the control officer, if any, of the county, district or region in which such fire is allowed. The setting of any such fire shall be constructed in a manner and at such

time as approved by the Director, unless doing so would defeat the purpose of the exemption.

E. The following fires may be excepted from the provisions of this Section when permitted in writing by the Director of the Department of Environmental Quality or the control officer of the county, district or region in which such fire is allowed:

1. Fires set for the disposal of dangerous materials where there is no safe alternative method of disposal.

a. "Dangerous material" is any substance or combination of substances which is able or likely to inflict bodily harm or property loss unless neutralized, consumed or otherwise disposed of in a controlled and safe manner.

b. Fires set for the disposal of dangerous materials shall be permitted only when there is no safe alternative method of disposal, and when the burning of such materials does not result in the emission of hazardous or toxic substances either directly or as a product of combustion in amounts which will endanger health or safety.

2. Open outdoor fires for the disposal of ordinary household trash in an approved waste burner in nonurban areas of less than 100 well spread out dwelling units per square mile where no refuse collection and disposal service is available.

a. An "approved waste burner" is an incinerator constructed of fire resistant material with a cover or screen which is closed when in use having openings in the sides or top no greater than one inch in diameter.

b. Open burning of the following materials is forbidden: Garbage resulting from the processing, storage, service or consumption of food; asphalt shingles; tar paper; plastic and rubber products (such as waste crankcase oil, transmission oil and oil filters); transformer oils; and hazardous material containers including those that contained inorganic pesticides, lead, cadmium, mercury, or arsenic compounds.

F. The Director of the Department of Environmental Quality or the air pollution control officer, if any, of the county, district, or region may delegate the authority for the issuance of allowable open burning permits to responsible local officers. Such permits shall contain conditions limiting the manner and the time of the setting of such fires as specified in the Arizona Guidelines for Open Burning and shall contain a provision that all burning be extinguished at the discretion of the Director or his authorized representative during periods of inadequate atmospheric smoke dispersion, periods of excessive visibility impairment which could adversely affect public safety, or periods when smoke is blown into populated areas so as to create a public nuisance.

1. Any local officer delegated the authority for issuance of open burning permits shall maintain a copy of all currently effective permits issued including a means of contacting the person authorized by the permit to set an open fire in the event that an order for extinguishing of open burning is issued.

G. Nothing in this Rule is intended to permit any practice which is a violation of any statute, ordinance, rule or regulation.

Historical Note

Amended eff. Aug. 6, 1976 (Supp. 76-4). Former Section R9-3-402 repealed, new Section R9-3-402 adopted eff. May 14, 1979 (Supp. 79-1). Amended and adopted by reference *Open Burning Guidelines for Air Pollution Control* eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-402 renumbered without change as Section R18-2-402 (Supp. 87-3).

R18-2-403. Forestry management

A. All national parks and national forests having areas which extend into more than one county of the State of Arizona, as well all State parks and forests shall be under the jurisdiction of the Director in all matters relating to prescribed burning or slash disposal.

B. Each entity mentioned in Subsection A. shall comply with the following:

1. Each national park, State park, national forest or State forest hereinafter called forest will apply directly to the Bureau for an annual burning permit for all planned burning projects. Application will be made in the spring of the year, prior to June 1 for the ensuing fiscal year.

2. The application shall be in the form of a letter listing all projects. Enclosed with the letter will be copies of the Park Service or Forest Service approved burning plans for each planned project. A map of the burn and immediate surrounding area must accompany each plan.

3. The application and the Park Service or Forest Service plans will list the following:

- a. Approximate date the project will start.
- b. Location of project by sections, townships, or ranges.
- c. Approximate elevation of project.
- d. Aspect of any slopes.
- e. Description of fuel to be burned.
- f. Prescribed conditions for fire (e.g. time of day, fuel moisture, weather).

4. Each forest as part of the application will provide the Bureau with one emergency or 24-hour telephone number.

5. Each forest will notify the Bureau when a project planned starting date is later changed. Notification will be by telephone. Any other changes, such as fuel type, duration of burn or location, should be included in this notification.

6. The determination to allow burning will be made on a day-by-day basis. It is the responsibility of each park or forest to telephone the Bureau for such a determination. Large fires and those that continue during nighttime hours will require special forecasts made by the national weather service, the Department's meteorologist, or by the permittee if forecast procedures are approved by the Department. On site meteorological measurements by the permittee may be required as inputs to dispersion forecasts and smoke management during the burn.

7. Once each year, on or before December 31, the Forest Service or Parks Service shall submit to the Bureau a report outlining the progress of research

and development concerning the effects of forest burn programs on air quality. Such report shall include, where applicable, innovations in the management of prescribed burning using meteorological data, as well as special burning methods, or innovative equipment. Alternatives to burning shall also be considered. Research as to cost effectiveness of the various methods should also be included.

Historical Note

Former Section R9-3-403 repealed, new Section R9-3-403 adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-403 renumbered without change as Section R18-2-403 (Supp. 87-3).

R18-2-404. Open areas, dry washes or riverbeds

A. No person shall cause, suffer, allow, or permit a building or its appurtenances, or a building or subdivision site, or a driveway, or a parking area, or a vacant lot or sales lot, or an urban or suburban open area to be constructed, used, altered, repaired, demolished, cleared, or leveled, or the earth to be moved or excavated, without taking reasonable precautions to limit excessive amounts of particulate matter from becoming airborne. Dust and other types of air contaminants shall be kept to a minimum by good modern practices such as using an approved dust suppressant or adhesive soil stabilizer, paving, covering, landscaping, continuous wetting, detouring, barring access, or other acceptable means.

B. No person shall cause, suffer, allow, or permit a vacant lot, or an urban or suburban open area, to be driven over or used by motor vehicles, trucks, cars, cycles, bikes, or buggies, or by animals such as horses, without taking reasonable precautions to limit excessive amounts of particulates from becoming airborne. Dust shall be kept to a minimum by using an approved dust suppressant, or adhesive soil stabilizer, or by paving, or by barring access to the property, or by other acceptable means.

C. No person shall operate a motor vehicle for recreational purposes in a dry wash, riverbed or open area in such a way as to cause or contribute to visible dust emissions which then cross property lines into a residential, recreational, institutional educational, retail sales, hotel or business premises. For purposes of this Subsection "motor vehicles" shall include, but not be limited to trucks, cars, cycles, bikes, buggies and three-wheelers. Any person who violates the provisions of this Subsection shall be subject to prosecution under A.R.S. § 36-1720.

Historical Note

Former Section R9-3-404 repealed, new Section R9-3-404 adopted eff. May 14, 1979 (Supp. 79-1). Amended by adding Subsection C. eff. Sept. 22, 1983 (Supp. 83-5). Former Section R9-3-404 renumbered without change as Section R18-2-404 (Supp. 87-3).

R18-2-405. Roadways and streets

A. No person shall cause, suffer, allow or permit the use, repair, construction or reconstruction of a roadway or alley without taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne. Dust and other particulates shall be kept to a minimum by employing temporary paving, dust suppressants, wetting down detouring or by other reasonable means.

B. No person shall cause, suffer, allow or permit transportation of materials likely to give rise to airborne dust without taking reasonable precautions, such as wetting, applying dust suppressants, or covering the load, to prevent particulate matter from becoming airborne. Earth or other material that is deposited by trucking or earth moving equipment shall be removed from paved streets by the person responsible for such deposits.

Historical Note

Former R9-3-405, Other industries, renumbered R9-3-406, new Section adopted eff. Sept. 17, 1975 (Supp. 75-1). Former Section R9-3-405 repealed, new Section R9-3-405 adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-405 renumbered without change as Section R18-2-405 (Supp. 87-3).

R18-2-406. Material handling

No person shall cause, suffer, allow or permit crushing, screening, handling, transporting or conveying of materials or other operations likely to result in significant amounts of airborne dust without taking reasonable precautions, such as the use of spray bars, wetting agents, dust suppressants, covering the load, and hoods to prevent excessive amounts of particulate matter from becoming airborne.

Historical Note

Former Section R9-3-405, renumbered eff. Sept. 17, 1975 (Supp. 75-1). Former Section R9-3-406 repealed, new Section R9-3-406 adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-406 renumbered without change as Section R18-2-406 (Supp. 87-3).

R18-2-407. Storage piles

A. No person shall cause, suffer, allow, or permit organic or inorganic dust producing material to be stacked, piled, or otherwise stored without taking reasonable precautions such as chemical stabilization, wetting, or covering to prevent excessive amounts of particulate matter from becoming airborne.

B. Stacking and reclaiming machinery utilized at storage piles shall be operated at all times with a minimum fall of material and in such manner, or with the use of spray bars and wetting agents, as to prevent excessive amounts of particulate matter from becoming airborne.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-407 renumbered without change as Section R18-2-407 (Supp. 87-3).

R18-2-408. Mineral tailings

No person shall cause, suffer, allow, or permit construction of mineral tailings piles without taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne. Reasonable precautions shall mean wetting, chemical stabilization, revegetation or such other measures as are approved by the Director.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Amended eff. Oct. 2, 1979 (Supp. 79-5). Former Section R9-3-408 renumbered without change as Section R18-2-408 (Supp. 87-3).

R18-2-409. Agricultural practices

No person shall cause, suffer, allow or permit the performance of agricultural practices including but not limited to tilling of land and application of fertilizers without taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-409 renumbered without change as Section R18-2-409 (Supp. 87-3).

R18-2-410. Evaluation of nonpoint source emissions

Opacity of an emission from any nonpoint source shall not be greater than 40 percent measured in accordance with the Arizona Testing Manual, Reference Method 9. Open fires permitted under R18-2-402 and R18-2-403 are exempt from this requirement.

Historical Note

Adopted eff. May 14, 1979 (Supp. 79-1). Former Section R9-3-410 renumbered without change as Section R18-2-410 (Supp. 87-3).

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) SS.

COUNTY OF COCHISE

Nicole T. Luman

being duly sworn, deposes and says:

That she is the Secretary of the Sierra Vista Herald
and the Bisbee Daily Review, newspapers published six days a week in Bisbee and Sierra

Vista, Cochise County, State of Arizona

PUBLIC NOTICE

Public Notice
Arizona Department of Environmental
Quality
Chemstar, Inc.

