TABLE OF CONTENTS

SECTION I
(Public Hearing Package)

	PAGE
INTRODUCTION	1
Map of Plant Locations and Monitoring Sites	3
Table of Measured Concentrations for Area	4
Model Description	5
Analysis	13 - 141
Allied Chemical	13
Process Stack Emissions	16
Point Source Concentrations	26
Fugitive Emissions	28
Isopleth Map of Non-Attainment Area	29
Isopleth Map with Proposed Reductions	30 A
Analysis for 24 hour Standard	30 B
Church & Dwight	31
Process Stack Emissions	33
FMC	34
Process Stack Emissions	36
Fugitive Dust Summary	43 & 47
Point Source Concentrations	55
Isopleth Map Showing Non-Attainment Area	58
Isopleth Map with Proposed Reductions	64
Analysis for 24 hour Standard	64 A
Stauffer Chemical	66
Process Stack Emissions	68 - 75
Fugitive Dust Emissions	76 - 77
Map of Point Source Concentrations	93
Isopleth Map Showing Non-Attainment Area	100
Isopleth Map with Proposed Reductions	105
Analysis for 24 hour Standard	105 A
Texasfulf	107
Process Stack Emissions	118
Fugitive Dust Emissions	119
Map of Point Source Concentrations	133
Map of Point & Fugitive Dust Concentrations	135
Isopleth Map of Point & Fugitive Concentrations	136
Map of Point and Area Source Projection for 100% Capacity	138
Monitoring Requirements	141
Proposed Regulations	142
Addendum	150
Comments on 1st Draft of Plan	151
Company Submitted Compliance Schedules	193
Revised Proposed Regulations	214

(Cont.)

TABLE OF CONTENTS

SECTION II

	PAGE
COMPANY COMMENTS	
Allied Chemical	222
FMC	248
Stauffer	288
Texasgulf	297
AIR QUALITY DIVISION SUPPLEMENTAL ANALYSIS	300
Allied Chemical	301
Adjusted Point Source Allowables	303 & 304
Final Isopleth Map for Attainment	311
Church & Dwight	301
Adjusted Point Source Allowables	305
FMC	301
Adjusted Point Source Allowables	306 & 307
Final Isopleth Map for Attainment	312
Stauffer Chemical	301 & 302
Adjusted Point Source Allowables	308 - 310
Final Isopleth Map for Attainment	313
REASONABLE FURTHER PROGRESS SUMMARY	314

WYOMING 1979 IMPLEMENTATION PLAN
FOR
SWEETWATER COUNTY NON-ATTAINMENT AREA

Introduction

Part D of the Clean Air Act as amended in August of 1977 requires the demonstration of attainment of air quality standards (primary and secondary) as expeditiously as practical, but in the case of the national primary standards not later than December 31, 1982.

On December 2, 1977, and pursuant to Section 107(d) of these requirements, the State advised the U.S. EPA that based on data from industry operated monitors, portions of the Trona Industrial Area of Sweetwater County were in non-compliance with the National Ambient Air Quality Standards for particulate matter. Table 2 of this section summarizes measured particulate values collected in this area for the period 1974-1977. Figure 1 shows locations of individual monitors for each of the facilities in the area of concern. The National Primary Standard for particulates is 75 $\mu g/m^3$ and the secondary standard is 60 $\mu g/m^3$. Wyoming's standard is 60 $\mu g/m^3$. These standards are annual geometric means.

Certain provisions of Section 110 of the Act and Part D - Plan Requirements for Non-Attainment Areas, require the State to develop an Implementation Plan Revision which will provide for attainment and maintenance of the Standards and submit the required "attainment plan" to EPA by January 1, 1979.

Wyoming's plan which follows this section is separated into three major portions - diffusion model description, an analysis section, and proposed regulations.

The major portion of the proposed plan will address the attainment and maintenance of the National Secondary Standard of 60 $\mu g/m^3$ annual geometric mean since this is Wyoming's standard for an annual ambient particulate concentration. The Division has also addressed attainment of the 24 hour national standard (260 $\mu g/m^3$) and secondary standard (150 $\mu g/m^3$) in a brief analysis following

the annual analysis for each facility for which violations of the 24 hour standard were measured.