To All Interested Persons and Parties:
You are hereby notified of the opportunity for written public comment and to attend Public Hearings concerning the operating permit application by Chemstar, Inc. to operate a limestone quarrying and quick lime manufacturing plant in Paul Spur near Douglas, Cochise County, Arizona and an amendment to the State Implementation Plan (SIP). This facility proposes to emit the following air contaminants: Particulates, NOx, SO2, & CO from lime production kilns and particulates from limestone crushing operations. Conditions in the proposed operating permit are also proposed for inclusion in the (SIP) for control of particulate pollution at Paul Spur.
A copy of all materials submitted by the applicant, the draft permit proposed by Arizona Department of Environmental Quality (DEQ), and the proposed SIP are available for public inspection at the Bisbee Public Library, 4 Main Street, Bisbee, and at DEQ, 2005 N. Central Avenue, Room 403 C, during normal business hours. All interested persons shall have until March 2, 1990, to submit written comments and/or request notification of the proposed agency action. All comments and/or requests should be addressed to Nancy C. Wrona, Assistant Director, Office of Air Quality, DEQ, 2005 N. Central Avenue, Phoenix, Arizona, 85004. The Arizona Department of Environmental Quality (ADEQ) will hold public hearings beginning at 3:00 p.m., March 1, 1990 in the Bisbee City Council Chambers for public comment on both the proposed SIP and the draft operating permit and application. All pertinent comments received in writing by the aforementioned deadline, or presented at the public hearing shall be considered by the Department in making its decision on the application. All comments will be made available for public inspection at the DEQ, 2005 N. Central Avenue, Phoenix.
Please contact Mr. Prabhat Bhargava, phone 602-257-2288, at the above DEQ address for further information.
Publish: Jan. 24, 1990.

a copy of which is hereto attached, was
published in its issues for 1 times

on the following dates:

January 24, 1990

Subscribed and sworn to me this 29th
day of January, 19 90

Sherry R. Breunig
NOTARY PUBLIC

APPENDIX D

Public Comments

CHEMSTAR

CHEMSTAR, Inc.
2800 North 44th St., Suite 400
Phoenix, AZ 85008-1557
602-955-5711 FAX 602-468-0488

March 2, 1990

HAND-DELIVERED

Ms. Nancy Wrona
Assistant Director
Office of Air Quality
Arizona Department of Environmental Quality
2005 North Central Avenue
Phoenix, Arizona 85004

Re: Operating Permit for Chemstar's Douglas Plant

Dear Ms. Wrona:

Pursuant to the public notice published by the Arizona Department of Environmental Quality (ADEQ), Chemstar, Inc. hereby submits its comments on the draft operating permit for Chemstar's lime manufacturing plant located near Paul Spur, Arizona. The draft permit contains conditions which would require further reductions in emissions of particulate matter less than 10 microns in diameter (PM-10) from Chemstar's plant. These conditions were developed by ADEQ as part of a process to amend the State Implementation Plan (SIP) in order to achieve attainment with the National Ambient Air Quality Standard (NAAQS) for PM-10. In a separate letter of even date herewith, Chemstar has provided comments on the proposed SIP amendment.

As previously discussed with ADEQ, Chemstar is prepared to implement control strategies to achieve reductions in PM-10 emissions from the plant as called for by the proposed SIP amendment. Chemstar is also prepared to ensure that its operations comply with ADEQ's air quality regulations applicable to the operation of an existing lime manufacturing plant. However, Chemstar will not accept, and therefore objects to, arbitrary permit conditions that go beyond the PM-10 emission reduction steps called for by the SIP amendment, or that impose requirements that do not find authority in ADEQ's regulations. If ADEQ wishes to pursue such requirements, it should proceed with appropriate rulemaking procedures to supplement its regulations, and not follow a procedure of ad hoc decisionmaking as part of the issuance of an operating permit.

Chemstar's comments concerning the operating permit conditions are presented below.

Ms. Nancy Wrona
March 2, 1990
Page 2

1. Attachment A
Section I - Facilities Operation

The last sentence of this Section should be revised to read:

"All equipment, facilities, and systems used to achieve compliance with the terms and conditions of this Permit shall at all times be maintained and operated, to the maximum extent practicable, in a manner consistent with good practice for minimizing emissions."

Reason for Change

The revision proposed by Chemstar tracks the language from R18-2-309.A.2. The language proposed in the draft permit, in requiring operations as efficiently as possible, imposes a requirement which is arbitrary, unachievable, and inconsistent with sound management and cost-effective operation, and goes beyond the requirements of ADEQ's existing regulations.

2. Attachment A
Section 10 - Other Conditions
Paragraph A.2

This sentence should be revised to read as follows:

"The Permittee shall maintain damper seals for each lime kiln in such a manner that they do not emit fugitive particulate emissions with an opacity in excess of forty (40) percent."

Reason for Change

The requirement that fugitive emissions from the damper seals be maintained so as to control such emissions to an opacity of less than 5 percent is inconsistent with ADEQ's regulations. R18-2-520.A.4 limits the emission of dust to 40 percent opacity, and R18-2-520.A.5 provides that fugitive emissions from lime manufacturing plants shall be controlled in accordance with R18-2-404 through R18-2-407. These regulations require that reasonable precautions be taken to prevent excessive amounts of particulate matter from becoming airborne. The draft SIP amendment would limit such emissions to 0.2 gram/second (g/s). As an alternate to the language proposed by Chemstar, ADEQ could revise the permit condition to limit such emissions to 0.2 g/s.

3. Attachment A
Section X - Other Conditions
Paragraph C.1

This sentence should be revised to read as follows:

"All conveyor belt transfer points shall either be enclosed to prevent excessive amounts of particulate matter from becoming airborne or, in the alternative, be enclosed and controlled by using exhaust system and dust collection, or by use of dust suppressant chemicals applied with sprays as approved by the Director."

Reason for Change

The suggested revision is consistent with the requirement set forth at R18-2-520.A.5, which requires fugitive emissions to be controlled in accordance with R18-2-404 through R18-2-407. R18-2-406 requires the taking of reasonable precautions so as to prevent excessive amounts of particulate matter from becoming airborne. Any requirement to control emissions to the maximum extent possible, as proposed in ADEQ's permit language, is arbitrary, unachievable, inconsistent with sound management and cost-effective operations, and goes beyond the requirements of ADEQ's existing regulations. Moreover, the proposed SIP amendment assumes drop point emissions will remain at current levels.

4. Attachment A
Section X - Other Conditions
Paragraph C.2

This sentence should be revised to read as follows:

"All stacking and reclaiming machinery handling products which contain fines shall be adjusted to provide minimum fall on storage piles and/or shall have sleeves installed."

Reason for Change

Chemstar has several products at its Douglas facility which are large screened stone sizes containing no fines. They are not compatible with sleeve type dischargers due to size, and water or chemical suppressants degrade their quality. Because they contain no fines, Chemstar feels that neither control measure would be appropriate. Chemstar's proposed language is consistent with R18-2-407, which requires equipment of this type to be operated at

all times to prevent excessive amounts of particulate matter from becoming airborne. ADEQ's language goes beyond the requirements of its existing regulations.

5. Attachment A
Section X - Other Conditions
Paragraph D

This condition should be revised to read as follows:

"Permittee shall modify the existing dust transfer and storage system for the existing Rotary Lime Kiln Number 5 Dust Collector. Design of the system modification shall be subject to the requirements of R18-2-301. Design of the system shall be approved in advance by the Director and shall include all equipment necessary to collect, transport and dispose of the collected dust in accordance with R18-2-406. Permittee shall submit a proposed design of the system modification within 30 days of issuance of this permit. Modifications shall be completed by Permittee no later than 180 days following issuance of an installation permit from the Director and other necessary permits."

Reason for Change

The suggested revision would increase the time given to Permittee to complete the required system modifications and would also revise the emission limitation applicable to dust disposal. With respect to the first revision, the system modification required by ADEQ comprises a major project. Copies of purchase orders previously provided to ADEQ show that procurement times for minor equipment items can easily be 10-12 weeks. More substantial equipment, such as called for by this permit condition, would require even a longer procurement time. This project also appears to require an installation permit from ADEQ, as well as one or more other permits from other jurisdictions. Because of these considerations, Chemstar requires more time than is provided by the draft permit condition. Chemstar commits to complete the design and installation in a diligent manner, and would be happy to discuss and demonstrate its progress to ADEQ at any time during the process. With respect to the second revision, the requirement for "no visible emissions" is unachievable and is inconsistent with ADEQ's regulations. Control of particulate matter during material handling operations is covered by R18-2-406. The proposed SIP amendment calls for PM-10 emissions from this source to be limited to 0.06 g/s.

Ms. Nancy Wrona
March 2, 1990
Page 5

6. Attachment A
Section X - Other Conditions
Paragraph E

This condition should be revised to read as follows:

"Permittee shall install a dust transfer and storage system for the existing Rotary Lime Kiln Number 4 Dust Collector. Design of the system shall be subject to the requirements of R18-2-301. Design of the system shall be approved in advance by the Director and shall include the following requirements:

1. Beginning at the current point of dust removal, the system shall include a fully enclosed screw-type or equivalent conveyor with fully enclosed transfer point(s).
2. The system shall include all equipment necessary to collect, transport and dispose of the collected dust in accordance with R18-2-406.

Permittee shall submit a proposed design of the system modification within 30 days of issuance of this permit. Modifications shall be completed by Permittee within 180 days following issuance of an installation permit from the Director and other necessary permits."

Reason for Change

The reason for this change is the same as that given for Comment No. 5. The proposed SIP amendment would limit emissions for Kiln 4 dust removal to 0.38 g/s.

7. Attachment A
Section X - Other Conditions
Paragraph G

The proposed condition specifying housekeeping requirements should be deleted.

Reason for Change

Chemstar recognizes that the current sources of fugitive dust in the plant area make the degree and method of housekeeping relevant to PM-10 emissions. However, Chemstar will be undertaking major modifications in its operations in order to provide further control of particulate emissions. These modifications will significantly reduce or eliminate the sources of the

fugitive emissions, which will, in turn, eliminate most of the benefit of the restrictive housekeeping practices. In the alternative, if a permit condition is to be included, it should simply require compliance with A.A.C. R18-2-404 to R18-2-407.

8. Attachment A
Section X - Other Conditions
Paragraph H.1

This paragraph shall be revised to read as follows:

"Beginning not later than 90 days after permit issuance, Permittee shall operate and maintain a water truck or trucks and utilize chemical dust stabilizers (e.g., magnesium chloride or sodium lignosulfonate) as required to maintain a 60 percent control of PM-10 emissions from the areas indicated on Attachment D to this permit as demonstrated by conductivity or silt testing."

Reason for Change

The suggested revision will accomplish the control required by the proposed SIP amendment, but will also give Chemstar the flexibility to select equipment in order to maximize cost effectiveness. Chemstar understands that ADEQ is agreeable to language similar to that proposed above.

9. Attachment A
Section X - Other Conditions
Paragraph J

This section should be revised to read as follows:

"After adoption of the foregoing conditions by the U.S. Environmental Protection Agency (EPA) as part of the State Implementation Plan (SIP), any modifications or amendments to such conditions shall not become effective until adopted by the EPA as an amendment to the SIP."

Reason for Change

The language proposed by Chemstar will give ADEQ the flexibility to make changes to existing permit conditions while still ensuring that such changes will only become effective after amendment of the SIP.

Ms. Nancy Wrona
March 2, 1990
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10. Attachment A
Section X - Other Conditions
Paragraph L

Emission limits specified in Attachment C for NOx, SO2, and CO from the stacks for Kilns 4 and 5 should be deleted.

Reason for Change

The standards of performance for existing lime manufacturing plants are set forth at R18-2-520. There are no limits specified for NOx, SO2 and CO, and it is inappropriate for ADEQ to impose arbitrary limits and ignore applicable rulemaking requirements. Chemstar recognizes that ADEQ's regulations, which are binding on the agency, authorize the Director to impose such permit conditions as "necessary to assure a source's compliance with the requirements of Article 2, Chapter 3 of Title 49 of the Arizona Revised Statutes and the provisions of this Chapter." A.A.C. R18-2-308. However, there currently are no requirements in the statutes or ADEQ's regulations concerning emissions of NOx, SO2 and CO from lime manufacturing plants. In order to maintain the integrity of administrative rulemaking, it is essential for ADEQ to amend its regulations if it desires to establish emission limits for these pollutants. Without waiving the foregoing argument, more acceptable limits than those given in the draft operating permit for these pollutants, based on AP-42 emission factors, maximum production rates, and expected fuel efficiencies, are as follows:

	<u>NOx</u>		<u>SO2</u>		<u>CO</u>	
	#/hr	T/Y	#/hr	T/Y	#/hr	T/Y
Kiln 5 Stack	62	262	174.6	765	45	197
Kiln 4 Stack	116	508	338.4	1482	83	363

11. Attachment D.

Attachment D should be revised to eliminate the public "Border Road" as a road which is subject to control of particulates by Chemstar.

Ms. Nancy Wrona
March 2, 1990
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Reason for Change

Chemstar understands that inclusion of Border Road on Attachment D as a roadway subject to control by Chemstar was inadvertent, and that Attachment D will be revised accordingly.

Very truly yours,

William E. Dodge
William E. Dodge *by CES*
V.P. Manufacturing

WED/jeb

MAR 2, 1990

CHEMSTAR

CHEMSTAR, Inc.
2800 North 44th St., Suite 400
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March 2, 1990

HAND-DELIVERED

Ms. Nancy Wrona
Assistant Director
Office of Air Quality
Arizona Department of Environmental Quality
2005 North Central Avenue
Phoenix, Arizona 85004

Re: SIP Amendment for Paul Spur, Arizona

Dear Ms. Wrona:

Pursuant to the public notice published by the Arizona Department of Environmental Quality (ADEQ), Chemstar, Inc. hereby submits its comments on the proposed State Implementation Plan (SIP) amendment designed to demonstrate compliance in the Paul Spur, Arizona area with the National Ambient Air Quality Standard (NAAQS) for particulate matter of 10 microns or less (PM-10). The focus of the SIP amendment is directed at the further control of emissions of PM-10 from Chemstar's lime manufacturing plant located near Paul Spur. ADEQ has also prepared a draft operating permit with conditions intended to achieve further reductions of PM-10. Chemstar has prepared comments on the proposed operating permit which are contained in a separate letter, addressed to you, dated March 2, 1990.

As ADEQ is well aware, Chemstar has met with the agency on several occasions during the past year to address numerous questions regarding ADEQ's measurement of PM-10 concentrations in the Paul Spur area, the agency's methodology used to identify sources of PM-10, and the agency's control strategies as found in the proposed conditions in the draft operating permit. Adequate resolution of these questions is essential to the development of a fair and accurate plan for achieving compliance with the NAAQS for PM-10. Although certain of these questions have been resolved, others have not. Therefore, although Chemstar is prepared to implement control strategies to achieve the reductions in PM-10 emissions called for by the SIP amendment, Chemstar is documenting, for the record, its concerns regarding PM-10 measurements, source identification, and operating permit conditions. Chemstar is taking this step not only so that suitable revisions to the SIP amendment can be made, but also to preserve its rights should the proposed controls turn out to be insufficient to

achieve attainment. These concerns are documented below, along with other comments on the proposed SIP amendment.

1. Executive Summary. As already noted, Chemstar is prepared to move forward to achieve further reductions in PM-10 emissions from its lime plant as called for by the SIP amendment. In doing so, however, Chemstar does not waive its concerns relating to matters addressed by the SIP and summarized in the Executive Summary. For reasons discussed in the comments which follow, ADEQ has not adequately supported the use of data acquired with the PM-10 samplers located at Paul Spur. Nor has ADEQ provided an adequate basis for the use of the CMB receptor model or rollback model. Nor has ADEQ used source specific information in the receptor model. Nor has ADEQ given adequate consideration to other potential sources of PM-10 in or near the Paul Spur area. Accordingly, as currently drafted, the SIP amendment does not provide an adequate basis for ADEQ to focus its control strategies and, with one exception, contingency plan solely on Chemstar's lime plant. The concerns raised by Chemstar need to be adequately addressed in order for a fair and accurate SIP amendment to be prepared.
2. §1.3. Although the main activities within the Paul Spur area may be associated with the lime plant, a more thorough discussion of the area and potential sources of PM-10 should be included. For example, the SIP does not address the condition of soils in the area and their potential contribution to ambient concentrations of PM-10. Nor does the SIP identify paved and unpaved roads in the area or other stationary sources, including other lime plants, located adjacent to the Paul Spur area which might contribute to PM-10 concentrations. A complete study area definition would include an identification of these other potential sources.
3. §2.0. This section states that source data was obtained from a source composition library (EPA-450/4-85-002, November 1984). As ADEQ itself has said:

Definite conclusions concerning specific sources cannot be made until local source profiles have been obtained. For example, lime plant particulate emissions have been deposited in significant quantities on the soil, road surfaces, and all other surfaces in the study area. This deposition tends to mask the contribution of roadway PM-10 sources since lime plant emissions are reentrained and accounted for by the CMB model as lime plant emissions. Local source profiles will be obtained in the near future

and are expected to improve source segregation.

ADEQ Report (copy attached), at 9-10. To Chemstar's knowledge, local source profiles never were obtained. It is well known that the CMB model is unable to discern chemically similar sources. This is significant because limestone (calcium carbonate) is an integral part of the crustal material found in Southern Arizona. Also, the unpaved roads in the area of the Chemstar lime plant have limestone deposited on them. In addition, deposition of limestone dust in the Paul Spur area has been occurring for years, not only from the Chemstar plant, but also from the two neighboring lime plants located next to the Paul Spur area in Mexico. Based on the foregoing, ADEQ should discuss its basis, with supporting analysis, for concluding that the Chemstar plant is the sole source of the limestone particles measured by the PM-10 monitoring.

4. §2.1. The SIP amendment states that a Sierra Anderson SA321A PM-10 sampler was used at the Paul Spur site. However, Table 2.1 indicates that a Sierra Anderson SA321B was used in 1985-86. If a SA321B was used, its accuracy should be addressed by the SIP rather than the accuracy of its sister model. Also, the dichotomous samplers used by ADEQ are not EPA-approved reference method samplers. This is not discussed in the SIP; neither are the limitations associated with the use of data acquired with such non-reference samplers.
5. §2.2.1. ADEQ states that the review of several factors affecting the choice of receptor model resulted in selection of the CMB approach. There is no discussion of this "factor analysis" contained in the SIP amendment to enable the reader to reach the conclusion that the CMB approach is appropriate.
6. §2.2.2.1. The SIP amendment fails to note that the North sampler is located on Chemstar property near a small group of houses which are and have been uninhabited for some time. Accordingly, the SIP should address the regulatory basis for concluding that the PM-10 concentrations measured by the North sampler reflect ambient levels of PM-10.
7. §2.2.2.2. The SIP amendment states that data collected at the South sampling site represents background conditions relative to the North site. Chemstar questions this statement. Because prevailing winds are from the southwest quadrant, it would seem that a background monitor site would be located southwest of the lime plant, not east of the plant, in order to measure the PM-10 contribution from the plant. If ADEQ does indeed consider the South site to measure background, on what basis can

ADEQ focus its control strategy on the Chemstar lime plant when considering that total PM-10 at the South site exceeded that measured at the North site every third day during the 30-day intensive sampling period? See §2.2.4.1.

8. §2.2.6. This is the only reference in the SIP amendment to the presence of two lime plants close to the Paul Spur air quality area. There is no discussion in the SIP of the potential contribution from these facilities to PM-10 concentrations in the Paul Spur area. Chemstar has conducted screening analyses which demonstrate that contributions from these facilities, which do not contain pollution control equipment, can be significant. These screening analyses indicate that, depending on wind speed and Pasquill-Gifford Stability class, and assuming flat terrain, particulate concentrations at Paul Spur can range from 13 ug/m³ to 1332 ug/m³ due to emissions from the Agua Prieta plant (9 miles away) and from 22 ug/m³ to 2482 ug/m³ due to emissions from the Naco plant (9 miles away). ADEQ's failure to consider these sources could be a significant shortcoming in its SIP amendment. This matter needs to be addressed.
9. §2.3. The discussion in this section seems to focus on data which generally supports ADEQ's overall conclusions. However, there is essentially no discussion of data which appears to be inconsistent with those conclusions. For example, PM-10 levels on September 15, 1987 were relatively high for both the North and South sites with the wind out of the north during the peak work hours. Emissions from the plant would have blown away from both monitor locations. What was the source of PM-10 on this day? Also, PM-10 levels on October 1 and 2 were relatively high for the South site with the wind out of the east during peak work hours. Emissions from the plant would have blown away from both monitor locations. What was the source of PM-10 on these days? A more thorough discussion of all the data should be provided. Also it is not clear why PM-10 data for October 13, 1987 was not considered for the South monitoring site (due to passage of a weather front) but was considered for the North site. Presumably the same weather front affected both sites.
10. §3.0. The SIP amendment states that the Chemstar lime plant is the only major source in the Paul Spur area. Although other minor contributors are mentioned, no mention is made of paved and unpaved roads, or facilities (including lime plants) adjacent to the Paul Spur area, or soils in the area containing limestone particles. On what basis were these other potential sources not included in this discussion?

11. §3.1.2.1. The discussion in this section is very confusing. It speaks of emission rates and emission estimates, but does not explain the difference. It refers to EPA-405/4-85-002 as being the source for emission factors for "different sources", but does not identify the "different sources" or the emission factors which were actually taken from the cited reference. Moreover, Table 3.1 does not refer to EPA-450/4-85-002 as the source for emission factors, but rather AP-42, which is not referenced in the discussion. This section should be rewritten.
12. §3.1.2.1. Contrary to the implications contained in the text, Table 3.2 clearly demonstrates that stack emissions from Kiln No. 5 and No. 4, and emissions associated with Kiln No. 4 dust removal, are minor in comparison to windblown emissions from cleared areas and roads. This should be corrected.
13. §3.1.2.1. The last paragraph in this discussion makes the bald statements that the majority of particulate matter from the lime kiln stacks is assumed to have a particle diameter of less than 10 microns, and that fugitive particulate emissions from storage and handling operations typically have mean particle diameters of 3-6 microns. In the absence of providing the basis for these statements, little weight can be given to their credibility.
14. Table 3.2. Use of an asterisk under the column titled "Permit Condition Emission (g/s)" is confusing in view of the footnote explanation associated with use of an asterisk. This should be corrected.
15. §4.0. The statement that the lime plant and Border Road are the only sources of PM-10 in the Paul Spur area is overly broad and unsubstantiated. The statement completely fails to recognize the contribution of reentrainment of particles from the soils into the air and the contribution from sources outside the Paul Spur area. Moreover, it is unclear how the statement can be made that road dust was not represented in the high concentrations at the North monitor site when, to Chemstar's knowledge, no analysis was done regarding the constituents of the road dust.
16. §4.2. Considering that other sources such as lime plants adjacent to the Paul Spur area, and reentrainment of limestone particles from surrounding soils were not addressed, it is sheer speculation to conclude that the rollback model is appropriate because there are only a few specific sources. Consequently, it is a major assumption to say that a "51% reduction in plant emissions" will accomplish the reduction required in order to achieve attainment.