Initially, the Division reasoned that there was sufficient cause to restrict the analysis to only the long term averages as measured violations at subject facilities are due for the most part to fugitive dust emissions. EPA's Guideline for Development of Control Strategies in Areas with Fugitive Dust Problems (OAQPS No. 1.2-071) page 4-1&2 states "A second reason for restricting the scope of the model to long-term considerations concerns the uncertainties associated with data base. Uncertainties are introduced at several stages of the air monitoring measurements, the emissions inventory compilation, and model formulation. The analytical limitations associated with the detailed documentation of short term particulate origins and their relationship to air quality levels would increase the uncertainties greatly, making the substantial additional effort needed for this task impractical and unwarranted at this time." Subsequent to the initial draft plan, EPA Region VIII has informed the Division that violations of the 24 hour standard must be addressed and suggested use of a proportional rollback model. The Division has applied this technique with reservations as to its usefulness and applicability. The one ingredient that is necessary for a rollback model on a short term basis is an accurate emissions inventory for the 24 hour period which is neither available for the point sources or fugitive dust sources in terms of worst case emissions.

The technique to be used throughout the annual analysis portion of the plan is to utilize best available emissions data (both stack and fugitive emissions) coupled with appropriate meteorological data for input into an appropriate dispersion model. A base year is selected for analysis which in this case is the year 1977. To determine a cause-effect relationship, plant stack emissions and fugitive dust emissions are modeled separately and compared to measured concentrations.

When model concentrations compare favorably with measured concentrations the model is assumed to be calibrated and to represent a reasonable picture of the

actual situation. If a non-attainment area exists (concentrations in excess of 60 $\mu g/m^3$), then reasonable achievable reductions in emissions are calculated and the model rerun until the non-attainment area is reduced to essentially the confines of the facility.

The non-attainment plan will address, as previously mentioned, the trona industrial area of Sweetwater County. This area as depicted in Figure 1 encompasses about 150 square miles and consists of four major facilities which mine trona from extensive underground mines and refine the ore to produce soda ash. Church and Dwight operate a sodium bicarbonate plant adjacent to Allied Chemical's Soda Ash Facility. Although particulate emissions from this facility are relatively minor in comparison to the larger plants, emissions data were used in the analysis for Allied Chemical.

Fig 1
Trona Industrial Area
Particulate Monitoring Network

TABLE

TOTAL SUSPENDED PARTICULATES - MEANS
($\mu g/m^3$)

Company	Hi-Vol I.D.	1977		1976		1975		1974	
		Arithmetic	Geometric	Arithmetic	Geometric	Arithmetic	Geometric	Arithmetic	Geometric
Allied Chemical	Pos. I	52	44	57	52	142	94	133	124
	Pos. II	40	35	40	37	58	49	134	-(1)-
	Pos. III	32	26	43	36	101[1]	-(1)-	57	49
	Pos. IV	36	29	49	37	50	-32-	68	57
	Pos. V	38	33	41	36	-(1)-	-(1)-		-(2)-
FMC	002	31	25	33	28	33	28	43[3]	35[3]
	003	262	229	290	250	272	232	274[3]	206[3]
	004	156	138	172	154	159	130	160[3]	133[3]
	005	64	51	78	62	74	56	80[3]	59[3]
	815	37	34						
	816	28	24						
Stauffer	1	265	209	218	156				
	2	29	25	27	23				
	3	24	22	27	23				
	4	36	33						
Texasgulf	1	23	21	22	20	18	16	24	21
	2	24	21	26	21	20	18	22	20
	3	24	21	23	20	20	17	24	22
	4	23	17	25	23	23	20	29	26

[1] Insufficient Data.
[2] Hi-Vol Inoperative.
[3] One Quarter's Data.

Model Description

The atmospheric dispersion model selected by the Division for the non-attainment analysis was the Climatological Dispersion Model (CDM). A description of the CDM model taken from "Interim Guideline on Air Quality Models", EPA Guideline Series, QAQPS No. 1.2-080 is attached in Appendix A of this section.