17. §5.0. The last sentence on page 51 is in error. Earlier screen modeling by ADEQ to account for Kiln No. 4 and its associated equipment on the design day was conducted assuming that windblown emissions from cleared areas and roads were 8.80 g/s. According to Table 5.2, maximum PM-10 emissions from these two sources are 178.07 g/s. Accordingly, using ADEQ's methodology as described in the SIP amendment, PM-10 emissions from Kiln No. 4 and its associated equipment have only a minor effect on concentrations at the North monitor site.
18. §6.0. Chemstar's comments on the selected control strategies are given in its letter addressed to Ms. Nancy Wrona dated March 2, 1990, commenting on the draft operating permit conditions.
19. §7.0. It is inappropriate to extrapolate production data from recent years to predict future levels. A review of production data since 1978 shows that customer demand has been cyclical, and does not support the trend suggested by Figure 7.1.
20. §9.0. The discussion on preconstruction review needs to be revised. As Chemstar has discussed with ADEQ, a municipal landfill is being proposed for the Paul Spur area adjacent to Chemstar's plant. ADEQ must take steps to ensure that new sources of significant PM-10 emissions are not allowed in the Paul Spur area. To allow such sources would defeat the additional control measures to be undertaken by Chemstar.
21. §10.0. This section should be rewritten to take into consideration PM-10 emissions from other potential sources as discussed previously in these comments.
22. Chemstar's lime plant should be referred to as Chemstar's Douglas Plant, not as the Paul Lime Division or Paul Lime Plant or Chemstar's Paul Spur Lime Plant.

Very truly yours,

William E. Dodge by *WED*

William E. Dodge
V.P. Manufacturing

WED/jeb

Attachment

SUMMARY

Ambient air PM-10 samples were collected with dichotomous samplers over a 30-day period in the vicinity of a Paul Lime, a lime production plant in southern Arizona. The elemental constituents of these samples are compared with available source profiles using a Chemical Mass Balance Model. Results from this screening approach, enhanced by simple wind speed and direction analysis, suggest that the Paul Lime Plant is the major contributor to high PM-10 concentrations in the Paul Spur area.

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1.0 INTRODUCTION

In February of 1979 the Arizona Office of Air Quality began total suspended particulate (TSP) sampling on the Paul Lime plant property a few hundred meters northeast of the processing area. Because of a plant expansion, a new sampling site was established in the same direction but several hundred meters farther from the plant. Although the average concentrations at the new site are about half of the old (because of the greater distance and heavier foliage canopy) violations of the 24 hr and annual TSP and PM-10 standards have occurred every year. Because of the number and severity of the violations (see Table 1) EPA designated the lime plant vicinity as a Group I area which required State Implementation Plan (SIP) development. Figures 1a and 1b show the location of Paul Spur in Arizona.

2.0 ASSESSMENT OF AIR QUALITY CONDITIONS

2.1 Site Selection

2.1.1 North Sampling Site (Dichot)

The North Sampling Site (Original Dichot Site) was located in the back yard of a residence appx. 220 meters ENE of the center of the limestone processing area. This site was selected for compatibility with the ADEQ TSP and PM-10 monitoring at that site prior to the current study. The site is located in the path of the prevailing winds generally downwind of the lime plant. It is surrounded by a group of trees which screen the dust and would tend to be representative of the dust levels to which the closest inhabitants would be exposed. It is believed that large trees in the proximity of the sampler act to some extent as filters on airborne dust being diffused to the sampling site. However, the site is thought to represent the maximum ambient PM-10 concentration in the area.

2.1.2 South Sampling Site (Dichot)

The South Sampling Site (Pasture Site) is located appx. 200 meters ESE of the center of the limestone processing area. Several criteria were used for site selection: 1) it was not directly in the path of the prevailing winds which carry the dust from the plant, 2) it was near the only dirt road in the immediate area which was not on the Paul Lime property, 3) it was located in an open field with good exposure to wind and unobstructed dust loading (there were no trees or other obstructions to interfere with the collection of good wind data and it allowed an excellent view of the complete Paul Lime processing area for photographic documentation) and 4) the availability of commercial power

2.1.3 Background Sampling Site (PM-10)

The site selected for sampling the background dust level (Hi

vol Samplers) was the P&G Douglas WME sampling site. It was selected because it is within a reasonable distance of the Paul Lime Plant (approx. 16 kilometers E of the plant), at the same surface elevation, with comparable topography and vegetation and much lower dust loading than the Paul Lime Site. The site was fully facilitated (it contained an instrument trailer and had 110v electrical power and it had easy access.

2.2 Airborne Dust Sampling

This phase includes daily (midnight to midnight) and intensive (every 4 hours) dust sampling (dichot) and background dust sampling (PM-10). Air sampling for this study commenced September 10, 1987, at which time an automatic dichotomous (dichot) PM-10 sampler (Sierra-Andersen Series # 245, PM-10) replaced the existing PM-10 sampler (Sierra-Andersen SSI) at the permanent ADEQ sampling site (north site). In addition, wind sensing equipment (speed and direction) and a similar dichot were installed at the south site. The intensive phase ended October 12, 1987. The north site dichot and the south site wind sensor will continue to operate until Sept. 10, 1988

The purpose of the daily sampling was to clarify short-term concentration patterns and to compile a data set from which a day (or days) for CMB and ISC modeling could be determined. Additionally, consecutive 4-hour samples (intensive sampling) were collected in lieu of daily samples during the period October 7-9, 1987. These samples were intended to provide correlation among dust emission activities in the study area, PM-10 measurements and the concurrent meteorology. Every-sixth-day dichot sampling recommenced at the north site after midnight on October 12, 1987 and will be terminated Sept. 10, 1988 in order to build a 12 month data base for source apportionment evaluation for designing emission control strategies for the area to comply with the annual and 24-hour PM-10 standards.

Sampling Schedule - Routine sampling was started Sept. 10, 1987 @0000 hrs. and was continued until Oct. 6, 1987 2330 hrs. It was begun again Oct. 12 and concluded Oct. 13. The sampling period was 24 hrs. Intensive sampling was begun Oct. 7 @ 0700 hrs. and concluded Oct. 9 @ 0700 hrs. The sampling period for the intensive sampling was 4 hrs.

2.2.1 Dichotomous (Dichot) Samplers

2.2.1.1 North Site

The site contains an automatic dichot sampler located on the roof of a 3 m X 1.8 m X 1.8 m metal shed. The electronics are contained inside the shed and somewhat sheltered from the environment. Temperature control is obtained using a thermostatically controlled exhaust fan. This is less than adequate because it draws in the dust from the outside.

2.2.1.2 South Site

This site also contains an automatic dichot sampler located on the roof of a DEQ portable air sampling trailer with the electronics located inside the trailer in a protected environment. The inside was cooled with an air conditioner and was found to be relatively dust free.

2.2.2 Background Samplers

The background site (Douglas NNE) contained two Hi Vol PM-10 samplers. They were run on alternate days in order to assure continuous monitoring. One hi vol sampler was located on the roof of the trailer (North) and the other was located on the tower (South). Sampling was performed to coincide with the dichot sampling.

2.2.3 Data Collection

All dichot (teflon) filters were pre-weighed and assembled into cassettes at the Desert Research Institute (DRI), Reno, Nevada. They were then sent to ADEQ for dust collection. After the samples were collected the filters were returned to DRI for post-weighing and analysis by Xray fluorescence (XRF) for an array of 34 elements.

All PM-10 (Quartz fiber) filters were pre-weighed at the state analytical lab. After each Hi Vol sample was collected the filter along with the appropriate documentation was returned to the state analytical lab for post weighing.

2.3 Inventory Dust Sampling

This phase includes road dust and storage pile dust sampling and is scheduled for completion July , 1988.

2.3.1 Road Dust Sampling

A vacuum cleaner type road dust sampler was purchased from NEA . It will be used to sample road dust and storage pile dust for the second phase (Phase II SIP). A propane powered electrical generator will accompany the sampler therefore allowing us flexibility in our sampling program. The samples will be collected on quartz PM-10 filters and the filters sent to DRI for re-suspension and analysis of the dust. The dust will be re-suspended in a sampling chamber and collected using a dichot sampler. The re-suspended dust will be analyzed using XRF Analysis. A sampling trip is being planned for late June - early July , 1988.

2.3.2 Grab Samples

Additional grab samples will be taken from the various dust piles within the plant area during the same sampling trip.

2.3.3 Stack Sampling

Stack sampling was performed in February 1987. Size selective (8 levels) samples were collected on quartz fiber filters and will be sent to the Desert Research Institute, Reno, Nevada (DRI) for re-suspension and XRF Analysis.

2.4 Meteorological Data

Low threshold wind equipment was used to collect continuous wind speed and direction data for the duration of the study. Data was recorded continuously on a strip chart recorder and 30 minute averages on a solid state data pod. The data from the data pod was reduced using a state owned IBM PC AT computer. The wind speed and direction sensors were located 10 m above ground level on the N side of the Pasture Site trailer. The electronics for the wind equipment was located inside the temperature controlled trailer.

Local meteorological measurements have included wind speed and wind direction measured at the south site using sensors that are located 10 meters above ground level. Data are being recorded graphically using a continuous strip chart recorder and electronically on a solid state data storage module (DSM) (Datapod Model 214 Wind Recorder, Omnidata International)

2.5 Photographic Documentation

2.5.1 35 mm Photography

Approximately 300 photos (250 prints and 50 transparencies) were taken of various areas of the Paul Lime Co., the Paul Spur area, the Douglas area, the 2 lime plants in Mexico (Mexicana de Cobra - south of Douglas and Sonocal - south of Naco), the Douglas NNE sampling site, and the highway between Douglas and Paul Spur. Two 35 mm cameras were used. Camera A had 300 mm, 135 mm 50 mm and 35 mm lenses and camera B had a 200-400 mm zoom lens. Photos were taken at various magnifications. The photos were mounted in a photo album for easier viewing.

2.5.2 Time Lapse Photography

A time lapse camera was purchased for this study but was not available at the time of the intensive sampling. A camera was borrowed for the intensive sampling study. This camera was housed in a steel cabinet with a clear glass front. The cabinet was located on top of the trailer at the Pasture Site. The camera was programmed to take one exposure every 12 seconds and was started at 0700 hrs. Oct. 7. One roll of super 8 film provided 10 hrs of sampling. Unfortunately the camera overheated as a result of intensive sunlight on the closed metal housing which was used to protect the camera from the environment. A radiation heat shield made from aluminum foil which appeared to solve the problem. The camera was also used in its continuous mode to photograph the visible dust cloud from a test vehicle.

2.5.3 Aerial Photography

An aerial reconnaissance of the Paul Lime Company and the surrounding area including the 2 Mexican Lime Processing Plant and the Mexican Copper Smelter was undertaken. Approximately 100 photographs (50 prints & 50 slides) were taken during a 2 hour airplane ride over the area.

2.6 Physical Observations

The Paul Lime Company and surrounding area was frequently observed and photographed during the 1 1/2 month study period.

2.6.1 Distributed Sources

At least 6 distributed sources were identified. These are as follows; A) Boarder Road - a dirt road, B) Paul Lime Plant haulage roads - all are dirt roads, C) various piles of fugitive dust, D) Paul Spur Road - an asphalt road connecting Paul Lime with the State Highway Route 80, E) Arizona Route 80 a concrete highway and F) Dirt road paralleling Route 80.

2.6.1.1 Boarder Road

This road is Cochise County Road #4182. It is a dirt road which connects the Paul Spur Road and Naco. The Cochise County Highway Planning Department was contacted in order to obtain traffic counts on this highway. The results are as follows;

- 1984 - 20 vehicles per day south of Paul Spur road
 - 1984 - 7 vehicles per day west of ranch turnoff
 - 1987 - 58 vehicles per day south of Paul Spur Road.
- The data was taken from 9-15 to 9-21

Several automotive tests on the road on order to establish the amount of visible dust associated with vehicle speed. The dust plume following the state Plymouth station wagon was photographed with the super 8 movie camera for speeds of 30, 37 and 45 m.p.h..