The model as described in Appendix A is applicable for urban areas only. The Division has made changes in the model to simulate dispersion in a rural area. These changes were made in the use of the vertical dispersion function in the program and in the association of the vertical disperson function to stability class.

The joint frequency function gives the joint frequency of occurrence of a wind direction sector, a wind speed class and a stability category. The joint frequency distribution is input to the model by means of the STAR program for Rock Springs 1971-1975 obtained from the National Climatic Center. The stability class as defined by Pasquill-Gifford is as follows:

Stability	Definition
A	Extremely unstable
B	Unstable
C	Slightly unstable
D	Neutral
E	Slightly stable
F	Stable

Vertical dispersion parameters have been developed to approximate atmospheric dispersion for each stability category. The model as received used the following stability categories and associated the listed dispersion functions with the stability categories for point and area sources.

CDM Stability Class	Pasquill Gifford Stability Class	Class of Dispersion Function Assigned by CDM	
		Point Sources	Area Sources
A	A	A	A
B	B	B	A
C	C	C	B
D-Day	D	D	C
D-Night	D	D	D
E	E&F	D	D

The result of the assigned dispersion function in the model as received was that the model never approximated diffusion under stable conditions for either point or area sources. The Division changed the assignment of the dispersion function to reflect that of the actual stability input. The change allowed the model to approximate diffusion under stable conditions. The Division also inputs the straight 6 class stability distribution rather than the Day-Night-Star.

As a result of the above modification the assignment of mixing heights was changed. The model input requires a maximum and minimum mixing height. The program then assigns the mixing heights as follows:

Stability Class	Mixing Height
A	1.5 H max.
B	H max.
C	H max.
D-Day	(H max + H min)/2
D-Night	H min.
E	H min.

The Division's changes resulted in the following assignment.

Stability Class	Mixing Height
A	1.5 H max.
B	H max.
C	H max.
D	(H max + H min)/2
E	H max.
F	H min.

The Division feels that the modification in the assignment of the vertical dispersion parameter allows the use of the model to approximate diffusion in a rural area.

Specific changes in the model program were made as follows:

1. The Data G array was expanded to include all of the vertical dispersion parameters listed in the original CDM users manual, Page 8.

2. The ICA and ICP arrays were changed as follows:

original ICA - 1, 1, 2, 3, 4, 4
modified ICA - 1, 2, 3, 4, 5, 6

original ICP - 1, 2, 3, 4, 4, 4
modified ICP - 1, 2, 3, 4, 5, 6

3. The mixing heights were changed as described on the previous page.

4. Other minor modifications were made in the model programming for convenience and did not affect the actual dispersion calculations.

STATE OF WYOMING

NON-ATTAINMENT PLAN

Reasonable Further Progress Summary

ALLIED CHEMICAL

Point Source Emissions Total	1798	TPY
Fugitive Dust Emissions Total	445	
Total Emissions Base Year (1977)	2243	

SOURCE	COMPLIANCE DATE	BASE YEAR EMISSIONS (ton/yr)	EMISSIONS REDUCTION (ton/yr)	REDUCED TOTAL (ton/
Equipment Movement	6/79	117	5	2238
Unpaved Roads	12/80	28.5	23	2215
Distressed Area	12/81	271.6	136	2079
Coal Stockpile	1/83	28.5	29	2050

FMC

Point Source Emissions Total	2219	TPY
Fugitive Dust Emissions Total	1419	
Total Emissions Base Year (1977)	3638.0	