2.6.1.2 Paul Lime Haulage Roads

These roads were observed to be watered on a daily basis. The watering appeared to be on a random basis. The watering had a short time effect and was effective for approximately 45 minutes. Much of the time we observed visible dust clouds when a truck would drive on a road.

2.6.1.3 Fugitive Dust Piles

There were various piles of fugitive dust near the kilns and near transfer points which would emit large clouds of visible dust

when a gust of wind would hit them. Many wind gust occurrences were observed and several such cases were photographed including one extreme case which appeared like a blizzard.

2.6.1.4 Paul Spur Road

This road is Cochise County road #3024. This is an asphalt road which connects State Route 80 and Paul Lime. It had some carry on dirt resulting from the watering of the haulage roads and after a rain. It also got dirty from soil washing downhill from the Paul Lime Plant during heavy rains.

1984 - 58 vehicles per day
1987 - 92 vehicles per day (9-15 to 9-21)

2.6.1.5 Arizona Route 80

This is an concrete highway appx. 800 meters north of Paul Lime which carries 2500-5000 vehicles per day. There are no apparent dust sources on this road as compared to Paul Spur Road.

2.6.1.6 Dirt Road Along Route 80

This is a dirt access road which runs parallel to Route 80 and is 30 meters south of it. Its comes within 1.6 kilometers of Paul Lime. Once per evening it is dragged by the Boarder Patrol in order to detect the passage of illegal immigrants. The dragging operation creates a large cloud of dust which nearly obliterates Route 80 but has not been observed to blow towards Paul Lime.

2.6.2 Point Sources

20 point sources were identified during the 1 1/2 month study period. The sources fall into 3 categories ; A) Stack Emissions, B) Crusher Emissions and C) Transfer Points. The dustiest point is the large rectangular stack leading from the rock bed filter. The next dustiest point is the final truck loading points. Next dustiest is the crusher and next dustiest is the transfer belts to the storage piles.

2.6.2.1 Stack Emissions

The dustiest point source by far was the large rectangular stack leading from the rock bed filter. This is the exhaust from all of the horizontal kilns. Visible clouds of dust were observed to come from that stack throughout the one month intensive sampling period. There were several times during this period when the dust cloud was extremely dense. Photographs were taken of one or two such clouds. It appears that the system is a very inefficient dust collector.

The second dustiest stack(s) were the two from the twin vertical kilns. Photos were taken of the visible emissions from these

stacks. There appears to be a problem with the damper system for these stacks.

2.6.2.2 Crusher Emissions

The crusher emitted visible dust at all times during its operation. It appears that the dust suppression system for the crusher is not performing adequately.

2.6.2.3 Transfer Points

The dustiest transfer points are the final loading points for the lime. In most cases the lime is dropped a distance of about 3.5 meters into either open trucks or tanker type trucks. Most of the time there appeared to be NO "elephant nose" type dust suppression transfer hose in use. Many transfers were observed where there were large opaque clouds of dust resulting from the transfer of the final product.

The next dustiest transfer points were the various belt transfer points associated with the crusher and storage piles. They were emitting dust on a continuous basis.

The next dustiest transfer point was the "bucket filling hopper" for the vertical kiln. The hopper would dump its contents into the bucket thus creating large clouds of dust. This source would be classified as intermittent.

2.7 Chemical Mass Balance (CMB) Modeling

CMB modeling was performed using the mass concentration and XRF data for both fine and coarse particulate matter concentration from samples collected during the study period. Thirty five (35) source profiles were used, 33 source profiles from the EPA Source Composition Library ¹ and 2 source profiles from NEA. The CMB model was run following the EPA guidelines. R-Square ranged from 0.9 to 1.0, chi-square ranged from 0 to 2.5, degrees of freedom were always greater than 5 and the percent mass accounted for was 100% +/- 12%. Preliminary CMB modeling results for the three days with highest and lowest PM-10 concentration at both sites are summarized in Table 2. These data imply that the primary constituent of the PM-10 samples is lime plant (limestone, lime and lime kiln) dust, the highest percentage occurring at the north site with relatively high ambient PM-10 concentrations. However, even with relatively low concentrations at the south site the lime plant contributed about 51% of the PM-10 mass. Road dust was not represented in the high concentration samples at the north site; however, on the three lowest concentration days road dust averaged 23% of the total mass. The contribution of the road dust at the south site was 22% (high days) and 15% (low days).

Definite conclusions concerning specific sources cannot be made until local source profiles have been obtained. For example lime plant particulate emissions have been deposited in significant quantities on the soil, road surfaces, and all other sur-

faces in the study area. This deposition tends to mask the contribution of roadway PM-10 sources since lime plant emissions are reentrained and accounted for by the CMB model as lime plant emissions. Local source profiles will be obtained in the near future and are expected to improve source segregation.

2.7 RESULTS

2.7.1 PM-10 Data

A summary of the 24-hour fine (0-2.5 μm), coarse (2.5-10.0 μm) and total PM-10 (0-10.0 μm) particulate concentration at the two sites from Sept. 10 through Oct. 13, 1987, is presented in Table 3. The coarse concentration was always found to exceed the fine concentration on a daily basis. The fine concentration averaged 16% of the PM-10 concentration at the north site and 20% at the south site. The average concentrations of fine, coarse and PM-10 were larger at the north site than at the south site. The PM-10 concentration at the north site exceeded that at the south site on approximately two-thirds of the study days.

Additional data collected during consecutive four-hour periods on Oct. 7-9, 1987 are presented in Table 4. Overall trends are similar to those seen in the daily samples; however, no clear diurnal trends are evident. It is seen, however, that relatively sharp temporary increases occur in coarse particulate matter concentration at the north site, a feature not seen in the south site data, with the exception of the first four-hour segment. Comparison of the data with wind information shows that these occurrences at the north site only happen in the presence of wind out of the southwest quadrant with relatively high speeds (i.e. 5-10 m.p.h.). The highest concentrations occurred during late night and early morning hours.

Because the loading at one site did not consistently exceed that at the other, the data were studied for possible explanations for the differences in loading patterns. For this part of the study two methods were used: 1) Comparison of ambient PM-10 concentrations with wind direction and wind speed, and 2) chemical mass balance (CMB) modeling of dichot data.

2.7.2 Wind Data

PM-10 concentration and associated meteorological parameters obtained during the daily sampling period (Sept. 10-Oct. 13) were examined. The three highest and three lowest PM-10 concentration days at both sampling sites were determined. Common characteristics of instantaneous hourly wind speed and direction for these data subsets are described in the following sections:

A) The days of highest PM-10 concentration at the north site (Sept. 11, 14 and Oct. 13) were characterized by fairly persistent southwest winds with relatively high speeds. Average wind directions without a southwest component were uncommon and persisted less than several hours. Wind speeds ranged from about 2 m.p.h. to more than 15 m.p.h. with the daylight average being approximately

10 m.p.h..

B) Days with lowest PM-10 concentration at the north site (Sept. 22, 30 and Oct. 2) were characterized by variable wind direction and somewhat lower average speeds than the highest loading days. Variability in wind direction was greatest at night and was associated with low speeds, generally less than 5 m.p.h. However, each of the three days were characterized by a rather abrupt shift to southeasterly wind at 8-9 AM (probably inversion breakup) with persistence of direction until 6-7 PM (inversion setup). With the southeasterly winds, speeds averaged around 10 m.p.h. with no peaks in excess of 15 m.p.h..

C) Four days were identified for highest PM-10 concentration at the south site (Sept. 10, 15 and Oct. 1, 13); both Oct. 1 and 13 had nearly the same PM-10 concentration. Because the direction and speed characteristics for Oct. 13 differed from the other three days due to mesoscale meteorology, this day was excluded. Of the remaining three days, two (Sept. 15 and Oct. 1) had variable winds with speeds of about 5 m.p.h. during nighttime hours; Sept. 10 had rather persistent southwesterly winds at night with average wind speed somewhat greater than 5 m.p.h.. On all three days a shift in direction occurred from about 7 AM until about 1-2 PM. During those hours the wind was out of the northeast quadrant on Sept. 10, and 15 and mostly out of the southeast quadrant on Oct. 1.

D) Days with lowest PM-10 concentration at the south site (Sept. 18, 19 and 26) were generally characterized by light and variable winds except on the 26th when southwest winds persisted during most of the nighttime hours. On these three days the hourly wind speed reached or exceeded 10 m.p.h. only twice.

The particulate data was segregated into two subsets, one for cases when PM-10 concentration at the north site exceeded that at the south site and the other for cases when the opposite was true. Hourly average wind direction and speed were then determined to represent a "typical" diurnal cycle for both particulate matter loading scenarios (Table 5). The data indicated that when the south site concentration was greater, the wind tended to blow out of the southwest quadrant from about 10 PM until about 6 AM with average speed less than 5 m.p.h.. From about 7 AM through about 9 PM the average wind direction appeared to shift through south to east-northeast by mid-afternoon and then back again to the southwest. Daytime average wind speed was in the 5-10 m.p.h. range. When the north site loading was greater the data indicated that the average wind direction was southwesterly from about 2 PM through about 7 AM. During the remaining seven hours the direction tended to be more southwesterly. Daytime average wind speed was similar to that in the previous scenario, but nighttime speeds appeared to be somewhat higher (i.e. about 6 m.p.h.).

Finally, wind roses were developed for the days when PM-10 concentration at the north site exceeded that at the south site and for the days when the PM-10 concentration was greater at the south site. The two roses, with associated average wind speeds by direction, are presented in Figure 2. They show that when the loading at the south site was greater there was a tendency of a

mix of wind direction with the dominant direction: average speed was highest with east-southeast winds (6.3 m.p.h.) and lowest with northwest winds (2.7 m.p.h.). When the concentration at the north site was greater there was a predominance of southwesterly winds: 60% of the hourly occurrences had a direction out of the south-southwest through west-southwest. Highest average speed (8.1 m.p.h.) was associated with westerly winds and the lowest average speed (3.3 m.p.h.) was associated with easterly winds.

Meteorological factors can directly or indirectly affect PM-10 concentration at a sampler. One that was considered was precipitation, which can accelerate deposition of particulates soon after emission and reduce particle reentrainment. Depending on antecedent surface conditions and subsequent weather conditions, the effect of precipitation in controlling fugitive emissions may be either small or great. Rainfall data from a nearby city and an associated FAA airport, located about 16 kilometers northeast of the lime plant, provided an indication of rainfall patterns in the study area. Measurable rainfall was recorded only during the period Sept. 17-26, with daily rainfall in excess of 4 mm being recorded only on the 22nd. No clear connection between low or high particulate matter loading at one site versus the other, relative to rainfall patterns was evident. Rather, precipitation appears to reduce particulate matter concentration for both sites.

2.9 Conclusions

Since meteorological data are limited to a one-month sampling period, they cannot be used to definitely represent an annual perspective of air quality and meteorological conditions in the study area. However, it is believed that the wind data are reasonably representative of conditions that can be expected from mid-September through May or June.

It is clear from the data presented that southwest winds are associated with occurrences of highest PM-10 concentrations at the north site and that particulate matter sources southwest of that site are the major contributors to that concentration. Major sources affecting the south site are not clearly indicated by meteorological data; even the unpaved highway is not clearly suspect as a major source when the loading is greater at the south site.

The preliminary CMB modeling results are in agreement with the meteorological implications of the lime plant as the primary source of ambient PM-10 concentrations in the area around the plant. Road dust is a potential, but less significant, contributor to PM-10 concentrations.

References

1. J. E. Core, J. J. Shah, J. A. Cooper Receptor Model Source Composition Library, EPA-450/4-85-002, EPA Research Triangle Park, NC, 1984.