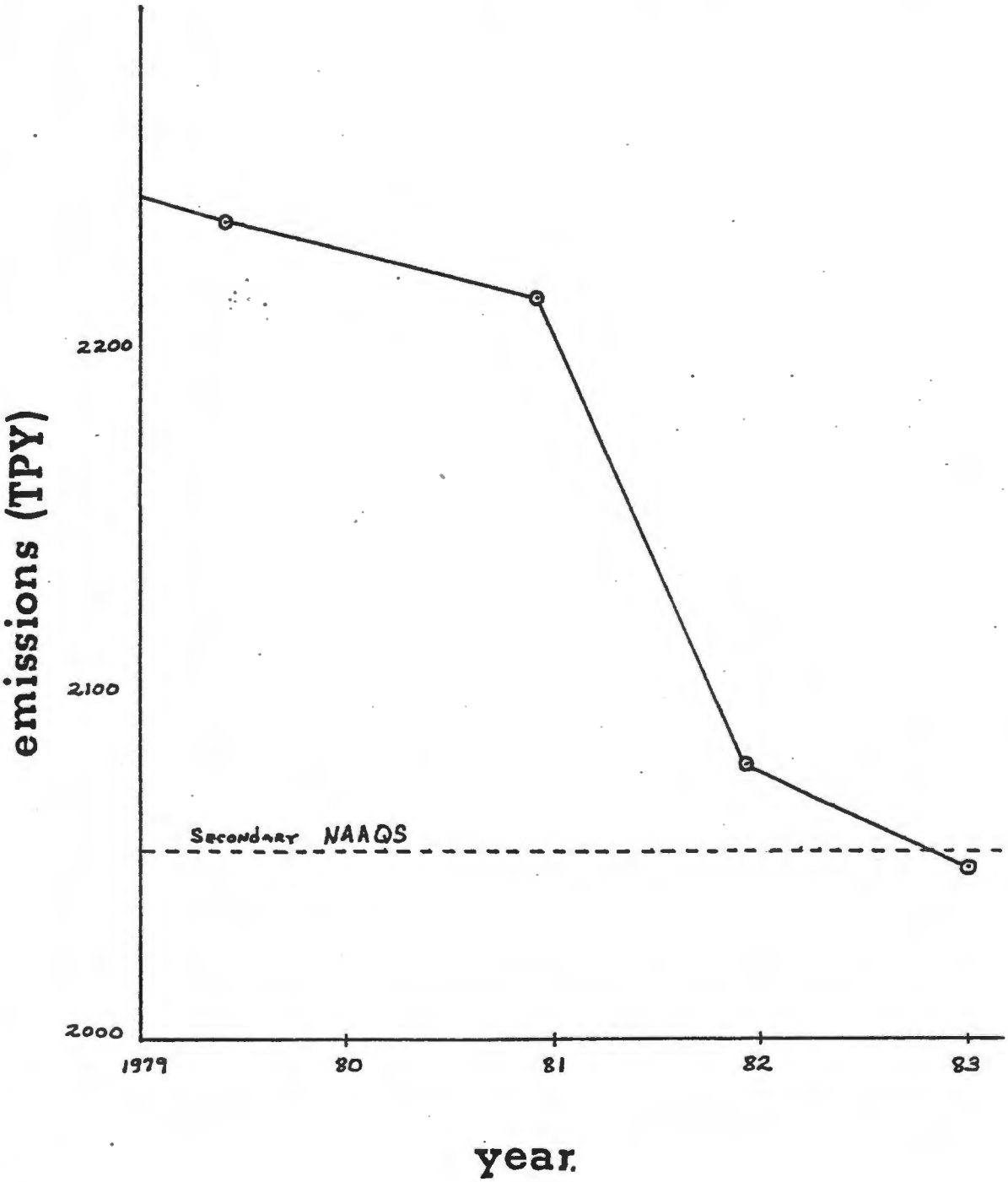
SOURCE	COMPLIANCE DATE	BASE YEAR EMISSIONS (ton/yr)	EMISSIONS REDUCTION (ton/yr)	REDUCED TOTAL (ton/
Over Flow Chutes	10/80			
Unpaved Roads	10/80	228	171	3467
Sesqui Ore Stockpile	1/81	175	96	3371
Mono Ore Stockpile	4/81	517	284	3087
Coal Stockpile	1/82	381	381	2706
Loadout Facilities	7/82	118	106	2600