3.0 TIMELINE FOR THE PHASE II SIP DEVELOPMENT

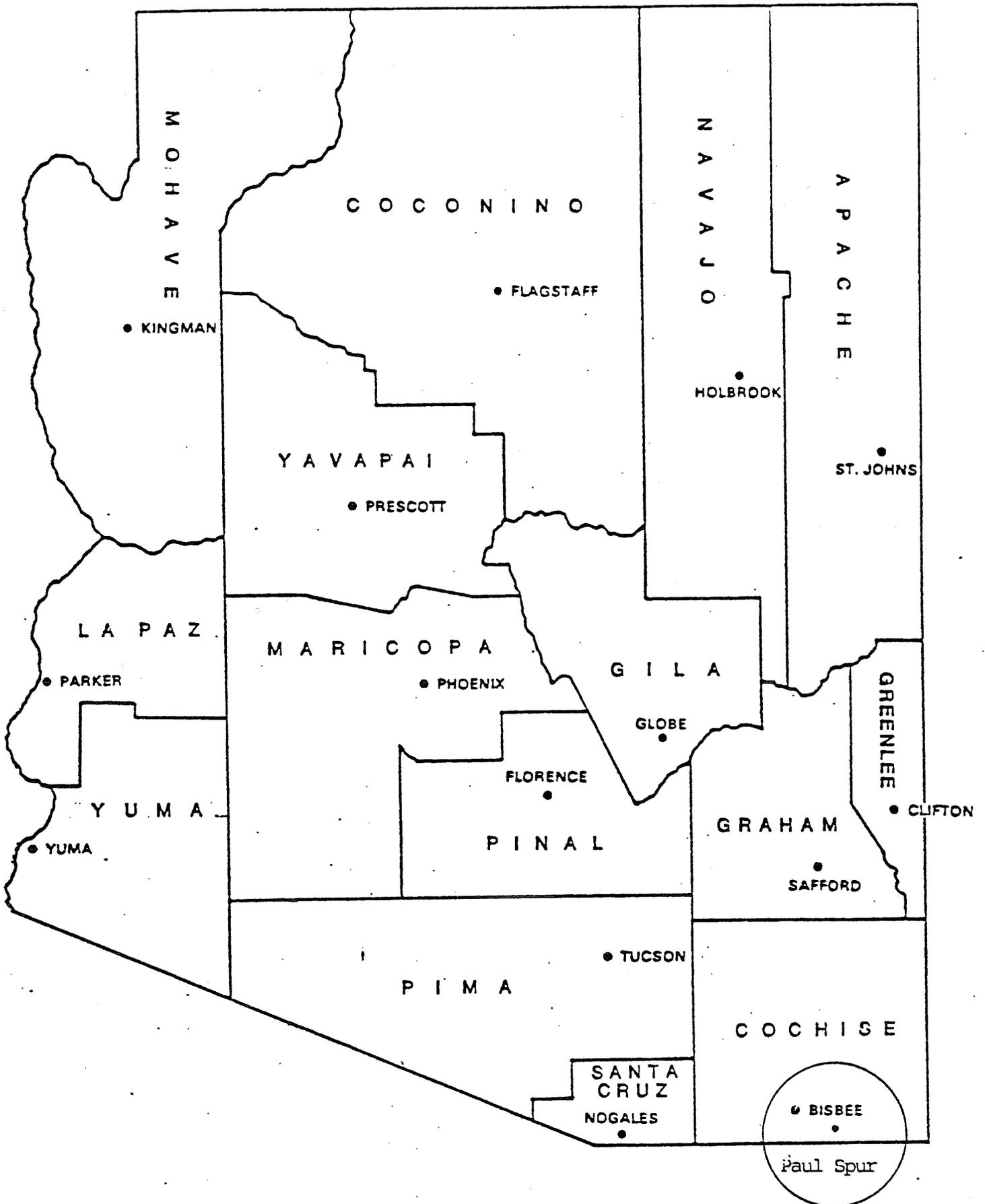
- 1 6 day SSI monitoring
3/85 On-going
- 2 ES emissions inventory due
- 3 Evaluate ES inventory
11/87
- 4 First revision inventory
(if necessary)
- 5 Run long term (six day) dichots
8/1/87 - 8/1/88
- 6 Intensive sampling dichots
9/10/87 - 10/13/87
- 7 Obtain dichot filter analysis
for 6 - day sampling
11/1/87 - 11/1/88
- 8 Collect meteorological data base
8/1/87 - 8/1/88
- 9 Determine 24-hour design day
11/1/88
- 10 Develop list of potential
control strategies
5/20/88
- 11 Develop modeling protocol
3/88
- 12 Refine inventory
5/1/88 - 8/1/88
- 13 Determine PM10 area boundaries
5/10/88
- 14 Coordinate with EPA, COG's
and major sources
(Ongoing)

NOTE:

- Phase I SIP 5/30/88
- Permit Conditions due 5/30/88

- 15 Evaluate control strategies/
estimate emission reductions
6/1/88 - 9/1/88
- 16 Validate, Reconcile Models
11/1/88 - 12/31/88
- 17 Prepare Technical Support document
2/1/89
- 18 Develop draft PM 10 Plan
2/1/89 - 5/1/89
- 19 COG approval of draft PM 10 Plan and
endorsement of control strategies
4/1/89 - 5/1/90
- 20 Advertise public hearing
4/1/90
- 21 Review of draft PM 10 Plan
3/1/90 - 5/1/90
- 22 Hold public hearing
5/1/90
- 23 Appropriate agencies formally commit
to control strategies
5/15/90
- 24 Prepare final PM 10 Plan
5/15/90 - 6/1/90
- 25 Final adoption of PM 10 Plan by COG
6/1/90
- 26 Submittal of PM 10 Plan to EPA
7/1/90
- 27 EPA review
7/1/90 - 10/1/90
- 28 Attainment date
9/15/93

Figure 1a



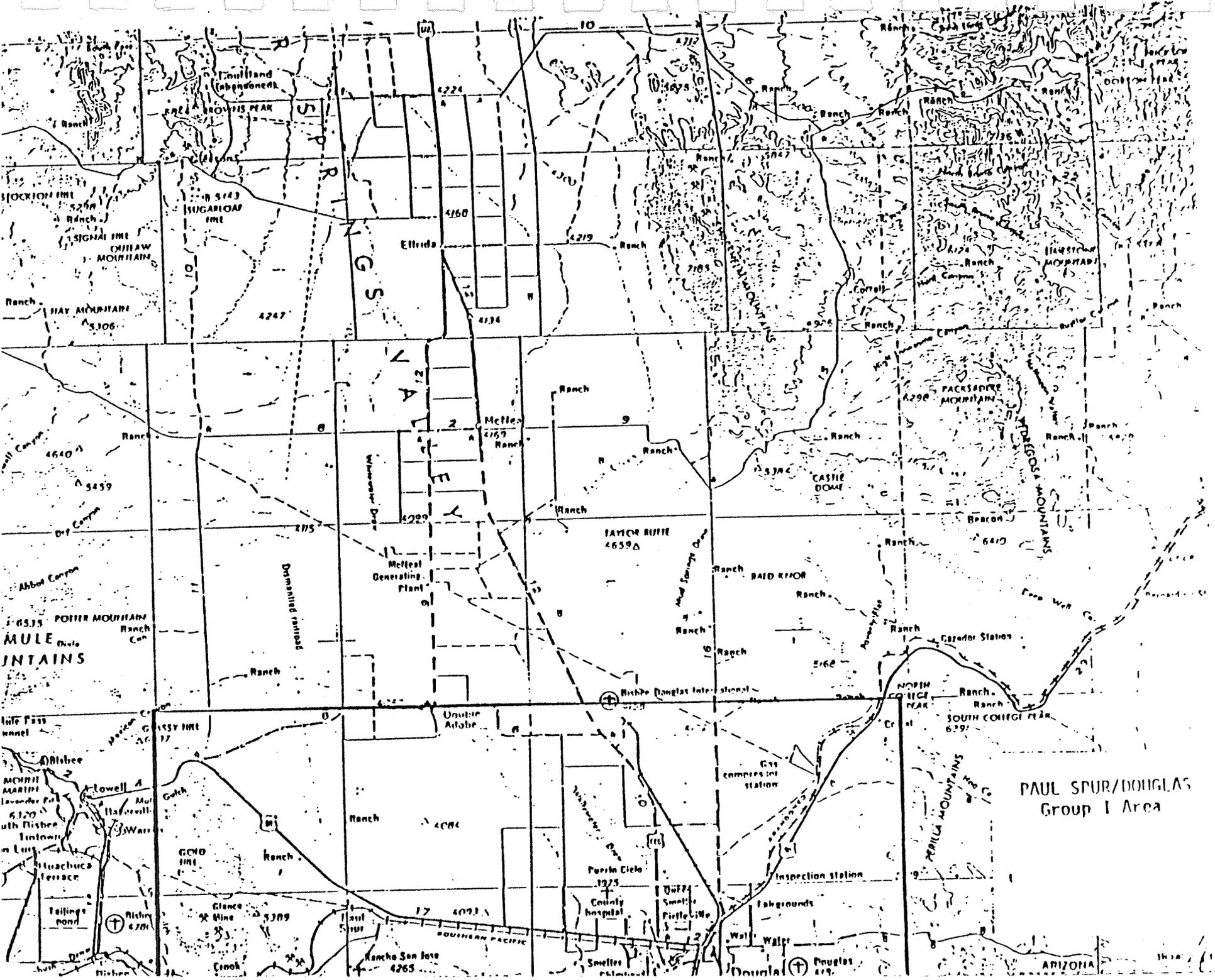
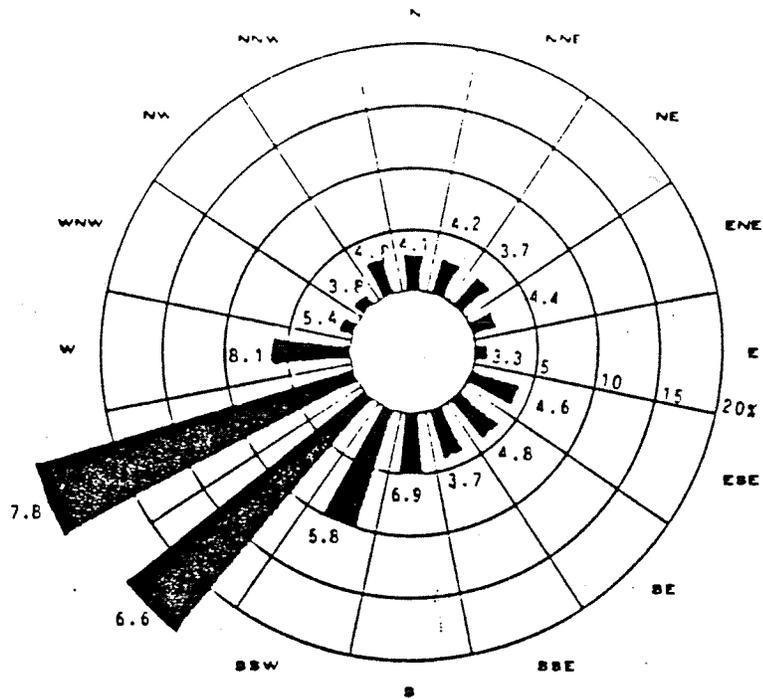


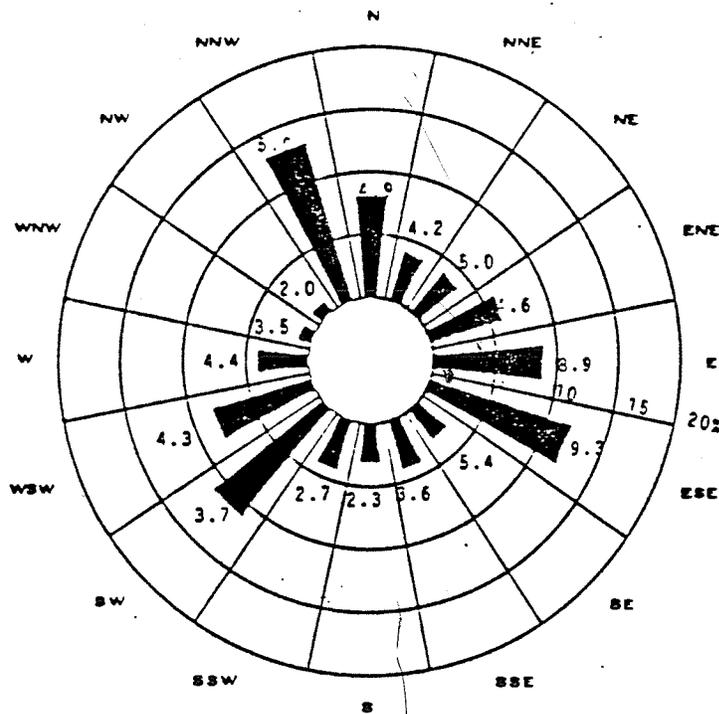
Figure 1b

PAUL SPUR/DOUGLAS
Group I Area

ARIZONA



a. North Site PM-10 Loading Greater Than at South Site



b. South Site PM-10 Loading Greater Than at North Site

FIGURE 2

Percent Frequency Occurrence of Wind Direction (Wind Rose Segment Length) and Associated Average Wind Speed (Number at End of Each Segment; MPH)

Table 1

Particulate Data from the Lime Plant Vicinity
1979 - 1987

Year	<u>Total Suspended Particulates</u>						<u>PM-10</u>				
	24- Hour Avg ¹	24- Hour Max ¹	2nd High ¹	Number of Exceedances		Number of Samples	Arith. Mean ¹	24- Hour Max ¹	2nd High ¹	Number of Exceed- ances	Number of Samples
1979	395	1853	1652	39	44	51					
1980	381	2483	2193	33	43	49					
1981	352	1046	1034	32	42	45					
1982	303	854	739	28	44	47					
1983	284	1222	740	24	34	41					
1984			No Data								
1985 ²	178	698	474	14	28	40	89	270	206	10	42
1986	193	765	642	22	36	53	111	353	322	11	49
1987	199	647	420	8	20	28	58	168	164	2	39

1 Micrograms per cubic meter

2 New sampler location

TABLE 2

Preliminary CMB Modeling Results for Selected Days

PM-10 Sample Constituent	Average Percent Contribution to Total Mass			
	3 Highest Days (North)	3 Lowest Days (North)	3 Highest Days (South)	3 Lowest Days (South)
Lime Plant Dust	86	57	67	51
Road Dust	0	23	22	15
(NH ₄) ₂ SO ₄	0	8	3	18
Others	<u>14</u>	<u>12</u>	<u>18</u>	<u>16</u>
Total	100	100	100	100

Others: Miscellaneous chemicals believed to be part of the background air mass.

TABLE 3

Summary of Daily Midnight-to-Midnight
PM-10 Measurements ($\mu\text{g}/\text{m}^3$)

Date (1987)	North Site				South Site			
	F	C	C/F	PM-10	F	C	C/F	PM-10
Sept. 10	10.5	85.7	8.2	96.2	10.2	57.4	5.6	67.6
11	15.4	111.2	7.2	126.6	8.8	46.7	5.3	55.5
12	11.1	87.4	7.9	98.5	20.4	22.0	1.1	42.4
13	7.8	29.8	3.8	37.6	5.8	17.9	3.1	23.7
14	11.8	98.1	8.3	109.9	5.7	42.6	7.4	48.3
15	13.7	65.3	4.8	79.0	11.7	62.2	5.3	73.9
16	13.5	59.2	4.4	72.7	12.3	42.8	3.5	55.1
17	11.1	67.4	6.1	78.5	8.9	37.4	4.2	46.3
18	7.6	18.8	2.5	26.4	4.5	4.6	1.0	9.1
19	8.1	27.0	3.3	35.1	6.9	13.7	2.0	20.6
20	7.9	28.4	3.6	36.3	6.8	14.1	2.1	16.2
21	7.5	39.9	5.2	47.4	NA	NA	NA	NA
22	5.5	16.7	3.0	22.2	6.6	39.5	6.0	46.1
23	2.6	2.7	1.0	5.3	5.9	23.0	3.9	28.9
24	NA	NA	NA	NA	9.0	38.7	4.3	47.7
25	9.4	47.6	5.1	57.0	8.6	17.0	2.0	25.6
26	11.8	56.1	4.8	67.9	8.2	10.7	1.3	18.9
27	10.1	59.1	5.9	69.2	7.1	16.0	2.3	23.1
28	8.8	37.3	4.2	46.1	11.2	47.5	4.2	58.7
29	9.0	19.7	2.2	28.7	9.3	43.6	4.7	136.9
30	5.2	11.7	2.2	16.9	5.9	26.6	4.5	32.5
Oct. 1	5.8	20.9	3.6	26.7	6.9	52.5	7.6	59.4
2	5.7	13.2	2.3	18.9	6.4	44.0	6.8	50.4
3	5.9	19.0	3.2	24.9	5.0	22.3	4.5	57.3
4	6.8	31.5	4.7	38.3	6.3	27.7	4.4	34.0
5	6.9	26.2	3.8	33.1	7.1	41.8	5.9	48.9
6	8.5	50.2	5.9	58.7	7.1	26.7	3.8	33.8
12	12.5	67.0	5.4	79.5	9.7	30.3	3.1	40.0
13	15.6	152.2	9.8	167.9	8.3	51.2	6.1	59.5
Avg.	9.2	48.2		57.4	8.2	32.9		41.1

F= fine (0.0-2.5 μm)
C= coarse (2.5-10.0 μm)
NA= Not available

TABLE 4

Summary of Four-Hour PM-10 Measurements
($\mu\text{g}/\text{m}^3$)

Date (Oct. 1987)	Start Hr.	North Site				South Site			
		F	C	C/F	PM-10	F	C	C/F	PM-10
7	0700	13.9	58.7	4.2	72.6	15.8	102.4	6.5	118.2
7	1100	10.6	7.7	0.7	18.3	6.1	11.6	1.9	17.7
7	1500	10.0	29.2	2.9	39.2	5.8	13.6	2.3	19.4
7	1900	18.9	103.1	5.5	122.0	7.5	15.5	2.1	23.0
7	2300	19.7	162.1	8.2	181.8	8.9	38.0	4.3	46.9
8	0300	10.8	42.1	3.9	52.9	12.2	57.4	4.7	69.6
8	0700	13.1	45.6	3.5	58.7	13.9	46.3	3.3	60.2
8	1100	17.8	111.0	6.2	128.8	10.3	58.6	5.7	68.9
8	1500	15.8	87.7	5.5	103.5	4.7	26.7	5.7	31.4
8	1900	20.0	143.4	7.2	163.4	6.7	19.0	2.9	25.7
8	2300	15.3	68.1	4.5	83.4	13.9	47.3	3.4	61.2
9	0300	16.1	67.0	4.2	83.1	11.9	33.5	2.8	45.4

F - fine particulates
(0.0-2.5 μm)

C - coarse particulates
(2.5-10.0 μm)

TABLE 5

Average Diurnal Wind
Direction and Wind Speed

September 10 - October 13, 1987

Hr.	South Site loading > north site loading <u>WD/WS</u>	North Site loading > south site loading <u>WD/WS</u>
1	226/3.5	230/5.8
2	232/4.3	233/5.2
3	244/4.2	254/4.9
4	271/3.8	232/4.5
5	280/3.2	234/4.6
6	269/4.4	236/4.5
7	170/3.3	219/4.8
8	89/4.1	173/4.1
9	80/6.1	111/5.2
10	95/7.4	127/6.0
11	91/7.8	135/6.8
12	96/8.2	163/8.1
13	89/8.4	174/8.5
14	75/9.5	189/9.5
15	71/8.0	212/8.7
16	116/7.7	206/8.4
17	100/7.8	222/7.5
18	127/4.1	250/5.9
19	106/3.8	238/6.1
20	134/6.1	240/7.0
21	176/5.2	246/7.2
22	271/4.5	250/6.9
23	255/4.6	215/5.6
24	298/3.5	247/5.5

Average --/5.6 --/6.3

WD= Average wind direction in degrees

WS= Average wind speed in miles per hour

SPEAKER SLIP

NO: _____

DATE: 21 Mar 1990

Name: Bill Podye, Chemstar Inc

Mailing Address: 2800 N. 44th St., Phoenix AZ 85007

Representing: Chemstar Inc

I wish to make an oral statement.
Approximate amount of time I wish to take to speak:
5 minutes.

I have submitted written comments.

I will submit written comments immediately after speaking.

I wish to submit written comments at a later time.

Subject: Comments on SIP of Chemstar

Operating Permit

APPENDIX E

Responsiveness Summary

RESPONSIVENESS SUMMARY

Comments on the Draft PM₁₀ SIP for the Paul Spur Group I Area

Public Hearing: March 1, 1990, 3:00 p.m.
Bisbee City Council Chambers, Bisbee, Arizona

Close of Comment Period: March 2, 1990

The only oral comments received were those by William Dodge, representing Chemstar, Inc. He only stated that detailed written comments would be sent to the Department. Two comment letters were received from William Dodge, representing Chemstar, Inc. One addressed the draft SIP, and the other addressed the draft operating permit, which is part of the SIP.

Comment: Section 1.3, Study Area Definition, only addresses the Chemstar lime plant as the primary activity in the area, and does not address other potential sources of PM₁₀ such as unpaved roads, soils, or other lime plants located near the study area.

Response: This type of detail is not necessary for the description of the study area, since many of the issues raised are dealt with in more detail in other sections of the SIP.

Comment: The Chemstar, Inc. lime plant located at Paul Spur is not the only potential source of lime dust, as limestone is a common component of the crustal material in the area, lime dust may be deposited on roads and surface soils in the area, and there are two lime plants in Mexico near the Paul Spur area. Further, these other sources of PM₁₀ are not characterized.

Response: Source characterization and Chemical Mass Balance receptor modeling were not the primary basis of the conclusions for the SIP. This is not clearly stated in the draft SIP, and will be remedied.

Comment: The accuracy of the Sierra Anderson SA321B PM₁₀ monitor is not addressed.

Response: Since the Sierra Anderson SA321A PM₁₀ monitor was not used, references to it will be excised. The accuracy considerations applied to the SA321A monitor do not apply to the SA321B monitor.

Comment: The dichotomous sampler is not an EPA-approved reference method.

Response: The dichotomous sampler has been accepted by the scientific community and, unofficially by EPA, as an accurate monitoring device for PM₁₀ for several years. EPA has approved this device as a reference method (see 54FR 31247, July 27, 1989).

Comment: The SIP does not describe what factors were taken into consideration in choosing Chemical Mass Balance (CMB) as the receptor model used.