STAUFFER

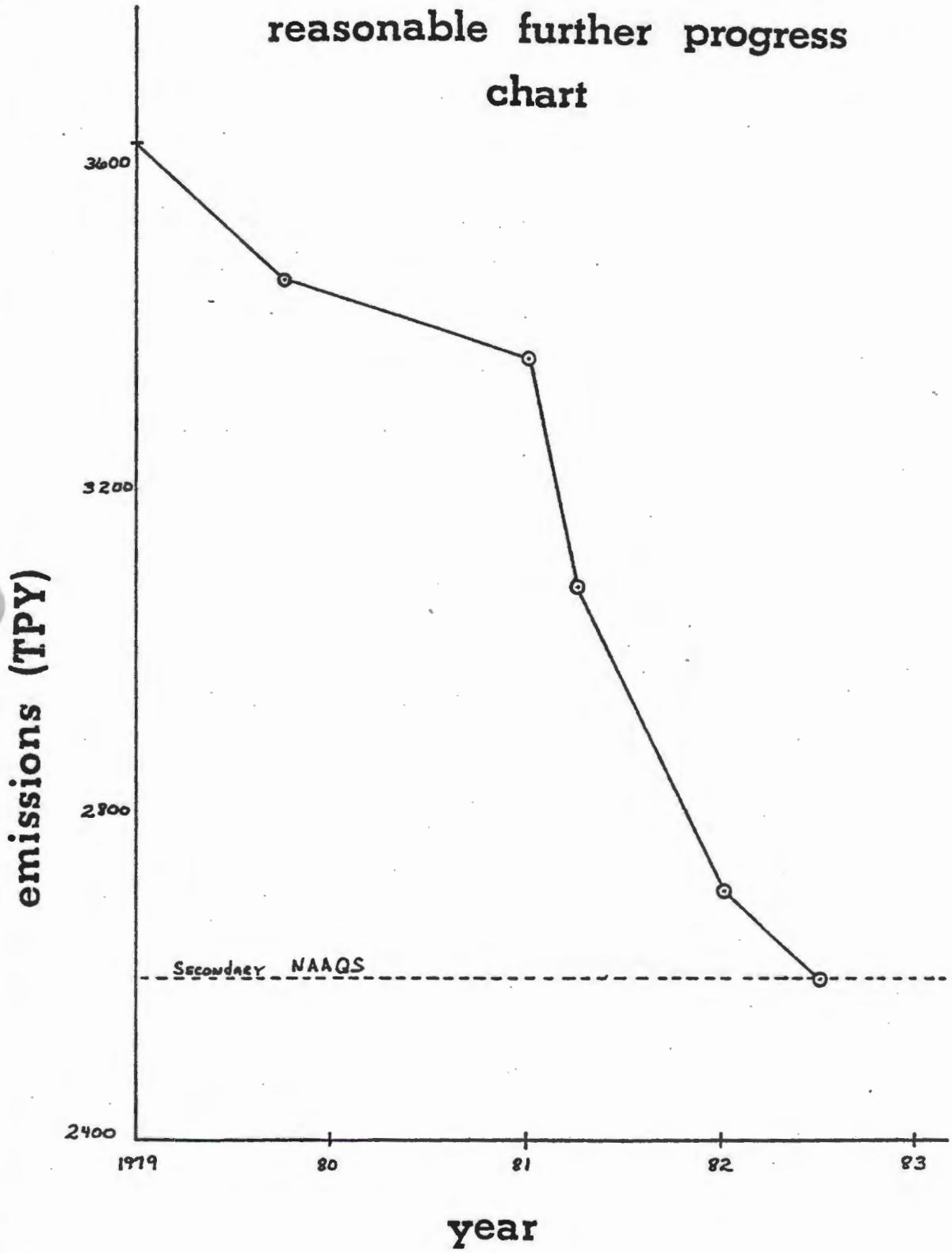
Point Source Emissions Total	1179	TPY
Fugitive Dust Emissions Total	1799	
Total Emissions Base Year (1977)	2978	

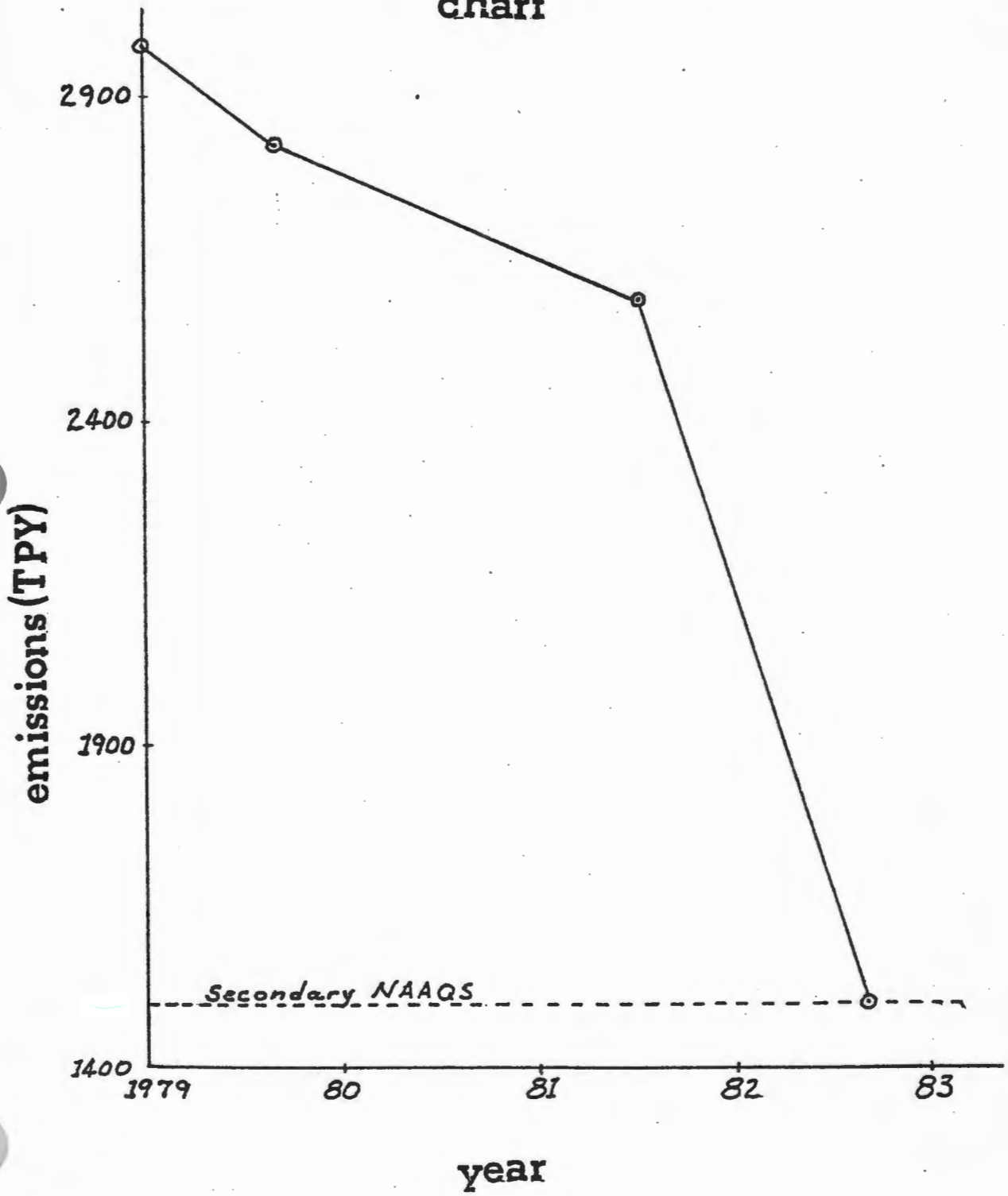
SOURCE	COMPLIANCE DATE	BASE YEAR EMISSIONS (ton/yr)	EMISSIONS REDUCTION (ton/yr)	REDUCED TOTAL (ton/y
Overflow Chutes	3/79			
[illegible]tressed Area	9/79	154	154	2824
[illegible] Stockpile	7/81	428	232	2592
Product Loadout	9/82	374	336	2256
Product Handling & Stor.	9/82	197	177	2079
Crusher Area	9/82	646	581	1498

ALLIED CHEMICAL
reasonable further progress chart



FMC
reasonable further progress chart



STAUFFER CHEMICAL

reasonable further Progress chart