Response: CMB is the only EPA approved receptor model. DEQ uses it for all PM₁₀ SIPs. The SIP will be revised to clarify this.

Comment: The North sample site is located near abandoned buildings and may not reflect ambient air conditions.

Response: This sample site is located outside of the fenced-in area of the facility and is accessible to the public. Therefore, it is measuring PM₁₀ concentrations in ambient air.

Comment: The South sample site is not justifiably a background monitor, because it is not always upwind of the facility. There were many days when the PM₁₀ concentrations at the South site exceeded those at the North site.

Response: The background site need only be located outside of the plume of PM₁₀ emissions. There were no days where South site monitor readings exceeded those of the North site and the PM₁₀ 24-hour average NAAQS was violated. Also, the South monitor was specifically located next to the unpaved road, because that road is the only source besides the Chemstar Douglas Plant thought to significantly influence PM₁₀ at Paul Spur.

Comment: The two lime plants located nine miles from the Chemstar facility in Mexico could have contributed significant quantities of particulates at the study area.

Response: For the "design day" used in the SIP, it is extremely improbable that either of these two facilities could have had a discernible impact on the PM₁₀ concentration measured.

Comment: The SIP does not explain all of the variability in PM₁₀ concentrations at all monitor sites.

Response: It is only necessary to explain PM₁₀ concentrations when the NAAQS is violated. Also, for the design day chosen, the receptor monitor was located directly downwind from the Chemstar facility for nearly that entire 24-hour period.

Comment: The SIP does not adequately justify exclusion of other sources of lime dust and other PM₁₀ emissions from consideration as contributors to the particulates pollution problem in the vicinity of Paul Spur.

Response: Time lapse photography, and analysis of meteorological factors and PM₁₀ loadings conclusively demonstrate that the vast majority of the PM₁₀ emissions that resulted in exceedances of the PM₁₀ NAAQS come from Chemstar facility. CMB modeling confirms that this is the case, because limestone based soils and lime dust contaminated soils would still contain higher concentrations of an array of other elements found in crustal material.

Comment: Section 3.1.2.1 does not consistently use the terms "emission rates" and "emission estimates", and relies on two different sources for determining these factors. This is confusing. This section needs to be rewritten.

Response: This section will be rewritten to improve clarity, and to appropriately reference the two sources used to determine emission rates and estimates.

Comment: Contrary to the implications contained in the text, Table 3.2 clearly demonstrates that stack emissions from Kiln No. 5 and No. 4, and emissions associated with Kiln No. 4 dust removal, are minor in comparison to windblown emissions from cleared areas and roads. This should be corrected.

Response: The text lists the largest emissions sources and implies no degree of severity of the sources by comparison. The text will be modified to list these sources in decreasing order of importance.

Comment: No justification is made or authority cited regarding assumptions about particle sizes associated with stack emissions and fugitive emissions.

Response: This will be clarified and corrected.

Comment: The use of asterisks in Table 3.2 is inconsistent and confusing.

Response: This will be corrected.

Comment: The claim that the Border Road and the Chemstar facility are the only sources of PM₁₀ in the Paul Spur area is unsubstantiated.

Response: Time lapse photography and other data clearly demonstrate that this is not a claim, but an accurate reflection of reality.

Comment: Considering that other sources such as lime plants adjacent to the Paul Spur area, and re-entrainment of limestone particles from surrounding soils were not addressed, it is sheer speculation to conclude that the rollback model is appropriate. Consequently, it is a major assumption that a "51% reduction in plant emissions" will accomplish the reduction required in order to achieve attainment.

Response: It may be a major assumption that the 51% reduction in plant emissions will result in attainment. However, given the data presented in the plan and in the time-lapse photography, the burden falls on Chemstar to demonstrate what the sources of PM₁₀ are if they cannot be primarily associated with these two sources. No such demonstration is made by Chemstar.

Further, the simple rollback determinations of emission reductions needed to achieve PM₁₀ compliance in the Paul Spur area is justified by the circumstances. Namely, an isolated emission source which under a nearly steady-state wind pattern creates a definitive source/receptor relationship. These circumstances not only justify a simple modeling method but also yields estimates with greater certainty than typically found in SIPs using sophisticated methods in more complex settings. There is no doubt that implementation of SIP controls will substantially reduce emissions and ambient PM₁₀. While all available information supports the Department's contention that a 51% reduction in plant emissions will result in attainment of the PM₁₀ NAAQS, this, like all SIPs, is not a guarantee.

Comment: The assumptions made in Section 5.0 regarding the contribution of Kiln No. 4 and associated equipment is in error. Earlier screen modeling by ADEQ to account for emissions from Kiln No. 4 and associated equipment on the design day was conducted assuming that windblown emissions from cleared areas and roads were 8.8 g/s. According to Table 5.2, maximum PM₁₀ emissions from these two sources are 178.07 g/s. Accordingly, using ADEQ's methodology as described in the SIP amendment, PM₁₀ emissions from Kiln No. 4 and its associated equipment have only a minor effect on concentrations at the North site monitor.

Response: This is not the case. Nowhere in the SIP are such figures used. Furthermore, attainment must be based on control of maximum potential emissions and not merely conditions that existed on the design day.

Comment: It is inappropriate to extrapolate production data from recent years to predict future levels. Review of production data since 1978 shows that customer demand has been cyclical, and does not support the trend suggested by Figure 7.1.

Response: The SIP must base emission reductions and continued attainment with the PM₁₀ NAAQS on the maximum production capacity of the Chemstar facility. Given this, the trend used in Figure 7.1 is both reasonable and necessary.

Comment: Chemstar's lime plant should be referred to as Chemstar's Douglas Plant.

Response: This correction will be made throughout the SIP.

Comment: The discussion of preconstruction review needs to be revised to account for the potential of new PM₁₀ sources locating in the Paul Spur area. Additional sources of PM₁₀ should not be allowed in the Paul Spur area.

Response: The Department is under no obligation to reserve the airshed for Chemstar. New sources locating in the Paul Spur area would be required to implement stringent controls, and may be required to negotiate offsets with Chemstar in order to locate in the Paul Spur area. The Department is obligated to prevent future violations of the PM₁₀ NAAQS in the Paul Spur area and will only allow new sources of PM₁₀ subject to State permitting requirements if it can be demonstrated that continued attainment is possible.

Comment: Section 10.0 needs to be rewritten to account for the location of new PM₁₀ sources in the Paul Spur area.

Response: This section of the SIP will be revised to account for new sources of PM₁₀ locating in the Paul Spur area.

Comment: The language proposed in the draft permit, in requiring operations to control emissions as efficiently as possible, imposes a requirement which is arbitrary, unachievable, and inconsistent ADEQ rules, and inconsistent with sound management and cost-effective operation.

Response: This language is identical to the language used in prior operating permits, and has never been objectionable in the past.

Comment: Requiring a 5% opacity limit on emissions from the damper seals is inconsistent with ADEQ's rules permitting up to 40% opacity. Further, the SIP permits up to 0.2 g/s. The permit condition should reflect this.

Response: A damper seal is not an allowable emission point, nor does it meet the definition of a fugitive emission (See A.A.C. 18-2-101.73). Therefore, the 40% opacity limit is not applicable. If the seal is functioning properly, there should be no emissions. The 0.2 g/s emission level in the SIP is not an allowable emission limit. EPA will only credit 80% control efficiency for the damper seals toward the attainment demonstration.

Comment: Minimum fall is not necessary for coarser materials because they do not contain fines. Also, using sleeves is not possible for material containing large stones.

Response: Unless coarser materials are washed before or during transfer, they will contain fines that will become airborne if minimum fall, sleeving, or other precautions are not employed. The requirement of minimum fall, or use of other precautions is consistent with ADEQ rules (R18-2-407). The words "so as to prevent particulate matter from becoming airborne" will be added to the subject permit conditions to provide further consistency with ADEQ rules, and to clarify the intent of the conditions. If

stacking and reclaiming machinery operates without causing particulate matter to become airborne, the condition is being satisfied.

Comment: One hundred and eighty days is not adequate time to design, secure all necessary permits for, acquire and install new equipment. Further, it does not allow time for DEQ to issue the necessary installation permit.

Response: The permit will be revised to require submission of an installation permit application within 30 days of operating permit issuance, and having the equipment on-line within 120 days of installation permit issuance. This is ample time for all of the modifications to the Chemstar Douglas Plant that will require installation permits from DEQ, including securing of all necessary permits issued by local jurisdictions.

Comment: The proposed SIP calls for PM₁₀ emissions from the Kiln No. 5 dust delivery system to be limited to 0.06 g/s. This conflicts with the permit condition that requires no visible emissions.

Response: The 0.06 g/s emission level in the SIP is not an allowable emission limit. EPA will only credit 80% control efficiency on this control toward the attainment demonstration.

Comment: The "no visible emissions" standard for the Kiln No. 4 and Kiln No. 5 dust collector systems is unachievable and inconsistent with A.A.C. R18-2-406.

Response: The permit will be revised to have emissions standards defined in the installation permits for this modifications to Kiln No. 4 and Kiln No. 5 dust collector systems.

Comment: Housekeeping requirements in Attachment A, Section X.G should be deleted because the installation of controls required in the permit will prevent the need for such procedures.

Response: Because years of fugitive dust accumulations exist throughout the plant site, housekeeping requirements are a necessary condition in the permit. Furthermore, fugitive dust accumulation cannot be totally prevented, no matter how well fugitive emissions are controlled. Thus, housekeeping requirements are both reasonable and necessary.

Comment: Requiring Chemstar to maintain two water trucks for control of emissions on unpaved areas in the plant may not accomplish the necessary level of control and is probably not cost effective. The permit condition should require a performance standard of 60% reduction in emissions from these areas, and allow Chemstar the flexibility to choose the number of water trucks necessary.

Response: The permit will be revised accordingly.

Comment: Attachment A, Section X.J of the proposed operating permit should be revised to read:

"After adoption of the foregoing conditions by the U.S. Environmental Protection Agency (EPA) as part of the State Implementation Plan (SIP), any modifications or amendments to such conditions shall not become effective until adopted by the EPA as an amendment to the SIP."

Response: The proposed wording was prepared in consultation with EPA and Department legal counsel in order to be approvable by EPA. The wording of this section will remain as proposed.

Comment: The proposed limits in Attachment C for NO_x, SO₂ and CO from the stacks for Kilns 4 and 5 should be deleted because they are arbitrary and ignore applicable rulemaking requirements.

Response: A.R.S. § 49-426.E. authorizes the Director to put conditions on operating permits that are consistent with Clean Air Act requirements and are found to be necessary. The pollutants, NO_x, SO₂ and CO are "criteria" pollutants regulated under the Clean Air Act and subject to regulation under the State's prevention of significant deterioration program. All emission limits cannot be subject to rulemaking because most of them are determined on a facility-specific basis.

Comment: The emission limits in Attachment C of the proposed permit are not appropriate for the Chemstar Douglas Plant. Appropriate emission limits are:

	<u>NOx</u>		<u>SO2</u>		<u>CO</u>	
	#/hr	T/Yr	#/hr	T/Yr	#/hr	T/Yr
Kiln 5 Stack	62	262	174.6	765	45	197
Kiln 4 Stack	116	508	338.4	1482	83	363

Response: The above emission rates are erroneous given they were not calculated in accordance with AP-42 procedures.

Comment: Attachment D should be revised to eliminate the public "Border Road" as a road which is subject to control of particulates by Chemstar.

Response: The permit and SIP will be revised accordingly.